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### HIGHLIGHTS

- **Zoonotic disease**: EBLV-2 in grounded Daubenton's bat.
- **Emerging disease reports**:
  - Continuing decline of Greenfinch population due to trichomoniosis.
  - Traumatic death of adult osprey at wind farm.
- **Risks to priority species**: No evidence yet of *B. salamandrivorans* in GB.
- **Mass mortality incidents**: Water bird botulism.

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VIDA diagnoses are recorded on the APHA FarmFile database and SAC Consulting 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 Consulting 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 Veterinary Investigation Centres and SAC Veterinary Surveillance Centres have UKAS Accreditation and 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 Food and Environment Research Agency (Fera now incorporated into APHA), the Centre for Environment, Fisheries and Aquaculture (CEFAS), the Wildfowl and Wetlands Trust (WWT), Natural England (NE) and the Forestry Commission England (FCE) produces the GB Wildlife Disease Surveillance Partnership Quarterly Reports. The details of the individual partners’ areas of surveillance and research can be found at:- http://www.defra.gov.uk/ahvla-en/files/pub-gbbsp.pdf

* APHA which began on 1st October 2014 is a combine agency comprising the AHVLA and four functions of Fera (Bee Inspectorate, Plants Health and Seeds Inspectorate, Plant Variety and Seeds Group and GM Inspectorate).

NOTIFIABLE DISEASES

H5N8 HPAI outbreaks in Europe

During November 2014 outbreaks of H5N8 Highly Pathogenic Avian Influenza (HPAI) have been officially reported in poultry flocks in Germany, the Netherlands and the UK (Defra, 2014; OIE, 2014). In the UK, one H5N8 HPAI outbreak was officially confirmed on a duck breeder premises in East Yorkshire on the 16th November 2014. The outbreaks in each country represent different poultry species and production systems, and whilst the detected H5N8 HPAI viruses are similar (but not identical), no discernible epidemiological links have been reported to date between them. Statutory sanitary disease control measures are in place on all affected holdings.

Since January 2014 H5N8 HPAI viruses have been detected from multiple poultry outbreaks in the Republic of Korea as well as poultry in China and Japan. Infection has also been detected from wild birds (species of ducks, swans and geese) in these countries. Furthermore, on 22nd November 2014 the German Ministry of Agriculture announced that a common teal (Anas crecca) tested positive for H5N8 HPAI virus. The healthy teal had been shot outside a risk area (50km radius) around the H5N8 HPAI outbreak on the affected turkey farm in north-east Germany. This bird was sampled as part of an active wild bird monitoring programme carried out by the German Federal state of Meccklenburg-Western Pomerania.

Wild birds have been postulated as one of several possible routes for the introduction of the disease into poultry in the affected countries. Therefore, the veterinary authorities in affected Member States are undertaking epidemiological investigations and enhancements to existing avian influenza wild bird surveillance activities to help understand risk pathways for source and spread of H5N8 HPAI virus infection. To date, the source of the H5N8 HPAI outbreak in the UK has not been definitively confirmed. Members of the public are also asked to remain vigilant for any wild bird mass mortality incidents and report these to the Defra Helpline: 03459 33 55 77 or 08459 33 55 77. All poultry keepers are also advised to maintain robust biosecurity measures, vigilance for clinical signs of disease and to promptly report suspect cases of notifiable avian disease to a local APHA office.

APHA office contact details and further information about avian influenza, the current outbreak and when and how to register your poultry flock are available on the APHA website: https://www.gov.uk/government/organisations/animal-and-plant-health-agency.

Great Britain AI Wild Bird Surveillance (AIWBS): July – September 2014

H5N1 Highly Pathogenic Notifiable Avian Influenza (HPNAI) was not detected from any of the 205 found dead wild birds tested in Great Britain (GB) during the quarter. Evidence of low pathogenic avian influenza virus (LPAIV) infection was detected from three wild birds that were found dead (Table 1). Investigations also included at least twelve different mass mortality incidents (defined as five or more wild birds of any species at any location in GB) involving wild waterfowl, of which the majority were attributed to avian botulism and also attracted local media interest. The last detection of H5N1 HPNAI in
wild birds in GB was during January-February 2008, from ten Mute swans (*Cygnus olor*) and one Canada goose (*Branta canadensis*) in South Dorset (Defra 2008).

