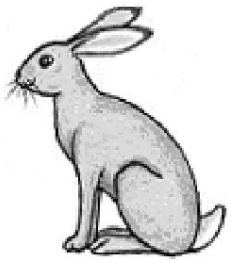

Great Britain Wildlife Disease Surveillance Partnership quarterly report

Disease surveillance and emerging threats

Volume 33: Quarter 2 – April to June 2021

Highlights

- mortality in Sandwich terns and Mediterranean gulls – page 23
- Gastrointestinal intussusception in a Common toad – page 27
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Contents

Introduction and overview

The Great Britain Wildlife Disease Surveillance Partnership comprising of: the Animal and Plant Health Agency (APHA), Scotland's Rural College (SRUC) Veterinary Services, Institute of Zoology (IoZ), the Centre for Environment, Fisheries and Aquaculture (Cefas), the Wildfowl and Wetlands Trust (WWT), Natural England (NE), Forestry England (FE) and the Garden Wildlife Health (GWH) project produces the Great Britan Wildlife Disease Surveillance Partnership Quarterly Reports which you can find on GOV.UK.

A full explanation of how data is analysed is provided in the annexe available on GOV.UK.

Issues and trends

This spring and summer we are particularly interested in two exotic viral diseases that have zoonotic potential.

The first is Usutu Virus and in this case we are interested to see if the disease recurs, following its detection in blackbirds (*Turdus merula*) and a house sparrow (*Passer domesticus*) in London last summer.

The second, West Nile Virus (WNV), is expected to occur if not this summer, then in the following summers, again in wild birds. Both diseases cause death and nervous signs in a variety of bird species and several birds in an area may be affected.

West Nile virus is notifiable so any suspicions of the disease should be reported to the APHA. Please be on the look-out for these diseases in wild birds.

This Wildlife Quarterly Report (WQR) contains wildlife disease data collated together for 2020 from three of the Great Britain Wildlife Diseases Surveillance Partners – APHA Diseases of Wildlife Scheme (DoWS), SRUC and GWH (IoZ) (see the appendices for a breakdown of the data).

This is something of an achievement, to combine data collected independently from government and non-government agencies together. A lot of data is presented and there may be some errors however we are hoping that it is accurate and reflects the work done together in our assessment of the health of the nation's wildlife.

Notifiable diseases

Avian Influenza (AI) Virus

Great Britain Avian Influenza Wild Bird Surveillance (AIWBS)

Total wild bird surveillance

New highly pathogenic avian influenza (HPAI) cases in poultry and wild birds were still occurring across Europe.

In poultry, latest dispatch reports of HPAI H5 subtype cases (mainly HPAI strain H5N8 but also strains H5N5 and H5N1) were received during the quarter from Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Lithuania, The Netherlands, Poland, Romania, Russia, Slovakia and Sweden with ongoing outbreak reports into the quarter 3 of 2021 from additional countries.

Similarly, latest dispatch reports of HPAI subtype H5 virus detection in non-poultry (including wild birds) were received from Austria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Latvia, Lithuania, Norway, The Netherlands, Poland, Romania, Russia, Sweden and Ukraine during the quarter 2.

During the second quarter of 2021, 387 birds were tested under the Avian Influenza Surveillance scheme, and 9 tested positive for Influenza A, all with a highly pathogenic H5 subtype.

Table 1: number of wild birds tested and results in Great Britain – Quarter 2 of 2021 (April to June 2021)

Surveillance activity	Number of birds tested*	Positive AI virus results and species of bird	Comments
Found dead or injured	387 (127)	Pheasants (6) Rooks (3)	Scanning surveillance conducted all year round

*Number of birds tested: figures for April to June 2019 are shown in brackets

Table 1 shows the number of wild birds tested under the Avian Influenza surveillance scheme. The number of birds tested under the Avian Influenza in quarter 2 (April to June) of 2021 was 387 as compared with 127 for the same period in 2020. Scanning surveillance continues year-round and all birds tested were found dead or injured.

Members of the public are asked to remain vigilant and report findings of target species in addition to mass mortality incidents to the Defra Helpline: 03459 33 55 77.

The criteria for a mass mortality incident are five or more wild birds of any species at any location (irrespective of county) in England, Scotland and Wales.

Warden Patrol Scheme

The main emphasis of the warden patrol scheme is on AIWBS in found dead wild birds, including mass mortality incidents, and patrols of designated reserves by skilled wild bird ecologists and wardens.

These warden patrols continue all-year-round, but are also seasonally targeted in the winter and spring periods (October to March) each year.

During the period 1 April to 30 June 2021 (quarter 2 of 2021), 162 warden patrols were performed at sites across Great Britain.

This compares 172 Warden Patrols performed during the same period in 2020 in Great Britain. During quarter 2 of 2021, all warden patrols were performed by the Wildfowl and Wetlands Trust.

In total during quarter 2 of 2021, 70 wild birds were reported found dead under the Warden Patrol Scheme of which 69 were tested, with no AI detections. This compares with 86 wild birds found dead of which 75 were tested during quarter 2 of 2020, with no AI detections.

In quarter 2 of 2021, Mallard ducks (34) were the most common target species found, and birds were most commonly found in south-west England with the lowest numbers in the east England and Scotland, which had no birds found dead by the Warden Patrol Scheme.

Similarly, Mallard ducks (35) were the most common target species found in quarter 2 of 2020 and birds were most commonly found in south-west England with the lowest numbers in east England, the Midlands and Scotland which had no birds found dead by the Warden Patrol Scheme.

Current EU situation

The current EU and UK outbreak situations can be found on GOV.UK.

APHA, in collaboration with Defra, monitors the international situation and distribution of avian influenza detections.

Current UK Situation

There have been 21 detections of HPAI in wild birds so far in 2021. The UK's risk status has been evaluated on a weekly basis. At the present time the official risk status is deemed to be low.

The HPAI cases in Great Britain during quarter 2 and the presence of HPAI in Europe serves as a reminder that at all times, poultry keepers should maintain robust biosecurity measures, be vigilant for clinical signs of disease and promptly report suspected cases of notifiable avian disease in poultry to APHA:

- in England – call the Defra Rural Services Helpline on 03000 200 301. The Helpline is open Monday to Friday, 8.30 am to 5.00 pm and there is an out of hours facility on the same number for reporting suspicion of disease in animals
- in Wales, the helpline number is 0300 303 8268
- in Scotland, contact your local APHA Field Services Office

Information about Avian Influenza

Further information regarding avian influenza in poultry and wild birds is also available on GOV.UK:

- Avian Influenza guidance
- when and how to register your poultry flock, and which species must be registered in Great Britain
- information about the chargeable testing scheme offered in Great Britain by APHA that enables veterinarians to request 'Testing for Exclusion of notifiable avian disease' in chicken and turkey flocks, in circumstances that would not require the implementation of statutory disease control measures (Gibbens and others, 2014)

References

- https://www.gov.uk/guidance/avian-influenza-bird-flu
- Weekly reports on findings of highly pathogenic avian influenza (bird flu) in wild birds in Great Britain
- Gibbens N, Brown IH, Irvine RM. Testing for exclusion of notifiable avian disease. *Veterinary Record* 2014;**174**:534-535. http://dx.doi.org/10.1136/vr.g3412

Julia Thomas and Lauren Lambert, Department of Epidemiological Sciences, APHA Weybridge; Vivien Coward, Scott Reid and Rowena Hansen, Avian Virology, APHA Weybridge

Wildfowl and Wetlands Trust's (WWT) role in Great Britain Avian Influenza Wild Bird Surveillance (AIWBS)

Summary: threats - HPAIV, targeted active surveillance of wetland birds

Throughout this quarter 2 of 2021, WWT continued to carry out passive surveillance of avian influenza across the reserves.

Between April and June 2021, 83 dead wild birds were found across seven WWT sites in Gloucestershire, West Sussex, Tyne and Wear, Greater London, Lancashire, Carmarthenshire and Somerset.

Of the birds found, 77 were sampled for avian influenza virus, with six carcases being too heavily predated or in advanced decomposition to swab.

14 priority target species were sampled during this quarter. These included species of swan, geese, ducks, gulls, and rails.

No Influenza A viral RNA was detected via PCR in the 77 samples that were sent to the laboratory for testing. During this quarter, at some specific centres, swabs collected were refrigerated and sent in weekly batches, in order to comply with COVID-19 related regulations.

For further details of HPAI surveillance from across Great Britain, refer to the section above for this quarter.

Rosa Lopez, Veterinary Officer (Conservation), Wildfowl & Wetlands Trust (WWT)

Zoonotic Diseases

APHA Diseases of Wildlife Scheme (DoWS); Salmonellosis in wildlife

Threat: Zoonotic, farmed and pet animal risk

There is no routine monitoring of *Salmonella* in wild birds or wild mammals. Therefore, all isolates are usually from clinical cases, although *Salmonella* may often not be the primary cause of disease. Occasionally, it is isolated from small-scale surveys.

There was one detection of *Salmonella* in wildlife in quarter 2 of 2021. A fully sensitive *Salmonella* Newport was cultured from a faecal swab from a dead badger (*Meles meles*) cub submitted from a wildlife centre. It had displayed neurological signs prior to death.

The significance of the *S*. Newport in the badgers demise is unclear. *S*. Newport has been previously reported in badgers (O'Hagen et al 2021).

Quality statement regarding these data

England and Wales data and the output of ad-hoc data retrieval from APHA FarmFile database. These figures are provisional. Research project and routine game bird isolates were excluded. All are from England and Wales.

Reference

- O'Hagan MJH, Pascual-Linaza AV, Couzens C, Holmes C, Bell C, Spence N, Huey RJ, Murphy JA, Devaney R, Lahuerta-Marin A. Estimation of the Prevalence of Antimicrobial Resistance in Badgers (*Meles meles*) and Foxes (*Vulpes vulpes*) in Northern Ireland. *Front. Microbiol*. 2021;12:596891. https://doi.org/10.3389/fmicb.2021.596891

Please also see the Wild Bird reports from Scotland later in this document for a case of salmonellosis in finches.

