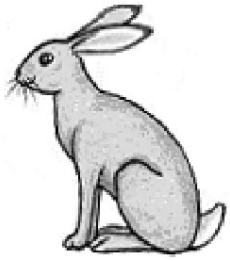
Great Britain Wildlife Health Partnership Quarterly Report

Disease surveillance and emerging threats



Volume 39: Quarters 1 and 2 – January to June 2023

Highlights

- **Investigation into winter emaciation in two pregnant roe deer (*Capreolus capreolus*).....pages 9-12**
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Introduction and overview

The Great Britain Wildlife Health Partnership comprising 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), the Forestry Commission England (FCE) and the Garden Wildlife Health (GWH) project produces the GB Wildlife Health Partnership Quarterly Reports.

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

Issues and trends

The highly pathogenic avian influenza (HPAI) outbreak in Great Britain remained the primary issue in wildlife in Quarters 1 and 2 of 2023. During these Quarters, the wild bird risk level across Great Britain was categorised as very high during January and February and then reduced to high from March 2023 onwards. HPAI positive findings were widespread across Great Britain including both coastal and inland locations and the greatest number of findings were in waterbirds and waders during Quarter 1. For Quarter 2, the greatest number of HPAI positive findings were in seabirds and birds of prey, with mass die-offs of black headed gulls. During Quarters 1 and 2, there were also positive detections in mammal wildlife species from Great Britain, including Eurasian otters, red foxes, grey and harbour seals and some cetacean species.

The Met Office reported that during winter 2023, most of January's rainfall came during the first half of the month. There was 103% of average UK rainfall in total during this month. Rainfall was below average in February away from north-west Scotland, with only 45% of average. Overall, the winter months of January and February were marginally milder than average. January had a mean monthly temperature 0.4 °C above average, whilst February had a mean monthly temperature 1.7 °C above the long-term average.

The Met Office reported that maximum temperatures for spring 2023 were slightly above average in many areas, due mainly to rather warm conditions during May. March and April saw an alternation between colder and milder spells of weather. Rainfall during the spring months was highly variable. For March, the overall UK rainfall total was 155% of average. April rainfall totals were generally closer to average, drier in some northern areas but rather wet in parts of the south and east, giving 97% of average UK rainfall overall. May was rather wet in a band from Devon to Norfolk but a very dry month in some other areas, with 55% of average for the UK.

Notifiable diseases

Great Britain AI Wild Bird Surveillance (AIWBS): Quarters 1 and 2 January to June 2023

Total wild bird surveillance

The Animal and Plant Health Agency (APHA) carries out year-round surveillance of dead wild birds submitted via public reports and warden patrols as part of its wild bird surveillance programme.

In Great Britain members of the public are encouraged to report findings of dead wild birds using the online reporting system or by calling the Defra helpline 03459 33 55 77.
APHA triages reports and does not collect all birds. They adjust the collection thresholds for dead wild birds for different species to increase or decrease the sensitivity of surveillance.

APHA and their contractors then collect some of these birds and test them to help us understand what risk posed to poultry and other captive birds is through understanding how the disease is distributed geographically and in different types of wild bird, not all birds will be collected.

APHA publish a report (updated weekly) on findings of HPAI in wild birds in Great Britain and further information on reports of avian influenza in wild bird in Great Britain and across Europe are available via APHAs outbreak assessments. We are unable to comment on any testing or reports that are not listed at this site as the results will not yet be ready for publication.

APHA have also launched a new interactive map of reported wild bird mortality and findings of avian influenza virus (bird flu) in wild birds and wild mammals and an interactive data dashboard of findings of avian influenza virus in wild birds.

Find out more on disposing of dead wild birds not required for surveillance in our removing and disposing of dead wild birds guidance.

Further guidance on wild bird incidents is available through the Mitigation Strategy for Avian Influenza in Wild Birds in England and Wales.

Report dead wild birds in Northern Ireland to the DAERA Dead Wild Bird Online Reporting Tool.

Reporting Suspicion of Influenza of Avian Origin in Wild Mammals

Avian influenza (bird flu) viruses can also infect mammals.

Find out how we monitor spillover of Avian influenza (bird flu): infection in wild birds and wild mammals.

If members of the public find a dead wild carnivore (for example, fox, otter, pine marten, stoat, weasel, pole cat, mink) or marine mammal (for example, seal, dolphin, porpoise, whale) where the cause of death is unknown, or the animal has shown signs of respiratory or neurological disease prior to death they should report it immediately to APHA by calling:

03000 200 301 if you're in England,

03003 038 268 if you're in Wales,

your local Field Services Office if you're in Scotland.

If you examine a wild mammal or a test a sample from a wild mammal and suspect or detect the presence of avian influenza virus or antibodies to avian influenza virus you must report it immediately to APHA using the telephone numbers above. If you do not report it, you're breaking the law.

See our guidance on Influenza A (H5N1) infection in mammals: suspect case definition and diagnostic testing criteria.

Marco Falchieri, Avian Virology, APHA Weybridge

Wildfowl and Wetlands Trust's (WWT) role in GB Avian Influenza Wild Bird Surveillance (AIWBS): - January to June 2023

Throughout the first and second quarter of 2023, WWT continued to carry out passive surveillance of avian influenza across the reserves. Between January and June, 256 dead wild birds were found and collected across 8 WWT sites located in Gloucestershire, West Sussex, Greater London, Tyne and Wear, Lancashire, Norfolk, Dumfriesshire, and Carmarthenshire. Of the birds collected, 135 were sampled for avian influenza virus, while the remaining carcasses were either too predated to swab or were part of an outbreak where sample swabbing was performed. During these quarters, 19 priority target species were sampled including various species of waterfowl, waders and birds of prey. In addition, samples were also obtained from 6 non-priority species: 5 common terns (*Sterna hirundo)*, 3 rooks (*Corvus frugilegus*), one barn owl (*Tyto alba*), one collared dove (*Streptopelia decaocto*), one kittiwake (*Rissa tridactyla*) and one pheasant (*Phasianus colchicus*).

Highly pathogenic avian influenza virus (HPAIV H5N1) was confirmed by PCR in 46 dead wild birds and low pathogenic avian influenza virus (LPAIV) was confirmed by PCR in one dead wild bird. All collected across seven surveillance sites (Table 1).

All carcases were swabbed and collected following recommended health and safety guidelines with full personal protective equipment (PPE), including FFP3 masks and goggles or face visors. Positive AI carcases were disposed of using an approved high-capacity incinerator for Category 1 ABP.

Table 1: Confirmed HPAIV/LPAIV cases in wild birds at different surveillance sites, detected between January and June 2023.

Site location	Total AI positive	Species	Subtype
Carmarthenshire	14	Black-headed gull x 11	H5N1 (HPAIV)
		Herring gull x 1	H5N1 (HPAIV)
		Lesser black-backed gull x 1	H5N1 (HPAIV)
		Mallard x 1	H5Nx (LPAIV)
Lancashire	14	Black-headed gull x 7	H5N1 (HPAIV)
		Common tern x 3	H5N1 (HPAIV)
		Pink-footed Goose x 2	H5N1 (HPAIV)
		Mallard x 1	H5N1 (HPAIV)
Gloucestershire	7	Black-headed gull x 7	H5N1 (HPAIV)
Tyne and Wear	5	Black-headed gull x 4	H5N1 (HPAIV)
		Common tern x 1	H5N1 (HPAIV)
West Sussex	3	Black-headed gull x 3	H5N1 (HPAIV)
Greater London	2	Black-headed gull x 2	H5N1 (HPAIV)
Dumfriesshire	2	Whooper Swan x1	H5N1 (HPAIV)
		Barnacle goose x1	H5N1 (HPAIV)
Total	**47**		

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

Zoonotic Diseases

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

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 report of *Salmonella* species detection in wildlife in Great Britain for Quarters 1 and 2 in 2023.

One *Salmonella* isolate (*S.* Typhimurium PT2) was reported in a Common Buzzard (*Buteo buteo*) that was submitted as part of the Avian Influenza (AI) monitoring scheme and tested AI negative. The buzzard was in poor body condition and had severe necrotising pharyngitis and oesophagitis caused by trichomonads, in addition to *S.* Typhimurium isolated from its intestinal contents. A variety of *Salmonella* species and serotypes have been positively isolated in European raptors, (including Common Buzzards) with *S.* Typhimurium commonly identified in several raptor species (Molina-Lopez and others., 2011; Botti and others., 2013; Giacopello and others, 2016).

References

Molina-Lopez RA, Valverdú N, Martin M, Mateu E, Obon E, Cerdà-Cuéllar M, Darwich L. Wild raptors as carriers of antimicrobial-resistant *Salmonella* and *Campylobacter* strains. *The Veterinary Record* 2011;**168**(21):565.

Botti V, Navillod FV, Domenis L, Orusa R, Pepe E, Robetto S, Guidetti C. Salmonella spp. and antibiotic-resistant strains in wild mammals and birds in north-western Italy from 2002 to 2010. Veterinaria Italia 2013;**49**(2):195-202.

Giacopello C, Foti M, Mascetti A, Grosso F, Ricciardi D, Fisichella V, Piccolo FL. Antimicrobial resistance patterns of Enterobacteriaceae in European wild bird species admitted in a wildlife rescue centre. Veterinaria Italia 2016;**52**:139-44.

Jennifer Cantlay, APHA Diseases of Wildlife Scheme

Report from Wildlife Zoonoses and Vector Borne Disease Research Group

Passive surveillance for lyssaviruses in UK bats

Four hundred and twenty-nine bats were tested for lyssaviruses under passive surveillance during this period. A total of 5 serotine (*Eptesicus serotinus*) tested positive for EBLV-1, of

which 2 were from Dorset, and 3 from Somerset. Forty-one exotic zoo bats were received for testing, all were negative for lyssaviruses. No suspect bat lyssaviruses cases were received during this period.

Rabies diagnosis

No animals were received during this 6-month period as a death in quarantine. Two dogs and one cat were tested for lyssaviruses, all as suspect cases with negative results.

Rabies surveillance in terrestrial wildlife

Vigilance continues for this notifiable disease in UK wildlife but no samples from terrestrial wildlife were submitted for testing this quarter.

West Nile virus surveillance and Usutu virus surveillance in wild birds

Brain and kidney tissue samples from 146 birds were submitted via APHA, SRUC and IoZ and were tested by RT-PCR for WNV with negative results.

Tissues from 88 birds were also tested by RT-PCR for Usutu virus and all were negative.

West Nile virus surveillance in Equids

Two serum samples were received for WNV serology testing, both as test to exclude during this period. All tested samples were negative for WNV antibodies.

Dr Arran Folly, Vector-borne diseases, APHA Weybridge

Mammal reports

Wild mammal reports from APHA DoWS

Rabbit Haemorrhagic Disease in wild rabbits (*Oryctolagus cuniculus*) in West Somerset

Three rescued wild rabbits all died suddenly within a few days. They were all in good bodily condition and no clinical signs were seen before death. There was little of obvious pathological significance seen during necropsy in any of these rabbits, except some degree of carcass congestion and splenic enlargement (Figure 1).

Systemic bacteriology was unrewarding, but calicivirus was detected in a liver sample by electron microscopy. Rabbit Haemorrhagic Disease Virus (RHDV) RNA was detected in the liver by PCR testing and RHDV genotyping sequence analysis indicated the presence of RHDV variant 2 RNA. Thus, confirming RHDV-2 as the cause of sudden death of these rabbits.