### Table 1: Number of wild birds tested and results in GB – 3rd 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</td>
<td>205 (89)</td>
<td>Influenza A virus positive (not H5)†, 2x Mallard ducks (<em>Anas platyrhynchos</em>); 1x Little Tern (<em>Sternula albifrons</em>)</td>
<td>Scanning surveillance, all-year-round, including Warden Patrols.</td>
</tr>
</tbody>
</table>

* Number of birds tested during July - September 2013 shown in brackets.
†Influenza A virus infection refers to the detection of influenza A viral RNA by Matrix (M) gene RRT-PCR test in samples from this bird. H5 and N1 RRT-PCR testing and attempted virus isolation in SPF embryonated fowls' eggs were negative. The Mallard ducks were found dead by Warden Patrols in different locations. The Little Tern was reported by a member of the public as part of a mass mortality incident.

During October 2010 Defra revised AIWBS approaches in GB following changes to European Commission guidelines. 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 01 July to 30 September 2014 (Q3-2014), 148 Warden Patrols were performed at sites in ten counties across GB, principally by the Wildfowl and Wetlands Trust (WWT; n=137). A further eleven patrols were performed by two wildlife trusts. In total, 27 wild birds found dead were tested for AI with evidence of infection detected in two Mallard ducks from separate locations (Table 1). During the same period last year 143 patrols were performed and 17 found dead wild birds were tested, with negative AI results. During Q3-2014, birds were most commonly found in the South East and South West regions of England and Mallard ducks comprised approximately two-thirds of the target species tested.

Members of the public are also asked to remain vigilant for mass mortality incidents and report these to the Defra Helpline: 03459 33 55 77 or 08459 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. Further information is available at:


### References


Avian Virology, APHA Weybridge
Wildfowl and Wetlands Trust's (WWT) role in GB Avian Influenza Wild Bird Surveillance (AIWBS)- July - September 2014
As part of the GB AIWBS, WWT conducted at least weekly patrols of its eight GB wetland reserves. Twenty-eight dead birds from eight species were reported from five reserves. Whooper swan Cygnus cygnus (1), western greylag goose Anser anser (1), mallard Anas platyrhynchos (18), European green-winged teal Anas crecca (2), coot Fulica atra (2), water rail Rallus aquaticus (1), herring gull Larus argentatus (1), and black-headed gull Chroicocephalus ridibundus (2). Cloacal and buccal swabs from all birds were submitted to AHVLA for virological examination. No AIVs were found.

WWT Slimbridge

ZOONOTIC DISEASES
Salmonellosis in wildlife
There is no routine monitoring of Salmonella in wild birds or wild mammals. Therefore all isolates are usually from clinical cases, although Salmonella may often not be the primary cause of disease. Two badger (Meles meles) cubs were submitted to investigate wasting and death in badger cubs at a wildlife rescue centre. One cub was dehydrated and there were scant contents within the gastrointestinal tract. The most notable finding in the other was marked jaundice and hepatomegaly. Large numbers of coccidia were seen in a faecal sear of the former and low to moderate numbers in the latter. Salmonella Newport was isolated on direct culture from the intestinal contents of both. However an untypable Salmonella species was isolated from the jaundiced liver. This would suggest that there was an underlying enteric salmonellosis and coccidiosis in these cubs but that the jaundiced cub had a concomitant salmonella septicaemia. Advice was given regarding zoonotic risks and general cleansing and disinfection between groups of badger cubs to prevent cross-infection.

A Eurasian siskin (Spinus spinus) that had been found dead in a garden was examined. Thick caseous material was present in the crop suggestive of trichomonosis. This was confirmed as large numbers of flagellate protozoa were seen in the crop contents. Also Salmonella Dublin was been isolated after enrichment from the intestinal contents. Salmonella Dublin is usually associated with infection in cattle. It is possible that this bird has become infected through contact with cattle or cattle faeces as there were several farms near the house, despite a request no further birds were submitted. Over the last ten years we have occasionally isolated this salmonella species from wild birds and mammals. Advice was given and an advisory leaflet was sent to the home-owner.

An adult and a juvenile European herring gull (Larus argentatus) were submitted to investigate a higher than usual mortality rate at a wildlife rescue centre. 54 birds and mammals had died since early July. A variety of species of birds have been found dead in pens. Some had shown mild respiratory signs. No cause of death was determined for the adult bird. In the juvenile gull, evidence of trauma to the head probably associated with pecking was found. Salmonella Typhimurium (untypable) was isolated from the intestinal contents suggesting that salmonellosis was a concurrent clinical disease. It was recommended that other birds at the centre were swabbed, and from 8 samples another S Typhimurium isolate was made. It was advised that spread of the pathogen could occur among animals unless strict hygienic precautions were practiced. It was also pointed out that handling and treating birds could pose a risk of salmonellosis to the Centre staff and again attention to appropriate standards of hygiene was important.

