Great Britain Wildlife Disease Surveillance Partnership quarterly report

Disease surveillance and emerging threats

Volume 40: Quarters 3 and 4 – July to December 2023

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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: Wildlife: GB disease surveillance and emerging threats reports - GOV.UK (www.gov.uk)

A full explanation of how data is analysed is provided in the annexe 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 3 and 4 of 2023. The wild bird risk level across Great Britain remained high from July to October 2023. HPAI positive findings in wild birds were widespread across Great Britain particularly at coastal locations in Quarter 3, with mass die-offs involving a wide range of seabird species, including guillemots and kittiwakes. The wild bird risk level was reduced to medium from November 2023 onwards, as confirmed positive cases fell during Quarter 4.

The Met Office reported that maximum temperatures for summer 2023 overall were well above average, particularly across the western half of Scotland. Although July and August mainly comprised unsettled weather. For many areas this was a rather wet summer overall, particularly across Northern Ireland and northern England with more than 150% rainfall in some locations. Autumn 2023 was warmer and wetter than average. Four named storms affected the UK during the autumn from late September to mid-November: Agnes, Babet, Ciarán and Debi. These contributed to exceptionally wet and, at times, stormy weather. Temperatures for autumn overall were above average except for northern Scotland, with the highest anomalies, exceeding +1.5°C, across southern England.

Notifiable diseases

Great Britain AI Wild Bird Surveillance (AIWBS)

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 335 577).
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 Guidance on removing and disposing of dead wild birds.
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)

Throughout the third and fourth quarters of 2023, WWT continued to carry out passive surveillance of avian influenza across the reserves. Between July and December, 83 dead wild birds were found across eight WWT sites located in Gloucestershire, West Sussex, Greater London, Tyne and Wear, Lancashire, Norfolk, Dumfriesshire, and Carmarthenshire. Of the birds found, 81 were sampled for avian influenza virus, with 2 carcases being in an unsuitable condition to swab. Eighteen priority target species were sampled. These included species of swan, geese, ducks, gulls, waders, and rails. In addition, samples were also obtained from 6 non-priority species: one Eurasian crane (*Grus grus*), one Mediterranean gull (*Larus melanocephalus*), one rook (*Corvus frugilegus*), one Eurasian curlew (*Numenius arquata)*, one barn owl (*Tyto alba*) and one mandarin duck (*Aix galericulata*).

Highly pathogenic avian influenza (HPAIV H5N1) was confirmed by PCR in 7 dead wild birds, collected at three 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 H5N1 submitted cases in wild birds at different surveillance sites, detected between July and December 2023

Site location	Total HPAI positive	Species
West Sussex	3	Mediterranean gull x 1 Mallard x 1 Canada goose x 1
Gloucestershire	2	Greylag goose x 2
Norfolk	2	Whooper swan x 2
Total	**7**	

From March to August, major HPAIV outbreaks were confirmed at 3 sites within a population through sample swabbing. Consequently, the number of submissions does not accurately reflect the losses in breeding seabird colonies.

The following numbers include the count of dead birds collected as part of field clearance during wetland management work, aimed at minimising the potential spread into other breeding waterfowl species. However, it is important to note that these efforts were not necessarily to prevent further spread within an already infected population.

Despite sharing the same water masses and land spaces for nesting with other bird species such as Eurasian cranes (*Grus grus*), oystercatchers (*Haematopus ostralegus*), avocets (*Recurvirostra avosetta*), and mallards, these outbreaks remained confined within the affected *Laridae* colonies. There were no reports of direct spread and detected mortality to other family groups.

- **Martin Mere** (Lancashire) – 330 black-headed gulls (*Chroicocephalus ridibundus),* 6 common terns (*Sterna hirundo*)
- **Slimbridge** (Gloucestershire) – 145 black-headed gulls
- **Washington** (Tyne and Wear) – 71 black-headed gulls, 222 common terns

The field collections were scheduled to ensure adequate PPE available, experienced staff on-site, allocated freezer space and collection for incineration following APHA guidance protocols.

Rosa Lopez, Veterinary Officer (Conservation), Wildfowl and 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 were 6 cases of *Salmonella* species detected in wildlife in Great Britain for Quarters 3 and 4 in 2023.

Two *Salmonella* isolates (*S*. Enteritidis PT11) were reported in 2 European hedgehogs (*Erinaceus europaeus*). Unfortunately, additional information regarding clinical findings or pathology are unavailable. *S*. Enteritidis PT11 is reported to be the most common *Salmonella* spp. isolated from hedgehogs and is common and widespread in hedgehogs in England (Keymer and others, 1991). Robinson and Routh (1999) suggest that *S*. Enteritidis PT11 appears to be endemic in hedgehogs.

Two European badgers (*Meles meles*) submitted to the Starcross Veterinary Investigation Centre in Autumn 2023 had a variety of *Salmonella* serovars isolated: Agama, Anatum, Berta (multiple serovars present in the first badger) and Newport (single serovar present in the second badger). No further information on the clinical findings or pathology are available. A wide range of *Salmonella* spp. are known to be commonly present in badgers in the UK (Wray et al., 1977; Euden, 1990; Wilson and others, 2003, O'Hagan and others, 2021). The reported range of serovars is broad, with S. Agama being the most commonly isolated serovar (Euden, 1990; O'Hagan and others, 2021).

The *Salmonella* isolate (*S.* Typhimurium RDNC) was detected in a female Red squirrel (*Sciurus vulgaris*) submitted to the Penrith Veterinary Investigation Centre that died having an extensive mandibular abscess. This squirrel also had pleuritis and pneumonia, with S. Typhimurium cultured from the lung tissue, which is an unusual bacteria to isolate from a squirrel. A heavy growth of *S.* Typhimurium RDNC was also the confirmed cause of septicaemia, enteritis and death in an immature Herring gull (*Larus argentatus*) submitted to the Shrewsbury Veterinary Investigation Centre. A wide range of *Salmonella* serotypes are carried by Herring gulls that are also found in humans (including *S.* Typhimurium), and it is likely that the gulls ingest these serotypes when feeding at untreated sewage outfalls on the coast (Butterfield and others, 1983). It is also known that higher proportions of immature Herring gulls feed on the coast, as compared to older birds (Butterfield and others, 1983), which may explain the isolation of *S.* Typhimurium from the reported immature bird.

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Report from Wildlife Zoonoses and Vector Borne Disease Research Group

Passive surveillance for lyssaviruses in UK bats

Six hundred and forty-two bats were tested for lyssaviruses under passive surveillance during this period. A total of 10 serotine (*Eptesicus serotinus*) tested positive for EBLV-1, 7 of which were from Dorset, 2 from Somerset and one from Wiltshire. Twenty-four exotic zoo bats were received for testing, all were negative for lyssaviruses. No suspect bat cases were received during this period.

Rabies diagnosis

Four dogs were tested for lyssaviruses (2 suspect cases and 2 deaths in quarantine) all 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 365 birds were submitted via APHA, SRUC and IoZ and were tested by RT-PCR for WNV with negative results.

Tissues from 131 birds were also tested by RT-PCR for Usutu virus and 4 were positive (3 blackbird, one feral pigeon).

West Nile virus surveillance in Equids

Forty-one serum samples were received for WNV serology testing, one as a test to exclude and 40 for export, 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

Bacterial infection causing the death of a juvenile European hedgehog (*Erinaceus europaeus*)

A juvenile European hedgehog (*Erinaceus europaeus*) was seen out during the day and was admitted to the Corsham Area Hedgehog Rescue Centre, but it died before any treatment was given. The carcass was frozen and only submitted for examination in July 2023. This was a juvenile male in good to fair bodily condition weighing 520g. A large abscess was seen on the right side towards the base of the neck (Figure 1 A). The mesenteric lymph node chain was enlarged with a whitish discolouration. Large numbers of *Crenosoma* larvae were seen in lung lavage samples (Figure 1 B), which also revealed a few *Eucleus* eggs. A few nematodes were seen in intestinal samples further identified as *Capillaria* spp. as the eggs from them had 2 distinctive polar caps (Figures 2 A and B). No *Salmonella* spp. were isolated from the abscess or systemic sites. Bacteriology was compromised by post mortem contamination. However, histopathology of mesenteric lymph node sections, large foci of Gram positive cocci were seen in areas of necrosis indicating ante mortem infection. The neck abscess might suggest a penetrating bite wound as the initial source of infection. There was evidence of verminous pneumonia and intestinal parasitism, but the hog was still in good condition. This would suggest that bacterial infection as a sequel to a probable bite wound was the likely cause of death.

A  B 

Figure 1: A. Gross pathology of the juvenile hedgehog showing the tissues of the neck cut open to expose the large, white coloured abscess towards the base of the neck. B. Microscopic view to show a large numbers of tightly coiled *Crenosoma* larvae from lung lavage samples.

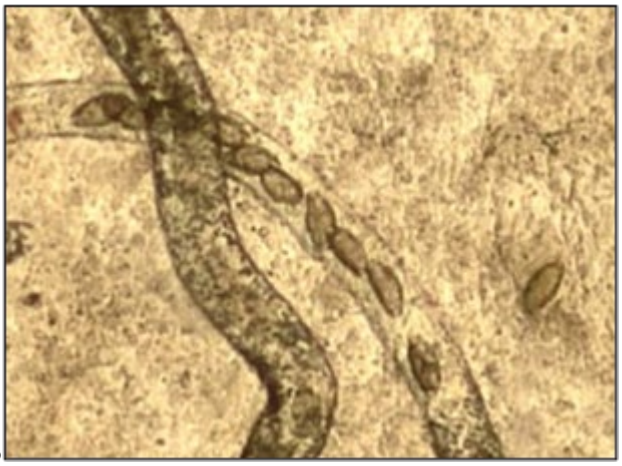
A  B 

Figure 2: Microscopic view of intestinal samples from the hedgehog. A. Cylindrical shaped nematodes of *Capillaria* spp. were present, identified by having two distinctive polar caps, and B. the further magnified view to show the internal appearance of these nematodes.

Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), Jinny Matters, Corsham Area Hedgehog Rescue

Rabbit Haemorrhagic Disease caused acute death of a Brown hare (*Lepus europaeus*) in Wiltshire

A fresh dead brown hare carcass was found dead on land near Great Somerford, Wiltshire at the beginning of September 2023. No other dead hares were seen in the immediate area. It was frozen and submitted for necropsy. This was an adult jack hare in good bodily

condition weighing 2.68 Kg. There were a few gross changes possibly due to feed/thaw artefact. The stomach was well distended with normal forage (Figure 3). The whitish discolouration was due to ice crystals. The rest of the intestinal tract was unremarkable, and the faeces were pelleted. This would indicate an acute death. Blood was present around the nose and the mucosa of the lower trachea was congested (Figure 4).

Figure 3: Gross pathology of the hare's abdomen with the stomach cut open to show the stomach distended with normal forage.

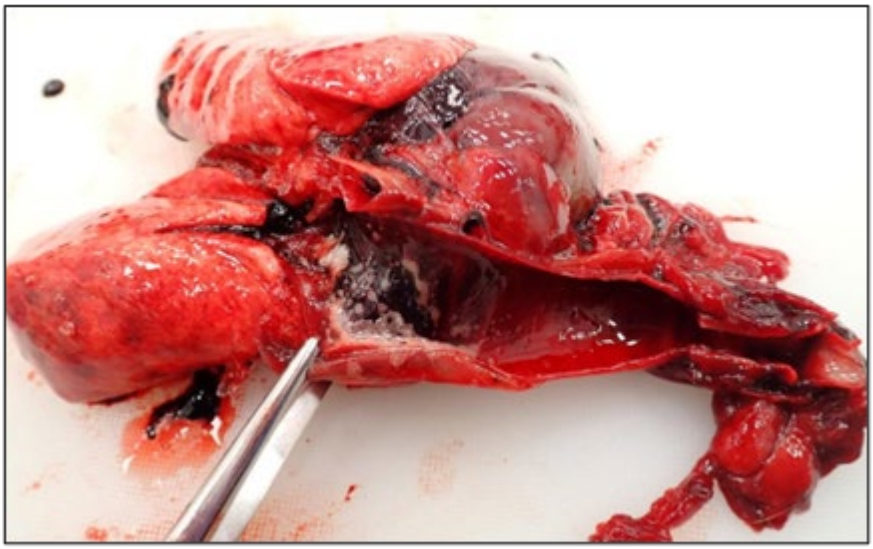


Figure 4: Gross pathology of the hare showing blood congestion present in the lower tracheal mucosa.

