GB Wildlife Disease Surveillance Partnership quarterly report
Disease surveillance and emerging threats
Volume 23: Q2 – April-June 2018

Highlights

<table>
<thead>
<tr>
<th>Highlights</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record numbers of suspect avian botulism submissions to APHA DoWS</td>
<td>15</td>
</tr>
<tr>
<td>Encephalomyocarditis virus in Hazel dormice</td>
<td>19</td>
</tr>
<tr>
<td>Ranid herpesvirus</td>
<td>23</td>
</tr>
</tbody>
</table>

Contents

Introduction and overview...................................................................................................................................1
Notifiable diseases..................................................................................................................................................2
Zoonotic diseases...................................................................................................................................................6
Ongoing new and re-emerging diseases, unusual diagnoses and horizon scanning........7
Annexe...............................................................................................................................................................25

The Animal and Plant Health Agency (APHA) is an executive agency of the Department for Environment, Food & Rural Affairs, and also works on behalf of the Scottish Government and Welsh Government.

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Introduction and overview

The GB Wildlife Disease Surveillance Partnership comprising the Animal and Plant Health Agency (APHA), 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 Disease Surveillance Partnership Quarterly Reports:


A full explanation of how data is analysed is provided in the Annexe.

Issues and trends

Cases of suspected avian botulism in waterbirds are investigated by the Diseases of Wildlife Scheme (DoWS) each year with most outbreaks seen in the warmer months of summer. During the first week of July 2018, several sites across the Northern half of England were affected within days of each other suggesting the involvement of an environmental trigger, almost certainly related to extended warm dry weather at this time. This summer DoWS has seen record numbers of submissions of this disease. In addition to the weather however it is possible that Clostridium botulinum, the bacterium producing the toxin responsible for the disease, may have been accumulating in the environments where outbreaks have occurred previously. Birds at sites which have experienced the disease may be increasingly likely to be intestinal carriers of this bacterium. The suggestion here is that sites and resident flocks of waterbirds previously affected may then be affected annually, through a combination of persisting environmental contamination plus birds carrying C. botulinum in their intestines from one summer to the next. As these outbreaks have occurred outside the report period only brief details are given.

Paul Duff, APHA Diseases of Wildlife Scheme (DoWS)
Notifiable diseases

Avian Influenza (AI) Virus

Great Britain AI Wild Bird Surveillance (AIWBS): April – June 2018

Total wild bird surveillance

During the first quarter of 2018 the number of HPAI H5N6 positive wild birds peaked, but then fell quickly. During the second quarter only three birds in GB submitted under the scheme were HPAI H5N6 positive. They were Eurasian buzzards (*Buteo buteo*) found within the same geographical location in Suffolk, and were thought to be linked to a single point source of infection – probably infected waterfowl eaten as carrion.

On 10th May 2018, the threshold criteria for collections and submissions of wild birds found dead for the purposes of AI surveillance was increased to three or more waterfowl target species – specifically wild geese, wild ducks, swans, and gulls found in the same location. The threshold remains at one or more for birds of prey, and five or more of any species, found in the same location (mass mortality event).

Number of wild birds tested and results in GB – 2nd Quarter

<table>
<thead>
<tr>
<th>Surveillance activity</th>
<th>Number of birds tested*</th>
<th>Positive AI virus result and species of bird</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Found dead/injured</td>
<td>276 (194)</td>
<td>Two buzzards (<em>Buteo buteo</em>) in Suffolk (week 13); One buzzard (<em>Buteo buteo</em>) in Suffolk (week 16).</td>
<td>Scanning surveillance All-year-round</td>
</tr>
</tbody>
</table>

*Number of birds tested (figure may be slightly different from other reports due to exact query run on dataset). Figures for April - June 2017 are shown in brackets Data query used for this report-date 'M gene approval'

Members of the public are asked to remain vigilant and report findings of target species in addition to mass mortality incidents to the **Defra Helpline: 03459 33 55 77**. The criteria for a mass mortality incident are five or more wild birds of any species at any location (irrespective of county) in England, Scotland or Wales.
Warden Patrol Scheme

The main emphasis is on AIWBS in found dead wild birds, including mass mortality incidents, and patrols of designated reserves by skilled wild bird ecologists and wardens. These Warden Patrols continue all-year-round, but are also seasonally targeted in the winter and spring periods (October to March) each year.

During the period 1st April – 30th June (Q2-2018), a total of 176 Warden Patrols were performed at sites across GB. This compares with a total of 192 Warden Patrols performed during the same period in 2017 (Q2-2017) in GB. During Q2-2018, the Warden Patrols were mainly performed by the Wildfowl and Wetlands Trust. Warden Patrols were also carried out by two other voluntary organisations. In total during Q2-2018, 65 wild birds found dead were tested, with no H5N8 detections. This compares with a total of 72 wild birds found dead and tested during the same period of 2017.

In Q2-2018, Black-headed gulls (Chroicocephalus ridibundus) were the most common target species found, and birds were most commonly found in the South East region with none submitted from the Midlands, North East of England and Scotland. This contrasts with Q2-2017, where Mallard (Anas platyrhynchos) ducks were the most common target species found, though similar in that birds were most commonly found in the South East of England with none submitted from the Midlands, North East and Scotland.

Current EU situation

The subtype HPAI H5N6 has been identified in Denmark, Finland, Sweden, the Netherlands, Germany, Ireland, and the Slovak Republic in addition to the UK in wild birds. However, unlike the HPAI H5N8 epizootic in 2017, there have been very few poultry or captive bird cases across Europe. Of late, cases have been reported along the Baltic Sea migration route, likely from birds migrating in an easterly direction towards their summer breeding grounds. Cases reported from Scandinavian countries have included waterbird species but also an increasing number of birds of prey, in common with the GB observed trend.

In 2018 HPAI outbreaks of subtype H5N8 have been detected in poultry in Bulgaria and Italy. HPAI H5N6 has been confirmed in poultry in the Netherlands and Germany and in captive birds in Sweden.

