

## THE IMPORTANCE OF INDICATORS

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Readers of *BTO News* will have seen 'indicators' mentioned in many previous articles. BTO staff members are involved in several very different pieces of research that involve 'indicators' and here they explain how indicators are being used in three of them.

### LA IMPORTANCIA DE LOS INDICADORES

Los lectores del *BTO News* han visto la palabra "indicadores" mencionada en muchos artículos anteriores. Miembros del BTO participan en distintos tipos de investigación que incluyen "indicadores" y aquí explican cómo se usan los indicadores en tres de ellos.

### BIRDS INDICATE THE CONDITION OF OUR COUNTRYSIDE

One of the dictionary definitions of indicator is 'a device indicating the condition of a machine etc' says **David Noble**, Head of the Census Unit. As most dedicated surveyors contributing to projects such as BTO /JNC/RSPB Breeding Bird Survey (BBS) know, population trends based on various surveys are annually assembled into composite wild bird indicators. Comprising the average trend for a suite of species associated with particular landscapes (such as farmland, woodland, or our coastal areas), these indicators are used by the Government for an ever-growing number of initiatives.

The most familiar is probably the Farmland Bird Index (one of the original, so-called 'Quality of Life' Indices). Based on trends in 19 farmland bird species at the UK level, this line (along with lines for woodland birds, seabirds and for all native bird species) forms part of the Government's Sustainable Development Strategy, and is part of an elite set of headline indicators along with measures of poverty, human health and education. An equivalent farmland bird index based only on data from England is used in the England Biodiversity Strategy.

Underlying the annual indicators (Fig 1) are smoothed versions with estimates of precision that take into account annual fluctuations and sampling error, and hence provide a robust statistical measure of whether a particular target, such as the government commitment to reverse the decline in farmland birds by 2010, has been achieved. An important assumption in the development of wild bird indicators is that they represent other components of biodiversity (e.g. declines in arable plants and in widespread butterflies and moths) as well as farmland birds. The Environmental Stewardship Scheme, launched in England in 2005, is intended to deliver recovery of farmland birds, and hence there is huge interest in the year-on-year changes in the indicator. The Forestry Commission has adopted the UK Woodland Bird Index as a measure of sustainable forest management, and the Environment Agency has recently funded development of a suite of wetland bird indicators that have the potential to be used to assess the impact of factors driving change in wetland habitats.

This is a rapidly developing area of work at the BTO. The next phases of indicator develop-