There were no other significant findings in the other body systems examined. Systemic bacteriology cultures remained sterile even after prolonged incubation. Calicivirus was identified in a liver sample by electron microscopy. Rabbit Haemorrhagic Disease Virus RNA was detected on PCR testing of liver. Further sequence analysis indicated the presence of RHDV variant 2 RNA. This confirms RHDV-2 as the cause of acute death of this hare. A separate investigation was carried out by APHA Starcross VIC into an increase in wild rabbit mortality on a farm in Devon. Two juvenile rabbits without external signs of injury were found to have oedematous lungs with diffuse ecchymoses over the lung surface on post mortem examination. One of the rabbits also had 2-3mm purulent foci

scattered throughout the liver. Histopathological examination and PCR testing confirmed a diagnosis of hepatic coccidiosis and RHDV variant 2. This confirms that RHDV-2 is still circulating in rabbit and hares in the West Country.

Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), University of Bristol Veterinary School, Diana Bell, University of East Anglia, Dave Kilbey, Natural Apptitude.

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

Uraemia, verminous pneumonia and possible spinal damage in an adult vixen

A Bristol Red fox (*Vulpes vulpes*) was admitted to a local partner veterinary school. It was unable to use its back legs and was euthanased. This was an emaciated vixen weighing 3.8Kg. There was loss of fur on the tail, with bare patches over the pelvis. Many fleas were seen and some ticks. Many first instar fly larvae were present on the right inguinal area. An area on the right foreleg had been shaved. Ulcers and mucosal necrosis as indicated by swollen pale mucosa were seen on the tongue and oral mucosa (Figure 5). The gum line was also reddened.

The liver was very friable with post mortem discolouration of the caudal edges. Vessels in the mesentery were black lined. A little light khaki mucus was in the stomach and a single *Toxocara* ascarid. The contents of the rest of the intestinal tract were mucoid.

The caudal diaphragmatic lung lobes were discoloured and consolidated. There was splenic enlargement and the inguinal lymph nodes were enlarged and black. The bladder was empty and the kidneys were pale. No obvious spinal injury was palpated but no radiographs were taken. The vertebral column was sectioned to reveal the spinal cord but no gross defects were identified and there was no evidence of a spinal abscess. Routine bacteriology was unrewarding, but the aqueous humour urea was 54.5 mmol/l. Histology revealed a severe extensive verminous pneumonia (Figure 6). A severe chronic interstitial nephritis was seen in kidney sections. Several problems were found but there was no evidence of septicaemia. This vixen was uraemic with the mouth lesions suggesting uraemic stomatitis. The kidney had chronic severe interstitial nephritis. The verminous pneumonia was more severe than suspected on gross examination. The dark inguinal lymph nodes and mesenteric vessels may be due to haemosiderin caused by trauma possible suggesting previous injury. There could have been traumatic spinal/nerve injury that was not determined during this examination.

Figure 5: Gross pathology external view of the adult vixen's muzzle with lower lip everted to show multiple ulcers present on the tongue and oral mucosa adjacent to the teeth.

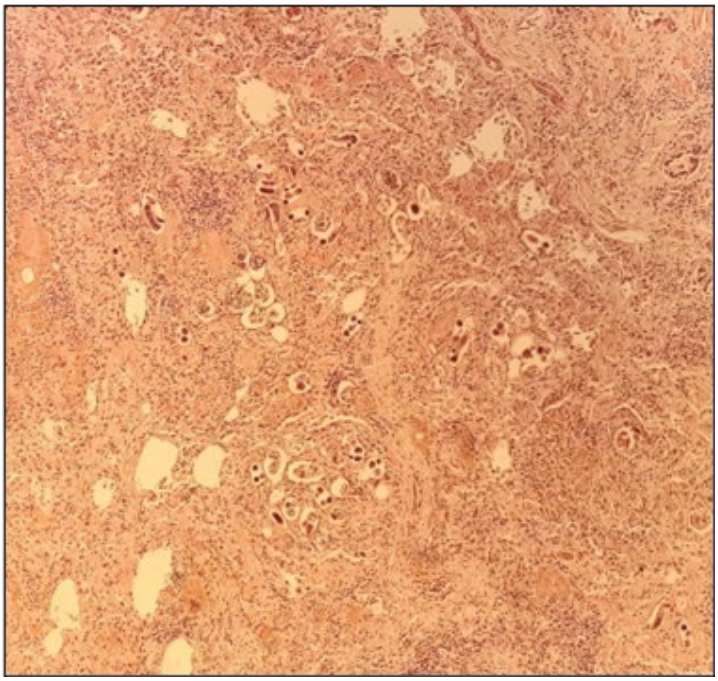


Figure 6: Microscopic view to show histological examination of the vixen's lung tissue with numerous coil shaped nematodes present.

Pyothorax and uraemia of uncertain aetiopathogenesis in adult dog fox

On 16 August 2003, a collapsed Bristol fox with agonal breathing was taken to a local partner vet school and died soon after arrival. Post mortem examination revealed that this adult dog fox was in poor body condition, weighing 4.8 Kg, with some reddening and ulceration of the oral mucosa (Figure 7).

Figure 7: Gross pathology external view of the adult dog fox's muzzle with the upper and lower lips everted to show the red and ulcerated gum mucosa in the mouth.

Scant subcutaneous fat was present. The abdominal cavity was unremarkable. The stomach was empty and there were scant contents in the rest of the intestinal tract. The thoracic cavity had a large volume of pale blood coloured pus of very fluid consistency (Figure 8). There was extensive pleurisy involving also the pericardial sac but there was no pericarditis. The lung lobes were considerably compressed by this fluid and pleurisy. A mixed bacterial flora containing a heavy growth of haemolytic *Escherichia coli* was isolated from a pleural fluid swab and a heavy pure growth of haemolytic *E. coli* from the lung.

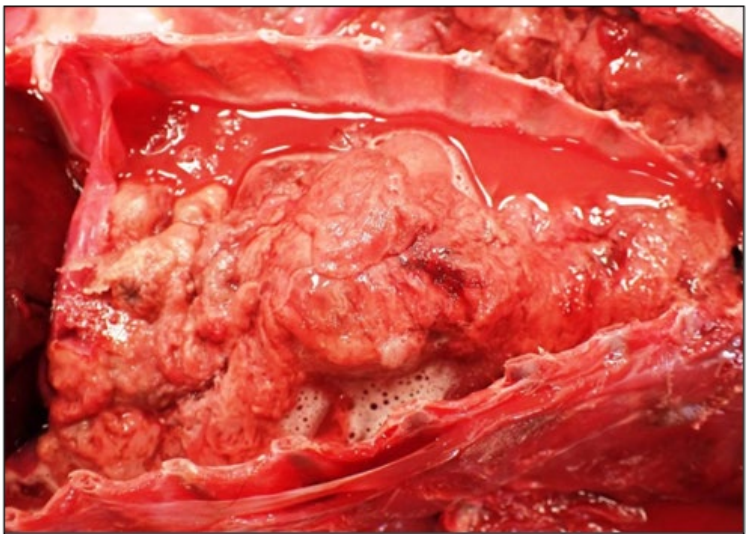


Figure 8: Gross pathology of the opened thorax showing a large volume of pale blood coloured pus in the thoracic cavity causing pyothorax.

The kidney cortices were markedly pale (Figure 9). Aqueous Humour urea was 37.5 mmol/l. with uraemia possibly causing uraemic stomatitis. Histology revealed limited intertubular inflammatory foci and possible tubular necrosis, but this may be partly a freeze/thaw artefact. The severe pyothorax was associated with heavy growths of haemolytic *E. coli.* However,

the aetiopathogenesis of the pyothorax is not obvious but may be due to a bite wound, parasitic migration or some other aetiology or even possibly the uraemic stomatitis.

Figure 9: Gross pathology of a longitudinal cut section of one kidney to demonstrate the pale outer layer of the cortex.

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

Unusual traumatic death of an adult Common pipstrelle bat (*Pipistrellus pipistrellus)*

A dead Common pipstrelle bat (*Pipistrellus pipistrellus*) was found impacted on the corner of a cable utility box on the corner of a road, in Warlingham, Surrey (Figure 10 A). It was collected about 24 hours after death. The right wing was wedged hard into a structural gap. The street lighting at the location seemed adequate for a normally sighted bat. The bat was then kept chilled and sent next day delivery to WNDS and was examined soon after delivery.

The incomplete carcass of a female adult Common Pipstrelle bat was received for post mortem. A few small first instar fly larvae were seen, which would suggest that the bat had died during the previous 20 hours before collection (Figure 10 B). It was then chilled delaying further development of the larvae.

The left side of the skull was cracked open (Figure 11). There were 2 breaks in the lower third of the left forearm, which were open but may have occurred during post mortem, and there was also a single break towards the top of the right forearm (Figure 10 B). An extensive wound through the skin and into the underlying viscera was present in the ventral thorax and on the right side of abdominal cavity. The remaining liver was pale and friable (Figure 12). The diaphragm was torn and there was ventral rib damage. It was noted that the left horn of the uterus was still enlarged suggesting that the bat had recently

had a single pup (Figure 12). There was no subcutaneous haemorrhage or muscle bruising over the back of this bat, nor any other significant findings.

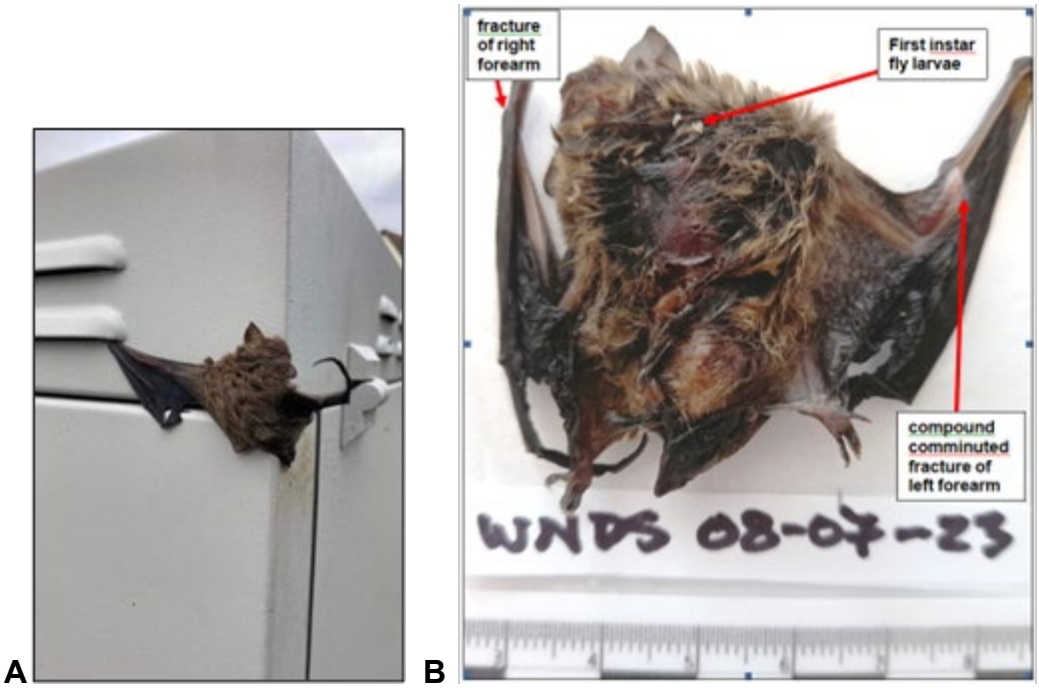


Figure 10: A. The dead bat with its body impacted on the corner of a cable utility box in an urban area. B. Gross pathology of the bat to show several abnormalities marked by red arrows that include: the first instar fly larvae present on the neck fur, the presence of a compound, comminuted fracture of the left forearm and a single fracture of the right forearm.

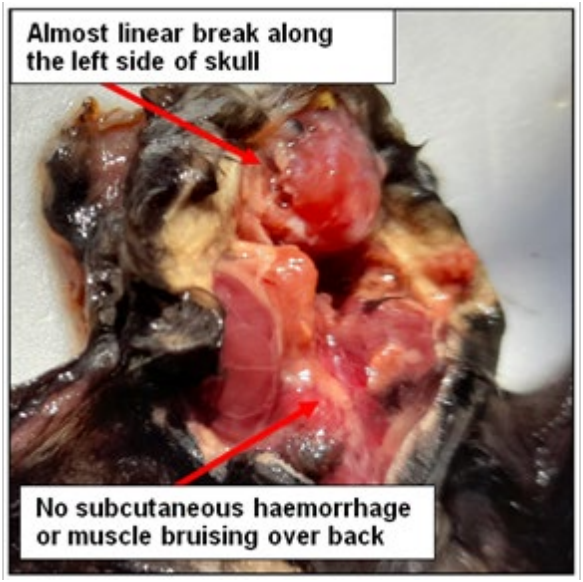


Figure 11: Gross pathology of the bat's body and head with the skin removed to show a linear fracture to the skull marked by a red arrow, but a lack of abnormalities over the back.