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

Current UK situation

There have been no outbreaks of HPAI of any kind in commercial or captive poultry or birds in the United Kingdom diagnosed up to late August 2018. In May 2018 the risk level for infection of wild birds with HPAI H5N6 was reduced (from high) to low, due to the improving environmental conditions (increased warmth and UV) and the departure of overwintering waterfowl. In addition, the risk to both free-range and housed poultry has also reduced to low. Avian Influenza Prevention Zones (AIPZ) which were in place across England and Wales were lifted on Friday 25th May 2018.

At all times, poultry keepers are advised to maintain robust biosecurity measures, vigilance for clinical signs of disease and to promptly report suspected cases of notifiable avian disease in poultry to APHA:

- In England – call the Defra Rural Services Helpline on 03000 200 301. The Helpline is open Monday to Friday, 8.30am to 5pm and there is an out of hour’s facility on the same number for reporting suspicion of disease in animals.
- In Scotland and Wales, contact your local APHA Field Services Office: https://www.gov.uk/government/organisations/animal-and-plant-health-agency/about/access-and-opening.

Further information regarding avian influenza in poultry and wild birds is also available:

- When and how to register your poultry flock, and which species must be registered in Great Britain: https://www.gov.uk/guidance/poultry-registration.
- Information about the chargeable testing scheme offered in GB by APHA that enables veterinarians to request ‘Testing for Exclusion of notifiable avian disease’ in chicken and turkey flocks, in circumstances that would not require the implementation of statutory disease control measures (Gibbens and others, 2014): http://ahvla.defra.gov.uk/vet-gateway/tte/nad.htm.

Avian influenza and Newcastle disease/PPMV-1 events, including H5 HPAI internationally, are also summarised in GB Wildlife Disease Surveillance Partnership quarterly reports.

References

- https://science.vla.gov.uk/flu-lab-net/docs/outbreak-hpai-h5n8-europe.pdf
- Avian influenza (bird flu) - GOV.UK
Wildfowl and Wetlands Trust’s (WWT) role in GB Avian Influenza Wild Bird Surveillance (AIWBS): April – June 2018

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

Throughout this quarter, avian influenza continued to be monitored in wild birds on WWT reserves across the country as part of its involvement in the GB AIWBS partnership. A total of 167 dead wild birds were found between April and June 2018, of which 65 were sampled for avian influenza viruses. The relatively low proportion of birds sampled for avian influenza can be attributed to a high mortality of black-headed gulls (*Chroicocephalus ridibundus*) in West Sussex (89 individuals; approximately 53% of total dead wild birds). This incident/event is being treated as a suspected outbreak of avian botulism (please see the following section for further details).

Sampled birds were found across six WWT reserves, located in Gloucestershire, Carmarthenshire, West Sussex, Greater London, Norfolk and Lancashire. The sampled birds comprised of 13 species of surveillance priority, including swans, geese, ducks, gulls and rails. All samples tested negative for avian influenza.

WWT
Zoonotic diseases

APHA Diseases of Wildlife Scheme (DoWS); Salmonellosis in wildlife; April – June 2018

Threat: Zoonotic, farmed and pet animal risk

There is no routine monitoring of *Salmonella* in wild birds or wild mammals. Therefore all isolates are usually from clinical cases, although *Salmonella* may often not be the primary cause of disease. Occasionally it is isolated from small-scale surveys. No *Salmonella* species were isolated from wild mammals or wild birds this quarter. Wild bird variant *S. Typhimurium* DT40 was isolated from pheasant chicks (*Phasianus colchicus*) on three game farms in England during June. Two of these groups of chicks were seven day-old and the other 16 days-old. No clinical histories were given.

There were no reports of bird variant *S. Typhimurium* DT56 or DT56v from domestic species. No *Salmonella* infections were identified by DoWS this quarter.

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

Alex Barlow, APHA Diseases of Wildlife Scheme

Report from Wildlife Zoonoses and Vector Borne Disease Research Group; 2nd Quarter; April – June 2018

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

Passive surveillance for lyssaviruses in UK bats

68 bats were tested for lyssavirus under passive surveillance. Sixty three bats were negative whilst one Daubenton’s bat (*Myotis daubentonii*) from Peterborough and four Daubenton’s bats from East Sussex were positive for European Lyssavirus 2.

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

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.
One dog showing suspect neurological signs was tested for rabies with negative results.

**West Nile Virus (WNV) surveillance in wild birds SV3045**

Brain and kidney tissue samples from 87 wild birds received from APHA RLs, SRUC Veterinary Services and ZSL representing 26 species of small passerines, corvids, raptors and water birds were tested by TaqMan PCR for WNV during this period with negative results.

**West Nile virus surveillance in Equids**

One serum sample from a horse which had been humanely killed following onset of neurological signs was tested for WNV by cELISA (detects both IgM and IgG) during this period with positive result. However, IgM capture ELISA carried out on this sample was negative. The WNV vaccination status of this horse is unknown.

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

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

**Mammal reports**

**Wild mammal reports from Scotland**

Suspected *Treponema* infection was isolated from a female mountain hare (*Lepus timidus*) found *in extremis* on an Angus hillside and shot. At necropsy, body condition was very poor, and severe proliferative-looking crusty lesions were seen on the nose, lips, eyelids and genitals. No other gross pathological lesions were seen. No significant histological abnormalities were detected in the viscera. Skin sections showed multifocal extensive erosive/ulcerative dermatitis overlain by a thick layer of serocellular crust, plus heterophil accumulation and very dense dermal plasma cell infiltration. No unequivocal spirochaetes were detected in a Warthin-Starry preparation. There was no dermal fibroblastic response typical of myxomatosis, and although no unequivocal spirochaetes were detected, the lesion distribution and the plasma cell infiltration are features suggestive of *Treponema* infection.