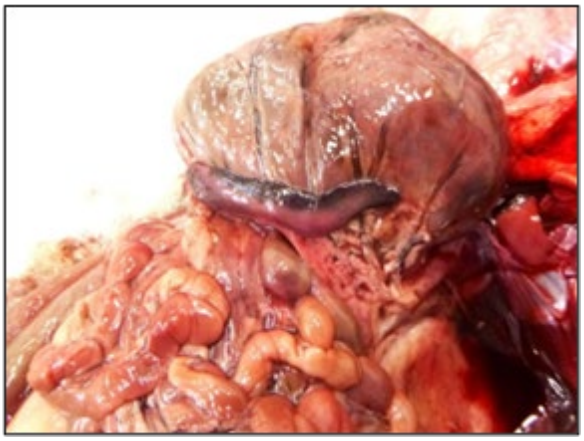

Figure 1: Gross pathology of one rabbit showing carcass congestion and splenic enlargement.

Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), University of Bristol Veterinary School

Investigation into winter emaciation in two pregnant Roe deer (*Capreolus capreolus*)

The first case was in late January 2023, when a roe deer (*Capreolus capreolus*) was reported trapped in a rural garden in South Gloucestershire. It was unable to get out of garden. It was examined and found to be emaciated so was euthanased in situ by captive bolt gun and pithing. This was an adult doe weighing 15.5kg. The carcass was frozen and submitted to Langford for necropsy.

A few keds and ticks were present on the carcass. The liver was very dark and there was scant body fat. The left anterio-ventral lung lobe was dark and consolidated with scattered pale foci (Figure 2). Histology revealed chronic active broncho-pneumonia. Inflammation was associated with Gram-positive cocco-bacilli. Plant material was seen due to perimortem inhalation of rumen contents and a heavy mixed growth of bacteria was isolated from the lung with predominantly non-haemolytic *Escherichia coli*, which may have overgrown any more pathologically significant bacteria.

The rumen was moderately filled, but the rest of the intestinal tract had scant contents and the faeces were pelleted. There was a single male foetus in the uterus (Figure 3), which weighed 130g.

Figure 2: Gross pathology of the roe deer showing the dark and consolidated left anterio-ventral lung lobe.

Figure 3: Gross pathology showing the single foetus in the uterus of the deer.

The liver copper was estimated at 1090.0 µmol/kg DM. The farmed ruminant range is given as 314-7850 µmol/kg DM but no reference ranges are reported for roe deer. Thus, this level is not likely to suggest copper deficiency. An examined faecal sample was firm but yielded worm egg counts of; Trichostrongyle-type 2700 eggs (per g), *Nematodirus battus* 150 eggs (per g) and *Trichuris* faecal worm egg count species of 50 eggs (per g).

This roe doe was very thin but not scouring suggesting the high faecal worm egg count was due to abomasal rather than small intestinal infestation. Pan-piroplasm PCR confirmed that this deer was positive for *Babesia capreoli.*

The second case was at the end of February 2023 in Somerset. The roe deer was collapsed in a rural garden. She was emaciated and had been scouring and was euthanised in situ. The carcass was frozen and submitted to Langford for necropsy. There was extensive faecal soiling around the perineal area and hind limbs. The rumen was well filled but there were scant contents in the rest of the intestinal tract and the faeces were fluid. Two male foetuses were present in the uterus weighing 300g and 340g (Figure 4). There were no other significant findings in the rest of the organ systems examined. A worm egg count of Trichostrongyle-type 200 eggs (per g) was recorded.

Figure 4: Gross pathology showing the two foetuses in the uterus of the deer.

The gut wash results are provided in Table 2.

Table 2: Gut wash results of the second roe deer.

Test	WNDS (GUT WASH)
Abomasum & small intestine total worm count for *Ostertagia spp.*	400
Abomasum & small intestine total worm count for *T. axei*	200
Abomasum & small intestine total worm count for Immature / L4	200
Small intestine total work count for immature / L4	100

No *Yersinia* spp. or *Salmonella* spp. were isolated from the intestinal contents. There was no evidence of Malignant Catarrhal Fever herpesvirus. The liver copper was 271.0 µmol/kg DM. This doe was also positive for *Babesia capreoli.*

In both cases a mixed aetiology was the likely cause of emaciation. The first case had parasitic enteritis and chronic pneumonia with the extra stress of pregnancy and the unknown effect of *B. capreoli.* The second deer had low copper, twin pregnancy, limited intestinal parasitism and *B. capreoli* infection.

Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), University of Bristol Veterinary School

Investigations into deaths in urban Red foxes (*Vulpes vulpes*) in Bristol

(i) Amyloidosis in an older fox

This fox was found collapsed. Although the fox had no obvious external injuries, it was in poor body condition and its breath had an ammoniacal smell. It was admitted to a local partner veterinary school and then euthanased after triage. This dog fox weighing 4.95kg and a dental examination suggested this was an older fox. The stomach contained a small amount of dark khaki liquid and the upper part of the small intestine had numerous *Toxocara* spp. nematodes present.

The main pathology was that both kidneys were enlarged with their surfaces diffusely mottled pale brown/yellow and red (Figure 5). There was a darker surface focus on the left kidney and the cortex of both had yellowish streaks (Figure 6). Routine bacteriology confirmed no evidence of septicaemia. Unfortunately, the aqueous humour was unsuitable for urea estimation.

Figure 5: Gross pathology showing enlargement of both kidneys with surface discolouration.

Figure 6: Sectioned left kidney showing yellow streaks in the cortex.

Renal histopathology revealed generalised dilation of collecting tubules with pale eosinophilic fluid. Occasional small foci of intertubular monocytic infiltration were seen. The glomeruli were generally enlarged with an extensive pale substance, which was confirmed as amyloid by differential staining (Figure 7).

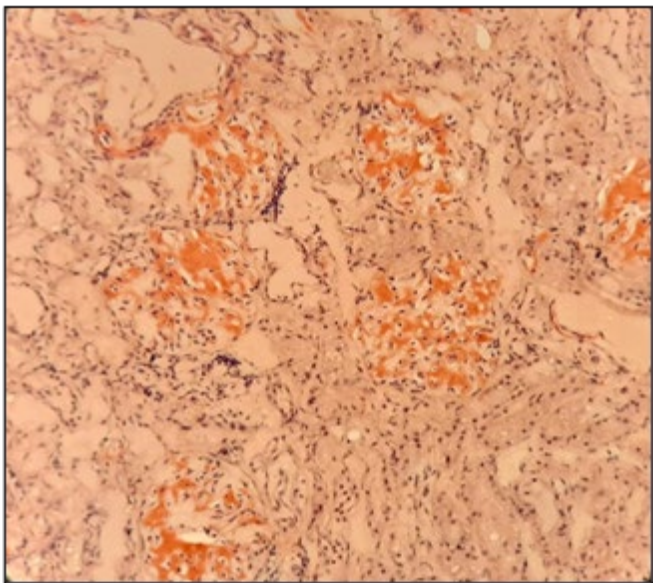

Figure 7: Renal histopathology with differential staining to show glomeruli enlarged with amyloid deposits.

(ii) *Pasteurella multocida* septicaemia as a sequel to probable intraspecific fighting

A fox was reported collapsed in a garden, but it had died before the local wildlife rescue arrived. This was an adult dog fox in poor body condition that weighed 6.91kg.

A focal lesion approximately 1cm in diameter was present in the left hind leg (Figure 8). Cutting into this area revealed purulent abscesses located subcutaneously and within the muscle (Figure 9). There was generalised enlargement of the carcass lymph nodes and the spleen was also enlarged. *Pasteurella multocida* was isolated from the heart blood and liver swabs, as well as the hind limb abscess.

Figure 8: 1cm focal lesion present in skin on the left hind leg of the fox.

Figure 9: Incision into skin to show purulent abscesses present in the subcutaneous and muscle tissues of the fox.

The gross post mortem findings and the bacteriology confirmed septicaemia with *Pasteurella multocida* as the cause of death. This was initiated by a bite wound probably due to intraspecific fighting. Duff and Hunt (1995) reported the post mortem findings of 27 foxes from East Anglia that were examined between 1989-1994. Seven of these adults (5 dogs, 2 vixens) died in January-February from deep bite wounds sustained during the vulpine rut. They died due to secondary bacterial infection and *Pasteurella multocida* was isolated from one of these, as in this case.

Harris and Smith (1987) noted that there was a significant increase in fox mortality in Bristol as the population density increased. Included with the causes of death they mentioned fights

with other animals (usually foxes). These reports confirm that intraspecific fighting in foxes, especially during January and February, is not unusual.

References

Duff JP, Hunt B. Courtship and mortality in foxes (*Vulpes vulpes*). *Veterinary Record* 1995; **136**(14):367.

Harris S, Smith GC. Demography of two Urban Fox (*Vulpes vulpes*) Populations. *Journal of Applied Ecology* 1987;**24**(1):75-86.

(iii) Concomitant Streptococcal and verminous pneumonia with septicaemia and a traumatic injury

Another fox was reported collapsed and twitching and it had blood in its mouth. It was collected by the local wildlife rescue and admitted to the local partner veterinary school where it was euthanised after triage. This was a dog fox in fair body condition that weighed 7.29 Kg. Free blood was seen in the abdominal and pleural cavities.

The liver had a few scattered pale foci, and the spleen was enlarged. Notably the lungs were dark red and there was palpable consolidation of the left caudo-ventral lung (Figure 10). *Streptococcus canis*. was isolated from systemic sites and the consolidated lung. Lung histology revealed marked autolysis with extensive areas of eosinophilic necrotic debris with many large foci of basophilic coccoid bacteria were evident (Figure 11). Throughout the section there were cross-sections of lungworm, large numbers of eosinophils, smooth muscle hypertrophy, fibrosis and occasional multinucleate cells (Figure 11).

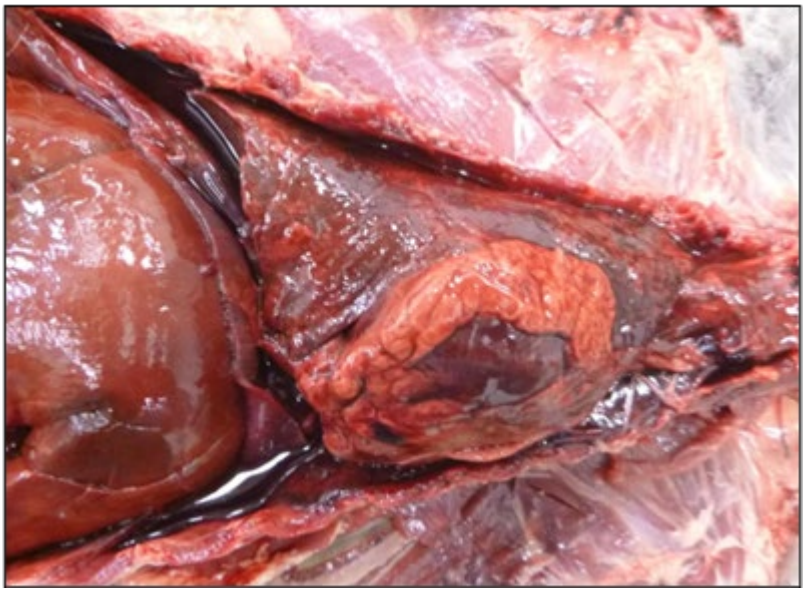

Figure 10: Gross pathology of the thoracic cavity showing the dark red colouration of the lungs.

