GB Wildlife Disease Surveillance Partnership Quarterly Report

Quarterly Report: Vol 22 : Q4 October – December 2017

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Highlights

- HPAIV H5N6 in wild waterbirds in England (January 2018) 3
- British breeding greenfinch – it could be an endangered species 9
- Mass mortality of gulls due to suspected fishery by-catch 11

VIDA diagnoses are recorded on the APHA FarmFile database and SAC Consultancy: 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 SAC C VS 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. SAC C VS have 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.
INTRODUCTION

The GB Wildlife Disease Surveillance Partnership comprising the Animal and Plant Health Agency (APHA), Scottish Agricultural College Consulting (SAC Consulting), 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:

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

OVERVIEW

Issues and trends
Although it did not occur during the report quarter, the most important recent event is the incursion of highly pathogenic avian influenza virus (HP AIV) H5N6 in wild birds in England. Initial findings are reported here.

Paul Duff, APHA Diseases of Wildlife Scheme (DoWS)

NOTIFIABLE DISEASE

Avian Influenza Virus

Great Britain AI Wild Bird Surveillance (AIWBS): October - December 2017

Total wild bird surveillance
The detection of Avian Influenza in wild birds in Europe has remained at a lower level through the fourth quarter of 2017 in comparison to winter 2016. Of 229 wild birds tested under the surveillance scheme, two birds, submitted on 4th & 8th December 2017 were reported positive (a whooper swan found in Lancashire and a barnacle goose found in Dumfries & Galloway). Both birds were influenza A positive but H5 negative. Wild bird surveillance remained heightened with a continued reduction in threshold numbers for target species.

Table 1: Number of wild birds tested and results in GB – 4th 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>
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<tr>
<td>Found dead/injured</td>
<td>229 (221)</td>
<td>One whooper swan (Cygnus cygnus) and one barnacle goose (Branta leucopsis) (influenza A positive, H5 negative)</td>
<td>Increased level scanning surveillance all-year-round</td>
</tr>
</tbody>
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*Number of birds tested (figure may be slightly different from other reports due to exact query run on dataset). figures for Q4 2016 are shown in brackets.

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

Warden Patrol Scheme
The main emphasis 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 October – 31st December (Q4-2017), a total of 452 Warden Patrols were performed at sites across GB. This compares with a total of 497 Warden Patrols performed during the same period in 2016 (Q4-2016) in GB. During Q4-2017, the Warden Patrols were mainly performed by Natural England...
and the Wildfowl and Wetlands Trust. Warden Patrols were also carried out by seven other voluntary organisations. In total during Q4-2017, 86 wild birds found dead and 75 were tested, with two AI detections (noted above). This compares with a total of 99 wild birds found dead (81 of which were tested with seven detections of H5N8) during the same period of 2016. In Q4-2017, whooper swans were the most common target species found, and birds were most commonly found in the East region with none submitted from the Midlands and Wales. This was similar as for Q4-2016.

**Current EU situation**

During winter 2017, H5 HPAI detections have continued to be reported across Europe; most notably HPAI H5N6 in northern and central Europe, and HPAI H5N8 in poultry in Northern Italy. APHA, in collaboration with Defra, monitors the international situation and distribution of avian influenza detections: [https://www.gov.uk/government/collections/animal-diseases-international-monitoring](https://www.gov.uk/government/collections/animal-diseases-international-monitoring).

**H5N6**

A distinct new wave of infection in winter 2017/18 began with a case on a commercial duck farm (16,000 birds) in the Netherlands. Suspicion of disease was recognised on 7th December, and confirmation of HPAI H5N6 infection was notified the following day. On the 15th December the Netherlands investigated suspicion of disease in a captive bird holding, which comprised both anseriforme and gallinaceous poultry, HPAI H5N6 was confirmed on 20th December. The Netherlands reported four separate disease events in wild mute swans (*Cygnus olor*); two events on the 9th December involving one lone swan found dead and six swans found dead together, one event on the 14th December where one swan was found dead and one event on the 18th December comprising four swans found dead. Switzerland reported one mute swan (*Cygnus olor*) found dead on 18th December. Further detections of HPAI H5N6 in wild birds have been made in Switzerland, Germany and the United Kingdom (Jan 2018).

**Current UK Situation**

The last reported outbreak of HPAI H5N8 in poultry was confirmed on the 3rd June 2017 in South Norfolk. There have been no further reports of HPAI H5N8 in poultry and the UK CVO declared the UK free of HPAI as of 13th September 2017. At the time of writing there is an Avian Influenza Prevention Zone in England and Wales following the incursion of HPAI H5N6 in wild birds (Jan 2018). To date, there have been no reports of H5N6 in poultry in the UK.


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 hours facility on the same number for reporting suspicion of disease in animals.

