



## NEWLETTER: Number 12. Monitoring activities in Wales

The [Cardiff University Otter Project \(CUOP\)](#). Otter monitoring by CUOP started in Wales and England in 1994. Wales was one of the UK strongholds for otters during Europe-wide population declines between 1950s-70s. Submissions of otters found dead in Wales have risen steadily from ~20 per year, peaking at 65 in 2007, and seem to have stabilised at 40-50/year for the past 5 years.

CUOP uses the carcasses and data submitted to guide conservation, conduct environmental monitoring, and carry out research on various aspects of population biology, contaminants, disease, and behaviour. The Project also uses the otter's status as a well-loved, charismatic species, in order to engage the public with issues of conservation and environmental protection (for example in 2014, CUOP ran events at the National Eisteddfod, Cardiff Science Festival, the National Museum Cardiff, and Natural History Museum in London).

The otter is a useful indicator of disease, and CUOP's work on parasites has recently revealed that *Toxoplasma gondii* (a parasite that affects ~30% of the human population) is common and widespread in freshwater systems. Infection was less common in Wales (29%) and SW England (30%) than elsewhere (e.g. 47% Midlands and North West, 49% East Anglia)<sup>1</sup>. Conversely, Welsh otters were more commonly infected with ticks (hedgehog tick, *Ixodes hexagonus*)<sup>2</sup>, and south Wales is a hotspot for a recently discovered (and possibly spreading) biliary parasite, *Pseudamphistomum truncatum*<sup>3</sup> that can infect humans eating infected fish.

As the UK's top predator in freshwaters, the otter is a valuable indicator of freshwater contaminants, that accumulate in its' tissues. The concentrations of most legacy contaminants (organochlorine pesticides, PCBs) measured in otter livers have declined since they were banned in the 1970s, and were lower (on average) in otters from Wales than those from England<sup>4</sup> - in keeping with less intensive arable farming, and less intensive industry in Wales. Analyses of otter tissues have also recently highlighted the occurrence of polybrominated diphenyl ethers (PBDEs, used as fire retardants) in otters from England and Wales<sup>5</sup>.

Effective conservation must be built on a clear understanding of populations and their biology; the diversity of CUOP research encompasses topics from genetic structure (revealing 3 distinct sub-populations in Wales), age structure, reproduction, and the regional 'dialects' of scent communication (Otter Project publications <http://www.otterproject.cf.ac.uk/publications.html>). Direct impacts on

<sup>1</sup> [Chadwick et al., 2013. Parasites and Vectors 6\(75\)](#)

<sup>2</sup> [Sherrard-Smith E et al., 2012. PLoS ONE 7\(10\) e47131](#)

<sup>3</sup> [Sherrard-Smith E et al., 2013. International Journal for Parasitology, 43 \(9\), 729-737](#)

<sup>4</sup> Kean & Chadwick, 2012. Persistent organic pollutants in the livers of Eurasian otters, *Lutra lutra*, from England and Wales collected between 1992 and 2009. CUOP Report to the Environment Agency

<sup>5</sup> [Pountney et al., 2015. Chemosphere, 118, 81-86](#)

conservation have been achieved *via* detailed analysis of mortality locations (e.g.<sup>6</sup>), used by environmental organisations such as Gwent Wildlife Trust to lever funding for/prioritise locations for mitigation on roads.

The [Wildlife Incident Investigation Scheme \(WIIS\)](#). The deaths of wildlife, beneficial insects and companion animals are investigated by Fera's Wildlife Investigation Unit (WIU) under the Wildlife Incident Investigation Scheme (WIIS), where there is evidence that pesticide poisoning may be involved. Several organisations collaborate to deliver the WIIS throughout the UK.

Monitoring this acute mortality from pesticides started more than fifty years ago, when the concern was from the impact of organochlorine pesticides. The primary purpose of WIIS continues to be monitoring of pesticide use after approval, so that product approvals can be revised if necessary, and provide a measure of the success of the pesticide registration process. However, it is clear from the results of the scheme, which can be seen at [Chemicals Regulation Directorate website](#), that many incidents are due to the illegal use of pesticides. Appropriate enforcement action will be taken under legislation on the use of pesticides and the protection of humans, food, the environment and animals. WIIS will test any sample submitted from Wales.

The [Predatory Bird Monitoring Scheme \(PBMS\)](#) Annually the PBMS receives approximately 30 whole carcasses or tissue samples from birds that have died in Wales. A third of these are barn owls which are included in our monitoring of second generation anticoagulant rodenticides. In addition, post mortem examination observations on the owls are returned to National Resource Wales (NRW) to inform North Wales Trunk Road Agency's assessment of the impact of the A55 to populations of this species.

The PBMS has worked in close collaboration with [Cardiff University Otter Project](#) (CUOP) to compliment and extend the analysis suite employed in this previously-Environment Agency funded project. Recent published reports examined toxic metal exposure (including lead and mercury) and levels of brominated flame retardants in otters. Both reports can be downloaded from our [Recent PBMS Publications](#) page. The PBMS currently supports the CUOP by archiving sub samples from the otters that have been collected.