There were five disease incidents this quarter on game bird farms associated with bird variant Salmonella Typhimurium (Copenhagen) DT40. One of these was in red-legged partridges (Alectoris rufa). 150 dead were reported dead in a group of 4000 of 13-14 weeks of age. Five birds were examined from which Salmonella Typhimurium DT40 was isolated. The other incidents were in pheasants (Phasianus colchicus). All involved some degree of mortality and wasting and this salmonella phage type was isolated from either birds or cultures submitted by private laboratories. The youngest batch, a flock of 18,000, were affected at seven days of age; the next of 3,000 of which 1,000 had died was eight days old. The third group of 17,000 was 15 days old and wasting was a consistent feature, no further history was given for the oldest batch of 21 days. Salmonellosis was suspected by the PVS as the cause of high mortality in the eight day old birds and this had been confirmed by a private laboratory before a subculture was submitted to the AHVLA for routine confirmation and serotyping of the isolate. No notifiable disease was suspected in this case.
There were no isolations of bird variant S. Typhimurium DT56 or DT56 from wildlife or domestic species during July - September 2014. It is suggested that host adapted salmonellae from garden birds may be a source of infection for domesticated species. 

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

**APHA Wildlife Group**

**Salmonellosis report from Scotland**

_Salmonella_ Dublin was isolated from an adult male badger (_Meles meles_) which was found dead in the road with no obvious injuries. Body condition was very poor and the animal weighed 7kg. The prescapular lymph nodes were enlarged, as was the spleen, and the faeces were fluid. Large areas of fly-strike were seen over skin defects or lacerations over the dorsum, which appeared to be pre-mortem. _S. Dublin_ was isolated from the liver tissue. _S. Dublin_ is a cattle adapted salmonella species and thus is most frequently isolated from cattle.

See also the Wild bird report from Scotland

**SAC Consulting Veterinary Services**

**Passive surveillance for lyssaviruses in UK bats**

One hundred and seventy four wild bat and 3 zoo bat carcasses were tested at AHVLA in this quarter for lyssaviruses. One wild bat sample from a Daubenton’s bat (_Myotis daubentonii_) was positive by FAT and PCR for EBLV-2 all other samples tested were negative. The positive Daubenton's bat was found alive and unable to fly at Stokesay Castle, Shropshire on 16th July but, despite treatment for dehydration, died the following day and represents the third detection of EBLV-2 in this bat species at a single site in UK. The person who found the bat had previously been vaccinated against rabies and wore gloves whilst handling and treating it. This is the 10th EBLV-2 virus positive case recorded in Daubenton’s bats in this country since 1996 and the human contact involved highlights the value of continued EBLV-2 surveillance in the UK and awareness of the associated risks for both the general public and those working with wildlife.

**Rabies surveillance in terrestrial wildlife**

Vigilance continues for this notifiable disease in UK wildlife and there were no suspected cases in terrestrial wildlife this quarter. Although no animals were examined, efforts to investigate rabies in terrestrial animals will be maintained. Two cats which had died in quarantine were negative for lyssaviruses and one bat which had been accidentally imported from Italy was also negative for lyssaviruses.

**WNV surveillance in wild birds**

West Nile Virus (WNV) surveillance in dead birds re-commenced in April, to coincide with candidate vector activity season. Brain and kidney tissues from 150 wild birds representing 25 species received between 1st July and 30th September 2014 from AHVLA Veterinary Investigation Centres (VICs), SAC and from The Institute of Zoology garden bird health project were tested by real time RT-PCR for West Nile virus with Negative results.

**West Nile virus surveillance in Equids**

Between 1st July 2014 and 30th September 2014 serum samples from three horses were tested by cELISA for WNV. Two of the samples were from polo ponies, submitted for WNV cELISA, as potential export candidates to Argentina. One of these horses was negative whilst the other was positive. A notifiable disease investigation (NDI) was actioned by VENDU and the background of this positive reactor investigated. It was found that the horse originated from Argentina and had spent some time in Spain where it was confirmed that WNV vaccination had been administered. A WNV IgM ELISA was carried out on this sample with negative results suggesting that the serological status of this horse was not due to a recent infection and that the positive cELISA result was due to previous WNV vaccination in Spain. The NDI notice was lifted.