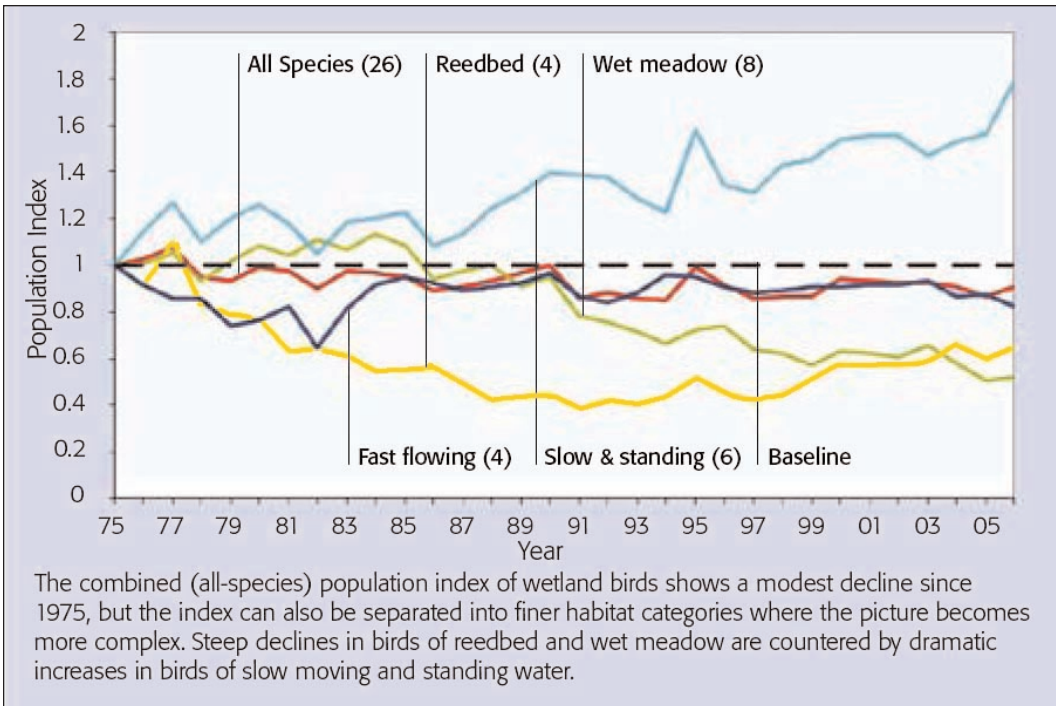


FIGURE 1. Proposed waterway bird indicator from 1975.

ment are likely to focus on better understanding of the relationship between the indicator and the effects of key drivers (agricultural practices, climate change, changes in habitat management). There is interest in new biodiversity indicators for upland and urban landscapes, and regional versions can reveal geographical differences in the fortunes of bird species that can help regional governments to deliver their own conservation priorities.

### INDICATOR FOR WATERBIRDS

Building on the successes of the farmland and woodland bird indicators in highlighting bird population change in those habitats, **Andrew Joys** and **John Marchant** describe work done recently, in conjunction with the Environment Agency, to produce an equivalent indicator for waterways. The aim was to develop a new set of wild bird indicators that would reflect the general health of freshwater waterway and wetland habitats across the UK. It is hoped that such indicators may be useful in directing future

policies towards improving the health of the aquatic environment and in helping the UK to meet its international obligations in protecting freshwater ecosystems.

To help achieve this we have developed a single waterways indicator, comprising the population indices of a broad range of waterside birds, to reflect change in the overall waterway environment. A number of more specific indicators have also been designed, containing carefully selected subsets of those species, to be directly relevant to particular issues of waterway management policy. These new indicators build on the Water & Wetland Indicator previously reported to the England Biodiversity Group.

For the majority of the species, the Waterways Breeding Bird Survey and the waterway component of the Breeding Bird Survey provide the population trends included in these indicators. Their predecessors, the Waterways Bird Survey and the Common Birds Census, extend the time span back to the mid 1970s. To achieve a more representative and robust trend

for a few species, we have added data from Constant Effort Sites ringing and from the Heronries Census.

The all-species indicator for waterways, and those for fast-flowing water, reedbeds and wet meadow, have all shown a decline since 1975,

while the slow and standing water indicator has increased (Fig 1). While the detailed structure of these indicators is still in development, it is already clear that they have an important role in highlighting the general health of our aquatic environment.

## INDICATORS FOR CLIMATE CHANGE

**Stuart Newson** of the Demography Unit describes current work on Indicators of Climate Change for Migratory Species.

Climate change is one of the major factors likely to affect the Earth's ecosystems in the coming years and centuries. Migratory species, by travelling large distances between sites are particularly likely to be affected by climate change at some point in their life. Birds comprise the best-studied group of migratory species, but the effects of climate change have been documented among species of migratory marine mammals, fish, turtles, squid, bats, terrestrial mammals and insects.

The Bonn Convention on the Conservation of Migratory Species of Wild Animals recently adopted a Resolution recognising the impacts of climate change on migratory species and called on parties and range states to undertake more research to improve our understanding of these impacts and to implement adaptation measures to help reduce foreseeable adverse effects. In order to achieve this successfully, monitoring of the impacts is required to quantify the problem, but also to assess the success of any implemented measures. Given the great range and diversity of taxa affected by climate change it is impossible to monitor all species and all effects of climate change. However, it is likely that many of the key processes through which climate change may impact wildlife could be monitored using indicator species or groups of species as a proxy for wider assemblages, habitats and ecosystems.

The UK government is a signatory to a number of international treaties and agreements that seek to promote and maintain the conservation status of migratory species of wildlife, for which Defra takes a lead role for the government. Funded by Defra, the BTO is collaborating with experts working on other groups of migratory wildlife from around the world to identify a suite of indicators, which can provide information on climate change impacts on the global status of migratory species. We look forward to presenting the findings and recommendations that come out of this ambitious project in a future issue of BTO News.

### FIND OUT MORE

The Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS, 1979) [www.cms.int](http://www.cms.int)