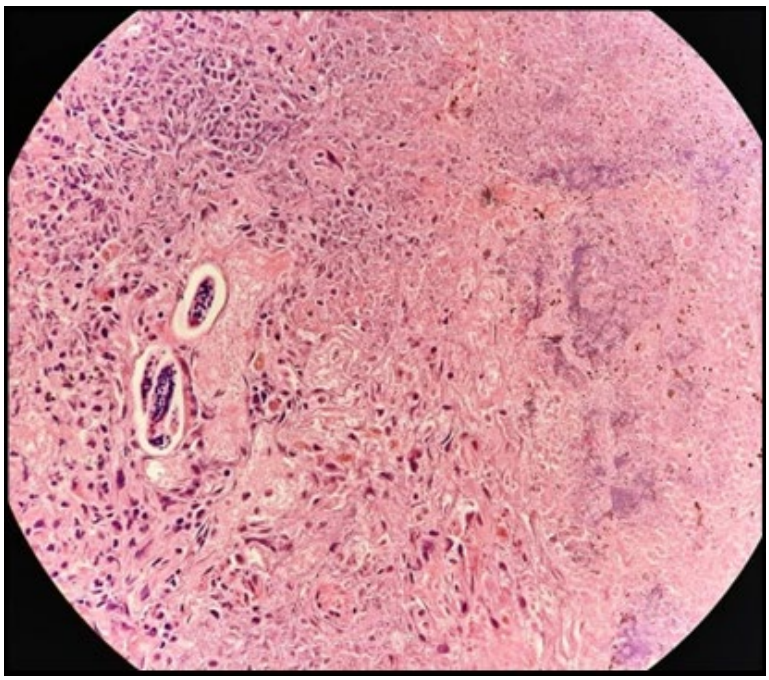

Figure 11: Lung histology showing foci of basophilic coccoid bacteria, cross sections of lungworms and large numbers of eosinophils present.

Two problems were identified. This fox had a very recent traumatic injury causing haemorrhage into the thorax and peritoneum. *Streptococcus canis* septicaemia with severe bacterial pneumonia was also confirmed. The verminous pneumonia was long standing and may have predisposed to *Streptococcus canis* infection, which led to septicaemic spread.

Streptococcus canis is a group G beta-hemolytic species of Streptococcus. Ross and Fairley (1967) in a study of disease in red foxes in Northern Ireland found that small white foci in the liver were associated with alpha and beta haemolytic streptococci but they didn't carry out speciation. Blackmore (1967) in a survey of disease in wild British foxes reported that 13% of natural deaths of 60 foxes were caused by streptococci but again no further speciation was given.

References

Blackmore DK. A survey of disease in British wild foxes. *Veterinary Record* 1964;**76**:527-533.

Ross JG and Fairley JS. Studies in the Red fox (*Vulpes vulpes*) in Northern Ireland. *Journal of Zoology* 1967;**157**(3):375-381.

Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), University of Bristol Veterinary School; Terry Hooper and Zoe Webber, Bristol Fox study.

Severe verminous pneumonia and parasitic enteritis in a European hedgehog (*Erinaceus europaeus*)

A juvenile European hedgehog (*Erinaceus europaeus*) was seen out during the day curled into a tight ball on its side. It was a male in poor body condition and weighed 390g. It was admitted to a Hedgehog Rescue centre in Wiltshire in early May 2023 and died 10 hours later the same day.

There was very little subcutaneous fat. Gross pathology showed some mottling discolouration of the lungs. Large numbers of *Crenosoma striatum* larvae (Figure 12) and a few *Eucoleus* eggs were seen in a lung lavage sample. There were no gross abnormalities seen in the abdominal cavity. The renal system was unremarkable.

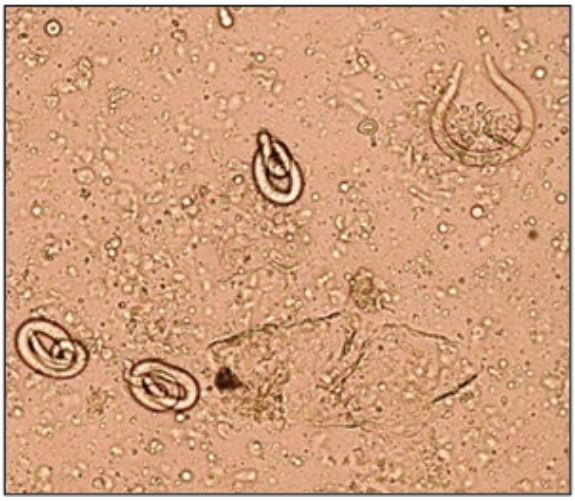

Figure 12: Microscopic examination of lung lavage contents showing *Crenosoma striatum* larvae.

The stomach contained a little khaki mucus and the rest of the intestinal contents were semifluid/fluid. Numerous *Brachylaemus erinacei* (intestinal fluke) were seen (Figure 13) as well nematode worms, presumptively *Capillaria erinacei* (Figure 14) in a wet preparation of the intestinal contents.

Figure 13: Microscopic examination of intestinal contents from the hedgehog showing the intestinal fluke, *Brachylaemus erinaceid,* viewed as a linear shaped parasite.

Figure 14: Microscopic examination of intestinal contents showing the coil shaped nematodes, likely to be *Capillaria erinacei.*

These findings confirm severe verminous pneumonia and parasitic enteritis as the cause of the clinical signs and death of this hedgehog.

Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), University of Bristol Veterinary School

Severe pulmonary haemorrhage caused by lungworm in a Grey seal (*Halichoerus grypus*) pup

The carcass of a Grey seal *(Halichoerus grypus)* pup was submitted to APHA Starcross VIC after rescue from a harbour in Cornwall. At the time of rescue, it was noted to have blood around the mouth and a haemorrhagic nasal discharge. It was uplifted for veterinary assessment, by which time it had become unresponsive to handling and was showing moderate to severe respiratory distress and haemoptysis. It was euthanased based on poor prognosis. The seal was in good condition, with a good coverage of blubber and no evidence of trauma. The externally noted blood appeared to originate from the respiratory tract, with extensive areas of haemorrhage throughout the lung parenchyma (Figure 15), and a heavy burden of lungworm present in the bronchi. Lung cultures were sterile, but histopathology revealed striking intramural parasitic granulomas throughout the pulmonary arteries, which would have impacted vascular integrity and predisposed to rupture and pulmonary haemorrhage. Previous cases in seals have attributed these lesions to the lungworm species *Otostrongylus circumlitus* (Barnett and others, 2019).

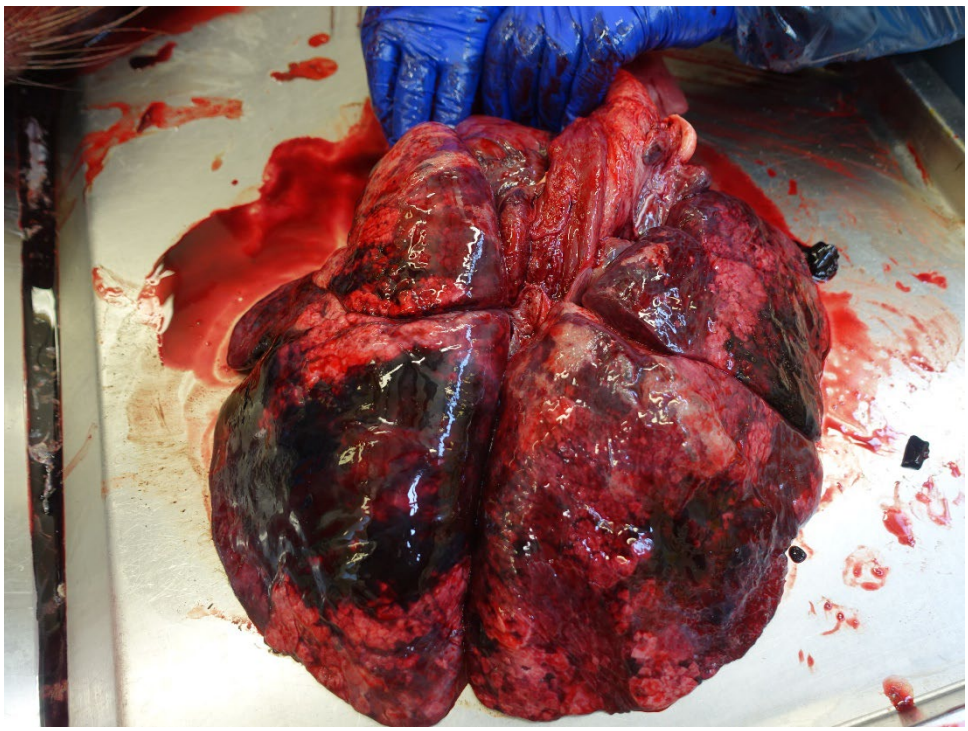

Figure 15: Gross pathology of the organs from the thorax of the grey seal showing extensive areas of haemorrhage throughout the lung tissue (specifically lung parenchyma due to lungworm parasite.

References

Barnett JEF, Bexton S, Fraija-Fernández N, Chooneea D, Wessels ME. Novel Pulmonary Vasculitis with Splendore-Hoeppli Reaction in Grey Seals (*Halichoerus grypus*) Associated with *Otostrongylus circumlitus* Infection. *Journal of Comparative Pathology* 2019;**173**:83-91.

Liz Nabb, APHA Starcross

Wild mammal reports from IoZ

No wild mammal cases to be reported from the IoZ for these quarters.

Institute of Zoology (IoZ)

Wild mammal reports from Scotland

Streptococcus dysgalactiae in a Eurasian otter (Lutra lutra)

Acute bacterial pneumonia and septicaemia with pulmonary haemorrhage caused by *Streptococcus dysgalactiae* was diagnosed in an otter cub (*Lutra lutra*) which was found alone but alert in Skye. The otter failed to feed well in rehabilitation, and lethargy and death followed the next day. Body condition was poor, and three demarcated haemorrhages were noted in the lungs, in the left caudal, right caudal, and left middle lung lobes. Bacterial cultures returned heavy growths of *Streptococcus dysgalactiae,* which is often associated with acute septicaemia, and which has been commonly isolated from otters in the UK (Simpson, 2007). Histopathology found that the haemorrhage appeared to centre on large blood vessels with extensive fibrin deposition and colonies of coccoid bacterial in the margins of the lesions. It was considered likely that the haemorrhagic lesions were caused by exotoxins produced by the *S. dysgalactiae*. The presence of hepatic haemorrhage and necrosis, and similar bacteria in the liver and in perirenal tissue supported the hypothesis of an acute septicaemia as the cause of death.

References

VR Simpson VR. Health status of otters in southern and south west England 1996-2003. Science Report: SC010064/SR1, published by the Environment Agency. 2007.

Inter-species conflict between mammals in Scotland

An interesting incidence of inter-species conflict was documented when a surveillance camera filmed an otter (*Lutra lutra*) pulling the carcass of a beaver (*Castor fiber*) from a loch in the west of Scotland in February. The male beaver was microchipped and was the smallest kit of a family which had been released into the loch in January. The carcass was retrieved the next day, and had been heavily scavenged; however, extensive perimortem trauma was still visible around the head and muzzle, associated with haemorrhage. The severe penetrating trauma to the head was consistent with that which would be caused by bites from an otter.