The third was submitted for differential diagnosis of neurological disease and was negative. This horse was also screened by Haemagglutination Inhibition Test (HAI) for Louping Ill virus at The Moredun Institute again with negative results.
Flavivirus surveillance of wild birds
From the beginning of April to the end of September 2014, post-mortem examinations were performed on a total of 125 dead wild birds of 29 species from 86 sites with a widespread distribution across the UK. Tissue samples from the brain and kidney were tested for the presence of flaviviridae RNA using a pan-flavivirus TaqMan Real Time RT-PCR (Johnson and others 2010) and have thus far tested negative. The birds examined included six blackbirds (Turdus merula) from five sites, a species known to be susceptible to Usutu virus infection, and five corvids, a family which have been used as sentinels for West Nile virus detection in the USA. Surveillance of wild birds in Great Britain to date has found no evidence of Usutu or West Nile virus infection (Phipps and others 2008, Horton and others 2013).

References
IoZ and APHA

EMERGING AND ENDEMIC DISEASES
Wild bird report from the IoZ
Avian trichomonosis
This quarter, trichomonosis was confirmed or suspected in 32% (33/102) of birds examined post-mortem. These birds originated from 25 sites in 10 counties across England, Scotland and Wales and the majority (55%: 18/33) were greenfinches (Chloris chloris). Consequent to the emergence of finch trichomonosis, the UK breeding greenfinch population declined from circa 4.3 million to 2.8 million birds which equates to an overall decline of 35% of the national population from 2006 to 2009 (Lawson and others 2012). The BTO’s Breeding Bird Survey showed that this significant annual decline has continued with the UK greenfinch population suffering a further decline of 13% during the period 2012-2013 (Harris and others 2014).

The turtle dove (Streptopelia turtur) is a migratory columbid species which is resident in Britain during the summer months whose population has undergone marked and continued decline in recent decades. Trichomonosis and T. gallinae infection have been detected in turtle doves (Stockdale and others 2014) and a PhD to investigate the potential impact of trichomonosis on this species began in 2013 with collaboration between the RSPB and the University of Leeds.

Five nestling turtle doves from four monitored sites in East Anglia were submitted for post-mortem examination at the IoZ. Two individuals from the same site had visible upper alimentary tract lesions consistent with trichomonosis and Trichomonas sp. parasites were recovered from one of these birds confirming this diagnosis. This parasite isolate has been cryopreserved at the University of East Anglia pending further molecular characterisation and subtyping. It is hoped that this collaboration will increase our understanding of the epidemiology of T. gallinae in British wild birds and the significance of this infection to this species of conservation concern.

References
Avian pox

Avian pox is an emerging infectious disease of British birds in the Paridae (tit) family, with the great tit (*Parus major*) most commonly affected (Lawson and others 2012). During this quarter, sightings of tit species with skin lesions consistent with avian pox were received from members of the public in 17 sites in Great Britain. The distribution of these incidents remains similar to recent years with the majority of reports south of a line drawn between the Humber and the Mersey (Figure 1).

Post-mortem examinations were performed on a great tit and blue tit (*Cyanistes caeruleus*) from two of these sites which are pending histopathology for confirmation of the diagnosis. In addition, two dunnocks from two sites were examined with skin lesions consistent with avian pox: this infection has been endemic in this species in Britain for decades (Lawson and others 2012).

We previously showed that Paridae pox causes significant reductions to host survival but that significant disease-induced population decline is unlikely to occur at the observed prevalence of avian pox in the study population of great tits (Lachish and others 2012). Relative abundance data from the BTO’s Breeding Bird Survey showed that the great tit population in England and Wales remained remarkably stable during the period 2012-2013 (Harris and others 2014).

References


Wild bird report from Scotland

*Salmonella typhimurium* was isolated in a case where three linnets (*Carduelis cannabina*) were found dead in reasonable body condition. *Salmonella typhimurium* 4,12:i:1,2 Phage Type RDNC was isolated from an adult male Siskin (*Spinus spinus*) which was found dead in poor body condition. *Salmonella typhimurium* PT193 was isolated from a siskin from a case where several siskins had died while robins (*Erithacus rubecula*) and other visitors to the bird table appeared unaffected. Signs of predation by a cat were recorded in addition to poor body condition and oesophageal necrosis.