Catherine Man, APHA Diseases of Wildlife Scheme

Report from Wildlife Zoonoses and Vector Borne Disease Research Group

Summary - Zoonotic, farmed, pet animal and international trade risk

Passive surveillance for lyssaviruses in UK bats

One hundred and eleven bats were tested for lyssavirus under passive surveillance during this quarter. All were negative.

Four zoo bats were tested in this quarter for lyssaviruses. All were negative.

Rabies diagnosis

Two dogs that died in quarantine were tested for rabies with negative results.

Rabies surveillance in terrestrial wildlife

The head of one fox showing neurological signs suspicious of rabies was submitted via the RSPCA in Kent but tested negative for Lyssavirus.

West Nile virus (WNV) surveillance and Usutu virus surveillance in wild birds

Brain and kidney tissue samples from 168 wild birds collected between 1 March 2021 and June 30 2021 and submitted via APHA, SRUC and IoZ were tested by PCR for WNV with negative results. Tissues from fifty birds were also tested by PCR for Usutu virus with negative results.

West Nile virus surveillance in Equids

Two horses showing neurological signs suspicious of WNV infection were tested by IgM ELISA during this period with negative results.

West Nile virus surveillance in other animals

Serum samples from 4 dogs received from a commercial company requiring tests to exclude WNV were tested by cELISA with negative results.

Paul Phipps, Wildlife Zoonoses and Vector Borne Disease Research Group, APHA Weybridge

Ongoing new and re-emerging diseases, unusual diagnoses and horizon scanning

Wildlife Diseases, horizon scanning; news items associated with wildlife populations and wildlife disease. Very brief summaries are given, including possible wildlife disease threats to human, livestock and biodiversity health

1. **Published paper on spillover infection of Rabbit haemorrhagic disease virus (RHDV) 2 to badgers (*Meles meles*) in Portugal.**

   Abade dos Santos, FA, Pinto, A, Burgoyne, T, *et al.* (2021). Spillover events of rabbit haemorrhagic disease virus 2 (recombinant GI.4P-GI.2) from Lagomorpha to Eurasian badger. *Transboundary and Emerging Diseases*, 00: 1– 16 https://doi.org/10.1111/tbed.14059

2. **First diclofenac intoxication of wild raptor in Europe.**

   Herrero-Villar, M., Delepoulle, É., Suárez-Regalado, L., Solano-Manrique, C., Juan-Sallés, C., Iglesias-Lebrija, J.J., Camarero, P.R., González, F., Álvarez, E. and Mateo, R. (2021). First diclofenac intoxication in a wild avian scavenger in Europe. *Science of The Total Environment,* 782, p.146890. https://doi.org/10.1016/j.scitotenv.2021.146890

3. **Active shedding of *Neosporum caninum* detected in Australian wild dogs.**

   Davidson, M. J., Huaman, J. L., Pacioni, C., Stephens, D., Hitchen, Y., & Carvalho, T. G. (2021). Active shedding of *Neospora caninum* detected in Australian wild canids in a nonexperimental context. *Transboundary and Emerging Diseases*, 00, 1– 10.

4. **Expanded host and geographic range of Perkinsea pathogen in amphibians.**

   Smilansky, V., Jirků, M., Milner, D.S., Ibáñez, R., Gratwicke, B., Nicholls, A., Lukeš, J., Chambouvet, A. and Richards, T.A. (2021). Expanded host and geographic range of tadpole associations with the Severe Perkinsea Infection group. *Biology Letters*, *17*(6), p.20210166.

Garden Wildlife Health summary

The Garden Wildlife Health project (GWH) has continued to conduct scanning disease surveillance of garden birds, hedgehogs, reptiles, and amphibians. The disease incident reports (DIRs) received, and postmortem examinations (PMEs) conducted by the GWH team during quarter 2 of 2021 are summarised in Table 2 and 3, and Figure 1.

Testing of wild animals examined postmortem included:

- microbiological screening of the liver and small intestinal contents in bird and mammalian species
- parasitological examination of the small intestinal contents in all animals
- culture of a crop sample from birds to screen for the presence of *Trichomonas gallinae*
- molecular testing (PCR) for ranavirus, *Batrachochytrium dendrobatidis* and *Batrachochytrium salamandrivorans* in all amphibian species, as well as for *Ophidiomyces ophiodiicola* in snakes

Additional diagnostic tests, including histopathological examination, are conducted when indicated.

Table 2: numbers of Garden Wildlife Health disease incident reports and postmortem examinations for quarter 2 of 2021

Taxon	Number of disease incident reports (number of sites)	Total number of animals observed (sick/dead)	Number of postmortem examinations (number of sites)
Amphibians	127 (108)	416 (44/372)	10 (9)
Birds	1320 (1210)	1788 (988/3020)	22 (19)
Hedgehogs	186 (145)	193 (25/168)	3 (3)
Reptiles	13 (12)	13 (0/13)	0 (0)
Total	1646 (1475)	2416 (1059/3573)	35 (31)

Table 3: compares the numbers of Garden Wildlife Health disease incident reports for quarter 2 of 2020 and 2021

Taxon	Number of disease incident reports in Quarter 2 (sick/dead)	
	2020	2021
Amphibians	176 (230/561)	127 (44/372)
Birds	1813 (1371/1032)	1320 (988/3020)
Hedgehogs	214 (38/204)	186 (25/168)
Reptiles	37 (5/34)	13 (0/13)
Total	2240 (1644/1831)	1646 (1059/3573)

No unusual trends in GWH DIRs were observed this quarter, with the general reporting patterns being comparable to quarter 2 of 2020. However, an overall decrease in the number of reports was received across taxa.

Due to the COVID-19 pandemic and people spending more time at home and in their gardens, we had a large increase in DIRs in quarter 2 of 2020 and therefore, with restrictions easing, a slight decrease in numbers of reports in quarter 2 of 2021 was expected.

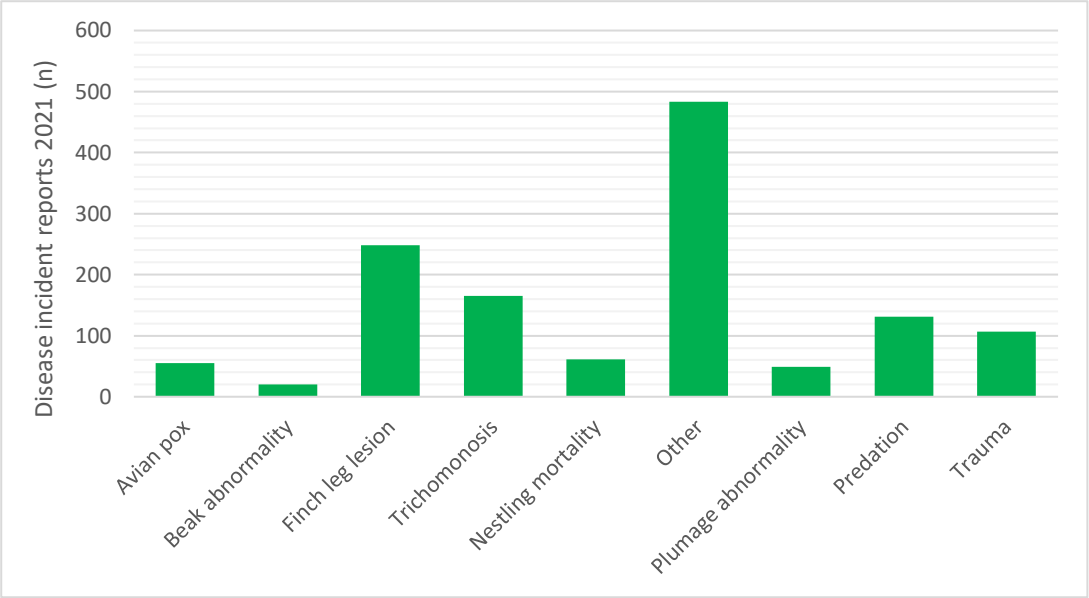

Figure 1: the graph shows the numbers of Garden Wildlife Health avian disease incident reports allocated suspect diagnoses for quarter 2 of 2021, with the category of 'other' mostly comprising reports of birds exhibiting non-specific signs of ill health (for example, fluffed-up plumage, lethargy). Further information on avian pox, beak abnormality, finch leg lesions, trichomonosis, and plumage abnormality is available on Garden Wildife Health website.

Institute of Zoology (IoZ)

Mammal reports

Wild mammal reports from APHA DoWS

Enteric digenean trematode infestation in a Common Pipistrelle (*Pipistrellus pipistrellus*)

An adult male pipistrelle was found on a house doorstep on 24 March 2021. It was collected by the local bat rescue centre and was noticeably under weight. It was reported that it had been found at a house next door to a recent bat cat victim. So initially it was thought that the cause of its condition may have been cat-attack related.

However on examination there was no gross evidence of this. In care its weight increased to 5.5g, but the weather was then too cold for its release. Subsequently it stopped eating and died on 19 April 2021 at 3.3g body weight. The body was immediately frozen and submitted to Wildlife Network for Disease Surveillance (WNDS) on 20 April 2021.

Figure 2 - the unopened carcase of the common pipistrelle bat

Figure 3 - the opened carcase of the common pipistrelle bat

The abdominal fur was damp and the skin had sloughed from the lower jaw, which was assumed to have occurred after death. Internally the stomach was bloated, which again may be a post-mortem change. No other gross lesions or abnormalities were identified either in the fresh carcase or after fixing in 10% formalin.