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](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):

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

**References**


Rowena Hansen, Avian Virology, APHA Weybridge
Joanna Tye, Data Systems Group, APHA Weybridge

**Wildfowl and Wetlands Trust’s (WWT) role in GB Avian Influenza Wild Bird Surveillance (AIWBS): October–December 2017**

**SUMMARY: Threats - HPAIV, targeted active surveillance of wetland birds**

As part of the GB AIWBS, the WWT continued monitoring for avian influenza in wild birds this quarter, at its nine wetland reserves, through the Wild Bird Surveillance programme (a minimum of one weekly patrol was conducted on 8 reserves, and ad hoc patrols were conducted at WWT’s managed wetland Steart Marshes). Between October and December 2017, 93 dead waterbirds were found at WWT sites, 83 of which were sampled for avian influenza virus, from seven sites (in Gloucestershire, West Sussex, Greater London, Norfolk, Lancashire, Tyne & Wear and Dumfries & Galloway). The sampled birds comprised 14 surveillance-priority waterbird species, including swans, geese, ducks, gulls, rails, plus two Eurasian sparrowhawks (*Accipiter nisus*). Those which were not sampled were either inaccessible, heavily predated upon, or in an advanced state of decomposition. All samples tested negative for highly pathogenic avian influenza (HPAI) viruses. Samples from three waterbirds (whooper swan (*Cygnus cygnus*), shelduck (*Tadorna tadorna*) and barnacle goose (*Branta leucopsis*)) tested non-negative, non-H5. See APHA report for fuller details of HPAI surveillance results from across the UK.

**WWT**
ZOONOTIC DISEASES

APHA Diseases of Wildlife Scheme (DoWS); Salmonellosis in wildlife;
October – December 2017

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 birds this quarter. Also there were no reports of bird variant S. Typhimurium DT40, 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 game bird isolates were excluded. All are from England and Wales.

No salmonella infections were identified by DoWS this quarter.

Alex Barlow, APHA Diseases of Wildlife Scheme

APHA Salmonella reports for 2017

No Salmonella species were isolated from any wildlife species submitted to APHA Diseases of Wildlife Scheme this year. Last year we had a typical case of Salmonella Typhimurium Copenhagen in goldfinches (Carduelis carduelis) but it is possible that the decline in finch numbers due to trichomonosis could be a reason for lack of carcases this year. Our partners, Garden Wildlife Health (GWH) carry out the majority of disease surveillance in garden birds and hedgehogs and report salmonella isolations separately. The GWH is a collaborative project between ZSL, the British Trust for Ornithology (BTO), Froglife and the Royal Society for the Protection of Birds, and is part funded by Defra, Welsh Government and the Animal and Plant Agency (APHA) Diseases of Wildlife Scheme (DoWS). Bird variant S. Typhimurium DT40 was isolated from a six week-old warmblood filly foal and S. Typhimurium DT40 was also isolated from two game farms hatching/rearing pheasants. There were no reports of bird variant S. Typhimurium DT56 or DT56v from domestic species.

Alex Barlow, APHA Diseases of Wildlife Scheme

IoZ; Salmonellosis in wildlife;
Zoonotic bacterial infections in Western European hedgehogs (Erinaceus europaeus)

Summary including possible threats – Point for Information (PFI);
Public health and animal welfare concern

Hedgehog populations in GB are in decline and we continue to prioritise investigations into whether infectious or non-infectious disease may be a contributing factor. Additionally, there are several reports of zoonotic diseases originating from hedgehogs in Europe highlighting their potential impact on public health.

In 2017, we received 126 Disease Incident reports (DIR) of hedgehogs (143 animals; 28 sick/115 dead) from 114 sites, of which 27 reports (30 animals; 4 sick/26 dead) were in Q4 (from 26 sites). We conducted a total of 56 PMEs on hedgehogs in 2017 (11 in Q4) from across England, Scotland and Wales. For the hedgehogs where the cause of death could be diagnosed on PME, 45% (15/33) had died due to an infectious disease, 16 due to trauma and/or predation, and two due to malnutrition. Several zoonotic pathogens were isolated:

i. In 2017, a Salmonella sp. was isolated from five hedgehogs in which it was considered to have contributed to the cause of death.

Salmonella infections are commonly reported in European hedgehogs from Britain and continental Europe; however, the impact on public health and on animal welfare and conservation are unknown. To address this knowledge gap, in collaboration with Public Health England, and eight wildlife casualty treatment and rehabilitation centres across GB, we conducted a large-scale investigation of Salmonella infections in British hedgehogs, 2012-2015 (Lawson and others, in press). Two biotypes of Salmonella Enteritidis sequence type 183 were isolated which formed two distinct clades on phylogenetic analysis. Phage type (PT) 11 was the most frequent, has been previously reported in hedgehogs from GB and mainland Europe, and is considered likely endemic.
PT11 was associated with a range of disease presentations and may also be carried without apparent disease. A novel PT66 was isolated from hedgehogs in southern and central Scotland only, which may suggest a recent emergence event: the affected hedgehogs had a severe disease presentation with abscessation of internal lymph nodes. Phylogenetic analysis indicated that hedgehog and human isolates with matched *S. Enteritidis* biotypes originate from a common population. Evidence that human infection with these ST183 biotypes is non-foodborne included stronger correlation between geographic and genetic distance, and significantly increased likelihood of infection in rural areas, than for the more common ST11. These results are consistent with hedgehogs acting as a source of zoonotic infection and highlight the need for sensible hygiene precautions (e.g. wearing gloves) for people with direct or indirect contact with hedgehogs, and washing hands after feeding hedgehogs or outdoor play, to reduce the risk of exposure. Nevertheless, it is important that the risk is kept in perspective since these hedgehog-associated biotypes accounted for only 0.6% of reported human *Salmonella* infections over the period January 2006 – December 2015 in England and Wales.

ii. *Yersinia pseudotuberculosis* was isolated from a hedgehog with evidence of systemic disease from West Yorkshire in Q1 in. With yersiniosis being the fourth most commonly reported food-borne zoonosis in humans in Europe, hedgehogs should be considered as a source of infection, although the prevalence of the pathogen in this species in GB is currently unknown.

