

The Future of Pollinators?

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The current status of pollinators in Europe is just now beginning to be understood at a continental level, as revealed by ALARM. Severe declines in managed honeybees are reported throughout Europe (Chapter 7, Potts et al.) and the indications are that this trend is set to continue unless concerted efforts are made to improve honeybee health and reduce the risks of new pests and diseases. While Colony Collapse Disorder (CCD), as documented in the USA, is not formally recognised in Europe, the loss of managed honeybees is so widespread that the likelihood of a catastrophic collapse of honeybee populations is no longer a highly improbable event. Lessons can, and should, be learnt from North America, where recent chronic losses of honeybees through CCD have had major negative impacts on the availability of managed pollination services for the multi-billion dollar almond industry. Indeed, this underlines the well established ecological principle that reliance on a single species to deliver an ecosystem services is a high risk strategy. In contrast, the availability of a diverse community of pollinators provides ‘insurance’ should environmental stressors remove one or more species, the chance is that the remaining species can still deliver pollination as a service.

The wild pollinators of Europe, however, are also under increasing threat, and many taxa such as bumblebees, solitary bees and hoverflies are also declining at a worrying rate (Biesmeijer et al. 2006). ALARM, for the first time, has quantified the extent of these losses at the national (UK and Holland) and local level, but the next step is to extend this assessment to other countries and regions. Further, we need to know specifically which pollinators, and in which regions, declines are occurring, and what are the life history traits which make these species more sensitive to drivers of loss. ALARM has established a standardised set of tools to assist in further assessing the status of pollinator communities throughout Europe and beyond (Chapter 7, Westphal et al.), but to understand more fully the condition of Europe’s pollinators we need to develop a monitoring framework which can detect changes and set a baseline for future comparisons to be made. The sound platform built by ALARM will underpin the STEP project (Status and Trends of European Pollinators, www.step-project.net) which tackles these, and many other, key challenges. STEP will produce the first ever continental Red List for bees which will act as a guide to direct policy to support conservation activities targeted at particular species; STEP will also develop a framework to monitor both pollinators and pollination services throughout Europe.

The drivers responsible for the observed declines in pollinators are diverse, and ALARM has provided clear indications that climate change (Chapter 3), environmental chemicals such as pesticides (Chapter 9, Barmaz et al.), invasive plants (Chapter 9, Vilà et al.) and pathogens (Chapter 9, Szentgyörgyi et al.) may all be important risks for pollinators. There are many remaining questions to address about the drivers of loss, and ALARM has set out some of the major issues for future research, such as quantifying the relative importance of the drivers of change and predicting future changes so that policy can respond appropriately. From this jumping off point, STEP will investigate the interaction of drivers to better understand how the sub-lethal effect of one driver makes pollinators much more vulnerable to a second (or even third) driver. STEP will also help us understand how drivers operate at different spatial and temporal scales from short-term effects at the individual species and habitat scale (e.g. pesticides) through to long-term drivers at the continental scale (e.g. climate change).

Given the documented declines in pollinators, ALARM has also highlighted the potential consequences of pollinator losses for the delivery of pollination services for both crops (Chapter 8, Gallai et al.) and wild flowers (Chapter 7, Nielsen et al.). While pollination services to crop production in Europe is estimated to be € 22 billion per year this valuation does not take into account many other additional benefits such as: (i) those fruits and vegetables grown in small scale gardens

and allotments that are directly consumed without passing through a market; (ii) the contribution of pollination to forage crops which are an important part of the diet of cattle and therefore help support the meat and dairy industry; (iii) the role of seeds and fruits from wildflowers which support birds, mammals, insects and other wildlife; (iv) the critical need for healthy wild plant communities which support other ecosystem services such as soil fertility, flood protection, water purification and contribute to the cultural and aesthetic value of flower meadows and amenity parks. ALARM has set the stage and identified these additional values and STEP will build on this to quantify them.

Pollinator losses have occurred, and will continue to occur, without concerted interventions. Europe has the best established network of protected areas, the Natura 2000 network, in the world and these many thousands of interlinked sites can provide good quality habitats for pollinators and also connectivity to potentially allow pollinators to move through the landscape under global change. However, this is not enough on its own, as Natura 2000 presents only a small fraction of the total terrestrial area of Europe, and the quality of sites and degree of connectivity can still be significantly improved for pollinators. Much of the remaining landscape in Europe is under various forms and agriculture and this is where many pollinators (and other components of biodiversity) are found. Agri-environment schemes are a widespread and potentially effective instrument to introduce pollinator friendly habitats into the farmed environment. Several countries already have scheme options targeted towards pollinators but there is still considerable scope to expand this, and coordinate the spatial allocation of options to improve the connectivity of the wider landscape. Other major land cover types, such as forest and urban areas, can also be managed to safeguard pollinators, but currently there are few policies and mechanisms specifically aiming to do this. ALARM has outlined this need and STEP will pick up the baton and run to identify policies and management practices which cover protected and managed areas of Europe to better adapt existing policies to help pollinators and also suggest new policies which will be effective under global change.

As national governments and the European Commission begin to more widely adopt the ‘Ecosystems Approach’, they will need to increasingly consider the role of ecosystem services derived from biodiversity in their policies. Pollination is one such service with wide ranging benefits to society. Core to the adoption and implementation of the Ecosystems Approach will be a more holistic move towards policy-making and delivery, with the focus on maintaining healthy ecosystems and ecosystem services such as pollination. Further, the value of pollination and other services will need to be better reflected in decision-making at the appropriate spatial scale and include the application of adaptive management of the natural environment to respond to changing pressures, including climate change. Demands on European landscapes are increasing with the need to meet food security, biodiversity conservation and ecosystem management goals, and pollination will also be a key part of these considerations.

The next few decades will see many manifestations of environmental change for much of Europe’s biodiversity (Chapter 9). Only now we are starting to understand how loss of biodiversity impacts on ecosystem function, and ultimately on the livelihoods dependent upon these ecosystem services. Pollinators play a key role in the maintenance of ecosystem integrity and the protection of pollinator communities and sustainable management of pollination services requires a clear understanding of the causes of pollinator loss and identification of appropriate interventions to mitigate against losses. ALARM has helped set the agenda for pollinators by identifying key risks, and the new challenge is to develop future research programmes, such as STEP, to provide evidence for how best to manage these risks in the future – in Europe and beyond!