In addition, the PBMS sample archive has been used in collaborative projects with Cardiff University, for their avian anatomic reference collection, and Wildlife DNA Services Ltd., a spin-out company of Bangor University, to develop DNA fingerprinting of captive and wild populations of raptors as part of a Defra-funded initiative

## Scheme News

[WIIS-Scotland](#). The results for the first 6 months of 2014 have been published on the [SASA website](#). The data are presented in a new format that lists results of all incidents reported to SASA in a spreadsheet which identifies whether pesticides found in an incident were the principle cause of the incident or present at background or trace levels only. This new reporting format will replace SASA publication of the annual Pesticide Poisoning of Animals Report - A Report of Investigations in Scotland.

**Cardiff University** are currently advertising two PhDs linked to the [Otter Project](#), and inviting members of the public in Wales to get involved in some dietary research. For further information, see <http://www.otterproject.cf.ac.uk/getinvolved.html>

**The National [Fish Tissue Archive](#)** paper 'PCB and organochlorine pesticide burden in eels in the lower Thames River (UK)' is now open access <http://dx.doi.org/10.1016/j.chemosphere.2014.06.088>

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<sup>6</sup> [Wilkinson, C and Chadwick, EA \(2012\) CUOP Report to the Trunk Roads Agencies.](#) (see also parallel reports for N and Mid Wales)

**WIIS:** The unique analytical chemistry skills of Fera's Wildlife Incident Unit played a vital role in providing the evidence for the conviction of a gamekeeper, who was given a 10-week jail sentence, suspended for a year and ordered to pay prosecution costs of £930. The gamekeeper for 24 years at the Study Estate in Norfolk, was convicted of killing 10 buzzards and a sparrowhawk. He was also found guilty of possessing illegal pesticides and other equipment including a syringe for injecting poison into eggs or meat baits, which prosecutors described as a "classic poisoner's kit".

**DRAHS:** Hen harriers are one of the rarest birds of prey in England. In support of Natural England's work to conserve this species, carcasses are examined by DRAHS, in collaboration with WIIS (to investigate toxicities) and PBMS (chemical exposure monitoring). Birds from two broods were examined post mortem in 2014 and important information on diseases in natural populations in this species has been garnered. See [Natural England](#) news.

**PBMS:** The contaminant analysis of samples received in 2013 has begun for the PBMS. This year we will expand our analysis of second generation anticoagulant rodenticides in sparrowhawks to investigate avian food chain transfer of these biocides. Following on from last year's pilot study a retrospective survey of perfluorinated compounds (e.g. PFOS) will carry out on gannet eggs from the 1970s to present day. We will also be applying stable isotope analysis to investigate the sources of mercury in golden eagle eggs. A report summarising the tissues held in the PBMS archive has recently been published and can be downloaded from our '[Publications](#)' web pages. The PBMS has contributed to a new review paper examining the potential for developing "ecopharmacovigilance" strategies for higher vertebrates. More details can be found on the PBMS [Blog](#).

## WILDCOMS news

The next **WILDCOMS** meeting will be held at Cardiff University on 2nd and 3rd of December.

A special issue of [Philosophical Transactions of the Royal Society B](#) has been dedicated to the issue of Pharmaceuticals in the Environment and contains papers on detecting exposure and effects in fish and higher wildlife. See <http://rstb.royalsocietypublishing.org/content/369/1656.toc>

We have compiled an inventory that contains information about the collaboration that occurs between WILDCOMS schemes and also between the schemes and organisations external to WILDCOMS. This information and other outputs are available from [Project outputs](#) pages of the website.

**Suspected Flunixin Poisoning of a Wild Eurasian Griffon Vulture from Spain.** A Conservation Biology research note has highlighted further concerns over poisoning of vultures in Europe with nonsteroidal anti-inflammatory drugs (NSAIDs). The paper, published by Spanish, UK and Canadian researchers, has described the finding of the carcass of a wild Eurasian Griffon Vulture (*Gyps fulvus*) in 2012 on an Andalucian (Spain) game hunting reserve. Forensic examination showed that the bird had severe visceral gout, a finding consistent with *Gyps* vultures from Asia that have been poisoned by diclofenac, and liver and kidney samples contained elevated concentrations of the NSAID flunixin. This is the first report of a wild vulture outside of Asia being exposed to and apparently killed by an NSAID and is the first report of mortality in the wild caused by an NSAID that is not diclofenac. The full citation of the research note is: Zorilla et al., 2014, Suspected Flunixin Poisoning of a Wild Eurasian Griffon Vulture from Spain. Conservation Biology. doi: 10.1111/cobi.12417

**CONTACT US:** If you would like to see a particular topic in the "spotlight" section of the WILDCOMS quarterly bulletin, or would like to contact us about other WILDCOMS related matters, please e-mail the WILDCOMS coordinator, Dr Gloria Pereira ([mdgds@ceh.ac.uk](mailto:mdgds@ceh.ac.uk)).