iii. *Listeria monocytogenes* was isolated from two hedgehogs that were examined in Q1 and Q4 2017, but found dead in East Sussex in June 2016 and in Denbighshire in March 2016, respectively. These *L. monocytogenes* isolates add to the previous three cases of infection that were detected in hedgehogs in 2013, 2015, and 2016, and are currently under further investigation.

iv. *Streptococcus dysgalactiae* ssp. *equisimilis*, *Pasteurella multocida* and *Candida albicans* were isolated from the lungs of an adult female hedgehog that died in West Sussex in February 2017. Whilst histopathological examination of the lung tissue revealed the presence of intralesional bacteria of mixed appearance, the advanced state of autolysis hindered interpretation of these findings and it is uncertain which of these pathogens was of the greatest significance. However, as mentioned in Q1, to our knowledge, *S. dysgalactiae* ssp. *equisimilis* has been isolated from various domestic and wild animal species, but not previously from a hedgehog.

As a consequence of the above and other pathogens with zoonotic potential that can be found in hedgehogs, through our Garden Wildlife Health project, we continue to routinely advise general hygiene precautions for people handling these animals, such as wearing gloves when in contact with animals or potentially infectious materials.

References

Report from Wildlife Zoonoses and Vector Borne Disease Research Group; 4th Quarter October – December 2017

SUMMARY - THREAT: Zoonotic, farmed, pet animal and international trade risk

Passive surveillance for lyssaviruses in UK bats
Thirty one wild bat and five zoo bat carcasses were tested at APHA in this quarter for lyssaviruses 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. One Aye Aye (Daubentonia madagascariensis) which had died in quarantine was negative for lyssaviruses.

WNV surveillance in wild birds SV3045
West Nile Virus (WNV) surveillance in dead birds re-commenced in April, to coincide with candidate vector activity season. Brain and kidney tissues from 196 wild birds representing 38 species received between 1st October and 31st December 2014 from APHA regional laboratories, SAC and from The Institute of Zoology, Garden Wildlife Health project were tested by real time RT-PCR for West Nile virus with Negative results.

West Nile virus surveillance in Equids
Between 1st October 2014 and 31st December 2014 one equine serum sample was tested by cELISA for WNV as part of differential diagnosis of neurological disease and was found to be negative.

Reference
Suspect West Nile encephalitis in a horse imported into the UK from Europe.
Paul Phipps, Wildlife Zoonoses and Vector Borne Disease Research Group, APHA Weybridge

Usutu virus surveillance
Summary including possible threats – not present in the UK but potential threat for introduction
Horizon scanning for Usutu virus; potential threat to blackbird and owl health and biodiversity if Usutu becomes established in the wild in GB
As mentioned in Q2, Usutu virus has been detected in multiple countries in mainland Europe since 2001, most recently in The Netherlands in 2016. As blackbirds (Turdus merula) are the wild bird species most frequently involved in multiple mortality incidents caused by Usutu virus, horizon scanning, and investigation of the aetiology of blackbird mortality reports remains a high priority for early detection in the event of viral incursion to GB. Mosquito species that are known to act as vectors for the virus are present in GB, but no cases of Usutu virus infection have been detected to date. Thirty five reports involving sick or dead blackbirds were received in 2017, four of them in Q4. PMEs were performed on 11 blackbirds, submitted from nine sites in England. Brain and kidney samples were submitted routinely to APHA laboratories for panflavirus real-time PCR testing from all 83 garden birds of 31 species examined between April and November 2017, inclusive.

References
Garden Wildlife Health Usutu virus factsheet (https://www.gardenwildlifehealth.org/portfolio/usutu-virus/)
IoZ
ONGOING NEW AND RE-EMERGING DISEASES, UNUSUAL DIAGNOSES AND HORIZON SCANNING

MAMMAL REPORTS

Wild mammal reports from Scotland

A first instar Hypoderma diana larva was found under the skin of a shot five-year-old red deer stag (Cervus elaphus) during field butchering. The larva caused concern to the gamekeeper, who submitted it for identification, since a type of warble fly (H. bovis) is a notifiable disease in cattle in Scotland, and there were cattle in the area. The larva was confirmed to be H. diana and not H. bovis. Cysticercus tenuicollis cysts, the larval stage of the tapeworm Taenia hydatigena, were identified in a year-old roe deer which was shot and butchered. Multiple cysts and a degree of peritonitis were reported, and the cysts were submitted for identification due to concerns about human consumption of the meat. Appropriate advice was provided.

Male psuedohermaphroditism was diagnosed in a four to five-year-old red deer (Cervus elaphus) which was shot during a cull. The deer had symmetrical, well developed antlers and no obvious external penis or scrotum. The reproductive tract grossly consisted of a large, protruding clitoris, a cervix and uterus which led into a vagina with a blind caudal end, and intra-abdominal gonads which were situated in an ovarian position but which resembled testes with poorly developed epididymi. Histopathology confirmed testicular tissue but lacking in spermatogenesis. The uterus showed a well-defined endometrium. The penis/clitoris contained transitional epithelium indicating urethral formation. The testes appear to have produced enough testosterone for grossly normal antler growth. This case is of interest as it is the first report we are able to find of hermaphroditism in this species.