This case was of interest as the keeper originally thought that the lesions were representative of myxomatosis, which is an OIE listed disease and is rare in hares. In addition, although *Treponema* infection has been widely described in European brown
hares (*Lepus europaeus*), we were unable to find published reports of the disease in mountain hares.

**Reference**


**Caroline Robinson, SRUC Veterinary Services**

**APHA DoWS**

**Wild mammal reports from APHA DoWS**

**Congenital hydrocephalus in fox cubs (*Vulpes vulpes*)**

**Threat: Possible Zoonotic risk**

A series of fox cubs submitted from wildlife hospitals in the West Country over the period 2001-2007 showed hydrocephalus. CNS tissue from some of these cases were positive for Ljungan virus (LV) using immunohistochemistry (IHC) (Department of Medical Cell Biology, Uppsala University, Sweden) but ten control brains that were collected from culled foxes in the West Country were all negative.

Ljungan virus is a member of the *Parechovirus* genus in the family Picornaviridae that was first isolated in 1998 from bank voles (*Myodes glareolus*) in Sweden. A variety of rodents are typical prey species of European foxes and thus they would be good sentinels for the possible presence of LV in GB. It has been suggested that LV might be a cause of hydrocephalus in mammals (Hauffe, 2008) and this lead to the decision to screen the fox cub brains for evidence of LV. Obstructive congenital hydrocephalus is a commonly reported finding in orphan foxes received by wildlife hospitals in Great Britain (Couper, 2016) and USA (Elise Able, personal communication).

Four fox cubs, all from the same litter, with hydrocephalus were admitted to a suburban wildlife hospital in the south east of England this year. They were euthanased and two were submitted to APHA Starcross Veterinary Investigation Centre. It was decided that Next-Gene Sequencing (NGS) would be the best way to screen for any infectious cause of the hydrocephalus including LV. However guided mapping using LV reference sequence identified no specific LV reads. Next, host reads were removed using dog genome reference sequence. Then analysis of remaining reads using a non-reference guided alignment of reads using comparison with; Picornavirus library; resulted in no picornavirus hits being obtained. From the complete virus library again, no virus hits were obtained. Broader screening was also carried out but no sequences from any pathogens were
detected. So in this case neither LV nor other viral causes were not detected. Further work should involve affected fox cubs from the same area as those screened in 2001-2007. LV has been implicated as a possible zoonosis (Niklasson and others, 2007).

References


Hauffe, H. C., Niklasson, B., Olsson, T., Bianchi, A., Rizzoli, A. and Klitz, W., 2008. Ljungan virus (a possible cause of several human health conditions) found in Bank Voles (Myodes glareolus) and Yellow-necked Mice (Apodemus flavicollis) for the first time in Northern Italy. EWDA Conference 2-5th October 2008.


Alex Barlow, APHA Diseases of Wildlife Scheme

Calodium hepaticum diagnosed a European brown hare (EBH) (Lepus europaeus) in England.

Threat: Zoonotic, farmed and pet animal risk

Calodium hepaticum a zoonotic nematode, is found world-wide but has been only rarely reported in Great Britain (GB). The main hosts of the parasite are rodents, but disease is occasionally reported in other species, including man. The liver is the main organ parasitised and infection is passed on by predation or scavenging a dead infected host. The last report in a EBH in GB was in 1911. The recent case was an adult EBH admitted to a Wildlife Hospital but died overnight. The carcase was in very poor bodily condition. It had been frozen but firm pale extensive mottling of the liver was seen on examination. Histolopathology revealed marked autolysis and very large numbers of nematode eggs were present in the liver. The eggs were thick walled with bipolar plugs and were presumptively identified as C. hepaticum (Barlow & Mullineaux, 2018). A review of zoonotic infection indicated the incidence and prevalence world-wide in man is rather low, but it can cause severe hepatic infection resulting in death if misdiagnosed (Fueher and others, 2011).

References


Avian Reports

Wild Bird report from the IoZ

In Q2 2018, a total of 204 DIRs involving 378 birds (204 sick/174 dead) of 35 species were reported from 124 sites from England, Scotland, Wales and Northern Ireland. PMEs were performed on 43 birds of 19 species from 38 sites from England, Scotland and Wales.

Finch Trichomonosis – update

Summary including possible threats – Point for Information (PFI);

Threat to bird health, welfare, biodiversity and cause of considerable public concern

In Q2 2018, a suspected diagnosis of trichomonosis was assigned to 70 DIRs, involving 105 sick and 78 dead birds from 50 sites from England, Scotland, Wales and Northern Ireland. Further, trichomonosis was diagnosed in 26 birds (comprising seven species, predominantly chaffinches (*Fringilla coelebs*) and greenfinches (*Chloris chloris*) examined post-mortem from 21 sites from England, Wales and Scotland). As in Q1, this included a single hawfinch (*Coccothraustes coccothraustes*) from Wales, marking the third time IoZ have diagnosed trichomonosis in this species.

Psittacine Beak and Feather Disease (PBFD)

Summary including possible threats – Point for Information (PFI);

Threat to free-living ring-necked parakeet (*Psittacula krameri*) health and welfare; Potential threat to captive Psittacine health

A mortality incident involving one juvenile ring-necked parakeet from a site in Greater London, England, was reported in February 2018. Several macroscopic abnormalities were noted on PME, including mild feather dystrophy, pericardial effusion, blood vessel congestion, hepatomegaly and splenic pallor with small area of grey-black discolouration. Histopathological examination of tissues revealed intranuclear inclusion bodies in the liver and intracellular inclusion bodies in the feather follicles. A sample of liver submitted to an external laboratory tested PCR positive for beak and feather disease virus (BFDV) DNA. PBFD is well known as a cause of mortality of captive and wild psittacines around the world. We have previously confirmed PBFD in a RNP, also from Greater London, England (Sa et al., 2014). The presence of BFDV in free-living RNP could pose a disease threat to captive psittacines, therefore aviculturists are recommended to take appropriate biosecurity measures. Since GB has no native psittacine species, there are no known risks
from BFDV to native British birds: however, limited evidence of host switching has been observed in captive passerines in Australia; therefore, continued surveillance is worthwhile (Sarker et al., 2015).

