giving nature a home

No.15

Renewable energy and conservation science

RSPB CENTRE FOR CONSERVATION SCIENCE

David J Slater (rspb-images.com)

Where science comes to life

RSPB CENTRE FOR CONSERVATION SCIENCE

While the RSPB is well known for its wonderful, wildlife-rich nature reserves, and for its annual Big Garden Birdwatch, it is far less well known for the remarkable scientific work it undertakes behind the scenes, in the UK and overseas. Yet, in reality, our scientific programme is an amazing asset, matched by few other conservation organisations. Because our scientific work has had a low profile with the wider public, many are unaware of the depth and breadth of our scientific knowledge. And it is this knowledge that informs all of our conservation work. Be that the way we manage our reserves to make them better for wildlife, the advice we provide to others, or the policies that we adopt and advocate to change hearts and minds in favour of nature conservation.

This case study forms part of a collection that aims to highlight RSPB science from the last decade. We have chosen these studies as they demonstrate great science, and have had, or are likely to have, a major impact on conservation.

The first ten case studies originally featured as part of the report (shown above) about the RSPB Centre for Conservation Science.

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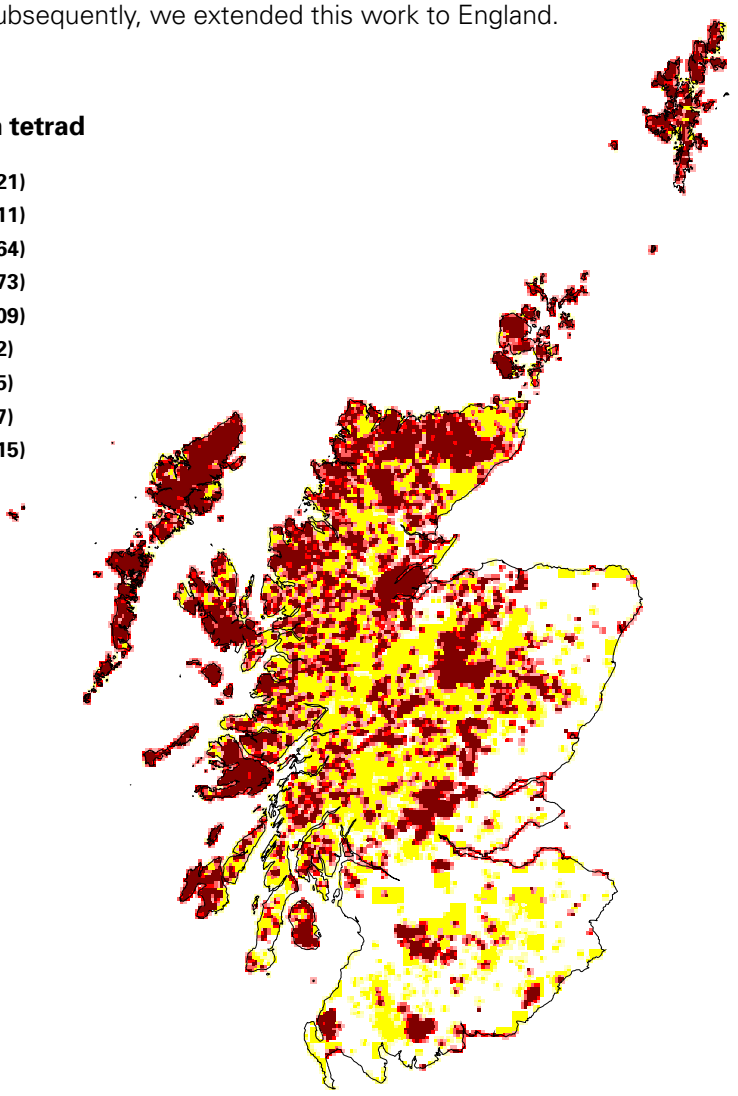
The RSPB is supportive of renewable energy technologies, such as wind farms, provided they do not damage special sites and wildlife. Scientific evidence is essential to underpinning our policy position on renewables, consequently we have carried out several reviews of the evidence, as well as investing in primary research.

Having identified location as a key factor determining the likelihood of adverse effects of wind-energy developments on birds, we developed a 'sensitivity map' as a strategic planning tool, initially for Scotland. This map identifies areas more (dark colours), or less (light colours), likely to hold bird species of high conservation status that are vulnerable to wind farms. The map has been incorporated into strategic locational planning guidance developed by Scottish Natural Heritage, the statutory nature conservation adviser to the Scottish Government. Subsequently, we extended this work to England.