Caroline Robinson, SRUC Veterinary Services

Avian Reports

Wild Bird reports from APHA DoWS

The continued occurrence of HPAI across Great Britain in Quarters 1 and 2 impacted on the number of wild bird carcasses that were submitted to Veterinary Investigation Centres for diagnostic investigations to determine other causes of mortalities. The majority of birds submitted under the Avian Influenza in Wild Birds Surveillance Scheme (AIWBS) that tested negative for avian influenza were examined by post-mortem as part of DoWS.

Aspergillosis in a Mute swan (*Cygnus olor*)

Systemic aspergillosis was diagnosed in an adult Mute Swan (*Cygnus olor*). There were multiple, cream-coloured plaques (Figure 16) varying in size from 2 to 4cm in diameter, with a raised, green centre throughout the caudal air sacs and overlying the surfaces of the left and right lung fields. Culture recovered *Aspergillus fumigatus* supporting the diagnosis that the bird had died from chronic, systemic mycosis leading to severe debilitation.

Figure 16: Gross pathology of the respiratory organs from the Mute Swan placed on a red table background to provide contrast to show the multiple, white, circular shaped fungal plaques present in the air sacs and lungs.

Alan Murphy, APHA Thirsk

Trichomonosis in a Peregrine falcon (*Falco peregrinus*)

A Peregrine falcon (*Falco peregrinus*) that was resident on a ledge with CCTV was noticed unsteady and was filmed walking backwards and falling off the ledge to its death. The body was recovered and submitted to Shrewsbury Veterinary Investigation Centre for post mortem examination. It had firm, pale, necrotic tissue extending over the roof of the pharynx in the region of the soft palate and partially occluding the oesophagus. Sectioning of the head revealed the lesion extending towards the base of the brain (Figure 17). Trichomonosis was suspected and histopathology confirmed severe necrotising oropharyngitis with trichomonads. It is suspected that the peregrine would have become infected after eating infected prey, typically pigeons.

Figure 17: Gross pathology of the sectioned (cut in half vertically) peregrine falcon head placed on a blue table background that shows extensive cream coloured lesions in the oropharynx tissue due to trichomonosis infection.

Paul Holmes, APHA Shrewsbury

Wild Bird reports from the IoZ

Proliferative leg skin lesions in finches

In January 2023, a single adult female chaffinch (*Fringilla coelebs*) was submitted for postmortem examination after being found dead in the Clyde Valley, Scotland. Severe, spikey, proliferative growths were observed on the left foot of the bird (Figure 18 A), and the cause of death was determined to be predation. Additionally, in early April 2023, a single adult male greenfinch (*Chloris chloris*) was also submitted, after being found dead in Essex, England. Proliferative beige-white skin lesions covered both legs (Figure 18 B) and the cause of death in this bird was also determined to be predation.

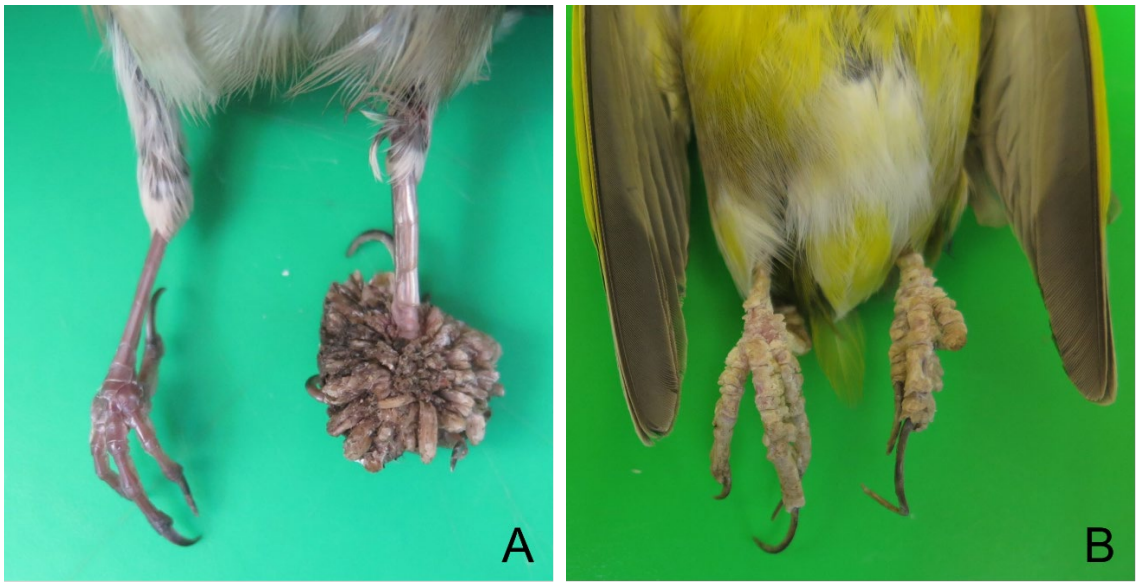

Figure 18: Gross pathology showing the legs and feet of two different species of dead garden birds placed on a green background to demonstrate the tissue abnormalities present. A. The photograph of the chaffinch (*Fringilla coelebs*) two legs and feet show the normal right limb in comparison to the abnormal left limb with multiple, spikey, proliferative skin lesions on the left foot. B. The photograph of the greenfinch (*Chloris chloris*) two limbs show that both feet have abnormal, irregular and proliferative skin lesions present.

Crush preparations were conducted on samples taken from the skin lesions of both birds and examined microscopically. No mites were observed in the chaffinch sample, however numerous mites (suspect *Cnemidocoptes* spp.) were identified in the greenfinch sample.

Histopathological examination was performed on tissue samples collected from the chaffinch and revealed the presence of hyperplastic and hyperkeratotic changes within the skin of the affected leg, associated with hypercellular skin (interpreted as dermatitis) and superficial Gram positive cocci bacteria. No mites were observed. Whilst the degree of preservation hindered interpretation with respect to viral inclusion bodies, infection with *Fringilla coelebs* papillomavirus 1 (FcPV1) is the suspected cause of the observed leg skin lesions in the chaffinch.

Proliferative leg lesions caused by papillomatosis (infection with FcPV1) and cnemidocoptosis (infestation with *Cnemidocoptes* spp. mites) in British finch species, whilst often seen, are rarely reported as causing mortality in affected birds (Lawson and others, 2018). Both causes of leg lesions have been reported in Great Britain since the 1960s, and the chaffinch is the most frequently affected species. Whilst infection with FcPV1 tends to cause more 'spikey' lesions, typically around the foot (as suspected in the reported chaffinch, Figure 2A), and infestation with *Cnemidocoptes* spp. mites tends to cause white-grey skin growths covering the foot and leg (as in the reported greenfinch, Figure 2B), coinfections with both conditions can occur, and may present with lesions of similar appearance in finches, meaning that laboratory investigations are needed to reach a diagnosis. Affected birds tend to remain bright and relatively unaffected by these leg lesions, however severely affected birds can be prone to entanglement or predation (as with both of these cases). Whilst this can lead to the death of the bird, there is no evidence that such leg lesions pose a conservation threat.

References

Lawson B, Robinson RA, Fernandez JRR, John SK, Benitez L, Tolf C, Risely K, Toms MP, Cunningham AA, Williams RA. Spatio-temporal dynamics and aetiology of proliferative leg skin lesions in wild British finches. *Scientific Reports* 2018;**8**(1):14670.

Institute of Zoology (IoZ)

Wildfowl and Wetlands Trust (WWT) report

Passive surveillance of water birds

Postmortem examinations were performed on 29 wild birds originating from five WWT sites (Arundel, West Sussex; Llanelli, Carmarthenshire; London Wetland centre, Greater London; Slimbridge, Gloucestershire; and Martin mere, Lancashire). A total of 9 target species were examined, which included 6 mallards (*Anas platyrhynchos*), 4 greylag geese (*Anser anser*), 4 mute swans (*Cygnus olor*), 3 moorhens (*Gallinula chloropus*), 2 whooper swans (*Cygnus cygnus*), 2 Canada geese (*Branta canadensis*), 2 Eurasian coots (*Fulica atra*), 2 great cormorants (*Phalacrocorax carbo*) and one lesser black-backed gull (*Larus fuscus*).

Two other species were also examined: a barn owl (*Tyto alba*) and 2 wood pigeons (*Columba palumbus*)

The primary causes of death for the abovementioned species are summarised below (Table 3). The most notable post-mortem finding was gross pathological lesions related to trauma (38%). Mixed lesions were observed within this group. Five mallards presented lesions compatible with same-species aggression (skin wounds, missing feathers, and bruising around the head and along the back), as well as secondary issues such as internal haemorrhage and drowning. Five cases involved injuries after severe collisions: one mute swan and a Canada goose presented complete limb fractures and pectoral

bruising. Other cases with pectoral bruising but also internal haemorrhage involved one barn owl, one Canada goose, and one lesser black-backed gull. Lastly, a greylag goose had to be euthanased on welfare grounds due to emaciation, poor feather condition, lice infestation, and the long-term effects of old injuries sustained from being shot (including beak rupture and tongue ulcers) at an unknown location (Figure 19). A shot pellet was found during postmortem examination in the right Gastrocnemius lateralis muscle. This greylag goose had previously visited the Gloucestershire reserve the summer before and managed to adapt to its injuries; however, during its second summer, it struggled and was no longer able to preen or graze, becoming extremely lethargic.

Figure 19: The two photographs on the left and bottom right show the live male greylag goose being held by a person wearing blue gloves to demonstrate the bird's severe facial injuries on the right side of the beak. The photograph on the top right shows the single shot pellet removed from right leg muscle of this same bird and placed on a purple background.

Predation was another predominant primary cause (17%). Most of the predated birds collected presented with intact skeletal structure and skin, but minimal soft tissue or missing sections, and absence or minimal presence of internal organs. In 2 cases, a moorhen and a wood pigeon had puncture wounds and were headless due to a sparrowhawk attack.

Lesions compatible with avian mycobacteriosis was found in 2 birds (7%): one greylag goose and one mallard. Necropsy revealed a characteristic presentation of multi-focal granuloma-like lesions throughout the intestinal mesentery and liver, and purulent-mucoid free fluid in the coelomic cavity.

Two birds, a whooper swan and a great cormorant had lesions consistent with aspergillosis and severe air-sacculitis (7%). Both carcases presented extensive, invasive, and infiltrating lesions affecting more than one area of the respiratory tract (pulmonary tissue, air sacs and trachea) with poor body condition and other concurrent issues (intestinal parasites: nematodes).

Digestive disorders comprised 7% of the examined cases. A male mute swan exhibited haemorrhagic mucoid content in its intestines, along with thickened intestinal lining. Furthermore, it had severe bruising to the neck and external trauma due to intraspecies aggression. A great cormorant also displayed haemorrhagic intestinal content, along with thickened and congested intestinal tissues, as well as pericardial effusion.