Avian tuberculosis was diagnosed in an adult buzzard (*Buteo buteo*) which was found dead on a golf course in poor body condition. The crop was found to be impacted with fur balls, and the oesophagus was dilated down to the thoracic inlet. The lungs were almost totally obliterated by a ping-pong ball sized tuberculous yellow caseous mass on the right, with many smaller caseous lesions on the left. The liver showed one small discrete caseous lesion. The proventriculus and gizzard were dilated. A ZN smear of the largest caseous mass showed numerous acid-alcohol fast bacilli.
A crop infection of unknown aetiology and subsequent trauma by road traffic vehicle were seen in the case of a dead sparrowhawk (*Accipiter nisus*) found on top of a hedge beside a road. The bird was in poor condition and the left femur showed a fracture with associated haemorrhage. The left scapula was torn away from the body and there was haemorrhage into the left lung. The crop contained a mass of pale, dry caseous material that was adherent to the lining in some areas. Histopathology showed a large amount of compact inflammatory debris replacing the lining and filling the lumen of the crop. The cause was not apparent. Toxicology revealed the presence of low residues of several anticoagulant rodenticides in the liver tissue from the bird, indicative of exposure to the chemicals, but not at sufficient level to be a cause of death.

Fungal pneumonia due to *Aspergillus fumigatus* was diagnosed in four immature gulls (herring gulls (*Larus argentatus*) and lesser black-backed gulls (*Larus fuscus*) which had been euthanased by cervical dislocation. Seven out of eight gulls (herring, lesser black-backed and common gulls (*Larus canus*) previously submitted to a local wildlife rescue centre had shown white lesions on the lungs and other tissues after death, and post mortem examination of these four revealed similar pale, circular nodular lesions of 2-4mm diameter throughout the lungs and clavicular and thoracic airsacs. The spleens appeared slightly enlarged. *A. fumigatus* was isolated from the lung tissue. Histopathology confirmed the lesions to be nodular foci of necrosis containing fungal hyphae. Bursal pathology was also found, consisting of chronic active inflammation with activated follicles and patchy histiocytic infiltrates in interfollicular areas, particularly adjacent to the lumen. There was quite marked epithelial hyperplasia and the lumen of the bursa contained numerous cryptosporidia. There was also widespread inflammatory cell infiltrates in the bursal lumen as well as foci of bacterial colonisation. There was no histological evidence of circovirus infection. It was considered likely that, although the fungal pathology was the most significant, the bursal pathology would have caused immunosuppression and predisposed to the fungal pneumonia.

Death in shell, likely due to bacterial infection, was seen in a white-tailed eagle (*Haliaeetus albicilla*) egg which showed failure to hatch. Faecal soiling of the shell was seen and the egg released a putrid gas under pressure when punctured. The contents were a green liquid with the remnants of early embryonic death. *Enterococcus* species bacteria were cultured from the contents, indicating faecal contamination. Salmonella cultures were negative.

Parasitism due to gapeworm and thorny-headed worm was diagnosed in two immature choughs (*Pyrrhocorax pyrrhocorax*) found dead at different times in the same area. The birds were lean, gapeworms were present in the trachea and the lungs were congested. Tapeworms were present in the small intestine of one chough, and thorny headed worms were embedded in the small intestinal walls of both choughs. Tapeworm, Capillaria, and *Syngamus trachea* eggs were all detected in intestinal contents of the first and *Syngamus trachea* eggs were detected in the intestinal contents of the second.

An adult male osprey (*Pandion haliaetus*) was found with signs of trauma close to a turbine on a wind farm. Body condition was reasonable. A complete open fracture of the left femur, two comminuted fractures of the proximal and distal left humerus and a comminuted fracture of the right proximal humerus were seen. There was bruising in the skin and bleeding into the soft tissues surrounding the fractures. There was also a complete fracture of the sternum, and the keel bone as a result was depressed into the body cavity. The heart and liver were displaced cranially and the heart muscle was opened so that the inside of the left ventricle was visible, with haemorrhage in to the body cavity.