Caroline Robinson, SAC Consulting Veterinary Services

APHA DoWS

Wild mammal reports from APHA DoWS

Rabbit haemorrhagic disease2 (RHD2) in wild rabbits (Oryctolagus cuniculus)

Summary – suspected epizootic of RHD2 in wild (and domesticated) rabbits in GB

RHD 2 was diagnosed in a wild rabbit from East Anglia, from a population which had thought to have declined over the summer of 2016 and during 2017 (there was also thought to be a decline in the local hare population). One animal was found and submitted during November. Post mortem examination revealed haemorrhages in the lung and abdominal musculature, a friable liver was also found. Testing of the liver by PCR for RHDV nucleic acid gave a positive result and subsequent sequence analysis indicated the presence of RHDV2 RNA. As commented in recent wildlife quarterly reports, it is generally considered that, at present, an epizootic of RHD2 is significantly reducing wild rabbit populations in Great Britain. The majority of affected rabbits die underground in warrens and as a result, estimating prevalence and local mortality is a challenge.

Badger (Meles meles)

Summary – awareness of unusual case. Found dead between two dairy farms.

Severe purulent pneumonia and septicaemia caused by Streptococcus equi-zooepidemicus was diagnosed in an adult female badger in East Anglia. These lesions probably arose from a neck abscess, the likely result of an old bite wound.

Hare (Lepus europaeus) – Summary - awareness.

Emaciation and death in a brown hare was considered to be secondary to significant abscessation of one kidney and both lung fields. The likely causative bacterium was Staphylococcus xylosus. Staphylococcal infections may arise from the skin or may also arise from tick bites.

Deer - Summary - awareness and differential diagnosis for notifiable disease (bovine tuberculosis).

Severe, chronic bronchopneumonia and pleurisy caused by Trueperella pyogenes infection was diagnosed in an adult roe deer (Capreolus capreolus). T pyogenes infection is often predisposed by concurrent disease, so to be thorough, a differential stain for mycobacteria was carried out. This gave a negative result.
Avian Reports

Wild Bird report from the IoZ

Finch trichomonosis
Summary including possible threats – Alert;
Biodiversity threat to British populations of greenfinch with continued significant population decline, animal welfare, cause of considerable public concern

Trichomonosis remains the most frequently diagnosed fatal infectious disease of garden birds examined at the IoZ, accounting for 38% of all wild bird post-mortem examinations in 2017 (51/133 birds). Finches remained the species in which this disease is most often diagnosed: 18 greenfinches (Chloris chloris) from 15 sites; five goldfinches (Carduelis carduelis) from five sites; 13 chaffinches (Fringilla coelebs) from 11 sites; one bullfinch (Pyrrhula pyrrhula); six siskins (Spinus spinus), four collared doves (Streptopelia decaocto), two feral pigeons (Columbia livia) and one woodpigeon (Columba palumbus) from seven individual sites, and one sparrow hawk (Accipiter nisus). Indeed, 35% (343/968) of all wild bird disease incident reports were suspected to be due to finch trichomonosis, based on the finch species involved and the clinical signs observed.

Finch trichomonosis, an emerging infectious disease first recognised in GB in 2005, has resulted in ongoing epidemic mortality of British greenfinches with a population decline of 59% (Massimino et al., 2017). A recent study by Stanbury and others (2017) reviewed British wild bird population trends using the IUCN extinction risk criteria (which considers population change over a decade) applied on a national basis and concluded that the British population of breeding greenfinches would now be classified as Endangered as a result of this decline.

We continue to provide the public with information on best practice for garden bird feeding and on the signs of ill health in affected birds to promote vigilance. In 2017, our Garden Wildlife Health Finch Trichomonosis factsheet was updated with additional guidance, produced in consultation with the APHA, BTO and RSPB, in an attempt to further reduce the opportunities for parasite transmission between birds of the same or sympatric species.

References

IoZ

Wildfowl and Wetlands Trust (WWT) report: October – December 2017
Passive surveillance of waterbirds

Post mortem examinations have (to date) been performed on 47 of the wild birds found dead between October and December 2017, comprising 12 species across seven WWT sites (in Gloucestershire, West Sussex, Greater London, Lancashire, Norfolk, Dumfries & Galloway and Somerset)(post mortem examinations are conducted once birds have tested negative for AI). The species were: whooper swan (17), mute swan Cygnus olor (7), Canada goose Branta canadensis (1), greylag goose Anser anser (1), mallard Anas platyrhynchos (8), black-headed gull Chroicocephalus ridibundus (4), coot Fulica atra (1), moorhen Gallinula chloropus (3), herring gull Larus argentatus (2), black-tailed godwit Limosa limosa (1), kitiwake Rissa tridactyla (1), and wood pigeon Columba palumbus (1). The primary causes of death are summarised below (Table 2).

Trauma was the most common (confirmed or suspected) cause of mortality, being diagnosed in 16 (34%) of birds: this included four cases of suspected predation, and three swans (two mute swans and one whooper) that had collided with powerlines. One greylag goose, and possibly one whooper swan, appeared to have been shot. Avian mycobacteriosis was associated with the
death of five (11% of) birds, all of which were mallards (of these, two were euthanased and three were found dead).