Other cases with less prevalent causes (21%) during these two quarters included a Eurasian coot that was part of a botulism outbreak, and another coot with advanced pododermatitis (bumblefoot) and renal disease. Postmortem examination and histopathology revealed lymphosarcoma disseminated in the liver, spleen, pancreas, intestines, and ovary of an adult female mute swan, along with incidental intraluminal parasites consistent with schistosomes. A whooper swan and another mute swan drowned, exhibiting concomitant signs of potential viral or bacterial infection, including pancreatic and intestinal lesions, as well as coelomic free fluid. Additionally, a wood pigeon presented with obstructive buildup of yellow plaque in the pharynx, indicative of trichomonas infection.

One wild bird (3%) did not receive a diagnosis due to the lack of obvious gross abnormalities.

Table 3: Confirmed and suspected causes of wild bird mortality (including morbidity meriting euthanasia on welfare grounds) at WWT reserves between January and June 2023.

Primary cause of death/PM findings	Total	Species (and notes)
Trauma	11	1 x lesser black-backed gull, 5 x mallards, 2 x Canada geese, 1 x mute swan, 1 x greylag goose, 1 x barn owl
Predation	5	3 x moorhens, 1 x greylag goose, 1 x wood pigeon
Avian mycobacteriosis	2	1 x greylag goose, 1 x mallard
Aspergillosis	2	1 x whooper swan, 1 x great cormorant
Digestive disorder	2	1 x mute swan, 1 x great cormorant
Other	6	1 x Eurasian coot (botulism), 1 x Eurasian coot (pododermatitis, renal disease), 1 x mute swan (lymphosarcoma), 1 x mute swan (infection), 1 x wood pigeon (trichomonas), 1 x whooper swan (infection)
No diagnosis (due to decomposition or lack of or inconclusive gross abnormalities)	1	1 x greylag goose

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

Wild Bird reports from Scotland

Pasteurella multocida in a Common buzzard (Buteo buteo)

Pneumonia, nephritis and peritonitis due to *Pasteurella multocida* was diagnosed in a Common buzzard (*Buteo buteo*) found dead in a forest in the southwest of Scotland. At necropsy, body condition was poor, and the left lung was solid and discoloured. There was a dark red exudate over the serosal surface of the intestines, and a large irregular mass at the caudal end of the left kidney with a yellow necrotic core. *Pasteurella multocida* was isolated in mixed growth from the lung and kidney and in pure growth from the coelomic cavity. *P. multocida* is a well-recognised cause of disease in all types of birds including raptors. It can cause acute and chronic disease affecting a wide range of tissues, especially the lung as in this case. A low, background residue of the rodenticide brodifacoum was found on routine toxicology and was not thought to be involved in the death.

Avian tuberculosis in a Taiga bean goose (*Anser fabialis*)

Avian tuberculosis was diagnosed in a GPS-tracked female taiga bean goose (*Anser fabalis*), which was left behind by the group when it migrated. It had lost 650g in weight over the previous two months and it was in moderate body condition at the time of death. At necropsy, a 0.5cm diameter flat, oval, yellow mass was found between the trachea and oesophagus at the heart base. It was adhered to the oesophagus but easily removed. Necrotic material was found within the lumen of the trachea proximal to the bifurcation, which occluded the airway. A 3 x 2 cm diameter firm granuloma was found where the spleen is normally located. This was whitish and homogenous on section. A similar 1 cm diameter mass was present within the gizzard wall close to its exit. A Ziehl–Neelsen smear made from the abdominal mass was positive for large numbers of acid fast bacteria. It was noted that, while liver and spleen are the most common sites to find lesions of avian tuberculosis, the gizzard wall and particularly the lesion in the trachea are more unusual presentations. Histopathology confirmed that the lesions at the base of the heart and in the gizzard were also due to avian tuberculosis. Airway obstruction due to the necrotic material within the trachea was the cause of death in this case.

Caroline Robinson, SRUC Veterinary Services

Amphibian reports

Amphibian reports from IoZ

Fatal phaeohyphomycosis in British amphibians

In February 2023, a single female common frog (*Rana temporaria*) from West Sussex was observed to be lethargic with multiple dark skin lesions prior to its death and was subsequently submitted for postmortem examination. Multiple dark brown lesions were observed on the skin (Figure 20 A), the subcutaneous space (Figure 20 B) as well as on the kidneys and oviduct. Additionally, there was a chronic laceration injury on the left lateral body and evidence of splenomegaly. Upon histopathological examination, a dense infiltrate of brown-pigmented fungal hyphae, consistent with phaeohyphomycosis, was found to partly replace the extensively thickened dermis and to extend into the subcutaneous muscle, dissecting degenerate or necrotic myofibers (Figure 19 C). Sequence analysis of the ITS region from a skin sample identified an *Exophiala* spp., closely related to *E. equina*, to be involved.

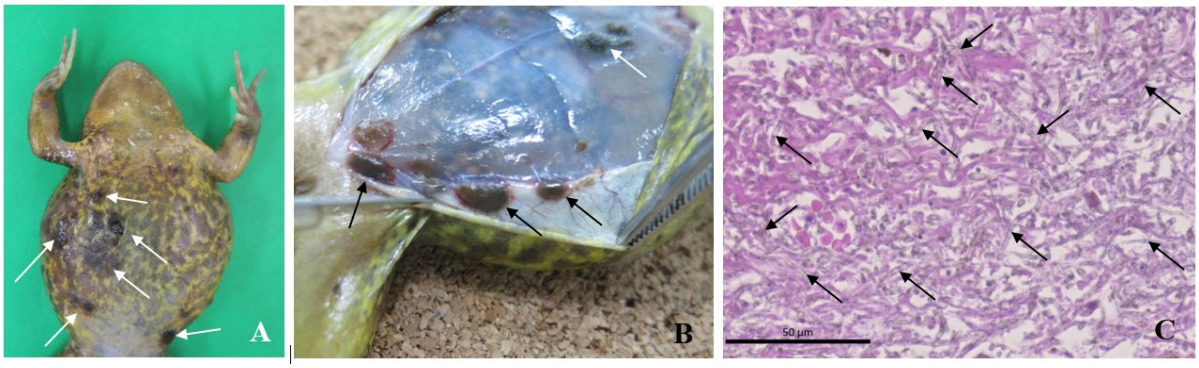

Figure 20. A. Gross pathology showing the external appearance of a dead female common frog (*Rana temporaria*) that had multiple, dark brown, abnormal skin lesions present on its body, specifically located on its chest and abdomen, as indicated by the white arrows on the photo. B. Gross pathology of the frog with its skin removed to show these abnormal lesions extending into the subcutaneous space, as indicated by the black arrows, and extending into the coelomic (body) muscle wall, as indicated by the white arrow. C. Photograph of the microscopic view for histopathological examination that showed a dense infiltrate of dark pigmented, septate, parallel walled fungal hyphae of 3 µm in diameter with acute-angle branching, as indicated by the white arrows, which are consistent with a diagnosis of phaeohyphomycosis.

This is the second case of fatal phaeohyphomycosis due to an *Exophiala* sp. infection in an anuran in GB, following a common toad (*Bufo bufo*) from Scotland submitted to Garden Wildlife Health for postmortem examination in September 2016 where multiple nodular skin lesions, marked hepatitis/hepatomegaly, and a large coelomic mass and coelomitis associated with pigmented fungal hyphae (most closely related to *E. cancerae*) were observed (Seilern-Moy and others, 2017).

Exophiala (Chaetothyriales) spp. are black yeasts that have previously been identified as a cause of amphibian phaeohyphomycosis, a mycotic infection increasingly recognised affecting ectothermic vertebrates (Seyedmousavi and others, 2013), and likely a sporadic cause of mortality in individual wild amphibians. Whilst there was no evidence of significant concurrent infection or generalised debility in either of the 2 anurans diagnosed with phaeohyphomycosis, it has been postulated that immunocompromised amphibians are increasingly susceptible to infection with opportunistic fungal pathogens such as *Exophiala* spp., and that traumatic injury to the skin (as observed in the common frog) may predispose animals to infection with these environmental fungi (Juopperi and others, 2002).

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Institute of Zoology (IoZ)

Appendix 1 – Combined Wildlife Disease Data 2022

Appendix 1 incorporates data from APHA Diseases of Wildlife Scheme, SRUC and Garden Wildlife Health (Institute of Zoology) wildlife submissions from 2022. This was achieved using the VIDA (Veterinary Investigation Diagnosis Analysis) coding system; listed diagnoses have set criteria that need to be fulfilled.

This data set only includes routine diagnostic submissions and does not include project work. Only a subset of the wild birds testing positive for avian influenza virus have been included in this summary (those received at the APHA Veterinary Investigation Centres). For the complete avian influenza in wild bird data set please refer to Avian influenza in wild birds: 2022 dataset found on Bird flu (avian influenza): cases in wild birds - GOV.UK.

"Mixed bird" submissions are submissions where multiple species have been submitted together. Some species have been listed as "unspecified" or unknown. This is usually due to severe autolysis impeding definitive identification or because the carcass is incomplete, making full identification impossible. Please note that the count is by submission, and not by carcass, in all the tables below. A single submission may often contain multiple carcasses. Notifiable diseases, such as tuberculosis and avian influenza in wild mammals, are not included in these tables, as reported information is available at Data on TB in Non-Bovine Species - GOV.UK and Bird flu (avian influenza): findings in non-avian wildlife - GOV.UK.

Table A1: the number of submissions by category of animal and country

Country	Animal Category	APHA	IOZ	SRUC	Total
England	Amphibian	0	22	0	22
England	Bird	1,503	76	13	1,592
England	Mammal	114	17	0	131
England	Reptile	0	2	0	2
Total for England		**1,617**	**117**	**13**	**1,747**
Scotland	Bird	3	4	433	440
Scotland	Mammal	1	1	27	29
Total for Scotland		**4**	**5**	**460**	**469**
Wales	Bird	97	3	1	101
Wales	Mammal	4	3	0	7
Total for Wales		**101**	**6**	**1**	**108**
Not specified	Bird	3	0	2	5
Total for Not specified		**3**	**0**	**2**	**5**
Total for all countries		**1,725**	**128**	**476**	**2,329**

Table A2: the number of submissions by category of animal and quarter reported

Animal Category	Year	Quarter	APHA	IOZ	SRUC	Total
Amphibian	2022	Q1	0	9	0	9
Amphibian	2022	Q2	0	7	0	7
Amphibian	2022	Q3	0	6	0	6
Total number of amphibians			**0**	**22**	**0**	**22**
Bird	2022	Q1	362	22	173	557
Bird	2022	Q2	286	18	145	449
Bird	2022	Q3	363	30	78	471
Bird	2022	Q4	595	13	53	661
Total number of birds			**1606**	**83**	**449**	**2138**
Mammal	2022	Q1	27	2	12	41
Mammal	2022	Q2	18	7	5	30
Mammal	2022	Q3	31	7	2	40
Mammal	2022	Q4	43	5	8	56
Total number of mammals			**119**	**21**	**27**	**167**
Reptile	2022	Q2	0	2	0	2
Total number of reptiles			**0**	**2**	**0**	**2**
Total number of submissions			**1725**	**128**	**476**	**2,329**

