



Wildlife Disease & Contaminant Monitoring & Surveillance Network

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The WILDCOMS newsletter (produced 3 or 4 times a year) reports recent newsworthy items, publications from member partners and items of interest about wildlife ecology from the UK and overseas. WILDCOMS is funded by NERC as part of the UK-SCAPE National Capability Programme (grant number NE/R016429/1)

WILDCOMS Scheme news

[GB Wildlife Disease Surveillance Partnership](#) - reports are published quarterly.

To access the latest reports see: <https://www.gov.uk/government/publications/wildlife-gb-disease-surveillance-and-emerging-threats-reports>.

The GB Wildlife Disease Surveillance Partnership is made up of the following organisations: Animal and Plant Health Agency (APHA), Scotland's Rural College (SRUC), Institute of Zoology (IoZ), National Wildlife Management Centre of APHA (formerly part of FERA), The Centre for Environment, Fisheries and Aquaculture Science (CEFAS), The Wildfowl and Wetlands Trust (WWT), Natural England (NE) and Forestry England (FE).

[Predatory Bird Monitoring Scheme \(PBMS\)](#)

The most recent of the PBMS reports was published in May 2022 - Second generation anticoagulant rodenticide residues in barn owls 2020 and is the sixth in a series of annual reports that describe the monitoring of second generation anticoagulant rodenticide (SGAR) liver residues in barn owls (*Tyto alba*) in Britain.

This work is an element of an overarching monitoring programme undertaken to track the outcomes of stewardship activities associated with the use of anticoagulant rodenticides. The barn owl is used for exposure monitoring as it is considered a sentinel for species that are generalist predators of small mammals in rural areas. The specific work reported here is the measurement of liver SGAR residues in 100 barn owls that died in 2020 at locations across Britain. The residue data are compared with those from 395 barn owls that died between 2006 and 2012 (referred to as baseline years), prior to changes in anticoagulant rodenticide (AR) authorisations and onset of stewardship.

Overall, there were few differences in liver SGAR accumulation between barn owls that died in baseline years and in 2020, the exception being a potential increase brodifacoum residues.

The lack of significant reductions in SGAR residues in barn owls in 2020 suggests that full implementation of stewardship since 2018 has yet to result in a statistically significant reduction in exposure of barn owls to SGARs. For the full report (and links all of our previous reports) see the [Reports pages](#).

Our ability (power) to use monitoring data to assess whether mitigation measures in chemicals management is having the desired effect is reliant upon of the number and frequency of samples analysed, the level of change we wish to detect, and the inherent variability in the contamination in the receptor we are monitoring. Lee Walker presented, at SETAC Europe 2022, a study exploring how these factors affect our power to detect temporal changes for a range of contaminants in the common buzzard samples from across Europe. A video summarising this work can be viewed at: <https://youtu.be/eQ66TpRuiOI>

Contaminant-specific power analysis for the common buzzard, *Buteo buteo*, for cost effective monitoring

Effective pan-European monitoring with pooled raptor samples is achievable

Lee Walker, Paola Movalli, Alessandra Cincinelli et al.



WIIS-Scotland

The results for 2021 incidents have been added to the [SASA website](#) and can be found [here](#).

The Pesticide Survey Team at SASA has recently published the latest Scottish Government survey of Rodenticide Use on Arable farms in Scotland in 2020, the report is available from [Pesticide Usage in Scotland: Rodenticides on Arable Farms 2020 - gov.scot \(www.gov.scot\)](#)



SASA IS A DIVISION OF THE AGRICULTURE AND RURAL ECONOMY DIRECTORATE

Disease risk analysis and health surveillance (DRAHS) by Dr Sophie Common and Georgie Gerard

Project news: Over the past twelve months the DRAHS team has been undertaking disease surveillance of the Eurasian beaver (*Castor fiber*) in England in collaboration with Natural England. The aim of this work is to improve our understanding of beaver health and threats to beavers in England and thereby maximise conservation outcomes from future interventions.