Table 2. The primary causes of mortality (or morbidity requiring euthanasia) in wild birds found dead on WWT reserves between October and December 2017. *n denotes euthanased birds, and number of birds euthanased; †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>
</table>
| Trauma                 | 16    | 6 x Whooper swan (*Cygnus cygnus*)†³ – 1 powerline collision; 1 possible shot  
3 x Mute swan†¹ – 2 powerline collisions  
3 x Moorhen (*Cygnus olor*)†² – 2 predated  
1 x Coot(*Fulica atra*) – predated  
1 x Greylag goose (*Anser anser*) – shot  
1 x Herring gull (*Larus argentatus*)  
1 x Black-tailed godwit (*Limosa limosa*) – predated |
| Avian mycobacteriosis  | 5     | 5 x Mallard (*Anas platyrhynchos*)*² |
| Aspergillosis          | 3     | 2 x Whooper swan  
1 x Mallard |
| Gizzard impaction      | 1     | 1 x Whooper swan |
| Heart worm             | 1     | 1 x Whooper swan – multiple heart worms in cardiac muscle |
| Parasite infestation (other) | 1 | 1 x Mallard – severe proventriculitis |
| Renal failure          | 1     | 1 x Black-headed gull (*Chroicocephalus ridibundus*) – visceral gout |
| Trichomonas            | 1     | 1 x Wood pigeon (*Columba palumbus*) |
| Tumour                 | 1     | 1 x Kittiwake (*Rissa tridactyla*)*¹ – tumour over left alula |
| Other                  | 4     | 2 x Black-headed gull – 1 foreign body ingestion, 1 abscess  
1 x Herring gull – foreign body ingestion |
Targeted surveillance for *Sarcocystis* in wildfowl

A web-based surveillance reporting system for *Sarcocystis* sp. infection of wildfowl (www.sarcocystissurvey.org.uk) began in September 2015 as a collaborative project between WWT, the University of Liverpool, and the British Association for Shooting and Conservation (BASC). The *Sarcocystis* sp. parasite causes ‘rice breast disease’ in these species, so-called for the distinctive lesions which appear as pale cylindrical cysts in muscle tissue, commonly the breast. Numbers of cases reported per shooting season have increased year on year since 2015 (>90 cases reported to date) which may reflect awareness of the reporting mechanism and general awareness of the disease but a questionnaire survey of wildfowlers suggests a real increase in cases.

Cases are widely distributed in the UK, being reported in 10 wildfowl species (mainly dabbling ducks). From analysis of affected tissues undertaken with the Royal Veterinary College, DNA sequencing of the 18S rRNA gene and ITS-1 region of UK isolates, confirm the presence of *Sarcocystis rileyi* which has been described in wildfowl within the flyway in recent years Kutkienė (2011), Prakas et al. (2014) and Gjerde (2014)). Myopathy was associated with this infection in some of the tissues examined although further research is required to understand impacts of the disease on survival.

**References**


**Wild bird reports from Scotland:**

Corvid respiratory syndrome was diagnosed in a rook (*Corvus frugilegus*) which was reported to the police following observed respiratory distress. At necropsy, brown discharge was observed around the nares, body condition was poor, there was necrotic debris around the tongue and fibrinopurulent airsacculitis were noted. *Pasteurella multocida* was isolated from lung tissue. This case caused concern to the member of public who reported it to police.

Trichomoniosis was diagnosed in a sparrowhawk (*Accipiter nisus*) which was found dead. At necropsy, body condition was poor and a round, raised lesions with a semi-solid yellow caseous core was observed to occlude the oesophageal lumen at the level of the thoracic inlet. The gizzard was empty and atrophied. Histopathology found large numbers of trichomonads in the necrotic lesions, consistent with trichomoniosis, most likely due to T. gallinae. This case caused concern to the member of the public who reported it, due to media publicity about raptor persecution.

**Caroline Robinson, SAC Consulting Veterinary Services**
APHA DoWS Report Wild birds

Mass drowning of herring gulls (*Larus argentatus*)
Summary including possible threats – Alert; Possible welfare implications.

A mass mortality, of fish (sardine/pilchard-type), herring gulls (about 50) and a common dolphin (*Delphinus delphis*), was reported on a beach in south Cornwall. It is suggested that the gulls were by-catch in the nets of local fishermen, although gulls are surface feeders, so how they were caught in nets is not clear. There is a possibility that gull by-catch in specific nets used in the area is a regular occurrence but may not be usually reported. Another suggestion from locals that this was caused by lightning strike and gale-force winds. Five herring gulls, two immature and three adult, were submitted to APHA as part of an investigation into this mass mortality. All these birds were in good bodily condition and the gross pathology was consistent with drowning (see Simpson and Fisher (2017)). Routine screening for AIV was carried out but no virus was identified.

Mute swan mortality
Summary including possible threats – for awareness
Submitted as part of AIV monitoring – all cases tested for AIV

Incursions of Highly pathogenic avian influenza virus (HPAIV) H5N6 first occurred in England during January 2018 (see previously, APHA AIV reports). At the time of writing there have been three incidents, in the southern half of England, in a range of wild waterbird species with a strong likelihood of more incidents to follow. For details of birds affected please see the appropriate Defra website.

A significant number of wild swans (*Cygnus olor*) were submitted during the quarter. This will reflect both the current concerns associated with HPAIV H5N6 incursion into Europe and England together with the relatively severe winter weather this year. Mute swans die from starvation and malnutrition in hard winters, and concurrent disease such as infectious and parasitic diseases probably take a larger toll on the swan populations.