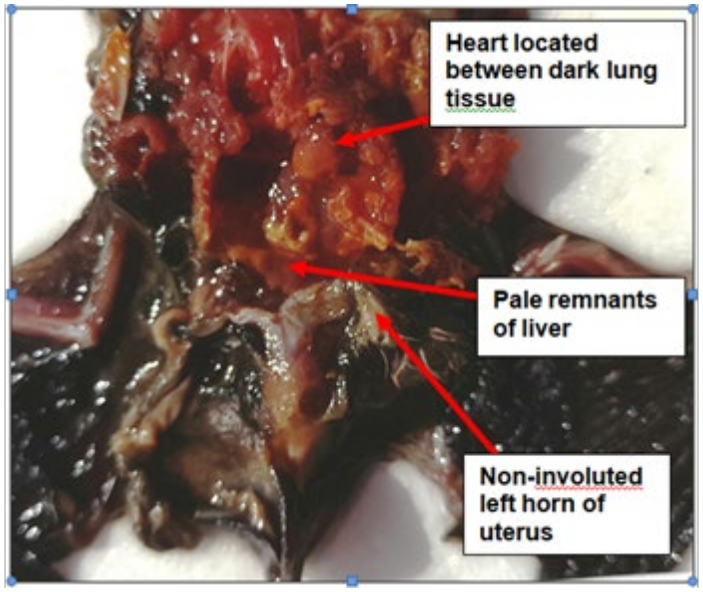


Figure 12: Gross pathology showing the thoracic and abdominal cavities opened up with red arrows pointing to the heart located between dark lung tissue, pale remnants of the liver and an enlarged left horn of the uterus.

It also should be noted that the property owner adjacent to the box's location advised that the new, large cabinet was installed only 2 to 3 days prior to the bat being found. There are a range of explanations for the cause of this bat impacting the cable or utility box resulting in its death for example:

- acoustic mirror
- ultrasound emitted from the cable or utility box
- trauma - hit by passing car
- trauma - caught on box and hit by a person
- CNS disease
- "pilot error"
- other

For the acoustic mirror aetiology, Greif and others (2017) showed in an experiment with greater mouse-eared bats (*Myotis myotis)*, in a tunnel that bats repeatedly collide with smooth, vertical surfaces. Nineteen out of 21 individuals collided with a vertical plate at least once (on average 22.8% of passes). It is suggested that it is attributable to the acoustic mirror properties of smooth surfaces, where echolocation calls are reflected away from the bat and no echoes return from the position of the plate while the bat is still outside the plate zone. Stefan Greif and Lisa Worledge (personal communications) both advised that this cabinet would not have acted as an acoustic mirror.

Ultrasound emission readings were taken using an Echo Meter Touch Pro at 3 feet from the front panel of the cabinet. Ultrasonic pulses were recorded but they were consistent

with sounds emitted from passing cars. No ultrasonic interference from the cabinet was involved with this case.

As regards to the cause of death being trauma, the direction of blood spatter would rule out being hit by a car onto the cabinet from the right-hand side. The impact point from ground level was 161cm (5ft 3ins). However, if this bat had been hit by a person on the pavement there would have been evidence of traumatic damage to the back of this bat, which was not seen during post mortem examination. Consequently, external trauma by car or person was ruled out.

For CNS disease, the histopathological examination of fragment brain sections revealed no obvious pathology. No virology or electron microscope were carried out but some fresh brain for was retained for possible virology or electron microscopy, to rule out European bat lyssavirus.

Gut histopathology revealed good amount of insect prey debris, which revealed that this bat had been actively feeding. This finding would not indicate any ante mortem clinical problems, as this bat had been catching prey. It was likely that the bat had recently given birth. A paper by Taub and others (2023) researching Kuhl's pipistrelles (*Pipistrellus kuhlii*) found that pregnant bats emit longer echolocation signals at around a 15% lower rate while flying slower (probably due to the weight of a pup in the uterus). Therefore, an immediate post partum bat may fly faster, but still use a lower frequency of echolocation signals.

"Pilot error" has been noted in birds especially starlings (Barlow and Sparkes, 2014). It is suggested that that when bats are flying along their long-standing flight paths, they sometimes reduce echolocation. This bat might be unaware of a newly installed cabinet near the flight path and there may have also been further reduced echolocation. Therefore, if this bat was swooping down on prey, it might not have realised the presence of the cabinet. Bats' bodies are fragile compared other mammals. The force of the impact was sufficient to burst the abdominal wall and caused instant death of the bat. The impact forced the right wing into the gap between the two sections of cabinet.

Thus, a combination of factors leading to "pilot error" was the likely cause of death.

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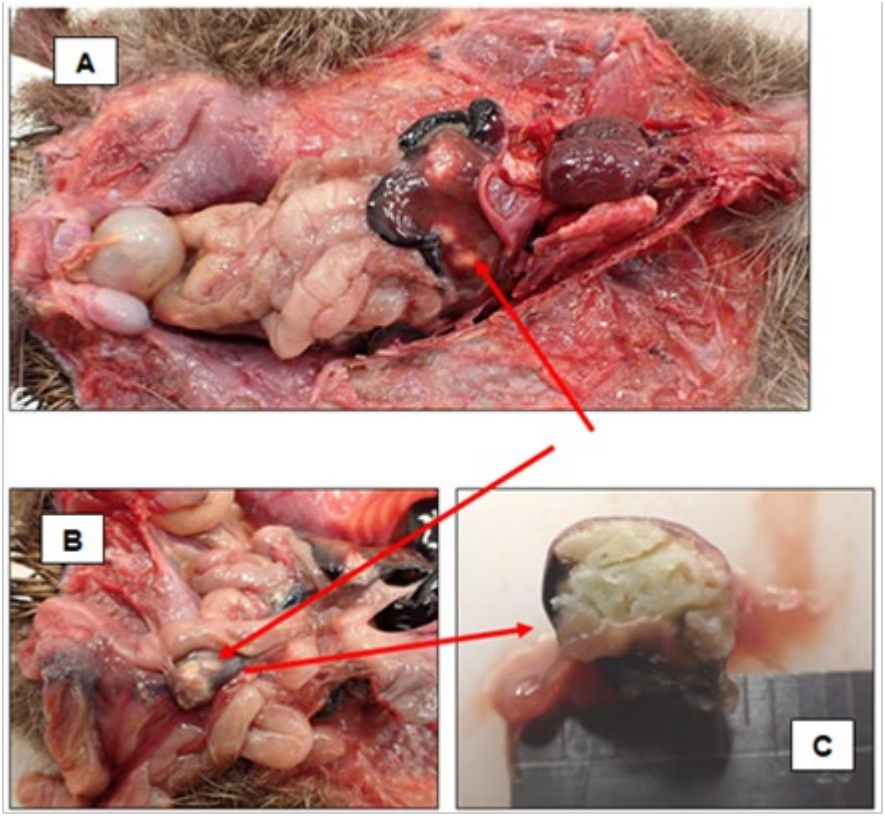
Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), University of Bristol Veterinary School, Steve Budd, London Bat Group, Philip Briggs, Bat Conservation Trust (BCT).

Chronic bacterial infections and intestinal fluke infestation causing death of a European hedgehog (*Erinaceus europaeus*)

A juvenile male European hedgehog (*Erinaceus europaeus*) was seen out during several days in a garden in Wiltshire before being found dehydrated and recumbent. He was admitted to a rescue centre in early June 2023 but died despite initial fluid treatment. He was in fair body condition (weighing 440g) at time of death.

Large cream-coloured abscesses were present in the liver (Figure 13 A) and mesenteric lymph nodes (Figures 13 B and C). These contained thick cream coloured inspissated pus. The lungs were not consolidated and only a few *Crenosoma* larvae were seen in a lung lavage sample. There was general enlargement of lymph nodes, and the spleen was enlarged. The stomach was empty and there were scant contents in the rest of the intestinal tract, but many intestinal fluke (*Brachylaemus erinacei)* were seen in the upper part of the small intestine (Figure 14).



Figures 13: A. Gross pathology of hedgehog thorax and abdomen opened up to show the liver with large cream coloured abscesses present (marked by a red arrow). B. A view of the abdomen to show the mesenteric lymph node that contains a large abscess (indicated by a

red arrow). C. The mesenteric lymph node has been removed, cut open and placed next to a ruler to demonstrate its size.

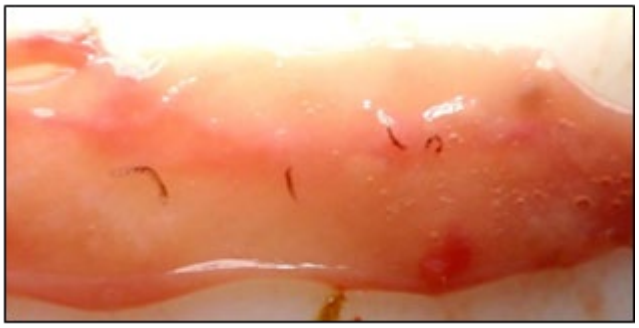


Figure 14: Gross pathology showing the upper part of the small intestine containing many curved intestinal fluke (*Brachylaemus erinacei)* coloured red.

There were no other significant findings in the rest of the systems examined. Bacterial cultures confirmed the presence of *Staphylococcus aureus* in heart blood swab and Listeria monocytogenes from the liver.

The abscesses seen are very typical of *S. aureus* infection in many species. A recent study from Sweden (Rasmussen and others, 2019) showed that the European hedgehogs may constitute a reservoir for methicillin-resistant *Staphylococcus aureus* (MRSA). The concomitant isolation of *Listeria monocytogenes* from the liver might suggest that dual bacterial septicaemia is present. Hydeskov and others (2019) examined 266 free-living European hedgehogs in GB between 2011-2017 and found five infected with *L. monocytogenes.* This bacterium is common in the environment and is zoonotic. but people usually become infected by eating contaminated food.

Chronic *Staphylococcus aureus* infection and *Listeria monocytogenes* infection together with an intestinal fluke (*Brachylaemus erinacei*) infestation combined to cause disease and death of this hedgehog.

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Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), Jinny Matters, Corsham Area Hedgehog Rescue

Severe verminous pneumonia in a young European hedgehog (*Erinaceus europaeus*)

A young hedgehog (*Erinaceus europaeus*) from Wiltshire was found out during the day and was lethargic. He was extremely dehydrated, emaciated and unable to curl and was admitted to a rescue centre on 27 June 2023 but died after 8 hours. He was very thin and weighed 400g. Large numbers of ticks at various stages were seen on the right side of the head and a few others scattered over the rest of the body. There was scant subcutaneous fat and excess fluid was present in the thoracic cavity and a little in the abdominal cavity. This may be partly due to a post mortem artefact after freezing but may be due to hypoproteinaemia. There was extensive consolidation of the lungs (Figure 15) and many *Eucoleus aerophilus* were seen in a lung lavage together with occasional *Crenosoma* larvae (Figure 16).

Figure 15: Gross pathology of the hedgehog lungs removed from the thorax that show extensive consolidation.

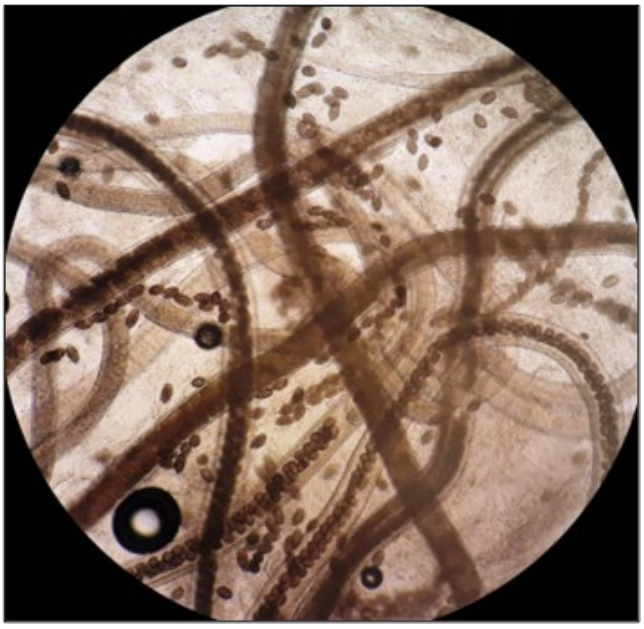

Figure 16: Microscopic view on examination of a lung lavage sample showing two different types of parasites present, which include many *Eucoleus aerophilus* and occasional *Crenosoma* larvae.

The stomach was empty and there were scant contents in the rest of the intestinal tract, but large numbers of *Eucoleus/Capillaria*-type eggs were seen in smears from the small intestine. The remnant rectal faeces were firm. There were no other significant findings in the other systems examined. Lung histopathology was carried out and the findings are shown (Figure 17).