Impaction due to intestinal parasitism with subsequent peritonitis was seen in a juvenile barn owl (*Tyto alba*) found dead on a nature reserve. Body condition was poor and the crop and gizzard were empty. The duodenum and upper small intestine were dilated and torn containing large, white nematodes. Individuals measured 5cm and more with curled up ends. Fibrinous pericarditis/peritonitis was seen.
Wildfowl and Wetlands Trust (WWT) report July – September 2014

Passive surveillance of waterbirds
Between July and September 2014, 40 wild birds of 11 species from three WWT sites (Slimbridge, Gloucestershire; Martin Mere, Lancashire; Arundel; West Sussex) and one non-WWT site (Bridgewater, Somerset), were submitted for post mortem examination. The majority (32.5% (13 birds)) of birds submitted for post mortem died as a result of a suspected avian botulism outbreak at WWT Arundel, Sussex. The outbreak lasted from the 3rd of August to the 20th of September and resulted in the deaths of 82 animals in total (Table 1). Wardens at the reserve are trained in managing against the disease (particular as there was an outbreak some 11 years ago), however, the outbreak began in an extensive area of reed bed where carcases were not discovered until searches began.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number found dead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mallard</td>
<td>31</td>
</tr>
<tr>
<td>northern shoveler (Anas clypeata)</td>
<td>1</td>
</tr>
<tr>
<td>European green-winged teal</td>
<td>23</td>
</tr>
<tr>
<td>mandarin (Aix galericulata)</td>
<td>3</td>
</tr>
<tr>
<td>Common pochard (Aythya farina)</td>
<td>1</td>
</tr>
<tr>
<td>Coot</td>
<td>3</td>
</tr>
<tr>
<td>moorhen (Gallinula chloropus)</td>
<td>2</td>
</tr>
<tr>
<td>water rail</td>
<td>2</td>
</tr>
<tr>
<td>Common pheasant (Phasianus colchicus)</td>
<td>1</td>
</tr>
<tr>
<td>black-headed gull</td>
<td>1</td>
</tr>
<tr>
<td>European eel (Anguilla anguilla)</td>
<td>13</td>
</tr>
<tr>
<td>fish (unknown species)</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1. Species and number of animals found dead during Aug/Sep 2014 Arundel botulism outbreak

Of the other 27 birds, 15 were juvenile or downy wildfowl or gulls which had died of reasonably typical conditions of young waterbirds at this time of year e.g. parasitic infestations (e.g. a juvenile teal with a heavy nasal leech and intestinal Amidostomum burden); aspergillosis; and trauma from flying accidents or predation. Adult deaths were due to a range of diseases including avian mycobacteriosis, trauma and one case of lead poisoning from lead shotgun pellet ingestion.

WWT Slimbridge

Wild bird surveillance APHA
Over the months of July, August and September 15 submissions, comprising 66 carcasses of waterbirds were received at APHA Veterinary Investigation Centres with suspected avian botulism. The submissions came principally from the North-west of England and the Midlands and comprised mainly mute swans (Cygnus olor), mallard (Anas platyrhynchos), Canada Geese (Branta canadensis), coot (Fulica atra), moorhen (Gallinula chloropus) and black-headed gulls (Chroicocephalus ridibundus) all of which are the commoner species on inland waterways. The reported mortality was much higher than the number of carcass submissions. Avian botulism in wild birds, in the absence of reliable, validated diagnostic tests, remains primarily a clinical diagnosis, and while the disease in the UK may occur in any month of the year, it is most frequent in the summer months. Provisional diagnosis at APHA was based on the clinical histories, with birds reluctant or unable to move their wings and fly and in some cases unable to walk. Avian Influenza Virus and West Nile Virus were not detected in any submission, nor were other pathogens isolated. It is assumed that the disease in the UK is caused by Type C botulinum toxin and does not pose a known risk to human health. However the plight of birds with flaccid paralysis with a clinical course often lasting 2-3 days caused public concern and concern in the council authorities with responsibility for the public water bodies in several incidents. Consultation with medical authorities
occurred following one incident in the Manchester suburbs. The incidents also received press attention. Avian botulism is recorded each year by APHA and the warm dry weather may have precipitated severe losses and a greater number of incidents than usual this summer. The distribution of the majority of cases in the North of England was not readily explainable (however see WWT report).

The failure of an important mixed lesser black-backed (*Larus fuscus*) and herring gull (*L argentatus*) colony in Cumbria was investigated by a submission of dead gull chicks. This was an entire colony failure with deaths of potentially 7000 chicks, none of which were seen to fledge. All chicks examined died from traumatic injury, with single severe punctate stab wounds, probably caused by other gulls. Avian influenza virus and West Nile virus infections were excluded. Observations by several site cameras monitoring nests and by people watching the colony supported the suspicion that the adults were attacking the chicks. It appears that both parents would leave their nests, and without a parent to guard the chicks, the chicks were then susceptible to attack by other adults. This large colony relied on a diet of natural marine foodstuffs and it seems likely that a lack of food was behind the behaviour and the deaths. A smaller, roof-nesting gull colony in a nearby city which relied on waste sites for food had a successful breeding season.