Proventriculitis in mute swans due to *Echinuria* sp. parasitism

Emaciation this winter has been a feature in adult mute swans primarily due, one suspects, to difficulties finding appropriate vegetative foodstuffs. In addition, in several submissions, parasitic proventriculitis due to suspected *Echinuria* sp. parasitism has been diagnosed (see photo right). Avian schistosomiasis was also suspected, on histopathological findings, in three mute swans from differing locations, it is not known how clinically significant this disease is. Necrotic enteritis is usually rapidly fatal and was diagnosed in three separate submissions. Heavy leech infestation of nasal airways in a malnourished swan caused by *Protoclepsis tasselata* was not thought to be contributing to the bird’s poor condition. Several swans with chronic parasitism also had concurrent amyloidosis usually affecting kidney or liver. Avian tuberculosis was seen in two separate submissions from the South of England. Among non-infectious disease, two fishhooks embedded in the oesophagus was seen in one bird, predation with likely tooth holes along the neck in one bird, traumatic injury due to likely airborne collision was seen in two birds and two further birds died from lead poisoning confirmed by tissue analysis.
Starling mass mortality

**Summary – mass mortality of starlings occasionally causes public concern**

Nine starlings (*Sturnus vulgaris*) were found dead at the base of a fence in the Midlands. One bird was still actually caught in the fence. All tested negative for AIV. The findings indicated death was due to trauma with the birds flying into the fence during a gathering/murmuring.

Miscellaneous cases

**Summary – awareness, some submitted as part of AIV monitoring**

Very similar pox-type lesions were seen in a magpie (*Pica pica*) and manx shearwater (*Puffinus puffinus*) both of which came from the same wildlife rescue centre. Attempts are being made to characterise the causative orthopoxvirus. A barn owl (*Tyto alba*) was submitted alive but weak to a veterinary practice. The feathers and all soft tissue from the middle part, only, of one wing had been removed leaving only the humerus and ulna bones intact and unbroken. Despite interviewing the people finding the bird no likely cause was found. Oral trichomonosis was suspected in three collared doves (*Streptopelia decaocto*) found in a mass mortality incident that also involved jackdaws. Jackdaws are not known to contract this disease commonly but unfortunately no jackdaws were submitted.

Reference

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5639757/pdf/12917_2017_Article_1214.pdf
APHA DoWS

**UK Priority and Conservation Concern Species**

**Disease Risk Analysis and Health Surveillance (DRAHS)**

**Summary including possible threats – conservation translocation and conservation concern**

The Disease Risk Analysis and Health Surveillance (DRAHS) partnership (Zoological Society of London/Natural England) are currently carrying out comprehensive disease risk analysis for the forthcoming conservation translocations of the hen harrier (*Circus cyaneus*), chequered skipper (*Carterocephalus palaemon*) and natterjack toad (*Epidalea calamita*), and undertaking disease risk management and post-release disease surveillance translocations of Fisher’s estuarine moth (*Gortyna borelii*), short-haired bumblebee (*Bombus subterraneus*), wart-biter cricket (*Decticus verrucivorus*), pool frogs (*Decticus verrucivorus*), sand lizards (*Lacerta agilis*), comcrakes (*Crex crex*) and dormice (*Muscardinus avellanarius*).

IoZ
MAMMAL REPORTS

Cholecystitis and hepatic necrosis in Eurasian otters (*Lutra lutra*)
Summary including possible threats – Point for Information (PFI);
Conservation concern, Zoonotic threat.

Fixed liver samples, showing gross lesions seen on post-mortem examination, were submitted from two dog otters from The Otter Project, Cardiff University. The Otter Project runs a long term environmental surveillance scheme, using otters found dead to investigate contaminants, disease, and population biology across the UK. The death of one of these, weighing 9.32kg, was thought to have been predisposed by hepatic failure caused by severe chronic bile fluke infestation. These “found dead” otters are usually rather autolysed and are frozen, with thawing before examination, so tissues are not surprisingly very autolytic. However there was evidence of hepatic fibrosis, bile duct hyperplasia and probable hepatic necrosis. Clumps of large numbers of operculate eggs were seen (see above and left). Similar pathology but no eggs were seen in the liver section of the other otter, which weighed 9.22kg. This animal died as the result of an RTA. Both these otters were from Somerset. The Somerset Otter Group is active in monitoring bile fluke infestation on the Somerset Levels (Gentner). The gross and histopathology are consistent of chronic infestation with bile fluke, a digean fluke, presumptively identified as (*Pseudamphistomum truncatum*) as described by Vic Simpson and others (2005). It should be noted that another digenean *Metorchis bilis* occurs in England (Sherrard-Smith and others, 2009) but it is very rare in Somerset, compared to *P. truncatum*. It also should be noted that both *P. truncatum* and *M. bilis* are zoonoses.

Reference


Simpson, V.R., Gibbons, L.M, Khalil, L.F. and Williams, J.L (2005) Cholecystitis in otters (*Lutra lutra*) and mink (*Mustela vison*) caused by fluke *Pseudamphistomum truncatum*. Veterinary Record 157 (2) 49-52

Alex Barlow, APHA Diseases of Wildlife Scheme
Chadwick, The Otter Project, Cardiff University
Cryptosporidiosis in young hedgehogs (Erinaceus europaeus)
Summary including possible threats - conservation concern and public and livestock health concern

Fresh faecal samples were submitted from young hedgehogs (Erinaceus europaeus) with a continuing problem of diarrhoea at two wildlife hospitals, which regularly submit wildlife specimens to the APHA Diseases of Wildlife Scheme. One of these centres had a problem with diarrhoea in hedgehogs last year caused by Salmonella Enteritidis phage type 11. However this year no Salmonella species were isolated from either wildlife hospital. No worm eggs or coccidial oocysts were identified but cryptosporidia were present in stained faecal smears from in ten samples. Representative samples were submitted to the Cryptosporidium Reference Unit in Wales and these were identified as Cryptosporidium parvum gp60 lldA19G1. Fixed intestinal samples had also been submitted with the faecal samples from one hospital, where cases with severe unresponsive diarrhoea had been euthanased. Marked villus stunting and clubbing was seen in sections of the small intestine and cryptosporidia were readily identified on the surface enterocytes. In one highly parasitised case, cryptosporidia were also seen in the large intestinal crypts (see figure; red arrows indicate cryptosporidia). Cryptosporidium parvum gp60 lldA19G1 is a subtype that also can be found in humans and farmed livestock (Sangster and others, 2016).