Sensitivity ratings with tetrad

4 high	**(5421)**
3 high	**(1411)**
2 high	**(1964)**
1 high	**(1573)**
4 medium	**(4109)**
3 medium	**(482)**
3 medium	**(785)**
3 medium	**(727)**
All low/unknown	**(5715)**

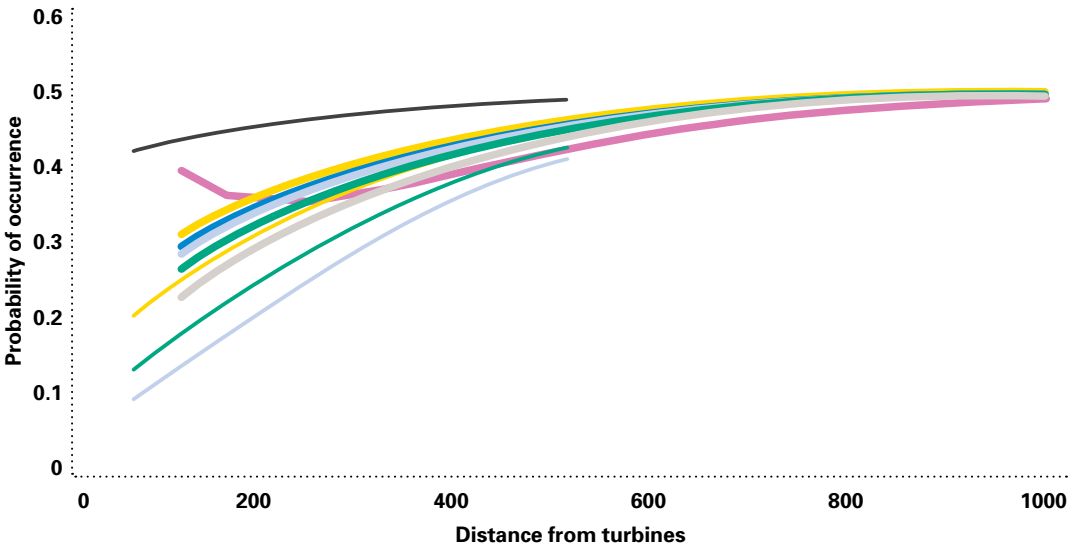


White-tailed Eagle.
Chris Gomersall (rspb-images.com)

Large, soaring raptors are among the species most susceptible to collision with wind turbines. Our research collaboration in Norway has demonstrated a reduction in the numbers of white-tailed eagles at a site where birds were being killed by colliding with turbine blades. This highlights the importance of being able to make robust predictions of potential collision mortality to help us decide whether or not to support a developer's application to build a wind farm. Consequently, we are helping to develop methods to better assess the risk of birds colliding with turbine blades. For example, we are investigating the behaviour and associated flight heights of hen harriers in the vicinity of an operational wind farm.

As well as birds being potentially killed by turbine blades, birds may be displaced away from wind turbines. Our field study of operational wind farms and paired control sites in the uplands of northern Britain, found that the densities of at least seven of the twelve breeding bird species were reduced around wind turbines. These species avoided otherwise suitable habitat within several hundred metres of the turbines. Our subsequent analysis of monitoring data from upland wind farms and paired reference sites, found that breeding populations of some species, including curlew, may be reduced when wind farms are being built, and that these effects can persist during subsequent operation.

Avoidance of wind farms by upland breeding birds



Probability of occurrence of breeding birds at increasing distances from wind turbines in the uplands of Britain. Each line represents a separate species. Most species are less common close to wind turbines. For three species, golden plover, snipe and wheatear, analyses were done at two spatial scales scales (fine scale = 50-500m; large scale: 100-1000m).

Another upland wader that may be susceptible to turbine displacement is the golden plover. Considerable uncertainty remains over the extent to which breeding populations of this species will be displaced, and we are currently studying impacts on this species throughout the pre-construction, construction and operational phases of a major Scottish wind farm built on the plover's preferred blanket bog habitat.

European golden plover. Andy Hay (rspb-images.com)

At onshore sites, surveys to map the locations of birds over large areas remains the most used method of measuring the displacement of birds around wind farms. However, technology can help here, and we have recently piloted work to examine the use of Global Positioning System (GPS) data loggers, fitted to adult curlews breeding at wind farms, to measure fine-scale displacement around the turbines. This technology holds great promise for future studies of the impacts of renewable developments on birds.

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Author

Dr Rowena Langston

Principal Conservation Scientist

Contact: rowena.langston@rspb.org.uk

Like many people, my day job involves a lot of sitting at a computer or in meetings. Just occasionally, I get to do fieldwork as part of my work. I have spent over twenty years as a conservation scientist, working mainly on interactions between human activities and wildlife conservation, including built developments such as energy generation infrastructure. This aspect of my work includes trying to find ways to improve our knowledge of the effects of these activities and to reduce potential conflicts with wildlife and special sites. I spend most free time in practical conservation projects, bird-ringing, observing and recording plants, moths and birds in the wider countryside.

David J Slater (rspb-images.com)

The RSPB

UK Headquarters
The Lodge, Sandy,
Bedfordshire SG19 2DL
Tel: 01767 680551

Northern Ireland Headquarters
Belvoir Park Forest,
Belfast BT8 7QT
Tel: 028 9049 1547

Scotland Headquarters
2 Lochside View, Edinburgh Park,
Edinburgh EH12 9DH
Tel: 0131 317 4100

Wales Headquarters
Sutherland House, Castlebridge,
Cowbridge Road East,
Cardiff CF11 9AB
Tel: 029 2035 3000

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