Monitoring breeding bird populations as a tool in conservation and management: a first step towards an integrated system

Anny Anselin & Koen Devos

Institute of Nature Conservation, Kliniekstraat 25, B-1070 Brussels, Belgium

One objective of bird population monitoring is to use the information on birds to monitor changes in the environment, so that the environment itself may be managed. By managing we understand not only direct actions as certain habitat improvements but also political processes necessary to advance such actions.

However, we have to determine thresholds for conservation action and distinguish natural from man-made causes. This means we need to have an understanding of the processes that lead to the population levels we observe, not just a knowledge of the levels themselves. For birds, knowledge of reproduction, mortality, emigration and immigration, and how they are affected by the environment and by population density, is central to building population models on which sound management can be based.

As a first step, a project was started in 1994 to census a number of breeding bird species in Flanders (Belgium) in a standardised way on a yearly basis. The project is co-ordinated by the Institute of Nature Conservation (Ministry of the Flemish Community) and Vlavico (an organisation of volunteer field ornithologists). Target species include all colonial breeders, rare breeding species (less than 150-200 pairs in Flanders) and all exotic species. The results of the 1994, 1995 and 1996 census campaigns are briefly presented and compared with population numbers in former decades. One of the most striking trends is the steady decrease of birds of reed beds and marshes. Numbers of Bittern (*Botaurus stellaris*), Little Bittern (*Ixobrychus minutus*) and Savi’s Warbler (*Locustella luscinioides*) reach critical levels. Many farmland species like e.g. Whinchat (*Saxicola rubetra*) and Garganey (*Anas querquedula*) show a long-term decline, while woodland species in general do well. Most exotic species show a strong increase.

The present-day project provides important data on population levels of breeding birds in Flanders. Even without a full understanding of all the underlying causes, this basic information can focus on certain problems and be used for certain management actions, which are briefly described.
Finally, the way in which the project could be developed into a more integrated monitoring system in Flanders is discussed. Information provided by scientific bird ringing is one hitherto relatively unexplored datasource. Increasing the number of target species and setting up specific standardised ringing schemes are other means to enlarge our knowledge of the processes determining population levels.

The use of transgenic plants in morphological research

Tom Beeckman
Vakgroep Biologie, Laboratorium Plantkunde, Universiteit Gent, K.L. Ledeganckstraat 35, 9000 Gent

Recently, the exploitation of genetic systems in model plants such as Arabidopsis and maize has led to the isolation of several genes that play major roles in important morphogenetic plant processes such as flowering, embryogenesis and regulation of the cell division cycle.

The production of transgenic plants makes it possible to use such genes as markers for a given process under different experimental conditions. For instance, the promoter of the gene of interest can be fused to the GUS-gene from Escherichia coli, encoding the β-glucuronidase or GUS enzyme and introduced by transformation in the plant. In cells and/or tissues where the promoter is switched on, the GUS-enzyme is produced. In a histochemical assay a colourless substrate, X-gluc, is applied and a blue precipitate will be localised, under appropriate conditions, in cells with GUS-activity.

From the moment transgenic plants containing promoter-GUS fusions with genes playing important roles in morphogenetic processes are available, the GUS-reporter system becomes an easy tool to analyse these processes during plant development.

In our study, we took advantage of the availability of promoter-GUS fusions of cell cycle genes to investigate the formation of endogenous meristems such as adventitious and lateral roots in Arabidopsis under different experimental conditions. The promoter-GUS fusion of the cycB1;1 gene can be used as a good marker for cells that have just entered mito-