Reference;

Alex Barlow, APHA Diseases of Wildlife Scheme
Rachel Chalmers, Cryptosporidium Reference Unit, Public Health Wales

Hepatic lipidosis in common pipistrelle bats (Pipistrellus pipistrellus)
Unusual clinical disease was reported in hospitalised common pipistrelle bats. The affected bats became progressively weaker, ate less food or refuse food and if they ate food, it was frequently regurgitated. Clinical signs lasted approximately three days, although the timing was variable and the affected bats died. The significant histological change seen in two bats examined was hepatic lipidosis. No predisposing causes were identified. However similar liver changes have been reported in insectivorous bats as a response to periods of inappetence and/or stress (Gozalo and others (2005)) and (Snyder and others (2015)).

References;

Alex Barlow, APHA Diseases of Wildlife Scheme
Red Squirrels (*Sciurus vulgaris*)

**Summary including possible threats - threat to biodiversity**

Red squirrels were submitted from North Wales, and a further case of squirrelpox virus infection was confirmed in one animal, which also had adeno virus nucleic acid detected by PCR in intestinal content. Recent publications by APHA demonstrate that the presence of grey squirrels (*Sciurus carolinensis*) and both these viruses, in this area, represents a significant threat to the slowly expanding red squirrel population. In Cumbria, two cases of squirrelpox were diagnosed in the isolated and threatened population of red squirrels in the Grasmere area. This population numbers approximately twenty individuals and is in contact with grey squirrels. Without further resource to manage the grey population, the red squirrels there face an uncertain future.

In an unrelated case of adenovirus enteritis in North Cumbria, histopathology revealed typical intestinal pathology of the disease including villus enterocytes with variable attenuation and prominent intra-nuclear inclusion bodies. This, to our knowledge, is only the second time that squirrel adenovirus intestinal pathology has been demonstrated; it is one thing to isolate the virus pathogen but another to show the microscopic lesions produced by the virus in the intestine, particularly in a free-living animal found in the wild, where tissues are often severely autolysed.

**APHA Diseases of Wildlife Scheme**

**BIRD REPORTS**

**Red kite (*Milvus milvus*) surveillance**

**Summary including possible threats – Point for Information (PFI); Animal welfare and conservation concern**

Our recently published paper in the European Journal of Wildlife Research (Molenaar et al., 2017) reviewed post mortem examinations on 162 red kites (*Milvus milvus*) found dead between 1989 and 2007. Toxicological analysis on 110 of these red kites confirmed poisoning in 32 cases, including second generation anti-coagulant rodenticides (SGARs) (n=19), pesticides (n=9) and lead (n=6). A further eight kites had levels of SGARs above the recognised toxic threshold of 110 ng/g but without visible haemorrhages. Our more recent findings indicate SGARs are continuing to be associated with death in a high proportion of red kites. Of 15 red kites submitted for post-mortem examination in 2016 and 2017, six birds (40%) had extensive internal haemorrhaging consistent with SGAR toxicity (SGAR levels will be tested) and a further three birds had SGAR levels above the toxic threshold but without visible haemorrhage. It is noteworthy that four of these 15 red kites also had signs of shooting injury (gunshot pellets in the carcass), three of which were historic and unlikely to have contributed to the death of the bird but suggest continued persecution of this species.

**References**


**Great Crane Project**

Faecal screening of samples from a roosting area of Eurasian cranes (*Grus grus*), released as part of the Great Crane Project, in Somerset, was conducted in October and December. In October, 3/10 samples were positive for *Eimeria* spp. and/or other unidentified coccidial oocysts, 5/10 samples were positive for nematode ova and 3/10 for *Campylobacter* spp.; in December, 5/10 samples were positive for *Eimeria* sp. and/or other unidentified coccidial oocysts, 3/10 samples were positive for nematode ova, and 8/10 for *Campylobacter* sp. Adult survival remains high, with four chicks fledged this year (a number of chicks did not make it to fledging) taking the total of surviving fledged young to 11 to date.

**WWT**
AQUATIC ANIMAL DISEASES

Summary including possible threats – Alert. Culture of an opportunistic bacterial pathogen

Grey seal (*Halichoerus grypus*) septicaemia

Two female grey seal pups that were found stranded on different beaches in the West Country died shortly after being rescued. One was in good bodily good but had healing puncture wounds on both sides of the front flippers and on its neck. Gross post-mortem findings were of a purulent cellulitis and with likely secondary septicaemia. This was confirmed with the isolation of *Providencia rettgeri* in septicaemic distribution. The other pup was in poor bodily condition but gross post-mortem findings were limited and non-specific. However again *P. rettgeri* septicaemia was confirmed. *P. rettgeri* is an opportunistic pathogen.