**APHA DoWS**

**Mammalian disease**

Carcasses of eighty two bats (*Pipistrellus* sp.) found dead in a 4m x 6m boiler room on a camp were examined. The room was last entered in April 2014 when there were no dead bats. The evidence suggested that the bats had died over a period of time. Many bodies were clustered around a rising main and this suggested that temperature and moisture were a factor in the deaths. It is possible that the room became very hot when the boiler was working, and unable to find a way to exit the room, the animals died from the effects of an adverse environment. The bodies were in a mummified state and unsuitable for rabies virus or other pathogen testing. It is not clear whether there was local knowledge that the bats used the boiler room but perhaps it indicates that personnel responsible for unpopulated site maintenance should routinely check for bats and other groups of wildlife using the empty buildings.

**APHA DoWS**

**Amphibian disease**

**Ranavirus**

Several different ranaviruses exist which vary in the range of species (amphibian, fish and reptiles) that they affect and the severity of disease that they cause. A single type of ranavirus (called FV3-like) has been known as a cause of amphibian mortality in GB since the 1980s and is thought to have been introduced from North America. This ranavirus primarily affects adult common frogs (*Rana temporaria*) and has been shown to cause local population declines of this species (Teacher and others 2010): this was the first report of an amphibian population decline due to this disease.

Twenty five amphibians were examined post mortem from 14 mortality incidents in ten counties this quarter: 19 common frogs (*Rana temporaria*), two common toads (*Bufo bufo*), two smooth newts (*Lissotriton vulgaris*) and two great crested newts (*Triturus cristatus*). Four frogs from three sites (one in West Sussex and two in Greater Manchester) were positive for ranavirus infection using PCR protocol, of which only two had characteristic lesions.

Two novel Common Midwife Toad Virus (CTMV)-like ranaviruses, CMTV and Bosca’s Newt Virus, have been described as causes of mass mortality in multiple amphibian species in northern Spain since 2005. These affect adult, juvenile and larval caudate (newt) and anuran (frog and toad) amphibians, leading to severe population declines in multiple species and sites (Price and others 2014). Infection with evidence of disease was also confirmed in a viperine snake (*Natrix maura*) consuming amphibian prey. CMTV-like ranavirus amphibian mortality has also recently been reported in the Netherlands (Kik and others 2011) and Belgium (Sharifian-Fard and others 2011). CMTV-like viruses may be emerging in amphibians in continental Europe and vigilance is required in the UK since this pathogen is not known from the British Isles. Whilst the PCR conducted routinely on amphibian samples at the IoZ should detect infection with either FV3-like or CMTV-like ranaviruses, sequencing will be required to identify infection with the novel viruses.
**Chytrid fungi**
The same 25 amphibians were tested for *Batrachochytrium dendrobatidis* and *Batrachochytrium salamandrivorans* (Bs) using a duplex PCR (Blooi and others 2013) and all were negative.

Bs is a novel chytrid fungus that emerged in the Netherlands and Belgium in 2013 (Martel and others 2013). Caudate amphibians (such as newts) are susceptible to experimental infection while anurans (i.e. frogs and toads) appear to be more resistant. Its arrival in Great Britain could present a serious threat to Natural England-protected species such as the great crested newt therefore vigilance is required for surveillance.

**References**


**UK Priority and Conservation Concern Species**

**WILD BIRDS**

**Corncrakes (Crex crex) reintroduction project and disease surveillance**
The Disease Risk Analysis and Health Surveillance (DRAHS) project at the IoZ continues to monitor the health of the corncrakes for the reintroduction programme in the Nene Washes, Cambridgeshire. Following the diagnosis of metabolic bone disease in captive-bred corncrakes in 2012 and 2013, and further dietary analysis, the birds’ diets were adjusted again in early 2014 and this has reduced the incidence of this condition. This year has seen a higher percentage of chicks released than in the previous two years.