Table A3: the number of submissions by sub-category of animal

Animal Category	Animal Sub-category	APHA	IOZ	SRUC	Total
Amphibian	Frog	0	13	0	13
	Newt	0	5	0	5
	Toad	0	4	0	4
Total number of amphibians		**0**	**22**	**0**	**22**
Bird	Bird of prey	461	0	130	591
	Game bird	43	0	3	46
	Garden bird	55	75	12	142
	Miscellaneous	2	4	0	6
	Pigeon and dove	66	4	4	74
	Seabird	365	0	149	514
	Waterbird	35	0	0	35
	Waterfowl	575	0	149	724
	Bird unspecified	4	0	2	6
Total number of birds		**1606**	**83**	**449**	**2138**
Mammal	Bat	1	0	0	1
	Canid	25	0	0	25
	Deer	6	0	3	9
	Hedgehog	3	21	0	24
	Mole	1	0	0	1
	Mustelid	5	0	20	25
	Rabbit and hare	11	0	2	13
	Rodent	24	0	2	26
	Seal	41	0	0	41
	Wild boar	2	0	0	2
Total number of mammals		**119**	**21**	**27**	**167**
Reptile	Lizard	0	1	0	1
	Snake	0	1	0	1
Total number of reptiles	**Total**	**0**	**2**	**0**	**2**
Total number of submissions		**1725**	**128**	**476**	**2329**

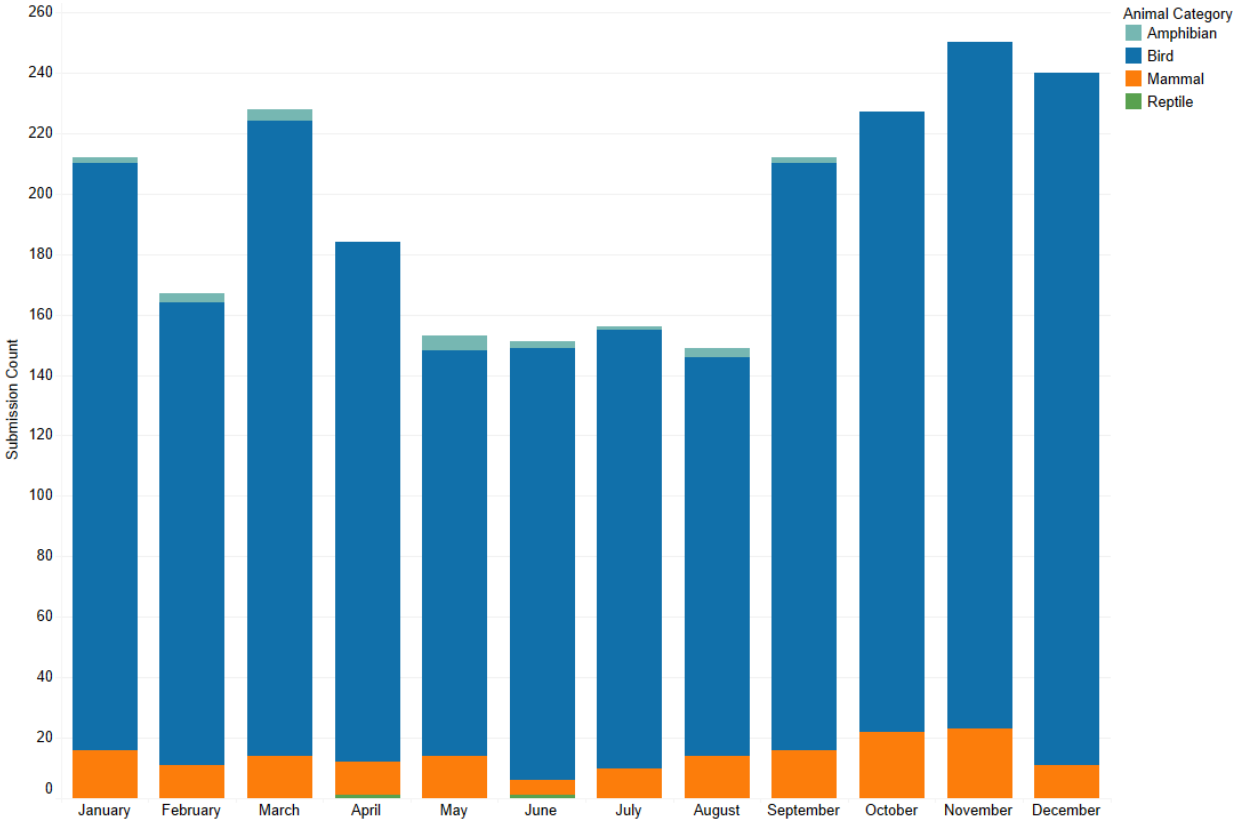

Figure A1: Bar chart to show the number of submissions (on the y axis) by animal category (on the x axis) for each month from January to December 2022, with amphibians shown as light blue bars, birds shown as dark blue bars, mammals shown as orange bars and reptiles as green bars. For this time period, the majority of submissions are categorised as birds of different species. The greatest number of submissions (240 submissions or more) occured in the months of November and December.

Table A4: the number of mammalian submissions by species

Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
Bat	Common pipistrelle bat	*Pipistrellus pipistrellus*	1	0	0	1
Canid	Fox	*Vulpes vulpes*	25	0	0	25
Deer	Fallow deer	*Dama dama*	1	0	0	1
	Roe deer	*Capreolus capreolus*	5	0	3	8
Hedgehog	European hedgehog	*Erinaceus europaeus*	3	21	0	24
Mole	European mole	*Talpa europaea*	1	0	0	1
Mustelid	Badger	*Meles meles*	3	0	2	5
	Eurasian otter	*Lutra lutra*	2	0	18	20
Rabbit and hare	European rabbit	*Oryctolagus cuniculus*	5	0	0	5
	Brown hare	*Lepus europaeus*	4	0	0	4
	Mountain hare	*Lepus timidus*	2	0	1	3
	Hare unspecified		0	0	1	1
Rodent	Beaver	*Castor fiber*	0	0	2	2
	Brown rat	*Rattus norvegicus*	1	0	0	1
	Rat unspecified		2	0	0	2
	Red squirrel	*Sciurus vulgaris*	21	0	0	21
Seal	Common/Harbour seal	*Phoca vitulina*	8	0	0	8
	Grey seal	*Halichoerus grypus*	33	0	0	33
Wild boar	Wild boar	*Sus scrofa*	2	0	0	2
Total number of submissions			**119**	**21**	**27**	**167**

Table A5: the number of bird submissions by species

Animal Sub-category	Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
Bird of prey	Buzzard	Common buzzard	*Buteo buteo*	166	0	73	239
	Eagle	Golden eagle	*Aquila chrysaetos*	0	0	10	10
		White-tailed eagle	*Haliaeetus albicilla*	0	0	2	2
	Falcon	Kestrel	*Falco tinnunculus*	63	0	8	71
		Merlin	*Falco columbarius*	1	0	0	1
		Peregrine	*Falco peregrinus*	15	0	3	18
	Harrier	Hen harrier	*Circus cyaneus*	0	0	4	4
	Hawk	Goshawk	*Accipiter gentilis*	2	0	0	2
		Harris hawk (feral)	*Parabuteo unicinctus*	1	0	0	1
		Sparrowhawk	*Accipiter nisus*	124	0	19	143
	Kite	Red kite	*Milvus milvus*	19	0	3	22
	Osprey	Western osprey	*Pandion haliaetus*	0	0	3	3
	Owl	Barn owl	*Tyto alba*	24	0	3	27
		Little owl	*Athene noctua*	5	0	0	5
		Tawny owl	*Strix aluco*	40	0	2	42
	Bird of prey	Bird of prey unspecified		1	0	0	1
Game bird	Grouse	Red (Willow) grouse	*Lagopus lagopus*	0	0	1	1
		Grouse unspecified		0	0	1	1
	Partridge	Grey partridge	*Perdix perdix*	1	0	0	1
		Red-legged partridge (feral)	*Alectoris rufa*	5	0	0	5
	Peafowl	Common peafowl (feral)	*Pavo cristatus*	0	0	1	1
	Pheasant	Common pheasant (feral)	*Phasianus colchicus*	37	0	0	37
Garden bird	Bunting	Yellowhammer	*Emberiza citrinella*	0	2	0	2
	Corvid	Carrion crow	*Corvus corone corone*	6	1	5	12
		Jackdaw	*Coloeus monedula*	6	0	1	7
		Magpie	*Pica pica*	5	0	0	5
		Raven	*Corvus corax*	2	0	0	2
		Rook	*Corvus frugilegus*	6	0	0	6
	Dunnock	Dunnock	*Prunella modularis*	2	2	0	4
	Finch	Brambling	*Fringilla montifringilla*	0	1	0	1
		Bullfinch	*Pyrrhula pyrrhula*	1	2	0	3
		Chaffinch	*Fringilla coelebs*	0	11	2	13

Animal Sub-category	Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
		Goldfinch	*Carduelis carduelis*	1	9	0	10
		Greenfinch	*Chloris chloris*	0	10	0	10
		Hawfinch	*Coccothraustes coccothraustes*	0	1	0	1
		Siskin	*Spinus spinus*	0	2	0	2
		Finch mixed		2	0	0	2
	Sparrow	House sparrow	*Passer domesticus*	4	9	1	14
		Tree sparrow	*Passer montanus*	0	1	0	1
	Starling	Common starling	*Sturnus vulgaris*	6	2	1	9
	Swallow	Barn swallow	*Hirundo rustica*	0	1	0	1
	Thrush	Blackbird	*Turdus merula*	8	7	0	15
		Mistle thrush	*Turdus viscivorus*	1	0	0	1
		Redwing	*Turdus iliacus*	0	2	0	2
		Song thrush	*Turdus philomelos*	0	1	1	2
	Tit	Blue tit	*Cyanistes caeruleus*	3	3	1	7
		Great tit	*Parus major*	0	2	0	2
		Long-tailed tit	*Aegithalos caudatus*	0	1	0	1
	Tree-clinging	Wren	*Troglodytes troglodytes*	1	1	0	2
	Wagtail	Pied wagtail	*Motacilla alba*	1	0	0	1
	Warbler	Blackcap	*Sylvia atricapilla*	0	1	0	1
		Chiffchaff	*Phylloscopus collybita*	0	1	0	1
		Garden warbler	*Sylvia borin*	0	1	0	1
		Willow warbler	*Phylloscopus trochilus*	0	1	0	1
Miscellaneous	Ring-necked parakeet	Ring-necked parakeet	*Psittacula krameri*	0	1	0	1
	Swift	Common swift	*Apus apus*	0	1	0	1
	Woodpecker	Great spotted woodpecker	*Dendrocopos major*	2	1	0	3
		Green woodpecker	*Picus viridis*	0	1	0	1
Pigeon and dove	Pigeon and dove	Collared dove	*Streptopelia decaocto*	2	0	0	2
		Dove (feral)		2	0	0	2
		Feral pigeon / Rock dove	*Columba livia*	33	0	0	33
		Stock dove	*Columba oenas*	0	1	0	1
		Domestic pigeon (feral)	*Columba livia domestica*	1	0	0	1
		Woodpigeon	*Columba palumbus*	25	3	0	28
		Pigeon unspecified		3	0	4	7
Seabird	Auk	Guillemot	*Uria aalge*	13	0	29	42