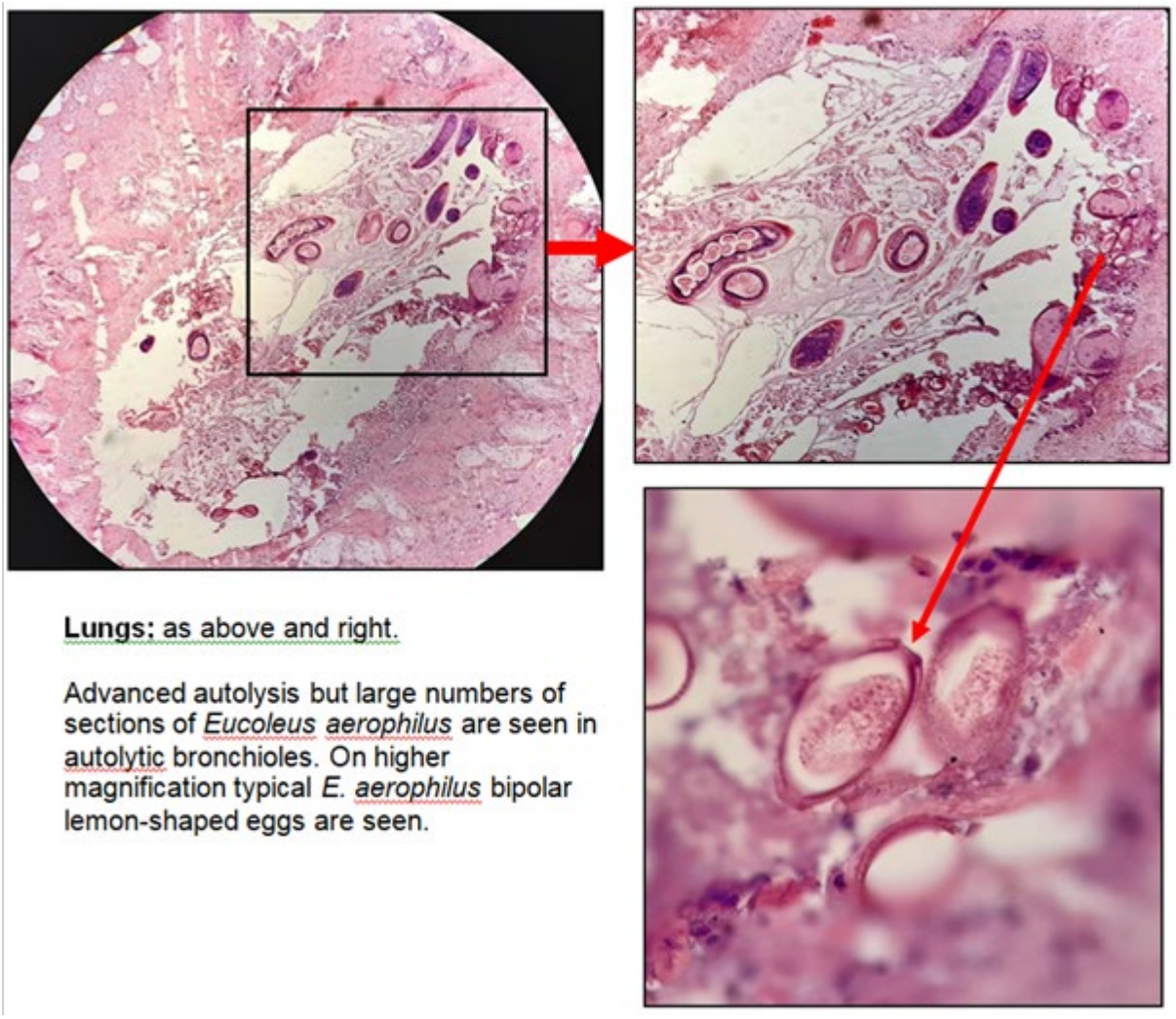

Figure 17: Microscopic views for the histopathology of hedgehog lung samples that demonstrate large numbers of *Eucoleus aerophilus* present in the bronchioles with a magnified view of the bipolar, lemon-shaped eggs indicated by a red arrow.

This is a typical case of verminous pneumonia in a young hedgehog.

Alex Barlow, Wildlife Network for Disease Surveillance (WNDS), Jinny Matters, Corsham Area Hedgehog Rescue

Pituitary abscess syndrome in a European fallow deer (*Dama dama*)

An adult Fallow deer (*Dama dama*) was euthanased due to clinical signs of lethargy, poor awareness, sunken eyes, fly strike at both antler bases and black tarry material around the perineum and tail (Figure 18). The deer was submitted to Starcross VIC and post mortem examination revealed a large, encapsulated abscess present in the pituitary gland (Figure 19). Bacterial culture isolated *Trueperella pyogenes* and *Fusobacterium necrophorum* from the abscess, common pyogenic bacteria found in ruminants and cervids. The subsequent diagnosis was pituitary abscess syndrome. Infection of the pituitary gland may have occurred via haematogenous or lymphatic spread from a foci of infection elsewhere in the body. Haematogenous spread of infection from the fly struck areas were the likely source of infection in this deer. Full details of the case are provided in an article for the Veterinary Record, October 2023. This case demonstrates the importance of fostering relationships between wild deer management bodies, particularly Forestry England and Natural Resources, Wales, and the APHA wildlife disease surveillance network for our reporting.

Figure 18: The Fallow deer that was found lying on the ground in a weak condition and euthanised.

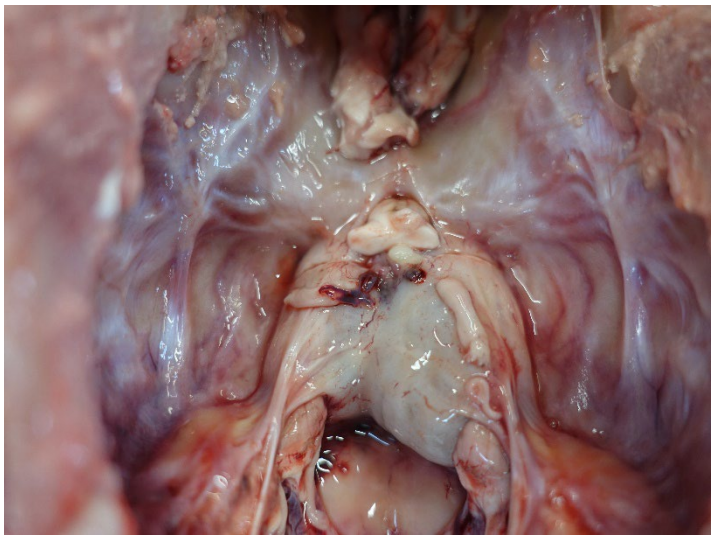

Figure 19: Gross pathology of deer tissues showing the cream coloured pituitary abscess.

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Liz Nabb, APHA Starcross

Wild mammal reports from IoZ

Morbillivirus encephalitis in a Fin whale (*Balaenoptera physalus*)

A 16.5m juvenile female fin whale (*Balaenoptera physalus*) was reported dead, stranded at Fistral Beach, Newquay, Cornwall in November 2023 (Figure 20). On post-mortem examination by James Barnett and the Cornwall Marine Pathology Team, part of the Defra-funded Cetacean Strandings Investigation Programme (CSIP) consortium, the whale was found to be in poor nutritional condition and with pathological evidence consistent with live stranding. Minor ectoparasite infestation (likely the copepod, *Penella balaenoptera*) was also noted. Most significantly, severe congestion and haemorrhage of the meninges was observed on removal of the brain.

Histopathological examination showed a non-suppurative encephalitis, which had likely driven this whale to live strand. Subsequent PCR testing of archived brain samples by the Moredun Institute detected dolphin morbillivirus, confirming the encephalitis to be caused by a cetacean morbillivirus (CeMV) infection.

A B

Figure 20: The photograph on the left shows the stranded juvenile fin whale (*Balaenoptera physalus*) found lying on the shore at Fistral Beach, Newquay. The photograph on the right shows the aerial view of the subsequent whale post-mortem examination conducted by James Barnett and the Cornwall Marine Pathology Team members, as some internal organs are examined on the beach.

CeMV infection has been previously reported in other fin whales stranded in the wider region (Dagleish and others, 2021; Mazzariol, S and others, 2012; Jauniaux, T. and others, 2000). In recent years, fin whales have been reported stranded around the English and Welsh coast (n=13, 2019 to 2023, CSIP database), however this increased to 7 fin whales in 2023, representing the highest number reported since the inception of the CSIP in 1990. This increase may at least in part be driven by potential fin whale population increases, sequential to the moratorium on commercial whaling introduced in 1986.

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Institute of Zoology (IoZ)

Wild mammal reports from Scotland

Hydrocephalus in a Eurasian otter (*Lutra lutra*)

External hydrocephalus was diagnosed in a male Eurasian otter (*Lutra lutra*) of around 3 months of age which had been found a month previously alone on a riverbank in Aberdeenshire. It was noted to be circling and behaving abnormally (racing around erratically, or sometimes seemingly unable to find food and water placed in front of it), and antimicrobial treatment was instituted. Three weeks later the otter was no longer circling and was gaining weight, so antimicrobial treatment was stopped, at which point the animal deteriorated. Further treatment was ineffective, and euthanasia was carried out. At necropsy, opening the skull revealed more than 15ml of blood-stained fluid around a small, slightly misshapen brain, with a diagnosis of hydrocephalus given (Figure 21). The brain was very soft, and was fixed, but no further work was requested by the submitting organisation.

Figure 21: Gross pathology showing transverse sectioned otter skull to reveal the small misshapen brain surrounded by some fluid. Image credit: Fiona Howie, BVMS, MVM, MRCVS, FRCPath.

Pneumonia in a Roe deer *(Capreolus capreolus*)

Pneumonia due to a member of the *Pasteurellaceae* was diagnosed in a 3 to 4 month-old roe deer fawn (*Capreolus capreolus*) which was submitted for necropsy in September after 9 dead roe deer had been found in and around a small highland village over a term of around four months, in gardens, on footpaths and on a moor. At necropsy, the animal showed scarce fat reserves, a heavy tick burden and congestion and consolidation of the cranial lung lobes. Histopathology revealed foci of fibrinosuppurative bronchopneumonia consistent with a *Pasteurellaceae* aetiology (*Mannheimia haemolytica*, *Pasteurella multocida*, *Bibersteinia trehalosi*). An underlying viral infection could not be excluded. Pasteurellosis and pneumonia in roe deer is not an uncommon diagnosis at necropsy (Pewsner and others, 2017; Žele Vengušt and others, 2021), but it was recommended that further submissions be made for investigation should the mortality cluster continue in the area.

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Caroline Robinson, SRUC Veterinary Services

Avian reports

Wild Bird reports from APHA DoWS

Aspergillosis in a Herring gull (*Larus argentatus*)

A Herring Gull (*Larus argentatus*) that tested negative for avian influenza and underwent post mortem examination was diagnosed with Aspergillosis. Gross findings were a thickened pericardial sac which was discoloured yellow (Figure 22 A and B). There were white fluffy plaques on the serosa of the distal trachea and numerous similar plaques were scattered throughout the airsacs, ranging from 2mm to 1cm in diameter. *Aspergillus fumigatus* was isolated on culture of the airsacs.

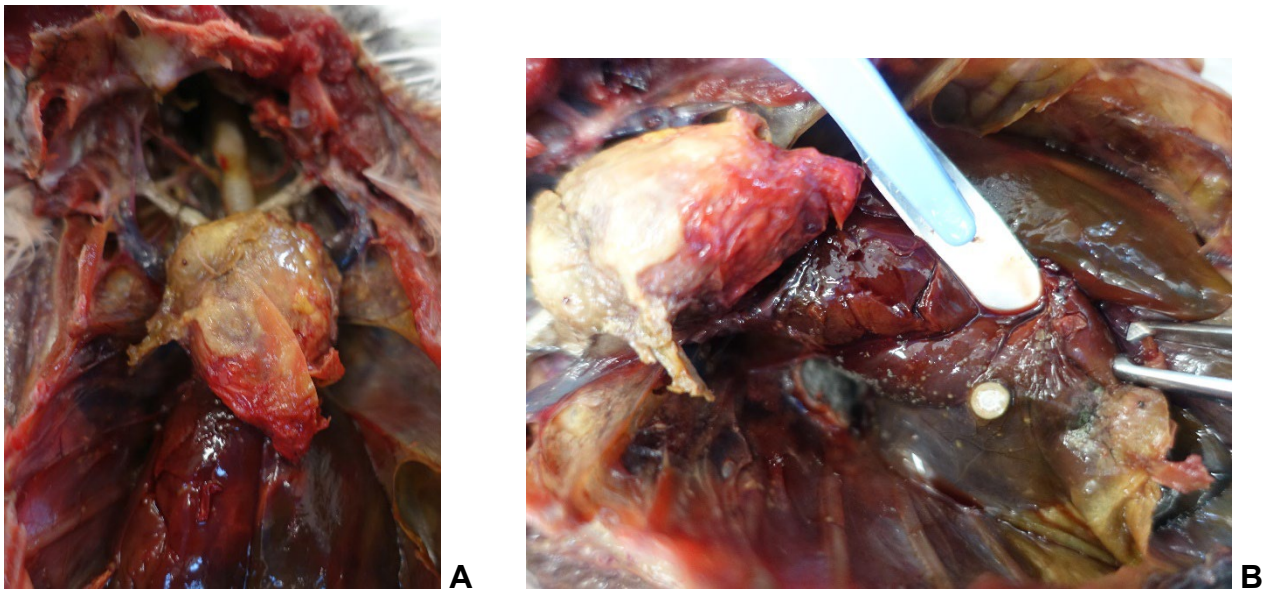

Figure 22: Gross pathology of the Herring gull thorax to demonstrate some abnormalities caused by the fungal disease of Aspergillosis. A. The thickened, yellow pericardial sac surrounding the heart is in the centre of the photo. B. The scalpel blade on the photo is placed next to white fungal plaques present in the airsac.