References

https://www.gardenwildlifehealth.org/portfolio/psittacine-beak-and-feather-disease/


Wildfowl and Wetlands Trust (WWT) report:—April – June 2018

Passive surveillance of waterbirds

Post mortem examinations were performed on 54 wild birds which were found dead between April and June and 15 from the previous trimester. These comprised 19 species across seven WWT sites (Slimbridge, Gloucestershire; Arundel, West Sussex; London Wetland Centre, Greater London; Martin Mere, Lancashire; Welney, Norfolk; Caerlaverock, Dumfries & Galloway; and Steart Marshes, Somerset). The following species were examined: mallard (Anas platyrhynchos) (24), whooper swan (Cygnus cygnus) (7), coot (Fulica atra) (7), herring gull (Larus argentatus) (6), black-headed gull (Chroicocephalus ridibundus) (4) (note that many of the mainly juvenile gulls involved in the avian botulism outbreak were juveniles and were often in an advanced stage of decomposition), mute swan (Cygnus olor) (3), moorhen (Gallinula chloropus) (3), greylag goose (Anser anser) (2), common shelduck (Tadorna tadorna) (2), lapwing (Vanellus vanellus) (2), pink-footed goose (Anser brachyrhynchus) (1), Canada goose (Branta canadensis) (1), tufted duck (Aythya fuligula) (1), lesser black-backed gull (Larus fuscus) (1), rook (Corvus frugilegus) (1), blackbird (Turdus merula) (1), wood pigeon (Columba palumbus) (1), pheasant (Phaisanus colchicus) (1), sparrowhawk (Accipiter nisus) (1). The primary causes of death are summarised below (Table 1).

Traumatic injuries were the main cause of mortality, with 13 birds in total. Causes of trauma included predation, injury and suspected intra/interspecific aggression (the latter including 5 mallard which is typical at this time of year). Some nine mallard from one site were euthanised due to apparent blindness. Further research is required as this is a recurring problem and as yet the nature and aetiology of the condition is not fully
understood. Despite management to attempt to reduce risks, it is likely that the warm weather in this trimester has precipitated deaths attributed to avian botulism – a disease common in waterfowl species and gulls during such conditions. Some of the undiagnosed deceased birds are likely to have succumb also to botulism, given the species and time of the year (Duff et al. 2017), as the diagnosis is often achieved by discarding other pathological processes in combination with a history of flaccid paralysis (given the lack of pathognomonic post mortem findings).

Table 1. The primary causes of wild bird mortality (or morbidity requiring euthanasia) found at WWT reserves mainly between April and June 2018 (and 19 birds from the previous trimester); †n denotes juvenile birds, and number of juvenile birds.

<table>
<thead>
<tr>
<th>Primary cause of death</th>
<th>Total</th>
<th>Species (and notes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma</td>
<td>13</td>
<td>5 x Mallard, 2 x Moorhen, 2 x Coot, 1x Canada goose, 1 x Blackbird†1, 1 x Pink-footed goose, 1 x Greylag goose†1</td>
</tr>
<tr>
<td>Blindness*</td>
<td>9</td>
<td>9 x Mallard</td>
</tr>
<tr>
<td>Avian botulism</td>
<td>3</td>
<td>2 x Herring gull†2, 1 x Lesser black-backed gull, (plus the previously mentioned black-headed gulls)</td>
</tr>
<tr>
<td>Tape worm infestation</td>
<td>3</td>
<td>1x Mallard, 1x Herring gull, 2 x Black-headed gull†1, 1 x Coot</td>
</tr>
<tr>
<td>Coelomitis</td>
<td>3</td>
<td>1 x Black-headed gull†1, 1 x Whooper Swan, 1 x Greylag goose</td>
</tr>
<tr>
<td>Avian mycobacteriosis</td>
<td>3</td>
<td>2 x Coot, 1 x Tufted duck</td>
</tr>
<tr>
<td>Starvation</td>
<td>3</td>
<td>2 x Lapwing, 1 x Whooper swan</td>
</tr>
<tr>
<td>Necrotizing Enteritis</td>
<td>2</td>
<td>2 x Whooper Swan†1</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>2</td>
<td>1 x Mute Swan, 1 x Mallard</td>
</tr>
<tr>
<td>Drowned</td>
<td>2</td>
<td>1 x Mallard, 1 x Shelduck</td>
</tr>
<tr>
<td>Aspergillosis</td>
<td>2</td>
<td>2 x Whooper Swan</td>
</tr>
</tbody>
</table>
Parasite Infestation  2  1 x Mallard, 1 x Sparrowhawk
Cloacal Impaction  1  1 x Mallard
Hepatitis  1  1 x Mallard
Egg Coelomitis  1  1 x Mallard
Neoplasia  1  1 x Wood pigeon
Ascites  1  1 x Coot
Gastro-intestinal Obstruction  1  1 x Whooper swan
Other  5  1 x Rook, 2 x Mallard – splenomegaly and hepatomegaly; 1 x Coot – Gastric foreign body; 1 x Mallard – Septic osteolytic lesion in beak

No diagnosis (due to heavy predation, decomposition or lack of gross abnormalities)  12  3 x Herring gull†2, 3 x Black-headed gull, 2 x Mute Swan†2, 1 x Moorhen, 1 x Coot, 1 x Pheasant, 1 x Shelduck

*Animals were euthanized

**WWT**

Wild bird reports from Scotland

Trichomonosis and presumptive salmonellosis was diagnosed in an adult male greenfinch (*Carduelis chloris*) which was found dead at a bird feeder near Wick. At necropsy, body condition was poor, and the mucosa of the oesophagus and crop were covered in white plaques. The gastrointestinal tract was mostly empty. Histopathology found the affected mucosa to show erosion and necrosis, with numerous colonies of bacteria present within the lesions and occasional forms consistent with trichomonads. Intracellular bacteria in the lesions and furthermore in the liver and spleen were Gram-negative bacilli, consistent with suspected *Salmonella* species.