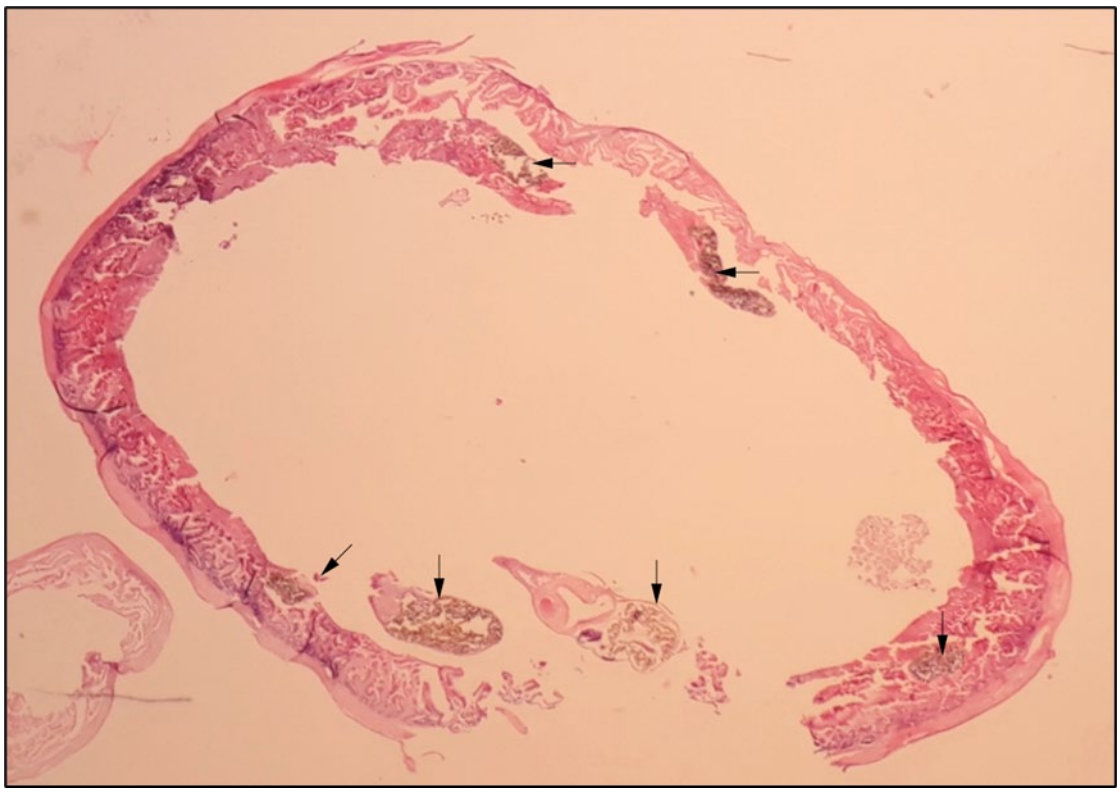

Figure 4: photomicrograph of a section of the small intestine, with multiple cross sections of fluke visible (arrowed)

No pathological changes were seen in the heart muscle and kidney sections. There was marked loss of architecture of the liver due to autolysis. The lungs had many alveoli congested with blood as well as the interalveolar septae. The gut sections contained large numbers of fluke (digenean trematodes) mainly indicated by gravid uteri. Sections of at least six fluke can be seen in Figure 4.

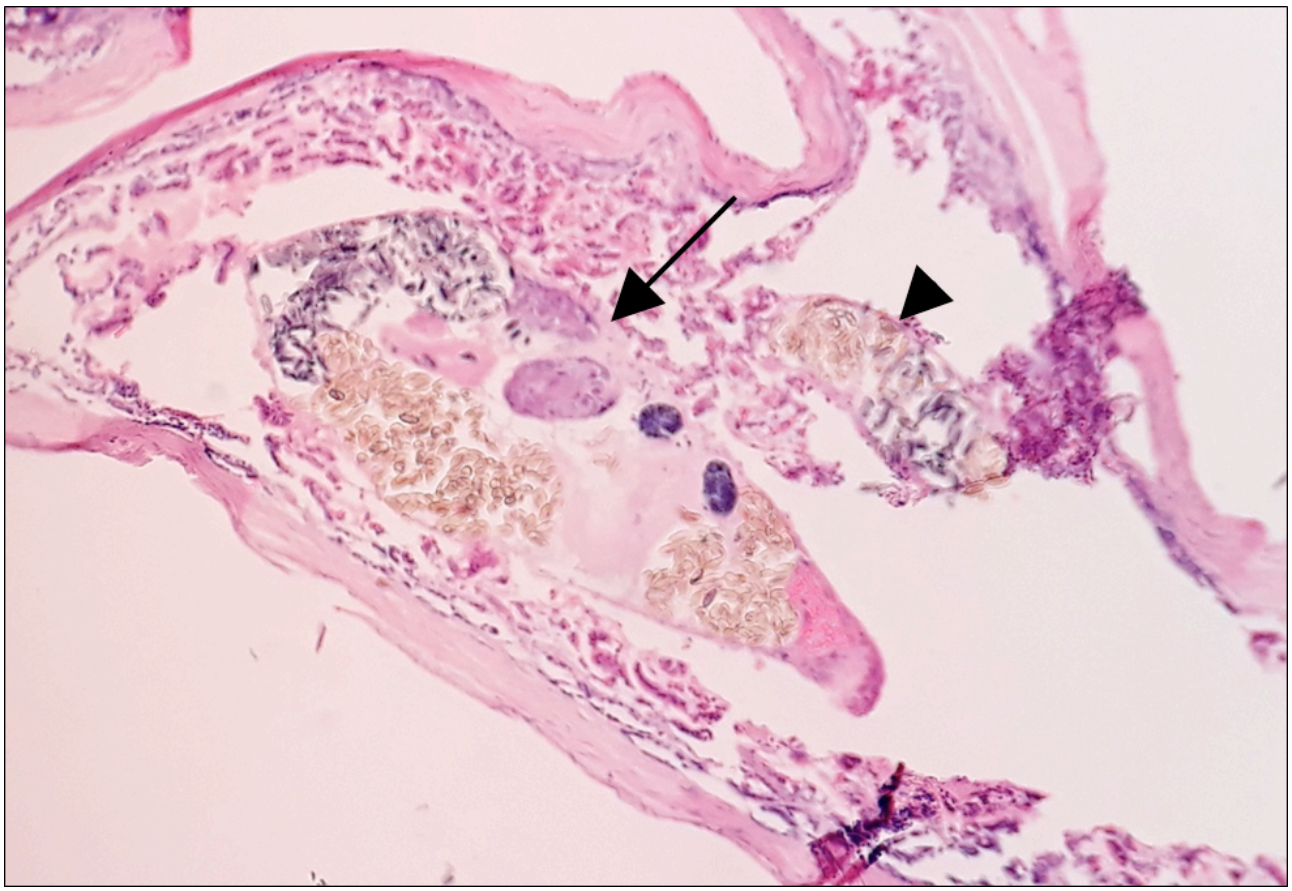

Figure 5: photomicrograph showing a longitudinal section through a fluke () and partial section of another (arrow head)

The abdominal and thoracic visceral changes are probably related to a degree of autolysis and terminal changes in a dying bat.

The helminths were presumptively identified as digenean trematodes, as research by Lords and others (2012) found that pipistrelle bats in the UK have a high prevalence of infection with digenean trematodes rather than other helminths.

Most studies on intestinal trematodes of bats have concentrated on species identification, numbers and prevalence.

There have been no detailed investigations as far as I'm aware as to the ultimate clinical significance of these endoparasites.

Although Warburton and others (2016) in a study of big brown bats (Eptesicus fuscus) in the USA found that body condition is a good indicator of the level of digenean trematode infestation. In this case there certainly was a significant trematode burden and low body weight had been recorded

There is evidence of significant digenean trematode infestation, which might be an underlying factor in the eventual death of this bat.

References

- Lord JS, Parker S, Parker F, Brooks DR. Gastrointestinal helminths of pipistrelle bats (*Pipistrellus pipistrellus*/ *Pipistrellus pygmaeus*) (Chiroptera: Vespertilionidae) of England. *Parasitology*. 2012;**139**: 366 – 374. https://doi.org/10.1017/S0031182011002046
- Warburton EM, Pearl CA, Vonhof MJ. Relationships between host body condition and immunocompetence, not host sex, best predict parasite burden in a bat-helminth system. *Parasitol. Res*. 2016;**115**: 2155. https://doi.org/10.1007/s00436-016-4957-x

Alex Barlow, Wildlife Network for Disease Surveillance (WNDS); Peter Proudlove, Rescue Centre (Leicestershire and Rutland Bat Group)

Squirrelpox virus infection in an isolated red squirrel (*Sciurus vulgaris*) population in the North of England

A small population of red squirrels exists at Formby, Lancashire in coastal conifer woodland. This population has experienced repeated outbreaks of pox virus disease, as the area is entirely surrounded by grey squirrels (*Scirurus carolinensis*) which carry the virus sub-clinically.

In June this year, APHA DoWS received lip skin and eyelid samples from the local Lancashire Wildlife Trust from an animal that was found with suspicious lesions. From both these skin samples typical pox virus was detected by electron microscopy.

Since then, contact with the Wildlife Trust has indicated that several more animals have been found dead in suspicious circumstances. APHA DoWS are expecting more carcases will be submitted.

The population is therefore under constant threat from the poxvirus-carrying grey squirrel population surrounding the conifer woods, ghe last outbreak occurred in 2018. Each outbreak causes significant mortality to an overall population of probably less than 100 red squirrels.

In the intervening years the red squirrel population recovers to some extent but only prior to the next outbreak of disease.

Disease mitigation efforts including excellent citizen science with local people rapidly reporting grey squirrels in the fir woods, camera traps and rapid grey squirrel control are all being eagerly applied and we wait for further reports. However there is a real risk that this well known red squirrel population faces extirpation caused by squirrel pox disease.

The Formby red squirrels is the latest in a series of disease outbreaks that have caused the depletion and extirpation of small, isolated, fragmented red squirrel populations across the North of England. Several of these disease outbreaks have been reported in previous WQRs.

Collaborative work between APHA DoWS, squirrel ecologists and local reserve wardens has resulted in a publication (Everest and others, 2021) describing wildlife disease investigation and

surveillance and the disease mitigation efforts and the outcomes of all these approaches in four such red squirrels populations, three in woods in England and one in a wood in Wales.