Liz Nabb, APHA Starcross

Myocarditis in a Common buzzard *(Buteo buteo)*

Gross post-mortem of a Common Buzzard *(Buteo buteo)* revealed an enlarged and flabby heart which had a thin right ventricular wall. The lungs were oedematous and there was frothy fluid containing several small blood clots in the thoracic cavity around the lungs (Figure 23). There was generalised congestion of the subcutaneous tissues of the neck and chest. The liver was enlarged. Cardiac disease occurs commonly in captive and wild birds of prey due to a variety of underlying causes (Oster and Pariaut, 2021).

Histopathological examination of fixed tissues revealed a severe myocarditis and evidence of a verminous pneumonia. Causes of myocarditis in birds of prey include HPAI H5 virus (Caliendo and others, 2022), which had been negated by PCR, and West Nile Virus (WNV) (Gamino and Hofle, 2013), which was dismissed because the bird was not received in the WNV vector season. In this case the initiating cause was unknown.

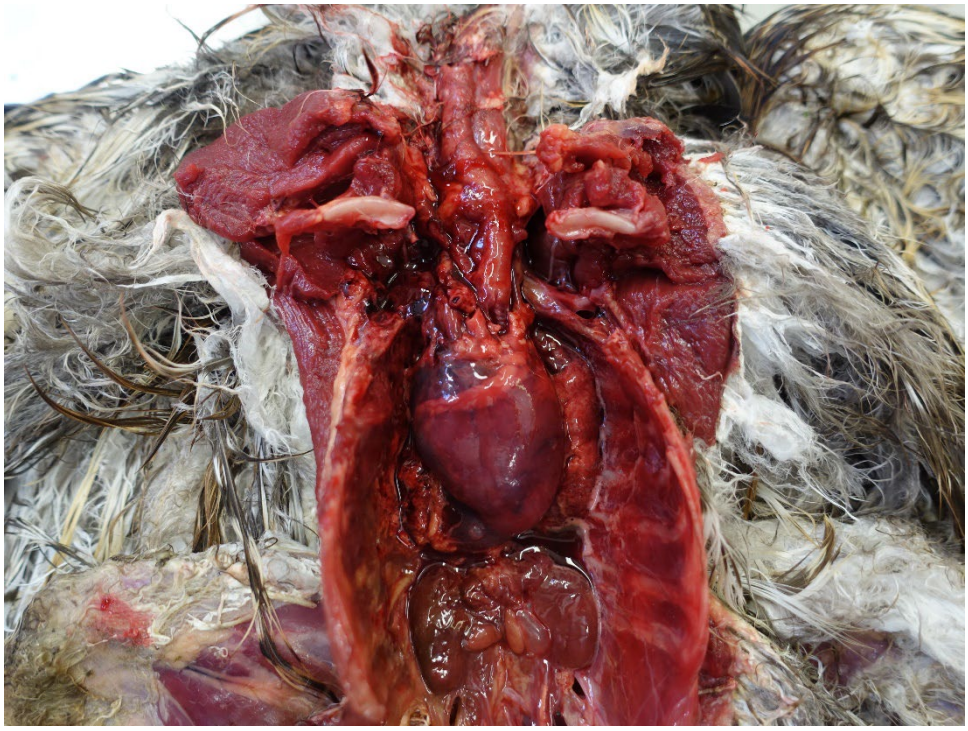

Figure 23: Gross pathology of the buzzard showing the opened thoracic cavity to reveal the abnormalities of an enlarged heart, frothy fluid and oedematous lungs.

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Liz Nabb, APHA Starcross

Wild Bird reports from the IoZ

Avian tuberculosis in a European robin (*Erithacus rubecula*)

In July 2023, a single adult female European robin (*Erithacus rubecula*) was observed in the West Midlands, England, with signs of lethargy and increased respiratory effort, and subsequently died. Upon post-mortem examination, the most significant finding was dark-red, firm lungs with multifocal, beige-yellow, nodular lesions throughout the organs (Figure 24). Similar lesions were also seen on the pericardium and the air sac walls. Upon histopathological examination, severe granulomatous and necrotising inflammation of multiple organs (lungs, liver, ovary, spleen, and pericardium) was observed, and a Ziehl-Neelsen stain of the liver showed a large number of acid-fast bacilli, consistent with *Mycobacterium avium* (Figure 25). PCR testing of the lung tissue conducted by the APHA was positive for *Mycobacterium avium*, the causative agent of avian tuberculosis.

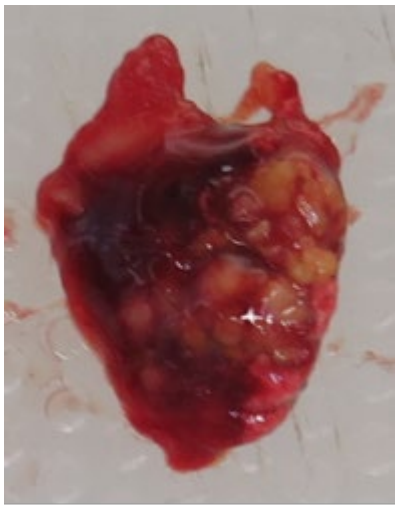

Figure 24: Gross pathology to show the dark red, firm, left lung of a European robin with multifocal yellow nodular lesions throughout the organ, consistent with a diagnosis of avian tuberculosis, also know as avian mycobacteriosis.

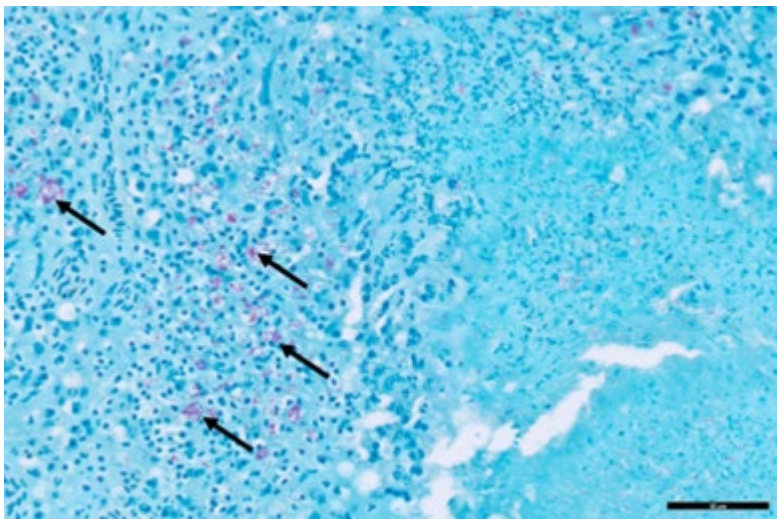

Figure 25: The microscopic view to show the Ziehl-Neelsen stain of the European robin liver that demonstrates numerous acid-fast bacilli (maked by black arrows), consistent with *Mycobacterium avium* infection (this view is taken at 40x magnification).

Avian tuberculosis is an infectious disease primarily caused by *Mycobacterium avium,* which predominantly affects birds, but may also occur in mammals (including humans) (Schmidt and others, 2022). The risk to humans, however, is considered low, and mostly concerns immunocompromised individuals (Kwaghe and others, 2015). Whilst *M. avium* may infect a wide range of bird species globally, susceptibility to avian tuberculosis varies and the disease is most commonly seen in the North Temperate Zone (Dhama and others, 2011). Transmission occurs mainly through ingestion of contaminated food or water, leading to granulomatous inflammation of affected organs (Kwaghe and others, 2015; Schmidt and others, 2022). Whilst avian tuberculosis is most typically observed in waterfowl, it remains a sporadic cause for morbidity and/or mortality in passerines (Gavier-Widén and others, 2012), with the disease having been confirmed in only 3 garden birds examined as part of the Garden Wildlife Health project previously: 2 adult woodpigeons (*Columba palumbus*) submitted from Kent, 2007, and London, 2014, and a single great tit (*Parus major*) from the Isle of Wight, 2019 (see Q3 2019).

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Institute of Zoology (IoZ)

Usutu virus infection in garden birds- update

Usutu virus (USUV) is a mosquito-borne flavivirus with birds as the primary hosts, most commonly affecting Passeriformes (perching birds) and Strigiformes (owls), (Clé and others, 2019). USUV was first detected in Africa in the 1950s and has since been confirmed in multiple countries across mainland Europe (Clé and others, 2019). Infections in humans are rare and usually asymptomatic, however, a small number of cases with mostly neurological signs have been reported (Clé and others, 2019).

Since 2013, kidney and brain samples from all wild bird carcasses submitted to the Garden Wildlife Health project for post-mortem examination during the active mosquito season (April-November inclusive) have been screened for flaviviruses. Since its first detection in August 2020 in 5 Eurasian blackbirds (*Turdus merula*) and one house sparrow (*Passer domesticus*), only a small number of USUV positive wild birds have additionally been confirmed at the initial detection site in Greater London each subsequent summer, 2021-2023 (Folly and others, 2020). However, disease surveillance findings integrated with population monitoring provides evidence to suggest a disease-mediated population decline in blackbirds in Greater London in 2020 (Lawson and others, 2022). In 2023, 131 wild birds examined at the Institute of Zoology and APHA regional labs were tested of which 4 tested positive for USUV: these comprised a single blackbird and feral pigeon (*Columba livia*) from the index site, and a further 2 blackbirds from a single site in Cambridgeshire, representing the first detection of the virus outside of Greater London (Schilling and others, 2023). In addition, by undertaking surveillance in mosquitoes at the index site, USUV was identified in mosquitoes that were reared up from larvae in 2023. This further adds to our understanding of how this mosquito-borne virus is persisting in the vector population in southern England.

A collaborative project, the Vector-Borne RADAR (Real-time Arbovirus Detection And Response), was launched in 2023 to further investigate the emergence and transmission of zoonotic mosquito-borne viruses of wild birds (visit the vb radar website). The team is led by the Animal and Plant Health Agency, in collaboration with scientists from the UK Health Security Agency, British Trust for Ornithology and Institute of Zoology. Passive wild bird disease surveillance will continue and be enhanced through a Home Office approved project licence (PP9908514) to deliver active surveillance of migrant and resident passerines in southern England, with targeted PCR and serological studies for flavivirus exposure conducted during the mosquito active season.

More information on USUV infection in wild birds can be found in the Garden Wildlife Health USUV disease factsheet and in the HAIRS risk assessment on USUV which was updated in December 2023.

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Institute of Zoology (IoZ) and APHA

Wildfowl and Wetlands Trust (WWT) report

Passive surveillance of water birds

Postmortem examinations were performed on 38 wild birds as part of the GBWHP originating from 4 WWT sites (Arundel, West Sussex; Llanelli, Carmarthenshire; London, Greater London and Slimbridge, Gloucestershire). A total of 9 target species were examined, which included 18 mallards (*Anas platyrhynchos*), 3 black-headed gull (*Chroicocephalus ridibundus*), 3 mute swan (*Cygnus olor*), 2 moorhen (*Gallinula chloropus*), one greylag geese (*Anser anser*), 2 coot (*Fulica atra),* one oystercatcher chick *(Haematopus ostralegus),* one black-tailed godwit (*Limosa limosa*) and one Eurasian crane (Grus grus).

Four other species were also examined: 2 collared doves (*Streptopelia Decaocto*), 2 rook (*Corvus frugilegus*), one wood pigeon (*Columba palumbus*) and one blue tit (*Cyanistes Caeruleus*).

The primary causes of death for the aforementioned species are summarised in Table 2. The most notable postmortem finding was gross pathologic lesions related to trauma (32%). Mixed lesions were observed within this group.

Six mallards exhibited lesions compatible with same-species aggression, including skin wounds, missing feathers, and bruising around the head and along the back, along with secondary lesions such as internal haemorrhage. Additionally, 2 mallards presented with internal haemorrhage and wing and hock fractures, with shot pellets located in both cases (found in the coelomic cavity and embedded in the intercostal muscles). Two collared doves and a blue tit suffered fatal head injuries from collisions, with one dove colliding after being chased by a sparrowhawk (*Accipiter nisus*). Lastly, one juvenile wood pigeon presented with a bruised keel and haemorrhage at the base of the head, suspected to be from a fall or collision.