Animal Sub-category	Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
		Puffin	*Fratercula arctica*	5	0	3	8
		Razorbill	*Alca torda*	3	0	2	5
	Diver	Great northern diver	*Gavia immer*	1	0	1	2
	Gannet, Cormorant and Shag	Cormorant	*Phalacrocorax carbo*	7	0	1	8
		Northern gannet	*Morus bassanus*	60	0	50	110
		Shag	*Gulosus aristotelis*	0	0	1	1
	Gull	Black-headed gull	*Chroicocephalus ridibundus*	54	0	1	55
		Common gull	*Larus canus*	17	0	7	24
		Great black-backed gull	*Larus marinus*	11	0	3	14
		Herring gull	*Larus argentatus*	147	0	20	167
		Kittiwake	*Rissa tridactyla*	8	0	3	11
		Lesser black-backed gull	*Larus fuscus*	10	0	1	11
		Little gull	*Hydrocoloeus minutus*	1	0	0	1
		Yellow-legged gull	*Larus michahellis*	1	0	0	1
		Sabine's gull	*Xema sabini*	1	0	0	1
		Black-backed gull unspecified		0	0	1	1
		Gull mixed		1	0	0	1
		Gull unspecified		4	0	12	16
	Petrel and shearwater	Manx shearwater	*Puffinus puffinus*	2	0	1	3
		Storm petrel	*Hydrobates pelagicus*	2	0	0	2
	Skua	Arctic skua	*Stercorarius parasiticus*	0	0	1	1
		Great skua	*Stercorarius skua*	1	0	2	3
	Tern	Arctic tern	*Sterna paradisaea*	1	0	2	3
		Common tern	*Sterna hirundo*	5	0	0	5
		Little tern	*Sterna albifrons*	1	0	0	1
		Roseate tern	*Sterna dougallii*	1	0	0	1
		Sandwich tern	*Sterna sandvicensis*	7	0	1	8
		Tern unspecified		1	0	0	1
	Seabird	Seabird mixed		0	0	5	5
		Seabird unspecified		0	0	2	2
Waterbird	Grebe	Black-necked grebe	*Podiceps nigricollis*	1	0	0	1
		Great crested grebe	*Podiceps cristatus*	4	0	0	4

Animal Sub-category	Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
		Red-necked grebe	*Podiceps grisegena*	1	0	0	1
	Heron	Grey heron	*Ardea cinerea*	6	0	0	6
		Little egret	*Egretta garzetta*	1	0	0	1
	Rail	Coot	*Fulica atra*	9	0	0	9
		Moorhen	*Gallinula chloropus*	3	0	0	3
		Water rail	*Rallus aquaticus*	1	0	0	1
	Wader	Common snipe	*Gallinago gallinago*	1	0	0	1
		Curlew	*Numenius arquata*	3	0	0	3
		Lapwing	*Vanellus vanellus*	1	0	0	1
		Oystercatcher	*Haematopus ostralegus*	2	0	0	2
		Woodcock	*Scolopax rusticola*	2	0	0	2
	Duck	Aylesbury duck (feral)	*Anas platyrhynchos domesticus*	1	0	0	1
		Domestic duck (feral)	*Anas platyrhynchos domesticus*	2	0	1	3
		Eider	*Somateria mollissima*	0	0	7	7
		Gadwall	*Mareca strepera*	2	0	0	2
		Goosander	*Mergus merganser*	2	0	0	2
		Hybrid duck (feral)		1	0	0	1
		Mallard (feral)	*Anas platyrhynchos*	69	0	4	73
		Mandarin duck (feral)	*Aix galericulata*	1	0	0	1
		Muscovy duck (feral)	*Cairina moschata*	1	0	0	1
		Pintail	*Anas acuta*	1	0	0	1
		Red-breasted merganser	*Mergus serrator*	1	0	0	1
		Shelduck	*Tadorna tadorna*	1	0	0	1
		Shoveler	*Spatula clypeata*	1	0	0	1
		Teal	*Anas crecca*	1	0	1	2
		Tufted duck	*Aythya fuligula*	8	0	0	8
		Duck unspecified		4	0	0	4
	Goose	Barnacle goose	*Branta leucopsis*	4	0	5	9
		Brent goose	*Branta bernicla*	1	0	0	1
		Canada goose	*Branta canadensis*	167	0	1	168
		Egyptian goose	*Alopochen aegyptiaca*	1	0	0	1
		Goose (feral)		1	0	0	1
		Greylag goose	*Anser anser*	69	0	13	82

Animal Sub-category	Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
		Hybrid goose (feral)		2	0	0	2
		Pink-footed goose	*Anser brachyrhynchus*	13	0	54	67
		White-fronted goose	*Anser albifrons*	1	0	0	1
		Goose mixed		3	0	0	3
		Goose unspecified		12	0	2	14
	Swan	Bewick's swan	*Cygnus columbianus*	1	0	0	1
		Mute swan	*Cygnus olor*	194	0	49	243
		Whooper swan	*Cygnus cygnus*	5	0	6	11
		Swan unspecified		5	0	5	10
	Waterfowl	Waterfowl mixed		0	0	1	1
Unspecified	Mixed or unknown bird	Bird unspecified		4	0	2	6
Total number of submissions				**1606**	**83**	**449**	**2138**

Table A6: number of amphibian and reptile submissions by species

Animal Category	Animal Group	Common Name	Scientific Name	IOZ	Total
Amphibian	Frog	Common frog	*Rana temporaria*	13	13
	Newt	Alpine newt	*Mesotriton alpestris*	1	1
		Great crested newt	*Triturus cristatus*	1	1
		Palmate newt	*Lissotriton helvetica*	2	2
		Smooth newt	*Lissotriton vulgaris*	1	1
	Toad	Common toad	*Bufo bufo*	4	4
Reptile	Lizard	Slow worm	*Anguis fragilis*	1	1
	Snake	Grass snake	*Natrix natrix*	1	1
Total number of submissions				**24**	**24**

Table A7: number of VIDA diagnoses in mammals by species

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Canid	Red fox	Colisepticaemia	1
		Ectoparasitic disease	1
		Haemoparasitic infection	1
		Leptospirosis	1
		Salmonellosis dt S. Typhimurium	1
		Staphylococcal infection	1
		Tick-borne fever	1
		Trauma: Road Traffic Accident	2
		Diagnosis not listed - nervous disease	1
Deer	Fallow deer	Parasitic gastroenteritis	1
	Roe deer	Ectoparasitic disease	1
		Haemoparasitic infection	1
		Mastitis dt Staphylococcus	1
		Neoplasm	1
		Parasitic pneumonia	1
		Ruminal acidosis	1
		Trauma: Predation	1
		Trauma: Road Traffic Accident	1
Hedgehog	European hedgehog	Parasitic pneumonia	11
		Pasteurellosis	1
		Salmonella Enteritidis	3
		Trauma: Predation	8
		Trauma/fracture	5
		Visceral parasitism	1
		Diagnosis not listed - digestive disease	1
		Diagnosis not listed - respiratory disease	1
Mole	European mole	Trauma: Predation	1
Mustelid	Badger	Malnutrition	1
		Neoplasm	1
	Eurasian otter	Gastric ulceration	1
		Malnutrition	2
		Parasitic gastroenteritis	1
		Pneumonia	4
		Streptococcal infection	1
		Trauma: Predation	2
		Trauma: Road Traffic Accident	9
		Trauma/fracture	1
		Diagnosis not listed	1
		Diagnosis not listed - respiratory disease	1

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Rabbit and hare	European rabbit	Meningitis/encephalitis	1
		Myxomatosis	2
		Rabbit haemorrhagic disease (including RHD2)	1
		Visceral parasitism	1
		Diagnosis not listed - systemic disease	1
	Brown hare	Coccidiosis	2
		Rabbit haemorrhagic disease (including RHD2)	1
		Trauma: Road Traffic Accident	1
	Mountain hare	Coccidiosis	2
		Ectoparasitic disease	1
	Hare unspecified	Rabbit haemorrhagic disease (including RHD2)	1
Rodent	Beaver	Trauma: Road Traffic Accident	1
	Brown rat	Trauma/fracture	1
	Rat unspecified	Trauma/fracture	2
	Red squirrel	Colisepticaemia	1
		Ectoparasitic disease	2
		Neoplasm	1
		Red squirrel adenovirus enteritis	3
		Squirrel pox	9
		Staphylococcal infection	3
		Diagnosis not listed - systemic disease	1
Seal	Common/ harbour seal	Malnutrition	1
		Parasitic pneumonia	1
		Septicaemia	2
	Grey seal	Colisepticaemia	1
		Malnutrition	2
		Meningitis/encephalitis	3
		Parasitic pneumonia	1
		Peritonitis	1
		Pneumonia dt Pasteurella spp.	1
		Streptococcal infection	1
		Trauma/fracture	2
		Diagnosis not listed - digestive disease	1
		Diagnosis not listed - musculo-skeletal disease	1
		Diagnosis not listed - skin disease	3

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
		Diagnosis not listed - systemic disease	1
		Umbilical infection +/- joint infection	1
Wild boar	Wild boar	Neoplasm	1
		Spinal abscess	1
Total number of diagnoses	**Total**	**Total**	**113**

Table A8: number of VIDA diagnoses in birds by species

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Bird of prey	Buzzard	Common buzzard	Avian Influenza	103
			Helminthosis	4
			Impactions of crop/gizzard/ duodenum	1
			Malnutrition	16
			Oral trichomonosis (avian) including oesophagitis in garden birds	7
			Peritonitis	1
			Pneumonia	3
			Syngamus species infection (Gapeworm)	1
			Trauma: Predation	1
			Trauma: Road Traffic Accident	4
			Trauma/fracture	9
			Diagnosis not listed - circulatory disease	1
			Diagnosis not listed - digestive disease	1
			Diagnosis not listed - respiratory disease	1
			Diagnosis not listed - systemic disease	5
	Eagle	Golden eagle	Avian Influenza	4
			Malnutrition	2
			Trauma/fracture	1
		White-tailed eagle	Avian Influenza	1
			Trauma/fracture	1
	Falcon	Kestrel	Avian Influenza	10
			Ectoparasitic disease	1
			Helminthosis	1
			Impactions of crop/gizzard/ duodenum	1
			Malnutrition	10
			Trauma/fracture	5
			Diagnosis not listed - systemic disease	1
		Merlin	Trauma/fracture	1
		Peregrine	Avian Influenza	9
			Malnutrition	1
			Oral trichomonosis (avian) including oesophagitis in garden birds	1

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
	Harrier	Hen harrier	Avian Influenza	1
			Malnutrition	1
	Hawk	Goshawk	Trauma/fracture	2
		Sparrowhawk	Avian Influenza	22
			Helminthosis	5
			Malnutrition	8
			Mycotic pneumonia or airsacculitis	1
			Oral trichomonosis (avian) including oesophagitis in garden birds	12
			Protozoal infection	1
			Salmonellosis dt S. Typhimurium	1
			Trauma: Predation	1
			Trauma: Road Traffic Accident	1
			Trauma/fracture	21
			Diagnosis not listed - digestive disease	1
			Diagnosis not listed - systemic disease	1
	Kite	Red kite	Avian Influenza	6
			Trauma/fracture	2
	Osprey	Western osprey	Avian Influenza	1
			Fungal Infection	1
			Salmonellosis dt S. Typhimurium	1
	Owl	Barn owl	Airsacculitis - cause not determined	1
			Avian Influenza	2
			Malnutrition	4
			Trauma: Road Traffic Accident	1
			Trauma/fracture	3
			Diagnosis not listed - digestive disease	1
			Diagnosis not listed - systemic disease	1
		Little owl	Malnutrition	1
		Tawny owl	Avian Influenza	5
			Helminthosis	2
			Oral trichomonosis (avian) including oesophagitis in garden birds	3
			Trauma: Predation	1
			Trauma/fracture	7
Game bird	Grouse	Red (Willow) grouse	Louping ill	1

