# CASE STUDY


## Predatory Bird Monitoring Scheme

**Detecting threats to the environment and human health through long-term monitoring of raptor carcasses and eggs**

### CUSTOMER

National and international policy-makers, NGOs and the public

### DELIVERABLE

Over five decades of data on pollutants in predatory birds

### OUTCOMES

Changes to UK and European policies on chemical use, leading to protection of predatory birds, other wildlife and biodiversity

> *"With its long-running programme of monitoring anticoagulant residues in barn owls, the Centre for Ecology & Hydrology will provide vital assessment of the effectiveness of the CRRU UK Rodenticide Stewardship Regime towards its aim of reducing contamination of wildlife with these substances."*
>
> **Dr Alan Buckle**
> Chairman, Campaign for Responsible Rodenticide Use, UK

## The challenge

Chemicals are essential for people's health, nutrition and well-being. However they have hazardous properties and can also pose a risk to the environment, ecosystem services and human health. It is essential to understand the risks from pollutants if we are to both benefit from the use of chemicals and also protect the environment.

Wildlife can act as sentinels of the health of our environment. Pollutants that accumulate in 'sentinel' species are very likely to accumulate and affect other species as well. Measuring contaminant levels in species such as birds of prey provides us with an early warning of potential harm to the birds themselves, to other wildlife and potentially to people.

## The research

The Centre for Ecology & Hydrology (CEH) runs the Predatory Bird Monitoring Scheme (PBMS), working with regulators and industry to try to minimise unintentional risk to wildlife from pollutants. Operating for over 50 years, the PBMS is now the longest-running scheme of its kind anywhere in the world.

We detect and quantify current and emerging chemical threats. We do this by measuring the levels of priority contaminants accumulated in the carcasses and eggs of predatory birds. Our data provide information on the extent of risk from chemicals, and how and why this risk varies over time and geographically.

Priority chemicals we currently monitor include rodenticides (used to control rodent damage, estimated to cost hundreds of millions of pounds per year), lead from ammunition and shot, mercury and various organic industrial pollutants such as flame retardants.

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> *"With its long-term tissue archive and responsive monitoring programme, the PBMS provides essential evidence and capabilities to address current and future concerns relating to the risk pollutants pose to wildlife and to help assess the success of any changes in the way those pollutants are managed."*
>
> Dr Alastair Burn
> Principal Specialist,
> Pollution and Freshwater,
> Natural England


Sparrowhawk


Barn Owl

*The CEH projects described here have multiple partners across the UK, Europe and worldwide that are too numerous to mention individually. Please visit our website for partner details.*

## Citizen science and partnerships

The PBMS relies on citizen science. Each year, members of the public typically send in 300 to 400 carcasses of birds of prey that they have found dead (often road traffic victims). Specially licensed bird ringers also send us around 150 failed eggs. We analyse these samples for chemical residues and retain them in a unique tissue and egg archive, which contains more than 40,000 samples collected since the late 1960s, representing a collection asset of some £4-5 million.

The PBMS is a partner in the Wildlife Disease & Contaminant Monitoring & Surveillance Network (WILDCOMS, www.wildcoms.org.uk), a collaboration between UK surveillance schemes that monitor disease and contaminants in vertebrate wildlife. We work closely with WILDCOMS and associated partner schemes to share samples and data, thereby widening the value of the PBMS. We contribute samples to projects that monitor the prevalence of wildlife diseases such as Trichomoniasis and West Nile Virus. We also share resources, samples and data with three WILDCOMS partners to provide a national overview of the exposure of red kites to rodenticides.

## The outcomes

The PBMS provides the scientific evidence base for national and international environmental policy, working with national and international regulators, key industry groups and charities to minimise damage to wildlife from pollutants.

Our data have contributed to:

- evidence of effects of organochlorine pesticides and PCBs on top predators: use of these chemicals is widely banned.
- demonstrating widespread exposure of British predatory birds to anticoagulant rodenticides, leading to rodenticide monitoring in barn owls being adopted in a recently-launched national stewardship scheme aimed at reducing exposure in wildlife.
- evidence of change in mercury contamination in the UK, thereby providing assessment of outcomes from the United Nations Minamata Treaty on mercury.
- evidence of the extent of lead contamination in UK birds of prey, informing regulators such as Defra's Lead Ammunition Group about the exposure of wildlife
- evidence on the effectiveness of EU conventions and directives, such as OSPAR and the Registration, Evaluation, Authorisation and restriction of CHemicals (REACH) directive, on controlling or banning emissions to the environment of harmful chemicals
- development of Europe-wide monitoring for contaminants using raptors, as part of the EURAPMON network.

Our data provide essential evidence of how pollutant risk varies over time and space, and responds to changes in chemical use or large-scale phenomena like climate change.

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