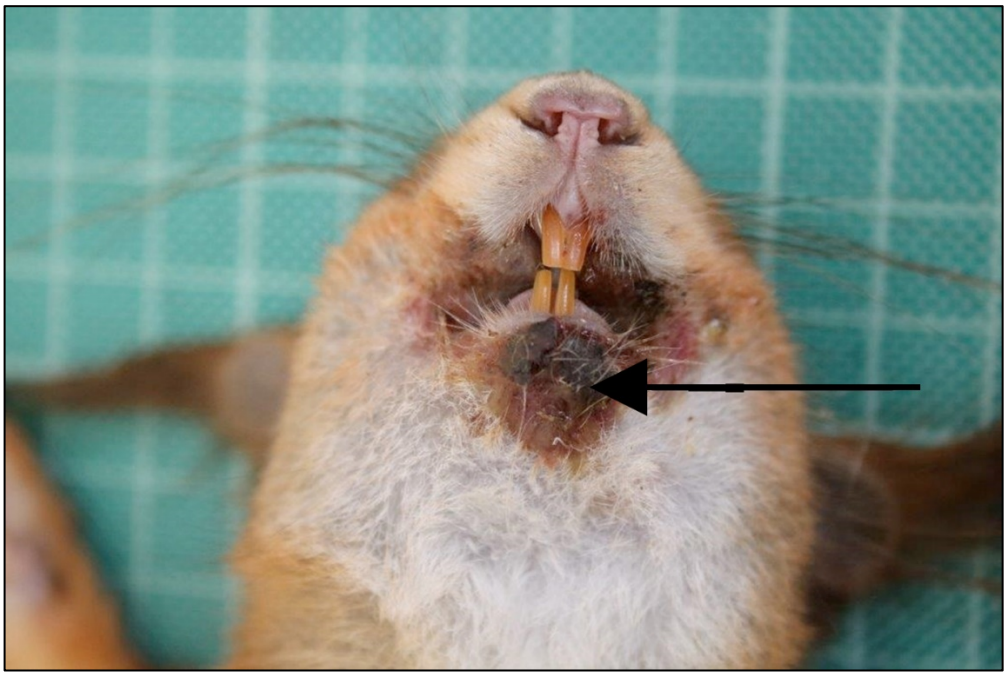

Figure 6: Squirrel pox lesion (black arrow indicates where the lesion is on the squirrels chin) on the chin of a red squirrel examined by APHA DoWS at APHA Shrewsbury. Lesions may appear relatively mild but the disease itself is invariably fatal.

Reference

- Everest, D., Floyd, T., Holmes, P., Duff, P., Man, C., Dunnett, E., Locke, R., Savage, L., Sutcliffe, S., Sapsford, B. and Shuttleworth, C., 2021. Disease monitoring and surveillance: case studies in the applied conservation of fragmented red squirrel (Sciurus vulgaris) populations in England and Wales. *Mammalian Biology*, pp.1-10. https://doi.org/10.1007/s42991-021-00157-8

Avian reports

Wild Bird reports from the IoZ

Update on Garden bird trichomonosis

In quarter 2 of 2021, a suspected diagnosis of garden bird trichomonosis was assigned to 165 DIRs, involving 209 sick and 82 dead birds from 124 sites across the UK.

Further, trichomonosis was diagnosed in 8 (8 out of 22) garden birds examined postmortem from 7 sites from England, Scotland and Wales. These birds comprised four species, chaffinch (*Fringilla coelebs*) (n=3), siskin (*Spinus spinus*) (n=2), feral pigeon (*Columba livia*) (n=1), and lesser redpoll (*Acanthis cabaret*) (n=2).

The lesser redpoll is a red-listed passerine of conservation concern, and this is the first time *Trichomonas gallinae* was isolated by GWH in this species confirming a diagnosis of trichomonosis. The two birds were both adult males from separate sites in Wales, submitted for examination in May and June 2021, respectively.

In addition to the significant and ongoing UK greenfinch (*Chloris chloris*) population decline that has occurred due to finch trichomonosis (Lawson and others, 2018), this emerging disease may be an additive threat to species already of conservation concern.

Sporadic cases of trichomonosis have been confirmed in other red-listed species such as the yellowhammer (*Emberiza citronella) and* hawfinch (*Coccothraustes coccothraustes*) in previous years.

Further, in both siskins diagnosed with trichomonosis in quarter 2 of 2021, found at the same site in North Scotland in May 2021, *Salmonella* Typhimurium was also isolated upon microbiological examination of the liver, as well as the oesophagus and small intestinal contents in one bird, although no gross lesions characteristic of salmonellosis were observed.

Carcass preservation did not permit histological examination, but concurrent passerine salmonellosis remains a tentative diagnosis.

Whilst trichomonosis is still the most frequently identified infectious condition that we diagnose in passerines, this case reinforces the need for microbiological examination to screen for concurrent infections and shows that there remain a number of differential diagnoses for multiple mortality incidents.

Passerine salmonellosis, caused by *Salmonella* Typhimurium, typically occurs during the winter months (Lawson and others, 2010). Whilst greenfinches and house sparrows (*Passer domesticus*) are most commonly affected, other species such as siskins are also susceptible (Lawson and others, 2010).

Sensible hygiene precautions, such as hand washing, are recommended as a routine when feeding garden birds (Lawson and others, 2014).

References

- Lawson B, Robinson RA, Toms MP, Risely K, MacDonald S, Cunningham AA. Health hazards to wild birds and risk factors associated with anthropogenic food provisioning. *Philosophical Transactions of the Royal Society B: Biological Sciences*. 2018;**373**(1745):20170091. https://doi.org/10.1098/rstb.2017.0091
- Lawson B, de Pinna E, Horton RA, Macgregor SK, John SK, Chantrey J, Duff JP, Kirkwood JK, Simpson VR, Robinson RA, Wain J. Epidemiological evidence that garden birds are a source of human salmonellosis in England and Wales. *PLoS ONE* 2014;**9**(2): e88968. https://doi.org/10.1371/journal.pone.0088968
- Lawson B, Howard T, Kirkwood JK, Macgregor SK, Perkins M, Robinson RA, Ward LR, Cunningham AA. Epidemiology of Salmonellosis in Garden Birds in England and Wales, 1993 to 2003. *EcoHealth* 2010;**7**(3):294-306. https://doi.org/10.1007/s10393-010-0349-3

Suttonella ornithocola in blue tits in the UK

In April 2020, a multiple mortality incident of blue tits (*Cyanistes caeruleus*) was reported in Essex where affected birds showed non-specific signs of ill health (such as, fluffed up plumage and lethargy) in combination with gasping.

A single blue tit was submitted for PME and evidence of mild pulmonary congestion was observed. Microbiological investigation of the lungs isolated a Gram-negative bacterium confirmed as *Suttonella ornithocola* through 16S rDNA gene sequence analysis.

Suttonella ornithocola infection has been most commonly observed in blue tits as a cause of pneumonia-like disease with a spring seasonality, though other birds within the tit families (*Paridae* and *Aegithalidae*) are also susceptible to infection (Lawson and others, 2011).

Since its detection in Great Britain in 1996 (Kirkwood and others, 2006), following a cluster of tit mortality incidents, only a small number of *S. ornithocola* infections have been identified with a widespread distribution across the country, suggesting this disease to be endemic within British tit populations.

In spring 2020, an epizootic of mortality associated with *Suttonella ornithocola* infection was reported in north-west Germany in blue tits, and to a lesser extent in coal tits (*Periparus ater*), leading to mass mortality of over 35,000 birds. High numbers of disease incident reports in blue tits have also been reported in Germany in spring 2021 (Nature and Biodiversity Conservation Union (NABU), 2021).

However, disease surveillance through GWH has observed no evidence of an atypical seasonal increase in tit mortality reports over the past year in Great Britain. In quarter 2 of 2021, we received 114 DIRs involving 108 sick and 116 dead blue tits.

These were submitted form 108 sites across the country and comprised reports of nestling mortalities (n=26), plumage abnormalities (n=14), beak abnormalities (n=10), trauma or predation (n=13), and avian pox (n=3), with the majority of reports (n=48) being categorised as 'other', mostly involving signs of general ill health.

References

- Lawson B, Malnick H, Pennycott TW, Macgregor SK, John SK, Duncan G, Hughes LA, Chantrey J, Cunningham AA. Acute necrotising pneumonitis associated with Suttonella ornithocola infection in tits (Paridae). The Veterinary Journal 2011;**188**:96-100. doi:10.1016/tvji.2010.03.010.
- Kirkwood JK, Macgregor S, Malnick H, Foster G. Unusual mortality incidents in tit species (family Paridae) associated with novel bacterium Suttonella ornithocola. Veterinary Record 2006;**158**:203-205. doi:10.1136/vr.158.6.203.
- Nature and Biodiversity Conservation Union (NABU) Suttonella ornithocola bacterium causes blue tit deaths. NABU Report 20 (Accessed on 19 July 19 2021). https://www.nabu.de/news/2020/04/27990.html

Institute of Zoology (IoZ)

Wildfowl and Wetlands Trust (WWT) report

Passive surveillance of waterbirds

Postmortem examinations were performed on 45 wild birds originating from seven WWT sites:

- Arundel, West Sussex
- Caerlaverock, Dumfries and Galloway
- Llanelli, Carmarthenshire
- London Wetland centre, Greater London
- Martin Mere, Lancashire
- Slimbridge, Gloucestershire
- Welney, Norfolk

Eleven target species were examined(the primary causes of death are summarised in Table 4), which included:

- Thirteen mallards (*Anas platyrhynchos*)
- Seven whooper swans (*Cygnus cygnus*)
- Five mute swans (*Cygnus olor*)
- Five greylag geese (*Anser anser*)
- Four common shelducks (*Tadorna tadorna*)
- Four moorhens (*Gallinula chloropus)*
- One eurasian coot (*Fulica atra*)
- One tufted duck *(Aythya fuligula)*
- One Eurasian wigeon (*Mareca penelope)*
- One herring gull *(Larus argentatus)*
- One canada goose (*Branta canadensis*)

Two other species were also examined:

- A feral pigeon (*Columba livia domestica*)
- A jackdaw (*Corvus monedula*)

The main causes of avian mortality during this quarter were predation (33%) and trauma (18%). The majority of the predated birds collected presented intact skeletal structure with skin, albeit minimal soft tissue or missing sections, and absence or minimal presence of internal organs. High suspicion of a mixture of gull and bird of prey predation in many of these cases.