Figure 1: Dr Sophie Common performing a post-mortem examination on a beaver at the Institute of Zoology, London



Figure 2: A radiograph taken of beaver carcass XT585-21 showing traumatic damage to the pelvis, spine and pelvic limbs (indicated by arrows) caused by a suspected road traffic collision



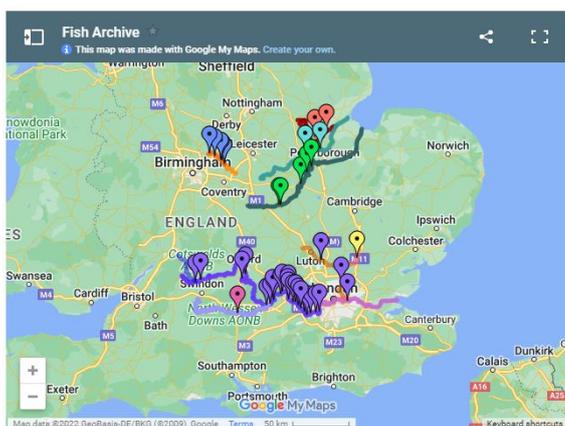
Figure 3: Beaver carcass 619-21 submitted to the DRAHS team in 2021 awaiting post mortem examination

Several small populations of beavers exist in England as a result of both licenced and unlicenced releases and many of these animals have an uncertain origin. Therefore, in the context of disease, it is possible that these animals pose a threat to other mammals, including people, in the UK. By undertaking detailed post-mortem examinations of any beavers found dead in England, we can build a picture of which parasites (including viruses, bacteria, fungi, protozoa, helminths and ectoparasites) these animals have, or have not, been exposed to, and whether these parasites are

likely to have contributed to disease in these animals or may spread to other mammals. The information can then inform the disease risk analysis which provides advice on future releases into England for example by showing which disease threats require careful monitoring. The disease risk analysis is also important for the beavers themselves, to ensure that any future releases are successful and that beaver populations can thrive in England.

So far, post mortem examinations have been performed on four beaver carcasses, all found in Kent. Three of these beavers were found to have been involved in road traffic collisions, reinforcing this threat as a high-risk hazard for these animals. Also, in one animal, two beaver-specific parasites were found; *Streptococcus castoreus*, a bacterium, and a fluke suspected to be *Neostichorchis subtriquetrus*. Further results on these findings are pending, along with specific targeted surveillance for a number of parasites of particular concern in England. We hope that over the next year continued submission of beaver carcasses will aid in building a picture of the risks from disease to beavers, other wildlife, domestic mammals and humans in England posed by future beaver releases, to inform mitigation measures and therefore maximise conservation outcomes for bringing this species back into England.

National Fish Tissue Archive



Scientists from the UK Centre for Ecology & Hydrology are working with the Environment Agency to develop a National Fish Tissue Archive for the UK. The main purpose of the archive is to enable chemical contamination in rivers to be assessed.

Watch a video with Dr Monika Jürgens explaining more about the National Fish Tissue Archive:

<https://www.youtube.com/watch?v=fE8qW3vnDx8&t=2s>

Explore a map of the sampling sites: <https://www.ceh.ac.uk/our-science/projects/national-fish-tissue-archive>

Cardiff Otter Project by Emily O'Rourke

A new publication (O'Rourke et al., 2022) shows widespread pollution of freshwaters with PFASs, and associations of concentrations in otters with anthropogenic sources.

50 otters were analysed from across Wales and England for 15 Perfluoroalkyl Substances (PFASs). PFASs are a large family of synthetic chemicals used in many consumer products for their oil and water repelling properties. They do not degrade easily in the environment and can bioaccumulate in wildlife and humans, potentially having a range of toxic effects.

All otters in the study had detectable concentrations of PFASs in their livers, with 80% of otters having 12 or more PFASs. As has been seen in other studies on wildlife, perfluorooctane sulfonic acid (PFOS), a type of PFAS which was used extensively prior to being added to the Stockholm Convention in 2009, was detected at the highest concentrations.

Otters act as effective 'sentinels' for chemicals which bioaccumulate and can tell us where the highest concentrations of chemicals are in the freshwater environment, and importantly the reasons for those high concentrations.