Lesions compatible with avian mycobacteriosis were found in 5 birds (13%): 3 mallards, one Eurasian crane, and one greylag goose. During necropsy, a characteristic presentation of multi-focal granuloma-like lesions was observed throughout the intestinal mesentery and kidneys, accompanied by purulent-mucoid free fluid in the coelomic cavity. Additionally, the greylag goose exhibited air-sacculitis and aspergillosis in all thoracic air sacs.

Predation was another primary cause (13%). Both the moorhen and the 3 mallards submitted for necropsy displayed intact skeletal structures and skin, but minimal soft tissue or missing sections, with either an absence or minimal presence of internal organs. One mallard exhibited a puncture wound on the dorsal aspect of the base of the neck, consistent with predation by a bird of prey or gull.

Other cases with less prevalent causes (16%) during these quarters include: A mallard with severe ocular infection and bilateral vision impairment, leading to its euthanasia on welfare grounds. A young mute swan with a low body score, swollen left hock, and gut infection resulting in secondary sepsis. A rook with yellow plaques and exudate on the mucosa of the soft palate and pharynx, obstructing the tracheal entrance and causing severe stenosis of the upper oesophagus. A black-headed gull and a black-tailed godwit, located in proximity to each other, presented with haemorrhagic mucoid content in their intestines, along with thickened intestinal lining (suspected bacterial gut infection). Lastly, an oystercatcher chick with no external lesions but slightly congested intestines and intermittent haemorrhagic content. It is suspected that it suffered from a lack of sufficient nutrients prior to death and infection after getting separated from its parents by a fence (where it was found).

Ten wild birds (26%) did not receive a diagnosis due to advanced decomposition, lack of obvious gross abnormalities or multifactorial non-fatal lesions present.

Table 2. Confirmed and suspected causes of wild bird mortality (including morbidity meriting euthanasia on welfare grounds) at WWT managed reserves between July and December 2023.

Primary cause of death/PM findings	Total	Species (and notes)
Trauma	12	8 x mallards, 2 x collared doves, 1 x blue tit, 1 x wood pigeon
Avian mycobacteriosis	5	3 x mallards, 1 x greylag goose, 1 x Eurasian crane
Predation	5	3 x mallards, 2 x moorhen
Other	6	1 x mute swan (septicaemia), 1 x rook (respiratory obstruction), 1 x mallard (ocular infection), 1 x oystercatcher chick (starvation), 1 x black-tailed godwit (septicaemia and gut infection), 1 x black-headed gull (septicaemia and gut infection)
No diagnosis (due to decomposition or lack of or inconclusive gross abnormalities)	10	2 x black-headed gulls, 2 x coots, 3 x mallard, 2 x mute swan, 1 x rook,

Rosa Lopez, Veterinary Officer (Conservation) and Bethany Norris, Veterinary Support Officer, Wildfowl & Wetlands Trust (WWT)

Wild Bird reports from Scotland

Intra-species conflict was found to be the cause of death of a year-old radio tagged Golden eagle (*Aquila chrysaetos*) found dead approximately 200m from the nest of an adult pair in Moray. At necropsy, penetrating trauma to the right thorax was noted, dorsally and laterally, with associated fractures and pulmonary haemorrhage. The carcass was further evaluated via CT scan, and the pattern of trauma was found to be consistent with that of a golden eagle on eagle attack. Golden eagles are aggressively territorial and are often found to grasp around the upper chest on attack. Similar cases have been submitted for postmortem in the past, and the pattern of grip and penetration of talons in front of and behind a shoulder is typical.

Caroline Robinson, SRUC Veterinary Services

Amphibian reports

Amphibian reports from IoZ

Herpesvirus infection in British anurans

Herpesviruses have long been known to affect frog species and have been observed in European frogs repeatedly over the last 3 decades (Bennati and others, 1994; Grossenbacher, 1997). In Great Britain (GB), the only herpesvirus detected in amphibians to date is ranid herpesvirus 3 (RHV3), which typically affects common frogs (*Rana temporaria*) during their breeding season in spring. Ranid herpesvirus skin disease is associated with 'candle wax-like' skin lesions, which usually regress over time and are not reported to cause significant morbidity (Origgi and others, 2017; Franklinos and others, 2018).

Bufonid herpesvirus 1 (BfHVR) is the first herpesvirus characterised in common toads (*Bufo bufo*) in mainland Europe, originally described in Switzerland (Origgi and others, 2018; Eisenberg and others, 2021). Affected toads present with proliferative skin disease, generally prominent, raised, brown multifocal patches on the skin, which are also mostly seen during the breeding season (Origgi and others, 2018). Although the impact this infection may have on the toad's overall health is not currently clear, in contrast to RHV3, it appears that common toads with BfHV1 may be affected with ill-health and even mortality (Origgi and others, 2018).

Whilst the presence of BfHV1 has not yet been confirmed in GB, reports from November 2023 of skin lesions in common toads from Cornwall (Figure 26) appear consistent with those described in the BfHV1 cases described in Switzerland (Origgi and others, 2018). Samples for laboratory testing would be required to further investigate the cause of these lesions, but this finding further illustrates the value of photographs submitted by citizen scientists that enable syndromic wildlife disease surveillance. Further investigation of the causes for these observed skin lesions is required to learn about any potential clinical significance to common toad health in GB.

Figure 26: A photograph of a live Common toad (*Bufo bufo*) on the ground that was reported to the Garden Wildlife Health project from Cornwall in November 2023 with multifocal, dark-brown skin lesions similar to those reported from Switzerland confirmed with bufonid herpesvirus 1 infection (Origgi and others, 2018). No samples were available to investigate the cause of disease in this case.

Image credit: Hilda Bowman-Harris, Canworthy Water Toad Crossing.

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Institute of Zoology (IoZ)

Appendix 1 – Combined Wildlife Disease Data 2023

Appendix 1 incorporates data from APHA Diseases of Wildlife Scheme, SRUC and Garden Wildlife Health (Institute of Zoology) wildlife submissions from 2023. 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: 2023 dataset found on Bird flu (avian influenza): cases in wild birds.

“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. Each submission may have several VIDA code diagnoses and therefore may be listed multiple times in each table. 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 and Bird flu (avian influenza): findings in non-avian wildlife

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
	Bird	1484	54	10	1548
	Mammal	169	36	0	205
	Reptile	0	4	0	4
Total for England		**1653**	**116**	**10**	**1779**
Scotland	Bird	5	7	455	467
	Mammal	0	3	33	36
Total for Scotland		**5**	**10**	**488**	**503**
Wales	Amphibian	0	3	0	3
	Bird	115	3	3	121
	Mammal	6	10	0	16
Total for Wales		**121**	**16**	**3**	**140**
Not Supplied	Bird	1	0	0	1
	Mammal	1	0	0	1
Total for Not Supplied		**2**	**0**	**0**	**2**
Total for all countries		**1781**	**142**	**501**	**2424**

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

Animal Category	Year	Quarter	APHA	IOZ	SRUC	Total
Amphibian	2023	Q1	0	9	0	9
		Q2	0	9	0	9
		Q3	0	3	0	3
		Q4	0	4	0	4
Total number of amphibians			**0**	**25**	**0**	**25**
Bird	2023	Q1	400	20	71	491
		Q2	377	19	42	438
		Q3	529	20	259	808
		Q4	299	5	96	400
Total number of birds			**1605**	**64**	**468**	**2137**
Mammal	2023	Q1	41	5	16	62
		Q2	30	17	7	54
		Q3	42	18	8	68
		Q4	63	9	2	74
Total number of mammals			**176**	**49**	**33**	**258**
Reptile	2023	Q1	0	0	0	0
		Q2	0	0	0	0
		Q3	0	3	0	3
		Q4	0	1	0	1
Total number of reptiles			**0**	**4**	**0**	**4**
Total number of submissions			**1781**	**142**	**501**	**2424**

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

Animal Category	Animal Sub-category	APHA	IOZ	SRUC	Total
Amphibian	Frog	0	12	0	12
	Newt	0	9	0	9
	Toad	0	4	0	4
Total number of amphibians		**0**	**25**	**0**	**25**
Bird	Bird of prey	540	0	108	648
	Game bird	14	0	10	24
	Garden bird	63	60	14	137
	Miscellaneous	2	3	0	5
	Pigeon and dove	45	1	6	52
	Seabird	501	0	266	767
	Waterbird	24	0	3	27
	Waterfowl	416	0	60	476
	Unspecified	0	0	1	1
Total number of birds		**1605**	**64**	**468**	**2137**
Mammal	Bat	3	0	0	3
	Canid	24	0	1	25
	Deer	12	0	3	15
	Dolphin	1	0	0	1
	Hedgehog	25	49	2	76
	Mustelid	8	0	16	24
	Porpoise	5	0	0	5
	Rabbit and hare	10	0	1	11
	Rodent	26	0	10	36
	Seal	59	0	0	59
	Wild boar	3	0	0	3
Total number of mammals		**176**	**49**	**33**	**258**
Reptile	Lizard	0	2	0	2
	Snake	0	2	0	2
Total number of reptiles		**0**	**4**	**0**	**4**
Total number of submissions		**1781**	**142**	**501**	**2424**

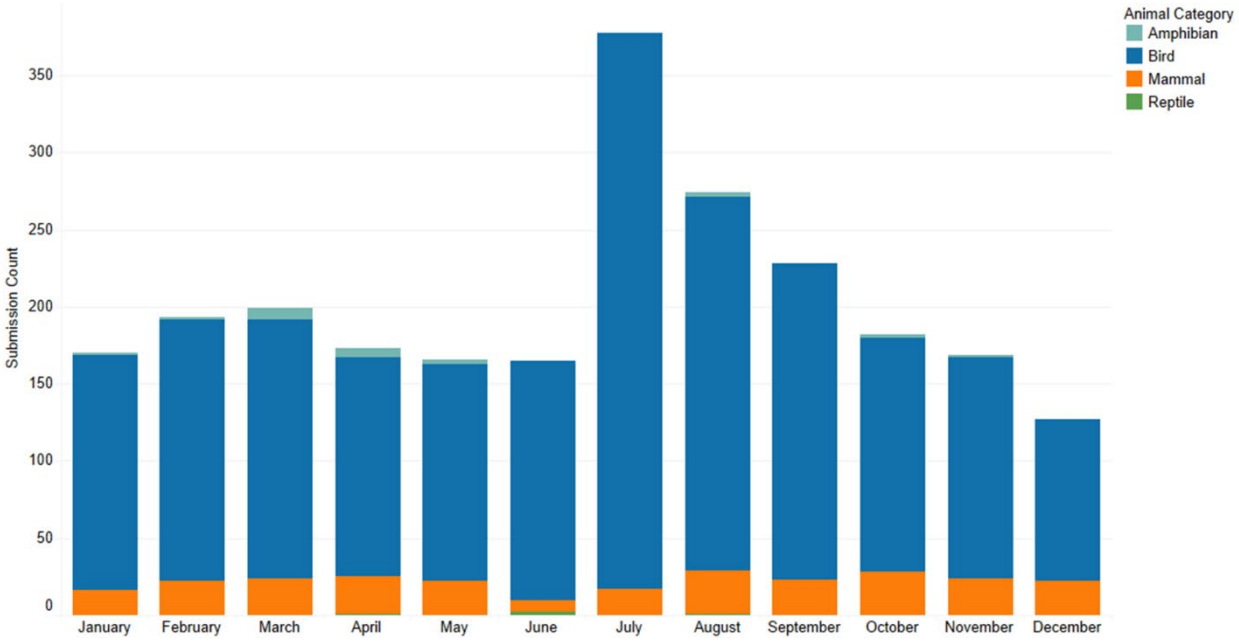

Figure A1: Bar chart to show the number of submissions (on the y axis) by animal category for each month from January to December 2023 (on the x axis), with amphibians shown as light blue bars, birds shown as dark blue bars, mammals shown as orange bars and reptiles as green bars. For this period, the majority of submissions are categorised as birds of different species. The greatest number of submissions (over 350 submissions) occurred in July.