Salmonellosis was diagnosed in a male siskin (*Carduelis spinus*) which was one of a number of garden birds found dead near a feeder over a month in Perthshire, at a rate of around a bird per day. At necropsy, body condition was fair, and a necrotic-looking lesion
was seen in the larynx and pharynx. The oesophagus was unremarkable. The gastrointestinal tract was fairly empty apart from a few seeds. The intestines appeared inflamed. *Salmonella* Typhimurium ST19 (10,7,12,9,5,9,2) was isolated from the affected tissues.

These two cases were of interest due to the importance of monitoring *Salmonella* levels and the emergence or disappearance of different strains of this zoonotic pathogen in various species around Britain.

Louping ill and coccidiosis were diagnosed in a male adult red grouse (*Lagopus lagopus*) which was found live but debilitated on a hill road in Inverness-shire with bruising to the skin over the occipital region. At necropsy, body condition was good, further bruising was found over the medial aspect of the right thigh and left sacroiliac region. The crop and gizzard contained heather, and gross examination of the internal organs was unrewarding. The brain was grossly unremarkable. A wet preparation from intestinal content showed a high coccidial oocyst burden. Histopathology revealed a severe nonsuppurative encephalitis with vasculitis, perivascular cuffing and gliosis, virtually confined to the cerebrum, suggestive of a viral (or possibly protozoal) infection. The extent of the lesions in this bird was unusually severe. A severe enteropathy with heavy coccidial infection and cestodiasis was also noted. Heavy intestinal coccidial infection is unusual in an adult and suggests potential immunosuppression, perhaps related to the encephalitis. Louping ill virus RNA was detected in brain tissue. Louping ill is an OIE listed disease and is of economic concern to the viability of grouse rearing in Scotland as well as being a zoonotic disease.

**Reference**


Caroline Robinson, SRUC Veterinary Services

**APHA DoWS Report Wild birds**

**Threats – mild biodiversity threats; public concern related to deaths observed in botulism outbreaks (occasionally with press coverage).**

**Failure of gull colonies in the North of England**

Failure of a 3000-pair breeding colony of lesser black-backed gulls (*Larus fuscus*) prompted the submission of 13 chicks of varying ages. The consistent finding was death due to trauma caused by a predator. The severe point haemorrhages, usually in the area of the back, and the lack of paired puncture wounds, all suggested an avian rather than a mammalian predator. This was supported in that several birds had point (focal) wing
wounds (gulls will use their beaks to catch other gulls by the wing) and, in a small number of cases, there was evidence of evisceration per vent. APHA DoWS have not reported evisceration as a cause of death before in wild birds, however it is a cannibalistic vice seen relatively frequently in domesticated poultry, so perhaps all birds have the behavioural potential to attack other birds in this way. The reason behind these attacks is not known, starvation has been found in the colonies in previous years but was not apparent this year. Fencing had been used around the colony to control fox and badger predation, which also supported the strong suspicion that deaths were being caused by intra-species (within, or among, gull species) aggression. Avian Influenza virus was not detected.

Suspected avian botulism in Cumbria

APHA Penrith VI Centre received four carcasses and one live mallard (*Anas platyrhynchos*) from a mass mortality event (MME) in Cumbria where over 100 waterbirds of different species started to die at the beginning of July 2018. The duck showed clinical signs typical of avian botulism including a reluctance to walk, using its wings when it did try to walk, difficulty standing up, loss of limb tone, inability to hold its wings close to the body, and prolapse of the third eyelid (the nictitating membrane). Avian Influenza Virus infection was excluded by testing and the remaining birds had no diagnostic pathology. Avian botulism was suspected from the clinical history. Throughout July 2018, on a national basis, APHA has received multiple submissions of waterbirds where Avian Influenza has been excluded and avian botulism is suspected on the basis of flaccid paralysis (floppy clinical signs) clinical presentations. The high number of outbreaks may have been associated with the very warm summer weather which encouraged water eutrophication and toxin production. There is no sensitive laboratory test in this country for the toxin in wild birds and as a result diagnosis is largely based on the clinical history. Several outbreaks involved more than 50 deaths and where these occurred on public waterways such as in public parks, there was often public concern, as APHA has noted in outbreaks in previous years. In the current outbreak the losses started to decline after 3 weeks. The organisation responsible for the water body used hoses in the water to improve water circulation and oxygenation and this may have reduced the number of deaths.


DoWS also produced an article on recognition of the disease at [http://dx.doi.org/10.1136/vr.j3069](http://dx.doi.org/10.1136/vr.j3069)

Wild waterbird ‘mass mortality event’ submissions - suspect botulism

Since the beginning of July 2018 there have been increased reports of dead waterbirds often associated with public lakes in urban areas, canals and reservoirs where public have access. Multiple submissions have been received at APHA.
Members of the public are encouraged to report the finding of dead wild waterbirds (swans, geese or ducks) or other dead wild birds such as gulls or birds of prey in England to the Defra Rural Services Helpline on 03000 200 301 (see page 4 of this Report for other regions and details). Some of these birds are then collected and screened for Avian Influenza, and postmortem examinations are carried out.

Where sick birds have been seen recently, the signs described include weakness, lethargy and flaccid paralysis before death. Several have been euthanased. An above average number of carcasses have been received for examination at APHA, (see some examples in table 1). Avian Influenza has not been detected and in the majority of cases birds have been in adequate body condition but have not been recently feeding. One submission of live birds had classical symptoms of avian botulism and avian botulism was suspected on the basis of clinical history in many of the other cases.