Within the trauma cases, there were seven mallards, six of which were female that suffered fatal wounds from same species aggression (most likely male mallards). There was also a shelduck within this category that presented wounds compatible with a combination of a predation attempt and collision.

Avian mycobacteriosis was the primary cause of mortality in 9% of the carcases found with a characteristic presentation of mutil-focal granuloma-like lesions in hepatic, splenic and/or renal tissues in all four birds (two whooper swans, one canada goose and one coot).

One case was euthanased on welfare grounds due to presenting oedematous limbs, advanced degree of bumblefoot on both feet and unable to bear any body weight (nonambulatory). These lesions were secondary to mycobacterium infection.

One whooper swan, a shelduck and a greylag were possible lead intoxication cases (7%) presenting severe oesophageal-proventriculus dilation with grass impaction extending into the gizzard and an empty intestinal package. Two also suffered trauma to one of their limbs and all presented poor body condition.

Severe necrotic enteritis was detected in one mute swan (2%) with congested intestinal loops and necrotic lesions within the intestinal lining.

Two whooper swans (4%), also presented congested and necrotic digestive tract, and had splenomegaly, petechaie present in several organs (myocardium and spleen) and congested lungs, indicative of a possible viral infectious disease rather than bacterial as with the mute swan.

Two wild birds (4%), a mallard and a whooper swan, from different sites suffered advanced respiratory disease involving advanced stages of airsacculitis affecting all thoracic and abdominal air sacs.

Seven wild birds (13%) did not receive diagnostic due to advanced decomposition, lack of obvious gross abnormalities or multifactorial non-fatal lesions present.

Table 4: confirmed and suspected causes of wild bird mortality (including morbidity meriting euthanasia on welfare grounds) at WWT reserves between April and June 2021; †n denotes juvenile birds and number of juvenile birds; *n denotes euthanased birds and number of euthanased birds

Primary cause of death or post mortem findings	Total	Species (and notes)
Predation	15	5 x mallards 4 x moorhen 1 x greylag goose†1*1 1 x herring gull*1 1 x tufted duck 1 x shelduck 1 x wigeon 1 x pigeon
Trauma	8	7 x mallards 1 x shelduck
Avian mycobacteriosis	4	2 x whooper swan 1 x canada goose 1 x coot
Proventricular dilation	3	1 x whooper swan 1 x greylag goose 1 x shellduck
Airsacculitis	2	1 x whooper swan 1 x mallard
Necrotic enteritis	1	1 x mute swan
Other	6	2 x whooper swan (viral disease) 2 x greylag geese†1*1 (unknown chronic disease and emaciated,) 2 x mute swans†1 (coelomitis and cardiovascular)
No diagnosis (due to decomposition or lack of or inconclusive gross abnormalities)	6	2 x mute swans 1 x shelduck 1 x whooper swan†1 1 x greylag goose 1 x jackdaw

Rosa Lopez, Veterinary Officer (Conservation), Wildfowl & Wetlands Trust (WWT)

Wild Bird reports from Scotland

Salmonella Typhimurium (ST19, 10, 7, 12, 9, 5, 9, 2) infection was diagnosed as the cause of death of a group of fourteen mixed finches (goldfinches and siskins, *Carduelis carduelis* and *Carduelis spinus* respectively) which were found dead in a garden in Easter Ross.

Autolysis and predation were present, but *S.* Typhimurium was isolated from intestinal swabs from all complete carcases (six adult goldfinches and two adult siskins). Increased hygiene at garden bird feeders and drinkers was advised.

Louping ill was diagnosed in a year-old red grouse hen (*Lagopus lagopus scotica*) which was found dead by the roadside. Body condition was moderate and several dark 5 to 10 mm focal lesions with light coloured centres were seen in the lungs.

Several smaller focal lesions, less than 5 mm in diameter with light centres were visible in the liver, and the spleen was enlarged. Histopathology revealed an acute multifocal fibrinous splenitis and an acute focal hepatic necrosis and fibrinous hepatitis.

Both these and the mild liver lesions are non-specific but were thought most likely due to bacterial infection. Louping ill virus RNA was detected in the brain.

Louping ill is a disease of concern for its financial impact on red grouse and sheep.

Caroline Robinson, SRUC Veterinary Services

Wild Bird reports from APHA DoWS

Hepatic myelolipoma in a mute swan

A dead adult male mute swan was received for examination under the AIWBS. The bird was found dead on land close to a town, with no obvious injuries. Examination revealed the bird was in a very poor body condition and had marked pathology in the liver and kidneys. The liver was dark brown and swollen with a ‘pitted’ surface.

Approximately 25% of the liver from the dorsal attachment was hard, with a ‘gristly’ feel to the tissues when cut. The adjoining 25% of the liver parenchyma was firm. The kidneys were markedly enlarged and firm throughout with some focal hardened areas in the tissue. There were sporadic and clustered tiny (pinprick) white foci in the kidney cortices.

Figure 7: the liver of an adult male mute swan, which is notably discoloured and swollen, with a 'pitted' surface

Figure 8: the kidney of an adult male mute swan, which were enlarged and firm

Histological examination of the liver revealed myelolipoma with osseous metaplasia, severe chronic fibrosis and suspected amyloidosis. Liver failure was the likely cause of death. Histology also confirmed a nephropathy, as well as focal granulomatous pneumonia, likely issues occurring secondary to chronic liver disease.

Hepatic myelolipoma has been described in other water fowl (Hatai and others, 2009; Suzuki and others, 2010) and some exotic bird species (Latimer and Rakich, 1995). Myelolipomas are commonly considered a benign tumour, but can cause obstruction.

It is therefore possible that the hepatic fibrosis had occurred secondary to circulatory disturbances caused by the tumoural masses. Ultimately, the specific clinical significance of myelolipomas is unclear. This is the first time that APHA has reported this condition in birds.

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- Suzi Bell, APHA VIC Shrewsbury and Alex Schock, APHA Lasswade

Mortality in Sandwich terns (*Sterna sandvicensis*) and Mediterranean gulls (*Larus melanocephalus*) – predation suspected

Multiple deaths were described in a Sandwich tern colony on an offshore island. Mediterranean Gulls were also breeding on the island. The colony is only visited intermittently by the warden and after a heavy rain storm the colony seemed quieter. It was visited six days later and found to have been abandoned.

A large number of dead adults and chicks, over 100, were present including some Mediterranean Gull chicks. Other gull and tern colonies in the vicinity were visited on the same day and appeared unaffected, suggesting the adverse weather was not a factor in the incident.

Five carcasses of Sandwich terns and Mediterranean gulls were received at APHA Shrewsbury. Avian Influenza and West Nile Virus were not detected after routine screening.

Four of the birds were suitable for examination and all had been in good bodily condition and three had large amounts of food in the gizzards indicating recent feeding. They also had puncture wounds/damage to the skin and fractures of the skeleton.

There was extensive subcutaneous and internal haemorrhage with blood in the body cavities particularly around the liver, heart and lungs. The damage was consistent with death due to trauma and predation was considered the most likely cause.

Further enquiries revealed that at low tides foxes are known to be able to access the colony. Further management of the colony is planned.

Figure 9: Sandwich tern with traumatic injury

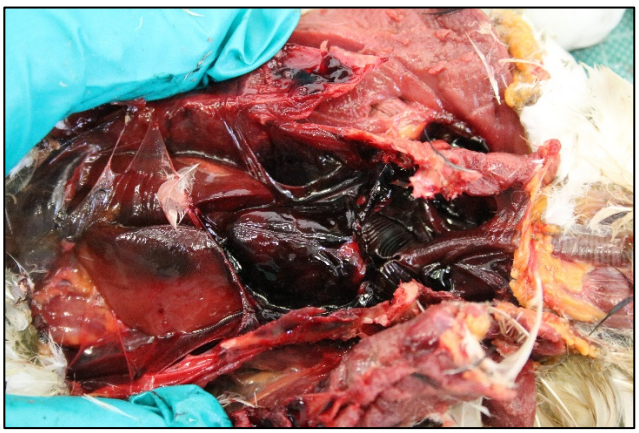

Figure 10: Sandwich tern with extensive internal haemorrhage

Paul Holmes, APHA DoWS

Investigation into the suspect shooting of a goosander

APHA DoWS helped the RSPB in an investigation into the death of goosander (*Mergus meganser*).

In May 2021, a female goosander was found dead on the ground in the Lake District National Park; the body was next to a nesting site. A previous visit had noted a female (presumed this bird) incubating eggs. The nest contents were missing. An initial radiograph did not show any metallic objects.

At postmortem the bird was found to be in reasonable body condition, there appeared to be an entry chest wound and an exit wound in the back, with a foreign material going through the body cavity at chest level.

The most likely cause of these lesions is shooting, a projectile (bullet) was not found. Heavy parasitism due to *Contracaecum* sp. appeared not to be clinically significant. Death was due to penetrative trauma most likely caused by a bullet. The illegal death of the bird was widely reported in the press and hopefully will help in preventing this type of pointless crime.

Figure 11: female goosander with wound on breast characteristic of an entry wound for a bullet, an exit wound was also found.

Contracaecum sp. nematode worms (*Anisakidae*) are seen reasonably frequently in fish-eating water birds, fish are often an intermediary host of the parasite. *Contracaecum* larvae can infect humans; the worms in this bird were adults, adult worms do not affect humans.

Heavy infestations in water birds can cause disease but usually do so acting in combination with other factors and did not cause ill-thrift in this bird.

