Conserving Strigiformes: The Bigger Picture

Abstracts

ARE NORTH-EUROPEAN PREDATORS OF VOLES THREATENED BY DECLINING PREY POPULATIONS?

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Monitoring of cyclic small mammal populations forms part of the Swedish National Environmental Monitoring Programme (NEMP). Basic aims of the NEMP are to give an "early warning" of any environmental disturbances and to indicate biological diversity. Voles and lemmings are a staple food of many northern predators and govern their reproduction and population cycles. Monitoring the main prey populations provides an indirect general insight on the potential status of these predators and the biological diversity they represent. We have snap-trapped small mammals at the landscape scale near Umeå in boreal Sweden since 1971. This has revealed an unexpected long-term decline of the vole populations, as has also been observed elsewhere at northern European latitudes. In a parallel study of the vole-eating Tengmalm's Owl (***Aegolius funereus***), we have also observed a long-term decline, and the population is now around 75% lower than the peak level at the start in the early 1980's and has remained at a fairly stable level for the last 5-6 years. We conclude that several other specialist predators have probably also declined in a similar way, and that scarcity of food is a new threat that must be accounted for in any conservation efforts towards these predators.

Tawny owls and their habitat: are lessons from habitat-population-relationships of a common species applicable to the dynamics of the rare ones?

Peter Sunde

The densities, dynamics and persistence of owl populations depend on the availability and dispersion of habitats of sufficient quality that enable reproductive rates to outweigh mortality

rates. Indices of habitat quality can be established on the basis of correlations between certain habitat features and the probability of presence or measures of reproductive success. But how well do we really understand the intricate interactions between resource availability, natural and artificial mortality agents and natural behaviour (reduced population growth rates due to territorial behaviour, unwillingness of juveniles to disperse far away from natal areas or skewed sex ratios)?
Rare or threatened populations are often hard to study. To learn more about the general dynamics of populations in marginal habitats one could instead study the responses of otherwise abundant species across environmental gradients ranging from suitable to unsuitable habitats. The tawny owl is one of the most common and easily studied owl species in Europe. It may therefore serve as subject for investigating how habitat quality, landscape heterogeneity and the presence of mortality agents (natural enemies as well as human caused factors) influence the performance of individuals and populations.
In the talk, I will summarise results of studies on spatial behaviour and population dynamics of tawny owls in relation to environmental variation and habitat heterogeneity in Norway, UK and particularly Denmark. Given the premise that the main difference between threatened and non-threatened populations is that the former have experienced a higher level of habitat degradation than the latter, I argue that widespread and abundant species may serve as good models to help us understand how habitat (***sensu lato***) influence individuals and populations.

Little Owl conservation in a strongly diminished and isolated population.

Since the mid 70's the Little Owl population in the northern part of the Netherlands has strongly declined and fragmented.
Monitoring the population in the last decade, the Little Owl working group Groningen did research on the possible causes of its decrease. Changes in habitat and isolation characteristics were measured as well as differences between occupied and abandoned territories. Furthermore, food composition was studied and habitat quality quantified. Thanks to government subsidies, the working group managed to improve the habitat quality in the areas where the last remaining populations live. Landscape restoration was the instrument most used. The protection measurements were very successful, but could not change the negative trend of the Little Owl population on the short term.
Can we prevent the Little Owl from distinguishing in intensively used agricultural landscapes? And what more do we need to do to achieve that goal?

Jan van 't Hoff,
Chairman of the Little Owl working group Groningen

The role of industry and local communities in Long-eared Owl Conservation.
Chris Sperring, Hawk and Owl Trust

In the UK, the Long-eared Owl, ***Asio otus***, is estimated to have declined by around 50% between 1950 and 1997. The secretive nature of this species has resulted in their being overlooked by both bird recorders and conservationists. The number of breeding pairs is

currently thought to be around 2000 and yet it is offered no special protection. The Long-eared Owl Conservation Project makes use of public knowledge in order to improve our understanding of Long-eared Owl distribution and habitat utilisation. There is a particular focus on education and involvement of local communities. Because of the bird's common association with commercial forest plantations, we also assist in producing management plans with foresters in order to improve habitat opportunities while not impeding the commercial activities on the site.