**Great Crane Project**
The Great Crane Project aims to restore a population of common cranes (*Grus grus*) in the wild in SW England, and to use the species as an ambassador for wetland conservation in the UK. In late August, 17 juvenile common cranes that had been hand-reared at WWT Slimbridge were released on the Somerset Levels. This marked the end of five years of releases for the project, bringing the total number of birds released over the five years to 93 (with a current survival rate post-release of 82%). This year’s cohort of chicks was health screened whilst in the rearing facility at WWT Slimbridge. Targeted surveillance for inclusion body disease of cranes virus, West Nile virus, avian influenza viruses, avian paramyxovirus-1 and haemoparasites was negative. As in previous years, there was found to be a high prevalence of *Campylobacter* sp. infection towards the end of the rearing period (up to 95% of
chicks were positive on faecal sampling). A minority of chicks were also found to have concurrent intestinal parasite burdens (Trichuris spp. (n=5), Trichostrongylus spp. (n=3) and Ascaridia spp. (n=1)) (the birds were treated with ivermectin (wormer) prior to their move to Somerset). These bacterial and parasitic infections were not associated with any abnormal clinical signs. The chicks were maintained on an in-feed coccidiostat throughout the rearing period, and coccidia infection was not detected whilst the birds remained at WWT Slimbridge. However, Eimeria reichenowi was detected in five of 10 pooled faecal samples collected when the birds were in their pre-release aviary in Somerset (AHVLA Scientific, AHVLA, Weybridge, Surrey (now APHA)). Eimeria gruis and E. reichenowi were first detected in the wild, reintroduced crane population in 2011 and 2012 respectively, following interaction of the flock with other free-living cranes: whilst these coccidia have the potential to cause serious disease in young crane chicks in captivity (O’Brien et al. 2011), their impact on the health of older, reintroduced birds, has yet to be elucidated.

Regular faecal sampling of the reintroduced crane population is ongoing: 10 pooled faecal samples, collected in August, were negative for bacteria and parasites, and 2 of 11 pooled faecal samples collected in September (once this year’s chicks had joined the flock) were positive for Campylobacter sp. infection.

References:

Mammals

Coccidiosis in a red squirrel (Sciurus vulgaris)
Coccidiosis was diagnosed in a juvenile red squirrel found recumbent on the doormat of a member of public. Death followed a few hours later. The small intestine and caecum contained a large amount of dark, crumbly material that coloured water slightly red. A coccidial oocyst count of 280000 oocysts per gram was found in intestinal contents. The spleen was swollen, and Escherichia coli was isolated from spleen tissue.

SAC Consulting Veterinary Services

Summary findings from the scanning surveillance of European hedgehogs
From April 2012, a total of 71 hedgehogs (Erinaceus europaeus) have been examined post-mortem from 66 sites from all nine English government office regions, North and South Scotland and Wales (Figure 2). Of those carcasses in which the cause of death could be ascertained, 57% (34/60) had died due to infectious disease, 10% (6/60) due to predation and 20% (12/60) due to trauma. The majority of cases with infectious disease as the cause of death suffered from parasitic diseases such as verminous pneumonia and bacterial infections due to a range of pathogens (e.g. Salmonella).

In addition, routine samples have been collected from each carcass for toxicological analysis should funding become available to investigate the significance of non-infectious disease as a potential contributory factor to the decline of this species.

Ioz

Influenza in European common seals
Several hundred harbour seals (Phoca vitulina) have been found dead in western Sweden this year, with mortality linked to infection with influenza A virus. Increased mortality of harbour seals also appears to be ongoing in Danish and German waters, with 100 dead seals found on Anholt island in Denmark in July and more recently, moribund and dead harbour seals reported in the Danish Wadden Sea and on the west coast of Schleswig-Holstein in Germany. Necropsies of dead seals by the University of Veterinary Medicine Hannover in Büsum and Hannover found evidence of bacterial and parasitic pneumonia. No evidence for infection with phocine distemper virus (PDV, responsible for previous epizootics in European seal populations) has been found to date (Common Wadden Sea Secretariat 2014).
Historically, influenza epizootics have occurred in populations of harbour seals around the world (Geraci and others 1982, Anthony and others 2012) as well as in other pinniped species (Goldstein and others 2013). The avian influenza A H3N8 virus that killed harbour seals along the New England coast in 2011 can spread through respiratory droplets and poses a potential threat to humans (Karlsson and others 2014).

Monitoring of seal mortality exists in the UK. However, the current lack of funding for systematic and routine seal necropsies in England and Wales may hamper our ability to detect the potential emergence of this disease in UK seal populations.

References
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