Figure 12: female goosander showing *Contracaecum* sp. nematode worms in the gastro-intestinal tract. Larvae of these worms are potentially zoonotic. The sawbill profile on the mandibles that gives these ducks the common name of 'sawbills' can be seen

Paul Duff, APHA DoWS

Visceral gout in common starlings (*Sturnus vulgaris*)

Five common starlings were submitted for post mortem examination as part of the avian influenza wild bird surveillance scheme (AIWBS) and had been found in a hedgerow by a member of the public. They were submitted in February 2021, at the time of a severe cold spell resulting in widespread freezing across the area.

After testing negative for avian influenza, the starlings underwent diagnostic postmortem examination as part of the Diseases of Wildlife Scheme (DoWS).

Four were suitable for examination, and were found to be in good to fair condition. The most significant finding on post mortem examination was the presence of multiple small granular deposits across the epicardium and pericardium in two of the birds, and the pericardium being completely adhered to the epicardium in one bird.

The kidneys in all four birds were pale and mottled, and they were markedly enlarged in one bird. Histopathological examination found renal gout in all four birds examined, and epicardial gout in one bird.

Further discussion with the submitter found this to be a single occurrence, despite continued vigilance. It was concluded that the most likely cause of the renal gout was water deprivation and dehydration, linked to the freezing of freshwater sources in the area.

Ed Fullick, APHA DoWS

Lead poisoning in a mute swan

A dead mute swan (*Cygnus olor*) was found in a waterlogged field and submitted as part of the avian influenza wild bird surveillance scheme (AIWBS). After testing negative for avian influenza, the swan then underwent diagnostic postmortem examination under the Diseases of Wildlife Scheme (DoWS).

The swan was in very poor condition and the carcase was autolysed, which limited the examination. However, the swan was found to have several pieces of presumed lead shot in the ventriculus.

Lead estimation on the kidney confirmed a significantly elevated concentration (171mg per kg Wet Matter), indicating lead poisoning was the cause of the swan's death.

The finding was discussed with the submitter, who noted that shooting was not uncommon in the area in which the swan was found. Swans and other wildfowl are thought to be particularly vulnerable to poisoning from lead pellet ingestion due to their feeding habits.

Ed Fullick, APHA DoWS

Beak deformity in a buzzard

A common buzzard was submitted to the AI wild bird surveillance scheme and to investigate the cause of death. At PME, the rhinotheca was found to be markedly misshapen, with a depression proximal to the external nares, and exposure of the internal structures of the nares (see figure 13 and 14).

The buzzard was in poor condition, and no other significant gross lesions were identified. Histological examination did not determine a cause of the beak deformity. Previous physical trauma was thought to be the most likely cause.

It was considered likely that the poor condition of the bird was due to from the effects of the beak deformity and resulted in the poor body condition and eventual death of this bird.

Figure 13: profile view of the beak deformity in the buzzard

Figure 14: front view of the beak deformity in the buzzard. The internal nasal structures are visible through the enlarged nares

Ed Fullick, APHA DoWS

Amphibian reports

Wild amphibian reports from the IoZ

Gastrointestinal intussusception in a Common toad (*Bufo bufo*) during the breeding season

Summary including possible threats – Point of information

In April 2021, a single Common toad (*Bufo bufo*) was found dead in Buckinghamshire and submitted to GWH for postmortem examination. The toad was found to be in thin body condition, with no visible fat bodies and a large amount of spawn present within the coelomic cavity.

There was gastrointestinal intussusception of the distal, empty stomach and proximal small intestines (see figure 15a), partly protruding into the oral cavity.

The serosa and mucosa of the affected regions were markedly congested (see figure 15b), suggestive of an at least subacute occurrence, likely preventing the animal from being able to feed.

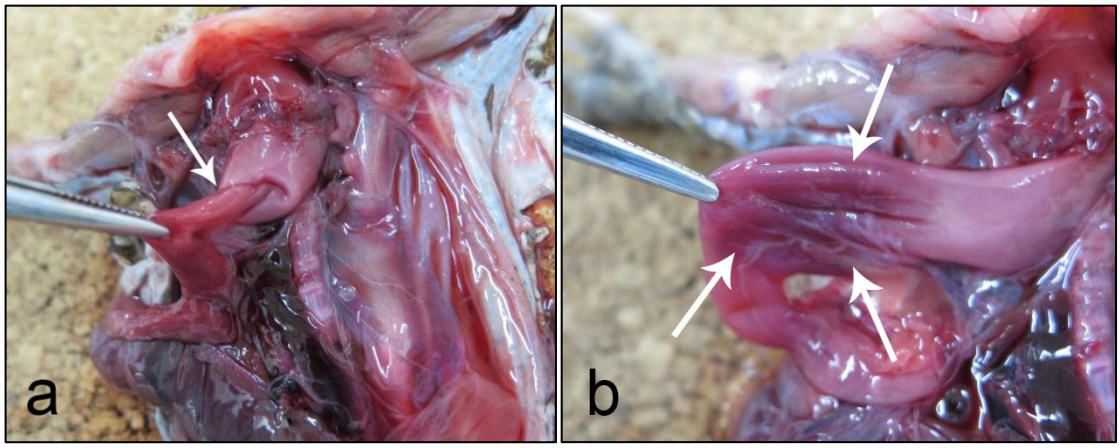

Figure 15a and 15b: a gastrointestinal intussusception (shown in figure 15a) in a Common toad (*Bufo bufo*) submitted for postmortem examination in April 2021 with evidence of serosal congestion (shown in figure 15b)

Given the time of the year and the presence of a large amount of spawn within the coelomic cavity, it is suspected that the intussusception might have occurred as a result of increased pressure due to amplexus of a male toad during the breeding period.

Cloacal prolapse is a relatively common observation during the breeding season, believed to occur for the same reason.

Institute of Zoology (IoZ)

Appendix 1: combined wildlife disease data 2020

Appendix 1 incorporates data from APHA Diseases of Wildlife Scheme, SRUC and Garden Wildlife Health (Institute of Zoology) wildlife submissions in calendar year 2020. This data set only includes routine diagnostic submissions and does not include project work. 'Mixed birds' submissions are submissions where multiple species have been submitted together.

Section 1: submission numbers

Table 1: showing the number of submissions by category of animal and country.

Country	Category of animal	APHA	IOZ	SRUC	Total number of submissions
England	Amphibian		8		8
	Birds	328	58		386
	Mammals	84	13		97
	Reptile		9		9
Country total		412	88		500
Scotland	Birds	4	3	74	81
	Mammals			19	19
Country total		4	3	93	100
Wales	Amphibian		1		1
	Birds	16	4		20
	Mammals	7			7
	Reptile		1		1
Country total		23	6		29
Unspecified location	Birds			2	2
	Mammals			1	1
Total				3	3
Total number of submissions		439	97	96	632

Table 2: showing the number of submissions by category of animal and quarter reported.

Category of animal	Quarter reported	APHA	IOZ	SAC	Total
Amphibians	1		6		6
	3		3		3
Total number of amphibians			9		9
Birds	1	22	16	10	48
	2	17	5	23	45
	3	28	36	15	79
	4	281	8	28	317
Total number of birds		348	65	76	489
Mammals	1	16	5	2	23
	2	8		9	17
	3	22	7	5	34
	4	45	1	4	50
Total number of mammals		91	13	20	124
Reptiles	1		1		1
	2		4		4
	3		5		5
Total number of reptiles			10		10
Total number of submissions		439	97	96	632

Table 3: showing the number of submissions by sub-category of animal.

Category of animal	Sub-Category of animal	APHA	IOZ	SAC	Total
Amphibian	Frog		5		5
	Newt		2		2
	Toad		2		2
	Total		9		9
Bird	Bird of Prey	55		48	103
	Game Bird	3		3	6
	Garden Bird	23	65	8	100
	Water Bird	234		17	251
	Unspecified	33			33
	Total	348	65	76	493
Mammal	Bat	2			2
	Canid	1			1
	Deer	2		3	5
	Hedgehog	5	13		18
	Lagomorph	18		2	19
	Mustelid	3		14	17
	Rodent	27		1	28
	Seal	33			33
	Total	90	13	20	123
Reptile	Snake		10		9
	Total		10		9
Total number of submissions		439	97	96	632