**APHA Diseases of Wildlife Scheme**

James Barnett, British Divers Marine Life Rescue

**Wild Wrasse disease surveillance; Threats; Biosecurity of salmonid fish farms**

Wild caught wrasse (in particular, ballan wrasse *Labrus bergylta*) from southwest England are increasingly being translocated for use as cleaner fish for sea lice removal in farmed Atlantic salmon reared in sea pens. Relatively little is known about their parasite/pathogen fauna in native populations and of potential risks to farmed and wild fish stocks once translocated. Ballan wrasse captured in South west England (n=47) were examined for the presence of infectious disease. No significant gross pathology was observed in sampled fish. Pathogens found in the sampled specimens were the ectoparasites sealice, *Cryptocaryon*-like ciliates, and the bacteria *Photobacterium damselae* which was confirmed in a single fish and was associated with necrotic changes in the spleen and gonad (ovary, see above right). Coccidiosis was detected in the intestinal epithelium of 18/47 Ballan wrasse examined (see left). Intensity of infection was low and host response was limited in most cases. Further work on establishing the identity of this parasite is underway.

Steve Feist, CEFAS
AMPHIBIAN REPORTS

Chytrid fungi and ranavirus surveillance

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

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

Ranavirus threat to amphibian health, welfare and biodiversity

In 2017, a total of 157 disease incident reports (DIRs) of sick or dead amphibians, involving 1213 individuals (340 sick/873 dead), were received from 113 sites from England, Scotland and Wales. The majority of reports involved anurans (from 101 sites of which 50 sites had multiple mortality incidents). Post-mortem examinations (PMEs) were conducted on 53 amphibians from 37 sites, which comprised various species including the common frog (26 PMEs), common toad (*Bufo bufo*) (14 PMEs), common midwife toad (*Alytes obstetricans*) (one PME), smooth newt (*Lissotriton vulgaris*) (four PMEs), great crested newt (*Triturus cristatus*) (one PME) and eight newts for which the species could not be identified due to advanced carcass decomposition.

Skin swabs were collected from each amphibian examined for real-time duplex PCR screening for chytrid fungi (*Batrachochytrium dendrobatidis* (*Bd*) and *B. salamandrivorans* (*Bs*)): a single common toad from a site in Kent tested positive for *Bd* in Q1 and all other samples tested negative, with two results still pending. *Bd* infection has a widespread but patchy distribution in GB: the common toad and natterjack toad (*Epidalea calamita*) are native species known to be susceptible to fatal disease with this pathogen which represents a threat to amphibian welfare and may adversely impact biodiversity.

To date, *Bs* has only been confirmed in captive amphibians in GB and has not yet been detected in the wild. Vigilance for possible incursion of *Bs* into free-living amphibians in GB continues as a scanning surveillance priority. *Bs* is considered a significant threat to native species biodiversity and animal welfare, particularly to the great crested newt, which is known to be susceptible to fatal *Bs* infection.

As mentioned in Q3, the IoZ is a partner in a European Commission project entitled, ‘Mitigating *Batrachochytrium salamandrivorans* in Europe’ and passed a “ring test” for the detection of *Bs* infection using qPCR.

A suspected diagnosis of ranavirus disease, based on set incident definitions, was assigned to nine DIRs in 2017 that fulfilled these criteria, all of which involved common frogs (*Rana temporaria*). Liver samples were collected from all amphibians examined post-mortem (where the state of carcass preservation permitted collection) for screening using a real-time PCR for ranavirus developed at the IoZ (Leung and others, 2017): one sample from a common frog was found to be PCR positive in August 2017, as reported in Q3, and results are still pending from two cases.

As mentioned in Q2, a study to characterise the ranavirus lineages present in British amphibians using post-mortem tissues archived over 25 years, found that two of 41 confirmed incidents were caused by common midwife toad virus (CMTV)-like *Ranavirus* and the remainder were due to frog virus 3 (FV3)-like virus (Price and others, 2017). This finding demonstrates that CMTV-like viruses have been in Britain for at least a similar period of time to FV3-like viruses, which have been known to affect wild amphibians in Britain since at least the early 1990s. Whole-genome sequencing is required to further characterise the relationship between the two British CMTV-like viruses to strains found in mainland Europe. This will enable greater understanding of the risk posed by incursion of virulent strains such as the CMTV-like viruses found in Spain, which have generated concern due to their considerable population impacts. See Q2 for more details.

References


IoZ
REPTILE REPORTS

First detection of snake fungal disease (SFD) in European wild snakes

Summary including possible threats – Alert;

Animal welfare and possible conservation concern

In 2017, a total of 10 reptile DIRs involving 12 individual snakes (1 sick/11 dead) were received from nine sites across England. PMEs were conducted on five animals from individual sites (one grass snake (Natrix helvetica), three adders (Vipera berus) and one slow worm (Anguis fragilis)). All snakes were screened for Ophidiomyces ophiodiicola, the causative agent of snake fungal disease (SFD), using real-time PCR. As mentioned in Q2, this disease was recently confirmed for the first time in European wild snakes and is known to cause skin disease in grass snakes in GB (Franklinos et al., 2017; see Q2 2017).

As reported in Q3, the grass snake found in Wiltshire in July 2017 with skin lesions consistent with SFD was submitted for PME; infection with O. ophidiicola was subsequently confirmed by qPCR and SFD was confirmed on histology. The samples from the three adders tested PCR negative for O. ophidiicola.

The impact of SFD on the health of native grass snake populations and whether it is a native or introduced pathogen requires further research through enhanced surveillance of wild snakes. Additionally, a new study from the United States of America (USA) showed that host species for SFD are both phylogenetically and ecologically randomly dispersed and that key information regarding the individual and species’ susceptibility of snakes is yet unknown (Burbrink and others, 2017). We continue to prioritise surveillance of wild snakes to gain a better general understanding of the potential impacts of SFD on British wild snake populations. A PhD position entitled ‘Population drivers, demographics and disease in wild snake populations’ is currently advertised to assist in this regard.

References