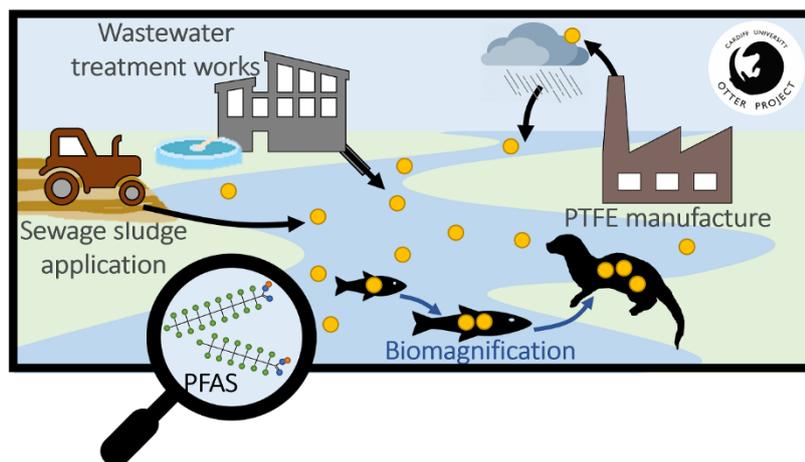


Associations were found between perfluorooctanoic acid (PFOA) concentrations in the otters and the location of a PTFE factory which used PFOA at the time of the study. Results support evidence that industry is a key source of PFAS pollution, and the distance away from the factory suggests air dispersal with prevailing wind direction is an important pathway for PFOA contamination of the environment. Results also suggest wastewater treatment works are a key

source of PFASs to the environment, with PFASs being released in effluent and retained in sewage sludge. Sewage sludge is spread on arable land as a fertiliser, and the PFASs can leach from the land and enter waterways.

The paper gained media attention (e.g. in [BBC](#) and [i News](#)), as has the recently released Otter Survey of Wales ([BBC News](#)). The survey has shown that, for the first time since surveys began in the 1970s, otter populations have declined in Wales (from a Wales-wide average of 90% in 2010, to 70%). The potential reasons for this decline are complex with a number of factors such as changing diet with the decline in key fish species (e.g. Moorhouse Gann et al., 2020), loss and fragmentation of habitat, road traffic collisions (e.g. Raymond et al., 2021) as well as pollution, all potentially playing a part. Further investigation is needed to identify the key causes. O'Rourke et al. found no clear evidence to suggest that the PFASs contributed to the deaths of any of the otters in this study, however PFASs are known to be toxic to both wildlife and humans and the relatively high concentrations of PFASs detected in the study does warrant some concern that the chemicals could be having sublethal effects on otter health, especially when the combined effect of exposure to multiple PFASs is considered. Thanks to Jeff Chard for the use of the otter image.

See [Cardiff Otter Project newsletter](#) for more about this and the otter project!



[Wildlife Incident Investigation Scheme \(WIIS\)](#)

WIIS makes enquiries into the death or illness of wildlife, pets and beneficial invertebrates that may have resulted from pesticide poisoning. The scheme has two objectives:

1. To provide information to the regulator on hazards to wildlife and companion animals (usually cats and dogs) and beneficial invertebrates (honeybees, bumble bees and earthworms) from pesticide use;
2. To enforce the correct use of pesticides, identifying and penalising those who deliberately or recklessly misuse and abuse pesticides.

Quarterly data for WIIS is available on the HSE pesticides website ([here](#)) and this currently includes investigations up to December 2021. The laboratory work to support WIIS in England and Wales has been exceptionally busy since 2020 with higher than typical numbers of submissions arriving at [Fera Science Ltd](#) for analytical testing. The expertise from Natural England, Welsh Government and the Animal Plant Health Agency is also critical to delivery of WIIS and other organisations such as the Police, RSPB, Private veterinary practices and courier services. Unfortunately, many of the investigations continue to involve the illegal use of pesticides and this is of particular concern when reintroduced species are involved ([here](#)).