Figure 1: showing the number of submissions by species category per month

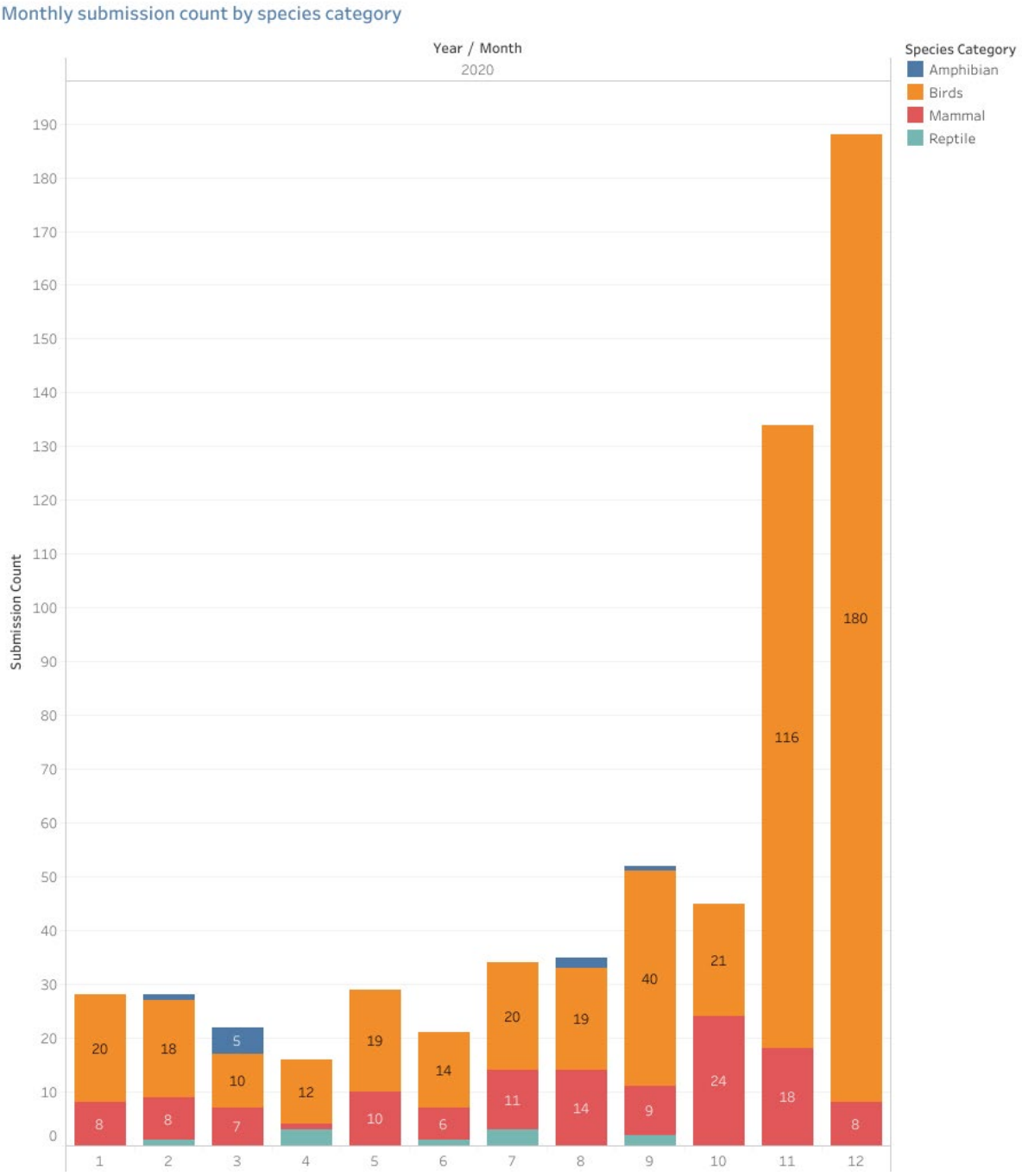

Table 4: showing the number of mammalian submissions by species.

Group	Common name	Species Latin name	APHA	IOZ	SAC	Total
Bat	Greater horseshoe bat	*Rhinolophus ferrumequinum*	1			1
	Lesser Horseshoe Bat	*Rhinolophus hipposideros*	1			1
Canid	Fox	*Vulpes vulpes*	1			1
Deer	Roe Deer	*Capreolus capreolus*	2		3	5
Hedgehog	European hedgehog	*Erinaceus europaeus*	5	13		18
Lagomorph	Brown Hare	*Lepus europaeus*	10		1	11
	European Rabbit	*Oryctolagus cunniculus*	8			8
	Mountain Hare	*Lepus timidus*			1	1
Mustelid	Badger	*Meles meles*	1		9	10
	Eurasian Otter	*Lutra lutra*			3	3
	Pine Marten	*Martes martes*			1	1
	Stoat	*Mustela erminea*	1			1
	Weasel	*Mustela nivalis*	1		1	2
Rodent	Grey Squirrel	*Sciurus carolinensis*			1	1
	Red Squirrel	*Sciurus vulgaris*	27			27
Seal	Common Seal	*Phoca vitulina*	19			19
	Grey Seal	*Halichoerus grypus*	14			14
Total number of submissions			91	13	20	124

Table 5: showing the number of bird submissions by species.

Group	Common name	Species Latin name	APHA	IOZ	SAC	Total
Buzzard	Buzzard	*Buteo buteo*	15		26	41
Eagle	White tailed eagle	*Haliaeetus albicilla*			4	4
Falcon	Kestrel	*Falco tinnunculus*	9		1	10
	Peregrine	*Falco peregrinus*	3		1	4
Hawk	Goshawk	*Accipiter gentilis*	1		2	3
	Hen Harrier	*Circus cyaneus*			2	2
	Sparrowhawk	*Accipiter nisus*	16		6	22
Kite	Red Kite	*Milvus milvus*			2	2
Osprey	Western Osprey	*Pandion haliaetus*	1			1
Owl	Barn Owl	*Tyto alba*	4			4
	Short-eared Owl	*Asio flammeus*			1	1

Group	Common name	Species Latin name	APHA	IOZ	SAC	Total
	Tawny Owl	*Strix aluco*	6		2	8
	Owl unspecified				1	1
Grouse	Red Grouse	*Lagopus lagopus*			3	3
Pheasant	Pheasant	*Phasianus colchicus*	3			3
Columbiformes	Collared Dove	*Streptopelia decaocto*	1	1		2
	Feral Pigeon/Rock Dove	*Columba livia*	2	1		3
	Woodpigeon	*Columba palumbus*	4	1	2	7
	Unspecified Dove		1			1
	Unspecfied Pigeon		1			1
Corvid	Carrion Crow	*Corvus corone*			1	1
	Jackdaw	*Corvus monedula*	2			2
Dunnock	Dunnock	*Prunella modularis*	1	4		5
Finch	Bullfinch	*Pyrrhula pyrrhula*		1		1
	Chaffinch	*Fringilla coelebs*	1	14	1	16
	Goldfinch	*Carduelis carduelis*	1	4		5
	Greenfinch	*Chloris chloris*	1	11		12
	Siskin	*Spinus spinus*		1		1
	Twite	*Linaria flavirostris*		1		1
Flycatcher	Spotted Flycatcher	*Muscicapa striata*		1		1
Sparrow	House Sparrow	*Passer domesticus*		2	1	3
Starling	Common Starling	*Sturnus vulgaris*	2	1		3
Swallow	House Martin	*Delichon urbica*			1	1
	Swallow	*Hirundo rustica*	1		1	2
Swift	Common Swift	*Apus apus*		1		1
Thrush	Blackbird	*Turdus merula*	4	6		10
	Song Thrush	*Turdus philomelos*		2		2
Tit	Blue Tit	*Cyanistes caeruleus*		4		4
	Coal Tit	*Periparus ater*		1		1
	Great Tit	*Parus major*		3		3

Group	Common name	Species Latin name	APHA	IOZ	SAC	Total
	Long-tailed Tit	*Aegithalos caudatus*		2		2
Warbler	Blackcap	*Sylvia atricapilla*		2		2
	Willow Warbler	*Phylloscopus trochilus*		1		1
Woodpecker	Green Woodpecker	*Picus viridis*	1			1
	Mixed Birds				1	1
Auk	Razorbill	*Alca torda*	1		1	2
	Mixed Auk				1	1
Diver	Great Northern Diver	*Gavia immer*	1			1
Duck	Eurasian Wigeon	*Anas penelope*	2			2
	Mallard	*Anas platyrhynchos*	8			8
	Shoveler	*Anas clypeata*	1			1
	Teal	*Anas crecca*	1			1
Egret	Great White Egret	*Ardea alba*	1			1
Gannet	Gannet	*Morus bassanus*	1		1	2
Goose	Brent Goose	*Branta bernicla*	1			1
	Canada Goose	*Branta canadensis*	23			23
	Greylag Goose	*Anser anser*	8			8
	Mixed Goose		1			1
	Pink-footed Goose	*Anser brachyrhynchus*	1			1
Gull	Black-headed Gull	*Chroicocephalus ridibundus*	5			5
	Common Gull	*Larus canus*	2			2
	Herring Gull	*Larus argentatus*	3		1	4
	Lesser Black-Backed Gull	*Larus fuscus*	3			3
	Gull Unspecified		2			2
Heron	Grey heron	*Ardea cinerea*	5			5
Cormorant	Cormorant	*Phalacrocorax carbo*	2		1	3
Rail	Moorhen	*Gallinula chloropus*	1			1
Swan	Black Swan	*Cygnus atratus*	4			4
	Mute Swan	*Cygnus olor*	121		10	131

Group	Common name	Species Latin name	APHA	IOZ	SAC	Total
	Whooper Swan	*Cygnus cygnus*	25		1	26
	Swan Unspecified		11			11
	Woodcock	*Scolopax rusticola*			1	1
	Mixed Birds		30			30
	Bird unspecified		3			3
Total number of submissions			348	65	76	489

Table 6: showing the number of amphibian and reptile submissions by species.

Category	Common name	Species Latin name	IOZ
Amphibian	Common Frog	*Rana temporaria*	4
	Fire Salamander	*Salamandra salamandra*	1
	Common Toad	*Bufo bufo*	1
	Natterjack Toad	*Epidalea calamita*	1
	Great Crested Newt	*Triturus cristatus*	1
	Palmate Newt	*Lissotriton helveticus*	1
Reptile	Adder	*Vipera berus*	5
	Grass Snake	*Natrix helveticu*	5
Total number of submissions			19

Section 2: Veterinary Investigation Diagnosis Analysis (VIDA) code diagnostic count

Table 7: showing the number of VIDA diagnoses in amphibians and reptiles by species.

Category	Species	Diagnosis description	Diagnostic Count
Amphibian	Common Toad	Trauma: Predation	2
		Visceral parasitism	1
	Fire Salamander	Trauma: Road Traffic Accident	1
	Great Crested Newt	Trauma: Predation	1
Reptile	Adder	Trauma: Fracture	2
		Trauma: Predation	3
	Grass Snake	Adverse environment	2
		Trauma: Fracture	2
		Trauma: Road Traffic Accident	1
Total number of diagnoses			15

Table 8: showing the number of VIDA diagnoses in birds by species.