An increase in number of cases is likely to be due to the prolonged hot, dry weather this summer which will favour environmental conditions in static water bodies inductive to botulism outbreaks. *Clostridium botulinum* is an anaerobic bacteria that multiplies in putrefying plants and animal material and is therefore often found in lakes and waterbodies in periods of anoxic conditions, poor water quality and when water levels are abnormally low. There have been several discussions with town councils, park keepers and others regarding controlling and preventing the disease.

Advice about avian botulism outbreaks and recognising avian botulism in waterfowl can be found in the links above:
Table: Wild water bird submissions to APHA Shrewsbury VI Centre – July 6th to August 9th 2018

<table>
<thead>
<tr>
<th>Location (County)</th>
<th>Habitat</th>
<th>Species Affected</th>
<th>Mortality (number reported)</th>
<th>Number of carcasses received</th>
<th>Comments*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater Manchester</td>
<td>Reservoir</td>
<td>Canada goose</td>
<td>60</td>
<td>5</td>
<td>Botulism suspected</td>
</tr>
<tr>
<td>Lancashire</td>
<td>Lake, town public lake</td>
<td>Canada goose</td>
<td>1</td>
<td>1</td>
<td>In progress</td>
</tr>
<tr>
<td>Cumbria</td>
<td>Lake</td>
<td>Mallard, Canada goose, gull sp.</td>
<td>40 ducks and geese</td>
<td>4</td>
<td>Botulism suspected</td>
</tr>
<tr>
<td>Yorkshire</td>
<td>Lake, town public park</td>
<td>Canada geese, Mallard duck</td>
<td>60+ mostly Mallards</td>
<td>4</td>
<td>Botulism suspected</td>
</tr>
<tr>
<td>Greater Manchester</td>
<td>Canal, marina</td>
<td>Canada goose</td>
<td>3</td>
<td>1</td>
<td>Botulism suspected</td>
</tr>
<tr>
<td>North Wales</td>
<td>Beach</td>
<td>Herring gull</td>
<td>5</td>
<td>4</td>
<td>Aspergillosis suspected in one gull</td>
</tr>
<tr>
<td>Devon and Somerset</td>
<td>Reservoir</td>
<td>Herring gull</td>
<td>17</td>
<td>2</td>
<td>Aspergillosis suspected in one gull</td>
</tr>
<tr>
<td>Greater Manchester</td>
<td>Lake, town public park</td>
<td>Mallard ducks, Canada geese</td>
<td>10+</td>
<td>5</td>
<td>Botulism possible</td>
</tr>
<tr>
<td>Lancashire</td>
<td>Canal, town centre</td>
<td>Mallard duck</td>
<td>12</td>
<td>1</td>
<td>Botulism possible</td>
</tr>
<tr>
<td>Norfolk</td>
<td>Lake, town centre</td>
<td>Mallard duck</td>
<td>3</td>
<td>3</td>
<td>Botulism possible</td>
</tr>
<tr>
<td>Greater Manchester</td>
<td>Town boating lake</td>
<td>Canada geese</td>
<td>10+</td>
<td>5</td>
<td>Botulism possible</td>
</tr>
<tr>
<td>Merseyside</td>
<td>Lake, town public park</td>
<td>Mallard duck</td>
<td>10 approx</td>
<td>1</td>
<td>Botulism suspected</td>
</tr>
<tr>
<td>Merseyside</td>
<td>Lake, town public park</td>
<td>Mallard duck</td>
<td>17</td>
<td>1</td>
<td>Botulism suspected</td>
</tr>
<tr>
<td>Lancashire</td>
<td>Canal</td>
<td>Mallard duck</td>
<td>12+</td>
<td>11</td>
<td>Botulism possible</td>
</tr>
<tr>
<td>Cheshire</td>
<td>Canal</td>
<td>Feral duck,</td>
<td>5</td>
<td>1</td>
<td>In progress, botulism possible</td>
</tr>
<tr>
<td>West Midlands</td>
<td>Lake, town public park</td>
<td>Mixed species</td>
<td>20</td>
<td>1 (Mallard)</td>
<td>Decomposed, no diagnosis.</td>
</tr>
<tr>
<td>Lancashire</td>
<td>Lake, urban</td>
<td>Canada geese, ducks, crows</td>
<td>40</td>
<td>3</td>
<td>Possible botulism</td>
</tr>
<tr>
<td>Cumbria</td>
<td>Reservoir</td>
<td>Black-headed gull</td>
<td>8</td>
<td>1</td>
<td>No diagnosis, decomposed</td>
</tr>
<tr>
<td>Location (County)</td>
<td>Habitat</td>
<td>Species Affected</td>
<td>Mortality (number reported)</td>
<td>Number of carcases received</td>
<td>Comments*</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------</td>
<td>-----------------------------------</td>
<td>------------------------------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lancashire</td>
<td>Lake, town public park</td>
<td>Mallard, Herring gull, corvid sp, moorhen,</td>
<td>10+</td>
<td>5</td>
<td>Aspergillosis suspected in Herring gull Botulism possible in ducks</td>
</tr>
<tr>
<td>Greater Manchester</td>
<td>Lake, town public park</td>
<td>Mallard duck, Canada goose</td>
<td>4</td>
<td>4</td>
<td>Botulism possible</td>
</tr>
<tr>
<td>Lancashire</td>
<td>Canal</td>
<td>Ducks, Canada goose</td>
<td>6</td>
<td>5</td>
<td>Decomposed</td>
</tr>
<tr>
<td>Greater Manchester</td>
<td>Canal</td>
<td>Mute swan, Duck</td>
<td>2</td>
<td>1</td>
<td>Decomposed</td>
</tr>
<tr>
<td>Oxfordshire</td>
<td>Lake (fishing)</td>
<td>Mallard ducks, coot, grebe</td>
<td>12</td>
<td>1</td>
<td>Botulism suspected from history, one swan alive</td>
</tr>
<tr>
<td>West Midlands</td>
<td>Lake, town public park</td>
<td>Mallards and Canada geese</td>
<td>10</td>
<td>7</td>
<td>Botulism suspected</td>
</tr>
<tr>
<td>Lincolnshire</td>
<td>River, near town centre</td>
<td>Ducks</td>
<td>30</td>
<td>9</td>
<td>Possible botulism</td>
</tr>
<tr>
<td>London</td>
<td>Lake, public country park</td>
<td>Canada geese and coot</td>
<td>6</td>
<td>2</td>
<td>Decomposed</td>
</tr>
<tr>
<td>West Midlands</td>
<td>Lake, city public park</td>
<td>Gulls, mallard, Canada Geese</td>
<td>14</td>
<td>2</td>
<td>Decomposed</td>
</tr>
<tr>
<td>Greater Manchester</td>
<td>Canal</td>
<td>Canada geese, ducks</td>
<td>7</td>
<td>5</td>
<td>Decomposed</td>
</tr>
<tr>
<td>Cheshire</td>
<td>Lake</td>
<td>Ducks, heron</td>
<td>32</td>
<td>2</td>
<td>Limited history, botulism not ruled out</td>
</tr>
<tr>
<td>Greater Manchester</td>
<td>City centre river</td>
<td>Various water birds</td>
<td>21</td>
<td>1(pigeon)</td>
<td>Fractured wing</td>
</tr>
<tr>
<td>West Midlands</td>
<td>Lake, city public park</td>
<td>Canada geese and mute swans</td>
<td>20</td>
<td>3</td>
<td>Botulism suspected</td>
</tr>
<tr>
<td>Cheshire</td>
<td>Lake</td>
<td>Various water birds</td>
<td>200</td>
<td>14</td>
<td>In progress</td>
</tr>
<tr>
<td>South Yorkshire</td>
<td>Lake, public</td>
<td>Ducks</td>
<td>3</td>
<td>2</td>
<td>Decomposed</td>
</tr>
</tbody>
</table>