Table A4: the number of mammalian submissions by species

Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
Bat	Brown long-eared bat	*Plecotus auritus*	1	0	0	1
	Common pipistrelle bat	*Pipistrellus pipistrellus*	2	0	0	2
Canid	Fox	*Vulpes vulpes*	24	0	1	25
Deer	Fallow deer	*Dama dama*	3	0	0	3
	Red deer	*Cervus elaphus*	2	0	0	2
	Roe deer	*Capreolus capreolus*	5	0	3	8
	Muntjac deer	*Muntiacus reevesi*	2	0	0	2
Dolphin	Common dolphin	*Delphinus delphis*	1	0	0	1
Hedgehog	European hedgehog	*Erinaceus europaeus*	25	49	2	76
Mustelid	Badger	*Meles meles*	2	0	7	9
	Eurasian otter	*Lutra lutra*	5	0	7	12
	Pine marten	*Martes martes*	0	0	1	1
	Stoat	*Mustela erminea*	0	0	1	1
	Weasel	*Mustela nivalis*	1	0	0	1
Porpoise	Harbour porpoise	*Phocoena phocoena*	5	0	0	5
Rabbit and hare	European rabbit	*Oryctolagus cuniculus*	5	0	0	5
	Brown hare	*Lepus europaeus*	5	0	1	6
Rodent	Beaver	*Castor fiber*	0	0	9	9
	Grey squirrel	*Sciurus carolinensis*	0	0	1	1
	Red squirrel	*Sciurus vulgaris*	26	0	0	26
Seal	Common/harbour seal	*Phoca vitulina*	12	0	0	12
	Grey seal	*Halichoerus grypus*	45	0	0	45
	Seal unspecified		2	0	0	2
Wild boar	Wild boar	*Sus scrofa*	3	0	0	3
Total number of submissions			**176**	**49**	**33**	**258**

Table A5: the number of bird submissions by species

Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
Buzzard	Common buzzard	*Buteo buteo*	163	0	37	200
	European honey buzzard	*Pernis apivorus*	1	0	0	1
Eagle	Golden eagle	*Aquila chrysaetos*	0	0	2	2
	White-tailed eagle	*Haliaeetus albicilla*	0	0	2	2
Falcon	Kestrel	*Falco tinnunculus*	41	0	2	43
	Merlin	*Falco columbarius*	2	0	0	2
	Peregrine	*Falco peregrinus*	21	0	2	23
Harrier	Hen harrier	*Circus cyaneus*	0	0	3	3
Hawk	Goshawk	*Accipiter gentilis*	7	0	7	14
	Sparrowhawk	*Accipiter nisus*	157	0	28	185
	Hawk unspecified		1	0	0	1
Kite	Red kite	*Milvus milvus*	23	0	3	26
Osprey	Western osprey	*Pandion haliaetus*	0	0	1	1
Owl	Barn owl	*Tyto alba*	44	0	10	54
	Little owl	*Athene noctua*	2	0	0	2
	Long-eared owl	*Asio otus*	1	0	0	1
	Short-eared owl	*Asio flammeus*	0	0	1	1
	Tawny owl	*Strix aluco*	70	0	8	78
	Owl unspecified		1	0	1	2
Bird of prey	Bird of prey mixed		0	0	1	1
Bird of prey	Bird of prey unspecified		6	0	0	6
Grouse	Red (willow) grouse	*Lagopus lagopus*	0	0	5	5
Partridge	Red-legged partridge (feral)	*Alectoris rufa*	1	0	1	2
Peafowl	Common peafowl (feral)	*Pavo cristatus*	1	0	0	1
Pheasant	Common pheasant (feral)	*Phasianus colchicus*	12	0	4	16
Bunting	Yellowhammer	*Emberiza citrinella*	1	0	0	1
Corvid	Carrion crow	*Corvus corone corone*	9	0	7	16
	Jackdaw	*Coloeus monedula*	4	0	0	4
	Magpie	*Pica pica*	6	0	1	7
	Rook	*Corvus frugilegus*	1	0	0	1
	Chough	*Pyrrhocorax pyrrhocorax*	0	0	1	1
Dunnock	Dunnock	*Prunella modularis*	0	1	0	1
Finch	Brambling	*Fringilla montifringilla*	0	1	0	1
	Chaffinch	*Fringilla coelebs*	4	18	1	23
	Goldfinch	*Carduelis carduelis*	4	5	0	9
	Greenfinch	*Chloris chloris*	3	11	1	15
	Siskin	*Spinus spinus*	1	1	0	2

Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
Flycatcher	Robin	*Erithacus rubecula*	2	1	0	3
	Spotted flycatcher	*Muscicapa striata*	0	1	0	1
	Nightingale	*Luscinia megarhynchos*	0	1	0	1
Sparrow	House sparrow	*Passer domesticus*	3	5	0	8
Starling	Common starling	*Sturnus vulgaris*	4	1	0	5
Swallow	Sand martin	*Riparia riparia*	2	0	0	2
Thrush	Blackbird	*Turdus merula*	8	9	1	18
	Fieldfare	*Turdus pilaris*	1	0	0	1
	Song thrush	*Turdus philomelos*	4	2	1	7
	Thrush unspecified		0	0	1	1
Tit	Blue tit	*Cyanistes caeruleus*	3	1	0	4
	Coal tit	*Periparus ater*	0	1	0	1
	Great tit	*Parus major*	1	1	0	2
Tree-clinging	Wren	*Troglodytes troglodytes*	1	0	0	1
Warbler	Reed warbler	*Acrocephalus scirpaceus*	1	0	0	1
Ring-necked parakeet	Ring-necked parakeet	*Psittacula krameri*	1	0	0	1
Woodpecker	Great spotted woodpecker	*Dendrocopos major*	1	2	0	3
	Green woodpecker	*Picus viridis*	0	1	0	1
Pigeon and dove	Collared dove	*Streptopelia decaocto*	4	1	0	5
	Feral pigeon / Rock dove	*Columba livia*	16	0	0	16
	Woodpigeon	*Columba palumbus*	23	0	4	27
	Dove unspecified		1	0	0	1
	Pigeon unspecified		1	0	2	3
Auk	Guillemot	*Uria aalge*	107	0	111	218
	Puffin	*Fratercula arctica*	4	0	2	6
	Razorbill	*Alca torda*	31	0	17	48
	Little auk	*Alle alle*	2	0	0	2
Gannet, Cormorant and Shag	Cormorant	*Phalacrocorax carbo*	9	0	11	20
	Northern gannet	*Morus bassanus*	12	0	4	16
	Shag	*Gulosus aristotelis*	3	0	10	13
Gull	Black-headed gull	*Chroicocephalus ridibundus*	111	0	1	112
	Common gull	*Larus canus*	6	0	9	15
	Great black-backed gull	*Larus marinus*	5	0	2	7
	Herring gull	*Larus argentatus*	151	0	29	180
	Kittiwake	*Rissa tridactyla*	18	0	18	36
	Lesser black-backed gull	*Larus fuscus*	11	0	2	13
	Mediterranean gull	*Ichthyaetus melanocephalus*	1	0	0	1
	Gull mixed		0	0	1	1

Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
	Gull unspecified		4	0	42	46
Petrel and shearwater	Fulmar	*Fulmarus glacialis*	3	0	0	3
	Manx shearwater	*Puffinus puffinus*	1	0	0	1
Tern	Arctic tern	*Sterna paradisaea*	2	0	1	3
	Common tern	*Sterna hirundo*	13	0	2	15
	Little tern	*Sterna albifrons*	1	0	0	1
	Sandwich tern	*Sterna sandvicensis*	6	0	0	6
Seabird	Seabird mixed		0	0	4	4
Heron	Cattle egret	*Bubulcus ibis*	1	0	0	1
	Grey heron	*Ardea cinerea*	3	0	1	4
	Bittern	*Botaurus stellaris*	1	0	0	1
Rail	Coot	*Fulica atra*	4	0	0	4
	Moorhen	*Gallinula chloropus*	2	0	0	2
	Common crane	*Grus grus*	1	0	0	1
Spoonbill	Spoonbill	*Platalea leucorodia*	1	0	0	1
Wader	Avocet	*Recurvirostra avosetta*	1	0	0	1
	Curlew	*Numenius arquata*	6	0	0	6
	Lapwing	*Vanellus vanellus*	1	0	0	1
	Oystercatcher	*Haematopus ostralegus*	2	0	2	4
	Woodcock	*Scolopax rusticola*	1	0	0	1
Duck	Domestic duck (feral)	*Anas platyrhynchos domesticus*	1	0	0	1
	Eider	*Somateria mollissima*	1	0	0	1
	Mallard	*Anas platyrhynchos*	77	0	3	80
	Muscovy duck (feral)	*Cairina moschata*	2	0	0	2
	Shoveler	*Spatula clypeata*	1	0	0	1
	Teal	*Anas crecca*	2	0	1	3
	Tufted duck	*Aythya fuligula*	1	0	0	1
	Wigeon	*Mareca penelope*	2	0	0	2
	Goldeneye	*Bucephala clangula*	1	0	0	1
	Duck unspecified		4	0	1	5
Goose	Barnacle goose	*Branta leucopsis*	2	0	1	3
	Brent goose	*Branta bernicla*	3	0	0	3
	Canada goose	*Branta canadensis*	87	0	0	87
	Egyptian goose	*Alopochen aegyptiaca*	1	0	0	1
	Greylag goose	*Anser anser*	24	0	4	28
	Pink-footed goose	*Anser brachyrhynchus*	16	0	10	26
	Bean goose	*Anser fabalis*	0	0	1	1
	Goose (feral)		3	0	0	3
	Goose unspecified		3	0	7	10
Swan	Mute swan	*Cygnus olor*	166	0	22	188
	Whooper swan	*Cygnus cygnus*	6	0	4	10

Animal Group	Common Name	Scientific Name	APHA	IOZ	SRUC	Total
	Swan unspecified		13	0	6	19
Mixed or unknown bird	Bird unspecified		0	0	1	1
Total number of submissions			**1605**	**64**	**468**	**2137**

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*	12	12
	Newt	Great crested newt	*Triturus cristatus*	4	4
		Palmate newt	*Lissotriton helvetica*	2	2
		Smooth newt	*Lissotriton vulgaris*	2	2
		Newt unspecified	*Salamandridae sp.*	1	1
	Toad	Common toad	*Bufo bufo*	4	4
Reptile	Lizard	Slow worm	*Anguis fragilis*	2	2
	Snake	Adder	*Vipera berus*	1	1
		Grass snake	*Natrix natrix*	1	1
Total number of submissions				**29**	**29**

Table A7: number of VIDA diagnoses in mammals by species

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Canid	Fox	Leptospirosis	1
		Listeriosis -systemic/enteric	1
		Mastitis dt *Staphylococcus*	1
		Nephritis	1
		Parasitic gastroenteritis	1
		Pneumonia	1
		Septicaemia	2
		Staphylococcal infection	1
		Streptococcal infection	1
		Trauma: Road Traffic Accident	1
		Trauma/fracture	1
		Diagnosis not listed - systemic disease	1
Deer	Fallow deer	Meningitis/encephalitis	1
		Diagnosis not listed - nervous disease	1
	Red deer	Trauma/fracture	2
	Roe deer	Malnutrition	1
		Parasitic gastroenteritis	2
		Pneumonia	1
		Diagnosis not listed - circulatory disease	2
Hedgehog	European hedgehog	Adverse environment	1
		Ectoparasitic disease	1
		Meningitis/encephalitis	1
		Neoplasm	1
		Parasitic gastroenteritis	1
		Parasitic pneumonia	21
		Pasteurellosis	1
		Pneumonia	2
		Ringworm	1
		Septicaemia	1
		Staphylococcal infection	2
		Trauma: Predation	10
		Trauma: Road Traffic Accident	6
		Trauma/fracture	9
		Visceral parasitism	2
		Diagnosis not listed - digestive disease	1
		Diagnosis not listed - reproductive disease (excluding disease/disorder in fetus)	2
		Diagnosis not listed - respiratory disease	1
		Salmonellosis dt S. Enteritidis	3
Mustelid	Badger	Trauma: Road Traffic Accident	2
		Trauma/fracture	1
		Diagnosis not listed - nervous disease	1

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
		Diagnosis not listed - skin disease	1
	Eurasian otter	Malnutrition	2
		Streptococcal infection	1
		Trauma: Predation	3
		Diagnosis not listed - systemic disease	1
	Pine marten	Malnutrition	1
	Weasel	Trauma/fracture	1
Rabbit and hare	European rabbit	Coccidiosis	2
		Myxomatosis	1
		Rabbit haemorrhagic disease (including RHD2)	3
		Trauma/fracture	1
	Brown hare	Coccidiosis	2
		Parasitic gastroenteritis	2
		Rabbit haemorrhagic disease (including RHD2)	1
		Septicaemia	1
Rodent	Beaver	*Fusobacterium necrophorum* infection	1
		Salmonellosis dt S. Typhimurium	1
		Staphylococcal infection	1
		Trauma: Predation	2
		Trauma: Road Traffic Accident	3
		Trauma/fracture	1
		Diagnosis not listed - circulatory disease	1
		Diagnosis not listed - skin disease	1
	Grey squirrel	Trauma: Road Traffic Accident	1
	Red squirrel	Coccidiosis	1
		Ectoparasitic disease	2
		Ectoparasitic disease caused by lice	1
		Malnutrition	1
		Red squirrel adenovirus enteritis	2
		Squirrel pox	13
		Trauma/fracture	2
		Diagnosis not listed	1
		Diagnosis not listed - musculo-skeletal disease	1
		Diagnosis not listed - respiratory disease	1
Seal	Common/harbour seal	Malnutrition	1
		Pneumonia	4
		Septicaemia	2
		Streptococcal infection	1
	Grey seal	Malnutrition	3
		Parasitic pneumonia	7
		Pneumonia	3