Investigations by WIIS often involve the use of anticoagulant rodenticides and these have been implicated in many poisoning incidents and have generated some publicity ([here](#)). These poisonings are usually categorised as “unspecified use”, as the residues detected in affected animals may be acquired from many sources that were encountered at different places and at different times. Therefore, one rodenticide treatment may not be the only source of exposure for an affected animal. Due to concerns about the use of anticoagulant rodenticides there is a



stewardship regime ([UK Rodenticides Stewardship Regime](#)) and coordinated data (from WIIS and [PBMS](#)) for species that are vulnerable to this exposure are reported [annually](#). Anticoagulant rodenticide data are also included in the [25-year Environment plan](#).

The WIIS relies on members of the public and other interested organisations to find and report suspicious incidents that usually involve the death of one or more animals. Anyone using anticoagulant rodenticides, should follow the Campaign for Responsible Rodenticide Use (CRRU) [Code of Best Practice](#). There is a Freephone number (0800 321600) to report suspicious incidents to WIIS. Anyone who has information relating to bird of prey persecution should report it to their local police force by calling 101, or to Crimestoppers anonymously on 0800 555111.

Pesticide and rodenticide monitoring of terrestrial mammals - filling the data gap

Last year we reported on an exciting collaboration to enhance monitoring of chemical residues in terrestrial mammals that has been made possible by funding from Defra. This involves partners in WILDCOMS: Fera Science Ltd (WIIS-England and Wales); the Institute of Zoology (Garden Wildlife Health (GWH) project) and the Animal & Plant Health Agency (APHA). This project has screened 100 liver samples from hedgehogs and 100 liver samples from foxes for pesticides and anticoagulant rodenticides. The aim is to provide baseline monitoring data for these species and to further compare the findings with available toxicological data from other species, such as predatory birds. It is



planned to assess the likely significance and potential impact of any detected pesticide or rodenticide exposure to wild mammal health. We will also explore whether trends in detected levels of exposure indicate that stewardship actions, restrictions on use and other authorisation changes have had a positive impact on these species. Filling these data gaps might also be of importance from a biodiversity perspective as hedgehog populations in England have declined significantly in recent decades and although the possible causes for this are not yet fully understood, they may be due to a combination of factors. This project aims to provide the data required to examine if one or more of a range of pesticides may be contributing to hedgehog population changes.

This project demonstrates the value of archived material from the GWH project for hedgehogs and of using samples



that are collected as part of a disease surveillance programme for *Echinococcus multilocularis* (a [notifiable animal disease](#)) for foxes.

There have been challenges in undertaking this work during a pandemic, but the results should be available soon and will be disseminated as widely as possible. There is likely to be much interest in the outcome of this work from a range of parties, for example, pesticide and rodenticide manufacturers, professional and amateur users of these products, conservation NGO's, wildlife rehabilitators and the general public.

[Garden Wildlife Health](#)

Garden Wildlife Health (GWH) is a collaborative project between the [Zoological Society of London](#) (ZSL), the [British Trust for Ornithology](#) (BTO), [Froglife](#) and the [Royal Society for the Protection of Birds](#) (RSPB) which aims to monitor the health of, and identify disease threats to, British wildlife.

GWH particular focus is on garden birds, amphibians, reptiles and hedgehogs. For this they count on the help of the public to submit reports of sick or dead wildlife and to submit samples for analysis.

See <https://www.gardenwildlifehealth.org/> and [Report sick or dead wildlife](#).

UK Cetacean Strandings Investigation Programme (CSIP)



Sperm whale in Northumberland, UK, taken by drone | Credit: Rob Deaville
(Source: ZSL)

[CSI of the Sea](#): Revealing the important work of the UK Cetacean Strandings Investigation Programme (CSIP). You can find a [series of YouTube videos](#), including [CSI of the Sea: What have we learnt from 30 years of investigating cetacean strandings?](#)*

Also available are two dissection demonstration videos:

[Dolphin dissection](#)* and [Porpoise dissection](#)*.

*Please be aware that these videos feature some graphic images and video of post mortem examinations, so viewer discretion is advised.

ChemPop: What are the impacts of chemicals on wildlife populations?