*Botulism suspected: clinical history and lack of other gross diagnosis,

*Botulism possible: limited history and lack of other diagnoses following gross PME

APHA DoWS Paul Holmes, APHA Shrewsbury
UK Priority and Conservation Concern Species

Mammal reports

APHA Diseases of Wildlife Scheme

Wild Mammal report from the IoZ

Encephalomyocarditis virus in Hazel dormice (*Muscardinus avellanarius*) reintroduced in England

Summary including possible threats – Point for Information (PFI);

Conservation reintroduction, animal welfare and conservation concern

Fifteen cases of respiratory disease were detected between 2001 and 2014 in free-living hazel dormice (*Muscardinus avellanarius*) submitted for PME to the IoZ, as a component of post-release health surveillance. Lung samples from seven of these were submitted to the APHA in May 2018 and next generation sequencing on a pooled sample revealed an encephalomyocarditis virus (EMCV). One of the sequences detected closely matched (94%) an EMCV from Germany detected in a wood mouse (*Apodemus sylvaticus*) (Philipps et al., 2012).

This appears to be the first time EMCV has been detected in a *Muscardinus* sp., although it was detected in edible dormice (*Glis glis*) in Tuscany in the 1990s: a strain that was lethal to mice and cytopathogenic to baby hamster kidney cells in laboratory experiments (Carpaneto & Cristaldi, 1995). EMCV has a wide host range among domestic and wild animals and a worldwide distribution (Spyrou et al., 2004). Small rodents (especially rats) are known to be reservoir hosts/carriers, but (in a laboratory setting) mice, gerbils and hamsters are highly susceptible (Doi, 2011).

Follow up research will aim to determine the distribution of EMCV in the free-living dormouse population, and to what extent the virus is associated with disease in this species.

References


**Bird reports**

**Wildfowl and Wetlands Trust Translocation projects**

**Project Godwit**

Project Godwit aims to increase the size and range of the breeding population of (currently declining) black-tailed godwits (*Limosa limosa limosa*) in the UK, and is predominantly situated on the Ouse and Nene Washes in East Anglia. In 2017 the disease risk analysis was completed, and was used to inform this year’s health management for the breeding season which involves a head starting programme whereby eggs are collected and birds reared to ~ 1 month old when they are released. This reducing losses due to predation, inclement weather, starvation and disease and so increases productivity significantly. Despite the extremely poor condition of some of the eggs at collection (literally dug out of the mud in some circumstances) there was high hatchability. Strict biosecurity measures were implemented throughout the egg collection, hatching, rearing and release phases. Disease screening in headstarted birds included targeted surveillance for AIVs (at APHA) – for which all birds were negative, and pooled faecal samples from the birds’ outdoor aviaries for bacteriology (*Campylobacter* sp. detected) and parasitology. No infectious diseases of concern were detected and 38 young birds were successfully reared to release.

Amongst the wild bird sightings, there were eight black-tailed godwits which had been released during the 2017 season, and having migrated to Portugal/west Africa for the winter had returned to the area. Two of these birds nested and produced chicks, which is uncommon for first year adults and a good sign of success of the project so far.

**Great Crane Project**

There are no surveillance results to report this quarter. In terms of the project as a whole, of the Eurasian cranes (*Grus grus*) released as part of the Great Crane Project 19 pairs (out of 33 pairs) made breeding attempts, a significant increase from last year’s 10 pairs. 13 pairs hatched at the first attempt, with two more pairs succeeding at the second laid
clutch. Although the total number of chicks is difficult to establish, at least 16 chicks have been reared. This increase in breeding success from the released birds further strengthens the wild population of common crane in South West of the UK.