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
		Septicaemia	4
		Streptococcal infection	4
		Trauma: Predation	1
		Trauma/fracture	3
		Diagnosis not listed - digestive disease	1
		Diagnosis not listed - nervous disease	1
		Diagnosis not listed - respiratory disease	2
		Diagnosis not listed - skin disease	1
		Diagnosis not listed - systemic disease	2
	Seal unspecified	Diagnosis not listed - musculo-skeletal disease	1
Wild boar	Wild boar	Fetopathy (fetus disease/disorder) diagnosis not listed	1
		Helminthosis	1
		Trauma/fracture	1
Total Number of Diagnoses Made			**162**

Table A8: number of VIDA diagnoses in birds by species

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Buzzard	Common buzzard	Adverse environment	1
		Avian Influenza	47
		Coccidiosis	1
		Fungal infection	1
		Helminthosis	8
		Malnutrition	14
		Oral trichomonosis (avian) including oesophagitis in garden birds	4
		Pasteurella multocida (and fowl cholera)	1
		Salmonellosis dt S. Typhimurium	1
		Trauma: Road Traffic Accident	4
		Trauma/fracture	17
		Urolithiasis	1
		Diagnosis not listed - circulatory disease	1
		Diagnosis not listed - digestive disease	1
		Diagnosis not listed - musculo-skeletal disease	1
		Diagnosis not listed - systemic disease	1
	European honey buzzard	Trauma/fracture	1
Eagle	Golden eagle	Trauma/fracture	1
	White-tailed eagle	Trauma/fracture	1
Falcon	Kestrel	Adverse environment	1
		Avian Influenza	1
		Malnutrition	5
		Diagnosis not listed - digestive disease	1
	Merlin	Avian Influenza	1
	Peregrine	Avian Influenza	13
		Malnutrition	1
		Trauma: Predation	1
		Trauma/fracture	1
Harrier	Hen harrier	Malnutrition	2
		Trauma: Predation	1
Hawk	Goshawk	Helminthosis	1
		Malnutrition	1
		Trauma/fracture	4
	Sparrowhawk	Adverse environment	1
		Avian Influenza	11
		Helminthosis	7
		Malnutrition	21

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
		Oral trichomonosis (avian) including oesophagitis in garden birds	4
		Trauma: Predation	2
		Trauma: Road Traffic Accident	1
		Trauma/fracture	27
		Diagnosis not listed - digestive disease	2
		Diagnosis not listed - musculo-skeletal disease	1
Kite	Red kite	Avian Influenza	1
		Trauma: Road Traffic Accident	1
		Trauma/fracture	2
Osprey	Western osprey	Trauma/fracture	1
Owl	Barn owl	Impactions of crop/gizzard/duodenum	1
		Malnutrition	7
		Trauma: Road Traffic Accident	2
		Trauma/fracture	10
		Diagnosis not listed - respiratory disease	1
	Little owl	Trauma/fracture	1
	Long-eared owl	Malnutrition	1
	Tawny owl	Avian Influenza	4
		Helminthosis	3
		Malnutrition	8
		Trauma: Predation	2
		Trauma: Road Traffic Accident	2
		Trauma/fracture	6
Bird of prey	Bird of prey mixed	Avian Influenza	1
Bird of prey	Bird of prey unspecified	Avian Influenza	1
Grouse	Red (willow) grouse	Avian Influenza	1
		Trauma/fracture	1
		Trichostrongylosis	2
Peafowl	Common peafowl (feral)	Diagnosis not listed - systemic disease	1
Pheasant	Common pheasant (feral)	Avian Influenza	2
		Trauma: Predation	1
		Trauma/fracture	2
Bunting	Yellowhammer	Oral trichomonosis (avian) including oesophagitis in garden birds	1
		Diagnosis not listed - digestive disease	1
Corvid	Carrion crow	Avian Influenza	4
	Jackdaw	Trauma: Predation	1
	Magpie	Ectoparasitic disease	1
		Trauma: Predation	1
		Trauma/fracture	1

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Dunnock	Dunnock	Oral trichomonosis (avian) including oesophagitis in garden birds	1
Finch	Brambling	Oral trichomonosis (avian) including oesophagitis in garden birds	1
	Chaffinch	Chaffinch papillomavirus	1
		Ectoparasitic disease	3
		Oral trichomonosis (avian) including oesophagitis in garden birds	15
		Trauma: Predation	1
		Trauma/fracture	4
	Goldfinch	Oral trichomonosis (avian) including oesophagitis in garden birds	3
		Trauma/fracture	4
	Greenfinch	Colisepticaemia	1
		Ectoparasitic disease	1
		Oral trichomonosis (avian) including oesophagitis in garden birds	8
		Pasteurellosis	1
		Trauma: Predation	1
		Trauma/fracture	3
	Siskin	Oral trichomonosis (avian) including oesophagitis in garden birds	1
Flycatcher	Robin	Fungal infection	1
		Trauma: Predation	1
		Trauma/fracture	2
		Avian mycobacteriosis	1
	Spotted flycatcher	Trauma/fracture	1
	Nightingale	Trauma/fracture	1
Sparrow	House sparrow	Adverse environment - asphyxiation	1
		Coccidiosis	1
		Ectoparasitic disease	1
		Trauma/fracture	2
Starling	Common starling	Trauma: Predation	1
		Trauma/fracture	1
Thrush	Blackbird	Pasteurellosis	1
		Trauma: Predation	2
		Trauma/fracture	7
		Usutu virus infection	3
		Visceral parasitism	1
		Diagnosis not listed - circulatory disease	1
	Fieldfare	Trauma/fracture	1
	Song thrush	Trauma: Predation	1

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
		Trauma/fracture	3
Tit	Blue tit	Malnutrition	1
		Trauma/fracture	1
		Diagnosis not reached - musculo-skeletal disease	1
	Coal tit	Trauma/fracture	1
	Great tit	Trauma: Predation	1
Warbler	Reed warbler	Avian Influenza	1
Woodpecker	Great spotted woodpecker	Trauma/fracture	2
	Green woodpecker	Trauma/fracture	1
Pigeon and dove	Collared dove	Oral trichomonosis (avian) including oesophagitis in garden birds	1
		Trauma/fracture	3
	Feral pigeon / Rock dove	Avian Influenza	1
		PMV of pigeons (PPMV-1)	2
		Salmonellosis dt S. Typhimurium	1
		Trauma/fracture	2
	Woodpigeon	Avian Influenza	1
		Oral trichomonosis (avian) including oesophagitis in garden birds	1
		PMV of pigeons (PPMV-1)	1
	Dove unspecified	Diagnosis not listed - systemic disease	1
	Pigeon unspecified	Avian Influenza	1
Auk	Guillemot	Avian Influenza	67
		Helminthosis	4
		Malnutrition	9
		Peritonitis	1
		Trauma/fracture	2
		Diagnosis not listed	1
		Diagnosis not listed - digestive disease	2
		Diagnosis not listed - respiratory disease	1
	Puffin	Avian Influenza	2
		Ectoparasitic disease	1
		Malnutrition	1
		Trauma/fracture	1
	Razorbill	Avian Influenza	5
		Helminthosis	1
		Malnutrition	6
		Trauma/fracture	1
		Diagnosis not listed - respiratory disease	2
	Cormorant	Avian Influenza	2
		Helminthosis	2

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Gannet, Cormorant and Shag		Malnutrition	1
		Trauma: Predation	2
		Trauma/fracture	1
		Diagnosis not listed - digestive disease	1
	Northern gannet	Avian Influenza	3
		Helminthosis	1
		Malnutrition	1
		Trauma - Snaring or entanglement	1
Gull	Black-headed gull	Amyloidosis	1
		Avian Influenza	81
		Malnutrition	2
		Trauma/fracture	2
		Diagnosis not listed - digestive disease	1
	Common gull	Avian Influenza	4
	Great black-backed gull	Malnutrition	1
		Trauma/fracture	2
	Herring gull	Avian Influenza	63
		Egg peritonitis/salpingitis complex	1
		Fungal infection	2
		Impactions of crop/gizzard/duodenum	1
		Malnutrition	2
		Mycotic pneumonia or airsacculitis	2
		Neoplasm	1
		Salmonellosis dt S. Typhimurium	1
		Septicaemia	1
		Starveout - failure to feed in first week of life	1
		Trauma: Predation	1
		Trauma: Road Traffic Accident	3
		Trauma/fracture	15
	Kittiwake	Avian Influenza	26
		Trauma/fracture	1
	Lesser black-backed gull	Avian Influenza	4
		Trauma: Predation	1
	Mediterranean gull	Peritonitis	1
	Gull unspecified	Avian Influenza	14
Petrel and shearwater	Fulmar	Avian Influenza	1
		Malnutrition	1
Tern	Arctic tern	Avian Influenza	2
	Common tern	Avian Influenza	13
	Little tern	Avian Influenza	1
	Sandwich tern	Avian Influenza	3

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
Seabird	Seabird mixed	Avian Influenza	1
Heron	Grey heron	Avian Influenza	1
Rail	Coot	Avian Influenza	1
		Trauma: Predation	1
	Moorhen	Avian Influenza	1
Spoonbill	Spoonbill	Trauma/fracture	1
Wader	Curlew	Candidiasis	3
		Diagnosis not listed - digestive disease	2
		Pododermatitis/hock burn/breast blister	1
		Rickets/osteomalacia	2
	Oystercatcher	Trauma: Road Traffic Accident	1
	Woodcock	Trauma/fracture	1
Duck	Domestic duck (feral)	Impactions of crop/gizzard/duodenum	1
	Mallard	Avian Influenza	5
		Egg peritonitis/salpingitis complex	1
		Impactions of crop/gizzard/duodenum	1
		Malnutrition	1
		Peritonitis of wild waterbirds - aetiology unknown	1
		Trauma: Predation	7
		Trauma: Road Traffic Accident	1
		Trauma/fracture	13
	Muscovy duck (feral)	Trauma: Road Traffic Accident	1
	Shoveler	Avian Influenza	1
	Teal	Avian Influenza	1
	Goldeneye	Trauma: Predation	1
	Duck unspecified	Avian Influenza	1
Goose	Brent goose	Trauma/fracture	2
	Canada goose	Amyloidosis	1
		Avian Influenza	13
		Avian pox	1
		Helminthosis	3
		Malnutrition	2
		Mycotic pneumonia or airsacculitis	1
		Trauma: Predation	4
		Trauma: Road Traffic Accident	3
		Trauma/fracture	18
		Diagnosis not listed - musculo-skeletal disease	1
	Greylag goose	Amyloidosis	1
		Avian Influenza	8
		Impactions of crop/gizzard/duodenum	2

Animal Group	Common Name	Diagnosis Description	Number of Diagnoses Made
		Trauma: Road Traffic Accident	1
		Trauma/fracture	4
		Ingestion of inappropriate materials	1
	Pink-footed goose	Avian Influenza	19
		Trauma/fracture	1
	Bean goose	Avian mycobacteriosis	1
	Goose (feral)	Trauma: Road Traffic Accident	1
	Goose unspecified	Avian Influenza	3
		Trauma: other	1
Swan	Mute swan	Airsacculitis - cause not determined	1
		Amyloidosis	2
		Avian Influenza	11
		Egg peritonitis/salpingitis complex	1
		Haemoparasitic infection	1
		Helminthosis	2
		Impactions of crop/gizzard/duodenum	2
		Malnutrition	5
		Mycotic pneumonia or airsacculitis	3
		Nephrosis / nephropathy	1
		Peritonitis of wild waterbirds - aetiology unknown	1
		Septicaemia	2
		Trauma: Predation	5
		Trauma: Road Traffic Accident	4
		Trauma/fracture	37
		Diagnosis not listed - digestive disease	1
		Diagnosis not listed - reproductive disease (excluding disease/disorder in fetus)	1
		Diagnosis not listed - skin disease	1
		Trauma - bycatch	1
	Whooper swan	Avian Influenza	1
		Trauma: Predation	1
		Trauma/fracture	1
	Swan unspecified	Trauma: Predation	1
		Trauma/fracture	2
Mixed or unknown bird	Bird unspecified	Trauma/fracture	1
Total Number of Diagnoses Made			**944**

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	Ectoparasitic disease	1
			Fungal infection	1
			Malnutrition	1
			Parasitic pneumonia	1
			Trauma: Predation	3
			Trauma/fracture	2
			Visceral parasitism	2
			Diagnosis not listed - digestive disease	1
	Newt	Smooth newt	Trauma: Predation	1
	Toad	Common toad	Trauma: Predation	1
Reptile	Lizard	Slow worm	Diagnosis not listed - systemic disease	1
	Snake	Adder	Trauma: Predation	1
Total Number of Diagnoses Made				**13**

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 website.

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.