With new chemicals constantly being used in agriculture, industry and everyday life, research is needed to understand the impact that new chemicals and combinations of chemicals are having on our ecosystems, and the animals and plants that depend on them. This research will inform the regulatory approach to the use of chemicals.

ChemPop is a four-year [NERC](#)-funded project which began in September 2018. It addresses the following research questions:

- What are the impacts of hazardous chemicals on populations, ecosystems and ecosystem services?
- What is their relation to other pressures in the environment?

These questions will be addressed by mining Britain's extensive wildlife monitoring databases, some of which date back more than 40 years. The aim is to identify which populations and environments are doing well under the current chemical regime and which are not. This will allow the UK to focus its research where the greatest wildlife declines are occurring and bring clarity to the issue of chemicals in the environment.

See <https://www.ceh.ac.uk/our-science/projects/chempop-does-discharge-chemicals-environment-harm-wildlife-populations>, and Greenop et al., 2021: <https://www.sciencedirect.com/science/article/pii/S0960982221010708>.

Mammal society – the Red List and, experienced otter survey volunteers needed

Red List for Britain's Mammals. One in four of our native mammals is threatened with extinction, and many others are in decline. With Britain now recognised as one of the most nature-depleted countries in the world, urgent action is needed. The Mammal Society is trying to change this. Unlike most organisations monitoring British wildlife, they receive no central government funding for core work; activities to halt the decline of threatened species, monitor their conservation status and advise on issues affecting British mammals, depend entirely on the generosity of their supporters! See <https://www.mammal.org.uk/> and <https://www.mammal.org.uk/science-research/red-list/>.

The Mammal Society are seeking experienced volunteer otter surveyors to help with the 6th Otter Survey of England! The Mammal Society is managing the survey and the Survey Manager is Andrew Crawford. The survey is jointly funded by The Environment Agency and Natural England with additional support from South West Water, United Utilities, Yorkshire Water and Southern Water. See <https://www.mammal.org.uk/national-otter-survey/>. Please note the deadline to register to survey is Sunday 31st July. You can access the registration form [here](#).

Recent publications from the WILDCOMS schemes

Androulakakis, et al., 2022. [Determination of 56 per- and polyfluoroalkyl substances in top predators and their prey from Northern Europe by LC-MS/MS](#). Chemosphere 287. <http://dx.doi.org/10.1016/j.chemosphere.2021.131775>.

Drake et al., 2022. [An assessment of minimum sequence copy thresholds for identifying and reducing the prevalence of artefacts in dietary metabarcoding data](#). Methods in Ecology and Evolution 13(3). <http://dx.doi.org/10.1111/2041-210X.13780>.

Greenop et al., 2021. [Patterns of invertebrate functional diversity highlight the vulnerability of ecosystem services over a 45-year period](https://doi.org/10.1016/j.cub.2021.07.080). *Current Biology* 31, 4627–4634. <https://doi.org/10.1016/j.cub.2021.07.080>.

Kean and Chadwick, 2021. Otter Survey of Wales 2015-2018. NRW Report No: 519, NRW: <https://cdn.cyfoethnaturiol.cymru/media/694539/osw-6th-report-final.pdf>.

Mathews and Harrower, 2020. IUCN – compliant Red List for Britain’s Terrestrial Mammals. Assessment by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough ISBN 978-1-78354-485-1.

Moorhouse-Gann et al., 2020. [Dietary complexity and hidden costs of prey switching in a generalist top predator](https://doi.org/10.1002/ece3.6375). *Ecology and Evolution*, 10:6395–6408. <https://doi.org/10.1002/ece3.6375>.

O'Rourke, et al., 2022. [Anthropogenic drivers of variation in concentrations of perfluoroalkyl substances in otters \(Lutra lutra\) from England and Wales](http://dx.doi.org/10.1021/acs.est.1c05410). *Environmental Science and Technology* 56(3), pp. 1675-1687. <http://dx.doi.org/10.1021/acs.est.1c05410>.

Raymond et al., 2021. [Temporal patterns of wildlife roadkill in the UK](https://doi.org/10.1371/journal.pone.0258083). *PLoS ONE* 16(10): e0258083. <https://doi.org/10.1371/journal.pone.0258083>.

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