Animal group	Species	Diagnosis description	Diagnostic count
Bird of prey	Buzzard	Diagnosis not listed - circulatory disease	1
		Mycoplasmosis	1
		Pneumonia	1
		Diagnosis not listed - skin disease	1
		Diagnosis not listed - systemic disease	3
		Malnutrition	6
		Trauma: Fracture	11
		Trauma: Road Traffic Accident	1
	White Tailed Eagle	Diagnosis not listed - systemic disease	1
		Malnutrition	2
		Trauma: Fracture	1
	Kestrel	Adverse environment	1
		Diagnosis not listed - systemic disease	1
		Malnutrition	1
		Trauma: Fracture	1
		Trauma: Predation	1
	Peregrine	Diagnosis not listed - systemic disease	1
		Trauma: Fracture	1
	Goshawk	Malnutrition	2
	Hen Harrier	Malnutrition	1
		Trauma: Predation	1
	Sparrowhawk	Diagnosis not listed - circulatory disease	1
		Diagnosis not listed - digestive disease	1
		Oral trichomonosis (avian) including oesophagitis in garden birds	1
		Malnutrition	1
		Trauma: Fracture	4
	Red Kite	Diagnosis not listed - circulatory disease	1
		Diagnosis not listed - digestive disease	1
		Trauma: Fracture	1
	Western Osprey	Trauma: Road Traffic Accident	1
	Barn Owl	Malnutrition	1
		Trauma: Predation	1
	Short-eared Owl	Trauma: Road Traffic Accident	1
	Tawny Owl	Trauma: Fracture	3
	Owl Unspecified	Septic arthritis or tenosynovitis dt bacterial infection	1
Game Bird	Pheasant	Listeriosis - systemic/enteric	1
		Trauma: Fracture	1
		Trauma: Road Traffic Accident	1
Garden bird	Collared Dove	Oral trichomonosis (avian) including oesophagitis in garden birds	2

Animal group	Species	Diagnosis description	Diagnostic count
	Feral Pigeon/Rock Dove	Oral trichomonosis (avian) including oesophagitis in garden birds	1
		PMV of pigeons (PPMV-1)	1
	Woodpigeon	Cardiomyopathy and heart failure	1
		Oral trichomonosis (avian) including oesophagitis in garden birds	2
	Dove Unspecified	Trauma: Predation	1
	Carrion Crow	Pneumonia	1
	Jackdaw	Infectious sinusitis	1
	Dunnock	Avian pox	1
		Ectoparasitic disease	1
		Trauma: Fracture	1
		Trauma: Predation	2
	Bullfinch	Oral trichomonosis (avian) including oesophagitis in garden birds	1
	Chaffinch	Oral trichomonosis (avian) including oesophagitis in garden birds	11
		Ectoparasitic disease	1
		Staphylococcal infection	1
		Trauma: Fracture	3
		Trauma: Predation	1
	Goldfinch	Oral trichomonosis (avian) including oesophagitis in garden birds	4
	Greenfinch	Oral trichomonosis (avian) including oesophagitis in garden birds	11
		Ectoparasitic disease	2
		Trauma: Fracture	1
	Siskin	Oral trichomonosis (avian) including oesophagitis in garden birds	1
		Trauma: Fracture	1
	Twite	Trauma: Fracture	1
	Spotted Flycatcher	Trauma: Fracture	1
	House Sparrow	Malnutrition	1
		Trauma: Fracture	2
	Common Starling	Trauma: Fracture	2
	Swallow	Malnutrition	1
	Common Swift	Trauma: Predation	1
	Blackbird	Diagnosis not listed Nervous disease	1
		Diagnosis not listed - systemic disease	1

Animal group	Species	Diagnosis description	Diagnostic count
		Malnutrition	1
		Pasteurella multocida (and fowl cholera)	1
		Trauma: Fracture	6
		Trauma: Predation	1
		Visceral parasitism	3
	Song Thrush	Avian pox	1
		Fungal Infections	1
		Trauma: Fracture	2
	Blue Tit	Trauma: Predation	1
	Coal Tit	Trauma: Fracture	1
	Great Tit	Avian pox	1
		Staphylococcal infection	1
		Trauma: Fracture	1
		Trauma: Predation	1
		Visceral parasitism	1
	Long-tailed Tit	Trauma: Fracture	1
	Blackcap	Trauma: Fracture	1
		Trauma: Predation	1
	Willow Warbler	Trauma: Fracture	1
	Mixed Birds	Trauma: Fracture	1
Water bird	Razorbill	Adverse environment	2
	Mixed Auk	Adverse environment	1
	Great Northern Diver	Trauma: Fracture	1
	Mallard	Trauma: Fracture	2
	Great White Egret	Salmonellosis dt Salmonella	1
	Brent Goose	Diagnosis not listed - systemic disease	1
	Canada Goose	Diagnosis not listed - digestive disease	1
		Diagnosis not listed - systemic disease	6
		Trauma: Fracture	5
		Trauma: Predation	2
	Greylag Goose	Diagnosis not listed - systemic disease	2
		Poisoning dt lead	1
		Trauma: Fracture	1
	Pink-footed Goose	Diagnosis not listed - systemic disease	1
	Mixed Goose	Haemoparasitic infection	1
		Poisoning dt lead	1
		Septicaemia	1
	Black-headed Gull	Malnutrition	1
		Trauma: Fracture	2
	Herring Gull	Diagnosis not listed - respiratory disease	1
		Malnutrition	1

Animal group	Species	Diagnosis description	Diagnostic count
		Trauma: Predation	1
	Lesser Black-Backed Gull	Botulism	1
		Diagnosis not listed - systemic disease	1
		Trauma: Predation	1
	Gull unspecified	Trauma: Fracture	1
		Trauma: Predation	1
	Grey heron	Diagnosis not listed - systemic disease	1
		Malnutrition	1
	Cormorant	Diagnosis not listed - digestive disease	1
		Helminthosis	1
	Moorhen	Trauma: Fracture	1
	Black Swan	Diagnosis not listed - systemic disease	2
		Poisoning dt lead	1
	Mute Swan	Diagnosis not listed - circulatory disease	1
		Haemoparasitic infection	3
		Diagnosis not listed - digestive disease	1
		Helminthosis	2
		Diagnosis not listed - respiratory disease	1
		Pneumonia	1
		Pneumonia, mycotic	4
		Diagnosis not listed - systemic disease	48
		Fungal Infections	1
		Malnutrition	1
		Poisoning due to lead	1
		Septicaemia	1
		Trauma: Fracture	8
		Trauma: Predation	2
		Trauma: Road Traffic Accident	1
		Tuberculosis	1
		Visceral parasitism	2
		Diagnosis not listed - urinary disease	2
	Whooper Swan	Haemoparasitic infection	1
		Diagnosis not listed - systemic disease	10
		Trauma: Fracture	2
	Swan unspecified	Diagnosis not listed - systemic disease	1
		Trauma: Road Traffic Accident	1
	Woodcock	Trauma: Road Traffic Accident	1
	Mixed Birds	Diagnosis not listed - circulatory disease	1
		Amyloidosis	1
		Helminthosis	1
		PMV of pigeons (PPMV-1)	1

Animal group	Species	Diagnosis description	Diagnostic count
		Botulism	3
		Diagnosis not listed - systemic disease	12
		Trauma: Fracture	2
Total number of diagnoses			321

Table 9: showing the number of VIDA diagnoses in mammals by species.

Animal group	Species	Diagnosis description	Diagnostic count
Bat	Lesser Horseshoe Bat	Malnutrition	1
		Trauma: Road Traffic Accident	1
Canid	Fox	Diagnosis not listed - systemic disease	1
Deer	Roe Deer	Meningitis/encephalitis	1
		Parasitic pneumonia	1
		Neoplasm	1
Hedgehog	European Hedgehog	Parasitic pneumonia	5
		Diagnosis not listed - skin disease	1
		Malnutrition	2
		Trauma: Fracture	1
		Trauma: Predation	3
Lagomorph	Brown Hare	Coccidiosis	1
		Parasitic Gastroenteritis (PGE)	1
		Diagnosis not listed - respiratory disease	1
		Colisepticaemia	1
		Diagnosis not listed - systemic disease	2
		European Brown Hare Syndrome	1
		Pasteurellosis	1
		Staphylococcal infection	1
		Yersiniasis	3
	European Rabbit	Coccidiosis	1
		Colisepticaemia	1
		Myxomatosis	3
		Rabbit haemorrhagic disease (including RHD2) Species Specific	4
Mustelid	Badger	Malnutrition	1
		Trauma: Fracture	3
		Trauma: Predation	1

Animal group	Species	Diagnosis description	Diagnostic count
		Trauma: Road Traffic Accident	3
	Eurasian Otter	Diagnosis not listed - digestive disease	1
		Pneumonia	1
		Trauma: Fracture	1
	Pine Marten	Trauma: Fracture	1
	Stoat	Trauma: Road Traffic Accident	1
	Weasel	Pneumonia	1
		Trauma: Predation	1
Rodent	Red Squirrel	Diagnosis not listed - circulatory disease	1
		Amyloidosis	1
		Coccidiosis	1
		Diagnosis not listed - digestive disease	1
		Parasitic gastroenteritis	1
		Red squirrel adenovirus enteritis	1
		Pneumonia	1
		Ectoparasitic disease	1
		Squirrel pox	5
		Adverse environment	1
		Erysipelas	1
		Neoplasm	1
		Pasteurellosis	1
		Staphylococcal infection	1
		Trauma: Fracture	3
		Trauma: Road Traffic Accident	1
Seal	Common Seal	Pneumonia	3
		Colisepticaemia	1
		Diagnosis not listed - systemic disease	1
		Staphylococcal infection	1
	Grey Seal	Meningitis/encephalitis	1
		Pneumonia	1
		Streptococcal infection	1
Total number of diagnoses			85

The material in this report has been compiled by the Animal and Plant Health Agency (APHA) Surveillance Intelligence Unit in collaboration with the APHA Surveillance and Laboratory Services Department.

The report is available on GOV.UK at:

https://www.gov.uk/government/collections/animal-disease-surveillance-reports.

Any enquiries regarding this report should be sent to APHA's Surveillance Intelligence Unit by emailing SIU@apha.gov.uk.

More information about scanning surveillance reports is available on APHA's Vet Gateway at http://apha.defra.gov.uk/vet-gateway/surveillance/index.htm.

APHA is an executive agency of the Department for Environment, Food & Rural Affairs, and also works on behalf of the Scottish Government and Welsh Government.