Barn Owls and Major Roads

David Ramsden, Barn Owl Trust

The study objective was to determine the effects of roads on Barn Owl populations and make appropriate recommendations. Barn Owl ***Tyto alba*** has declined significantly and at the same time the proportion of recorded deaths attributed to road traffic has increased dramatically. However, the relative importance of road deaths as a cause of population decline was unknown. The study included a literature review and various investigations using extensive Barn Owl datasets (live bird sightings, casualties, nesting, roosting, ringing and recoveries) accumulated by the Barn Owl Trust over a 15-year period in SW England. Live sightings were mainly on minor roads and casualties mainly on major roads. Most individuals that encountered a major road were killed by traffic very quickly. Major roads caused localised declines soon after construction and ongoing mortality resulted in the absence of local resident birds. Most road casualties were juvenile birds that should have survived rather than birds which were likely to die anyway. Major roads acted as partial barriers to Barn Owl dispersal and it is suggested that the major road network is a cause of wider population decline. The study provided the UK government with road design recommendations aimed at reducing major road mortality.

Barn Owl Productivity and Conservation in an Upland, Pastoral Environment

Jenny Holden. World Owl Trust

Following intensive work by conservation groups, the white-breasted barn owl ***Tyto alba alba*** has made a good recovery in the UK and its range is expanding. In Cumbria, North West England, barn owls are now found to be occupying habitats that are apparently sub-optimal and outside their normal range. Analysis of pellets from nest sites both in these areas and areas of optimal foraging have revealed significant differences in the proportions of prey species taken. In the past fluctuations in barn owl populations have been found to be correlated with vole cycles and they are frequently described as being a specialist hunter for this prey type. This study examines the energetic importance of ***Microtus agrestis*** to barn owl populations by correlating the percentage found in the diet with the success of a breeding pair, in terms of number of chicks fledged, in an attempt to evaluate the viability of these "out-lying" populations.

Revision of applied barn owl (Tyto alba) conservation in Hungary: Is exterior nest box provisioning the most effective method protecting barn owls?

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The widely applied method of barn owl (Tyto alba) conservation in Europe is the placement of exterior nest boxes in church towers. Despite the usefulness of nest boxes, there are several studies showing that artificial nest site supplements can have many disadvantages. The main objective of the present study was to elucidate whether the type of nest-site provisioning (nest box vs. open church tower) causes any difference in survival of the barn owl. We used survival time analysis (STA), which elucidated that owlets developing in nest boxes had significantly lower survival than those hatched in church towers. This difference was remarkable after the parent dependent period of the life history. Since barn owl conservation largely depends on the support of building owners, we verified the conservational force of our findings with a survey of churchmen's attitude, which showed that 63% of the questioned people supported the reopening of the church against nest box installation. Based on these results we offer some alternative methods (e.g. partial reopening), which may better meet both the owls' and churchmen' requirements. We recommend similar revision of other endangered species to get feedback on the methods, whether any modifications are needed.

DNA STUDIES OF OWLS:PHYLOGENY, PHYLOGEOGRAPHY AND POPULATIONS

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The application of DNA markers has widely helped to study owl genetics. We have started to reconstruct a complete phylogeny of owls by sequencing mitochondrial and nuclear marker genes, such as cytochrome b and RAG1. Furthermore we use genomic fingerprinting by ISSR analysis to discover variation at the nuclear DNA level. Using these markers we can already now design a new systematics of owls that will explain the genetic relationships between owl genera and will change the names of a few taxa. For example, the former genera ***Nyctea, Ketupa*** and ***Scotopelia*** are imbedded with the ***Bubo*** complex thus making Bubo a paraphyletic taxon. As a consequence we suggest to merge these genera with ***Bubo***. Since owls are rather resident species, we can discover a pronounced phylogeographic pattern in most widely distributed species. That means that we have specific genetic lineages in many parts of the distribution area; an important fact when birds are acquired from the wild for breeding programs. This topic will be illustrated using example from ***Bubo bubo, Athene noctua*** and ***Tyto alba***.

Floater dispersal dynamics and survival affects breeding population persistence: a case study with the eagle owl

Vincenzo Penteriani

The temporary settling zones used during dispersal by non-breeders are usually unknown for most species and the dynamics of dispersers within them poorly

studied. Therefore, the effects of habitat loss, mortality rates, extinction probability and environmental stochasticity have been considered as less important or ignored for settlement areas. As a consequence, such sites are typically less protected than breeding territories, which may lead to increased risk of mortality for dispersing individuals. As a result, habitat destruction and decline in survival rates within settlement areas could be critical factors affecting the persistence of the whole population. We previously showed that: (1) factors affecting floater survival influence the dynamics of the breeding segments of populations; and (2) increases in floater mortality can explain puzzling decreases or extinctions of breeding populations. Continuous radiotracking of 50 juveniles of Eagle Owl (Bubo bubo) during three years allow us to show now that specific dispersal patterns can be responsible of low occupancy rates of breeding territories affected by stochastic mortality of breeders. Moreover, because many floaters can share the same settlement area during dispersal, environmental stochasticity within settling zone may seriously reduce the available stocks of new mates able to occupy vacancies in breeding areas.