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
	Partridge	Red-legged partridge (feral)	Avian Influenza	1
			Trauma: Predation	1
			Trauma/fracture	2
	Peafowl	Common peafowl (feral)	Trauma/fracture	1
	Pheasant	Common pheasant (feral)	Avian Influenza	20
			Trauma - Shot	1
			Trauma/fracture	7
Garden bird	Bunting	Yellowhammer	Oral trichomonosis (avian) including oesophagitis in garden birds	1
			Trauma/fracture	1
	Corvid	Carrion crow	Airsacculitis - cause not determined	1
			Avian Influenza	2
			Trauma/fracture	1
		Jackdaw	Trauma/fracture	1
		Magpie	Avian Influenza	2
		Rook	Malnutrition	1
			Trauma/fracture	2
	Dunnock	Dunnock	Trauma/fracture	2
	Finch	Brambling	Oral trichomonosis (avian) including oesophagitis in garden birds	1
			Trauma/fracture	1
		Bullfinch	Oral trichomonosis (avian) including oesophagitis in garden birds	1
			Trauma/fracture	1
		Chaffinch	Ectoparasitic disease	2
			Oral trichomonosis (avian) including oesophagitis in garden birds	8
			Trauma/fracture	3
		Goldfinch	Colisepticaemia	1
			Malnutrition	1
			Oral trichomonosis (avian) including oesophagitis in garden birds	6
			Protozoal infection	1
			Trauma/fracture	2
		Greenfinch	Oral trichomonosis (avian) including oesophagitis in garden birds	9
			Protozoal infection	1

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
			Trauma: Predation	2
			Trauma/fracture	4
		Hawfinch	Oral trichomonosis (avian) including oesophagitis in garden birds	1
		Siskin	Oral trichomonosis (avian) including oesophagitis in garden birds	2
	Sparrow	House sparrow	Coccidiosis	2
			Ectoparasitic disease	1
			Oral trichomonosis (avian) including oesophagitis in garden birds	1
			Trauma: Predation	1
			Trauma/fracture	6
		Tree sparrow	Trauma/fracture	1
	Starling	Common starling	Avian Influenza	1
			Helminthosis	1
			Trauma/fracture	5
	Swallow	Barn swallow	Diagnosis not listed - reproductive disease (other than foetopathy)	1
	Thrush	Blackbird	Fungal Infection	1
			Pasteurella multocida (and fowl cholera)	1
			Trauma: Predation	4
			Trauma/fracture	1
			Usutu virus infection	1
			Visceral parasitism	1
		Mistle thrush	Trauma: Predation	1
		Redwing	Trauma: Predation	2
			Visceral parasitism	1
		Song thrush	Trauma/fracture	1
	Tit	Blue tit	Malnutrition	2
		Great tit	Ectoparasitic disease	1
		Long-tailed tit	Trauma/fracture	1
	Tree-clinging	Wren	Trauma: Predation	1
	Wagtail	Pied wagtail	Avian Influenza	1
	Warbler	Blackcap	Trauma/fracture	1
		Chiffchaff	Trauma/fracture	1
		Garden warbler	Trauma/fracture	1
		Willow warbler	Trauma/fracture	1

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Miscellaneous	Ring-necked parakeet	Ring-necked parakeet	Trauma/fracture	1
	Swift	Common swift	Trauma/fracture	1
	Woodpecker	Great spotted woodpecker	Avian Influenza	1
			Salmonella (excluding S. Enteritidis and S. Typhimurium)	1
		Green woodpecker	Malnutrition	1
			Trauma/fracture	1
Pigeon and dove	Pigeon and dove	Collared dove	Impactions of crop/gizzard/duodenum	1
		Dove (feral)	Avian Influenza	1
			Candidiasis	1
		Feral pigeon / Rock dove	Avian Influenza	9
			Oral trichomonosis (avian) including oesophagitis in garden birds	4
			Trauma: Predation	3
			Trauma/fracture	5
			Diagnosis not listed - systemic disease	1
		Stock dove	Oral trichomonosis (avian) including oesophagitis in garden birds	1
		Woodpigeon	Avian Influenza	4
			Avian pox	1
			Malnutrition	1
			Oral trichomonosis (avian) including oesophagitis in garden birds	6
			Trauma: Predation	2
			Trauma/fracture	2
			Diagnosis not listed – urinary disease	1
		Pigeon unspecified	PMV of pigeons (PPMV-1)	1
Seabird	Auk	Guillemot	Avian Influenza	32
			Malnutrition	1
			Diagnosis not listed - systemic disease	1
		Puffin	Avian Influenza	2
			Helminthosis	1
		Razorbill	Avian Influenza	2
	Diver	Great northern diver	Avian Influenza	1
			Visceral parasitism	1
		Cormorant	Avian Influenza	2

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
	Gannet, Cormorant and Shag		Malnutrition	1
			Trauma/fracture	1
			Diagnosis not listed	1
		Northern gannet	Avian Influenza	90
	Gull	Black-headed gull	Airsacculitis - cause not determined	1
			Amyloidosis	1
			Avian Influenza	22
			Malnutrition	3
			Nephrosis / nephropathy	1
			Trauma/fracture	2
			Diagnosis not listed - systemic disease	1
		Common gull	Avian Influenza	12
			Trauma/fracture	1
			Tuberculosis	1
			Diagnosis not listed - digestive disease	1
		Great black-backed gull	Avian Influenza	4
			Trauma/fracture	1
		Herring gull	Adverse environment	1
			Avian Influenza	62
			Fungal Infection	1
			Impactions of crop/gizzard/ duodenum	1
			Malnutrition	1
			Peritonitis	1
			Pneumonia	1
			Septic arthritis or tenosynovitis dt bacterial infection	1
			Trauma: Predation	1
			Trauma: Road Traffic Accident	1
			Trauma/fracture	14
		Kittiwake	Avian Influenza	8
			Malnutrition	1
		Lesser black-backed gull	Avian Influenza	3
			Trauma/fracture	3
		Black-backed gull unspecified	Avian Influenza	1
		Gull Mixed	Trauma/fracture	1
		Gull unspecified	Avian Influenza	9
	Petrel and shearwater	Manx shearwater	Avian Influenza	1
			Trauma/fracture	2

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
			Diagnosis not listed - systemic disease	1
		Storm petrel	Trauma/fracture	1
	Skua	Great skua	Avian Influenza	3
	Tern	Arctic tern	Avian Influenza	2
		Common tern	Avian Influenza	3
		Roseate tern	Avian Influenza	1
		Sandwich tern	Avian Influenza	6
	Seabird	Seabird mixed	Avian Influenza	4
	Seabird	Seabird unspecified	Avian Influenza	1
Waterbird	Grebe	Great crested grebe	Avian Influenza	1
			Trauma: Predation	1
			Trauma/fracture	1
		Red-necked grebe	Avian Influenza	1
	Heron	Grey heron	Avian Influenza	1
			Trauma/fracture	4
		Little egret	Avian Influenza	1
	Rail	Coot	Avian Influenza	3
			Trauma/fracture	1
		Moorhen	Avian Influenza	1
			Trauma/fracture	1
	Wader	Curlew	Impactions of crop/gizzard/ duodenum	1
			Trauma:Predation	1
		Oystercatcher	Avian Influenza	1
		Woodcock	Trauma/fracture	1
Waterfowl	Duck	Aylesbury duck (feral)	Trauma/fracture	1
		Domestic duck (feral)	Avian Influenza	1
			Trauma/fracture	1
		Eider	Avian Influenza	3
		Gadwall	Avian Influenza	1
		Goosander	Avian Influenza	1
		Hybrid duck (feral)	Avian Influenza	1
		Mallard	Avian Influenza	19
			Fungal Infection	1
			Neoplasm	1
			Starveout - failure to feed in first week of life	1
			Trauma: Predation	3
			Trauma: Road Traffic Accident	1
			Trauma/fracture	11
			Diagnosis not listed - digestive disease	1

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
			Diagnosis not listed - systemic disease	1
		Mandarin duck (feral)	Diagnosis not listed - circulatory disease	1
		Pintail	Trauma/fracture	1
		Red-breasted merganser	Impactions of crop/gizzard/ duodenum	1
		Shoveler	Avian Influenza	1
		Teal	Avian Influenza	1
			Malnutrition	1
		Tufted duck	Avian Influenza	2
			Trauma: Predation	1
		Duck unspecified	Malnutrition	1
			Trauma/fracture	1
	Goose	Barnacle goose	Avian Influenza	6
			Diagnosis not listed - systemic disease	1
		Canada goose	Avian Influenza	142
			Egg peritonitis/salpingitis complex	2
			Helminthosis	1
			Malnutrition	1
			Trauma: Predation	2
			Trauma/fracture	5
		Egyptian goose	Trauma/fracture	1
		Goose (feral)	Avian Influenza	1
		Greylag goose	Avian Influenza	67
			Helminthosis	1
			Syngamus species infection (Gapeworm)	1
			Trauma: Predation	1
			Trichostrongylosis	1
			Tuberculosis	1
			Diagnosis not listed - digestive disease	1
			Diagnosis not listed - systemic disease	1
			Diagnosis not listed - urinary disease	1
		Hybrid goose (feral)	Avian Influenza	2
		Pink-footed goose	Avian Influenza	53
			Trauma/fracture	2
			Diagnosis not listed - systemic disease	4
		White-fronted goose	Avian Influenza	1
		Goose mixed	Avian Influenza	2

Animal Subcategory	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
		Goose unspecified	Avian Influenza	6
			Trauma/fracture	1
			Diagnosis not listed - systemic disease	1
	Swan	Mute swan	Avian Influenza	146
			Colisepticaemia	1
			Egg peritonitis/salpingitis complex	3
			Fungal Infection	1
			Helminthosis	1
			Malnutrition	4
			Mycotic pneumonia or airsacculitis	1
			Necrotic enteritis dt Clostridium perfringens	1
			Trauma: Predation	2
			Trauma/fracture	8
			Diagnosis not listed - digestive disease	1
			Diagnosis not listed - systemic disease	2
		Whooper swan	Airsacculitis - cause not determined	1
			Avian Influenza	4
			Mycotic pneumonia or airsacculitis	1
			Diagnosis not listed - systemic disease	1
		Swan unspecified	Avian Influenza	1
	Waterfowl	Waterfowl mixed	Avian Influenza	1
Unspecified	Mixed or unknown bird	Bird unspecified	Diagnosis not listed - systemic disease	1
Total number of diagnoses				**1361**

Table A9: number of VIDA diagnoses in amphibians and reptiles by species

Animal Category	Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Amphibian	Frog	Common frog	Malnutrition	1
			Ranavirus-associated disease of amphibians	4
			Trauma: Predation	3
			Trauma/fracture	2
			Visceral parasitism	2
			Diagnosis not listed - systemic disease	1
	Newt	Palmate newt	*Batrachochytridium dendrobatidis* (Bd) infection	1
	Toad	Common toad	Adverse environment	1
Reptile	Lizard	Slow worm	Trauma: Predation	1
	Snake	Grass snake	Trauma/fracture	1
Total number of diagnoses				**15**

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.

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