Reference


WWT

Wild bird reports from Scotland

Trichomonosis ("frounce") was diagnosed in a six-month-old male satellite-tagged hen harrier (*Circus cyaneus*) found dead in Orkney four days after its tag raised suspicions of death. At necropsy, body condition was poor and there was yellow, crumbly, inspissated material at the base of the oesophagus with surrounding inflammation. The gastrointestinal tract was mostly empty. Examination of a Giemsa stained smear of crop content revealed occasional structures with the appearance of *Trichomonas gallinae*.

The opportunity was also taken to test for evidence of exposure to anticoagulant rodenticides. The analysis confirmed the presence of residues of brodifacoum, bromadiolone and difenacoum in liver tissue, with the bromadiolone residue at a level usually thought to be significant. However, in this case there was no evidence of haemorrhaging to substantiate a diagnosis of death due to rodenticide toxicity and, given the very poor body condition and the evidence of recent lack of feed intake, trichomonosis was identified as the likely cause of death.

This case was of interest because of the red-list status of the species affected, the current controversy in the media regarding the reasons for harrier scarcity and breeding failures, and because trichomonosis is a significant cause of mortality in wild birds in the UK.

Caroline Robinson, SRUC Veterinary Services

Amphibian reports

Amphibian reports from the IoZ

In Q2 2018, a total of 160 disease incident reports (DIRs), involving 1016 individual amphibians (234 sick/782 dead), were reported from 117 sites from England, Scotland and
Wales. The majority of reports were of anurans only: 128 DIRs involving common frogs (*Rana temporaria*) from 99 sites (83 of which had multiple mortalities), seven DIRs involving common toads (*Bufo bufo*) from separate sites (two of which had multiple mortalities). 25 reports involved urodeles: eight DIRs involving 14 smooth newts (*Lissotriton vulgaris*) from seven sites, 13 DIRs involving 32 palmate newts (*Lissotriton helveticus*) from four sites, and four DIRs involving single newts of unknown species from four sites.

Post-mortem examinations (PMEs) were conducted on 42 amphibians, comprising: 29 common frogs from 24 sites from England, Scotland and Wales; five common toads from three sites from England; four palmate newts from one site in England; three smooth newts from two sites from England; and one newt of unknown species from a site in England.

**Chytrid fungi and ranavirus surveillance**

*Batrachochytrium salamandrivorans* (Bsal); potential threat to newt health, welfare and biodiversity if Bsal becomes established in the wild in GB;

*Batrachochytrium dendrobatidis* (Bd); threat to amphibian health, welfare and potential threat to biodiversity;

**Ranavirus threat to amphibian health, welfare and biodiversity**

In Q2 2018, skin swabs and liver samples were taken from each of the 42 amphibians examined post-mortem for real-time duplex PCR screening for Bd/Bsal and real-time PCR for ranavirus, respectively. All samples tested negative for Bd/Bsal. Three samples tested positive for ranavirus DNA: two common frogs from a single site (total observed mortality 12 dead) from England, and a common frog from a single site (total observed mortality 2 dead) in England. These three common frogs had lesions consistent with ranavirus disease, including petechial skin haemorrhages and skin ulceration.

Ranavirus disease, most often caused by frog virus 3-like clade strains of ranavirus, is known to be widespread in England and Wales (Price *et al*., 2017). Common frogs are most frequently affected during the summer months, and this disease has been shown to cause long-term population declines at breeding ponds in this amphibian species (Teacher *et al*., 2010).

Bsal is considered a significant threat to native urodele biodiversity, in particular the great crested newt (*Triturus cristatus*), in which Bsal-associated chytridiomycosis is known to be fatal. As Bsal has been confirmed in captive amphibians in GB, we continue to engage in heightened surveillance for Bsal, prioritising investigation of newt mortality incidents, and remain vigilant for possible incursion of Bsal into free-living urodele populations in GB.

**References**


**Ranid herpesvirus skin disease surveillance**

**Summary including possible threats – Point for Information (PFI);**

**Threat to amphibian health**

In 2018, a syndromic diagnosis of ranid herpesvirus skin disease (based on set incident definitions) was assigned to disease incident reports (DIRs) (11 sick/two dead) from six separate sites from England.

Common frogs with ranid herpesvirus skin disease develop proliferative grey or white-coloured raised skin lesions, often described as candle wax-like in appearance (Image 1.).

Whilst there have been sporadic reports of this condition in GB since the 1990s, understanding of the geographical distribution and epidemiology of ranid herpesvirus disease in Europe remains limited. Our surveillance over the past 20 years indicates that herpesvirus skin disease, due to ranid herpesvirus 3 infection, is endemic in common frogs in GB, with widespread distribution at apparently low prevalence, and a pronounced seasonal peak during the early spring (Franklinos *et al.* in press). Field observations indicate that the skin lesions typically regress in affected frogs, and recurrent infection at sites may occur but it is unknown if the virus negatively impacts populations.

**Reference**

common frogs (Rana temporaria) in Great Britain. *Diseases of Aquatic Organisms* (In press)

IoZ
Annexe

VIDA diagnoses are recorded on the APHA FarmFile database and SRUC Veterinary Services LIMS database and comply with agreed diagnostic criteria against which regular validations and audits are undertaken.

The investigational expertise and comprehensive diagnostic laboratory facilities of both APHA and SRUC Veterinary Services are widely acknowledged, and unusual disease problems tend to be referred to either. However recognised conditions where there is either no diagnostic test, or for which a clinical diagnosis offers sufficient specificity to negate the need for laboratory investigation, are unlikely to be represented. The report may therefore be biased in favour of unusual incidents or those diseases that require laboratory investigation for confirmation.

APHA VICs have UKAS Accreditation and comply with ISO 17025 standard. SRUC Veterinary Services has UKAS accreditation at their central diagnostic laboratory and at the Aberdeen, Edinburgh, Perth, Ayr, Dumfries, Inverness, St Boswells and Thurso Disease Surveillance Centres which comply with ISO 17025 standard.
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APHA is an executive agency of the Department for Environment, Food & Rural Affairs, and also works on behalf of the Scottish Government and Welsh Government.