GB Wildlife Disease Surveillance Partnership


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Highlights

- Scotland – raptor deaths
- Listeriosis in hedgehogs
- RHD2 – possibly causing population declines in wild rabbits across England

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.


OVERVIEW
Issues and trends
No specific new issues identified during this quarter. The threats to amphibian biodiversity through viral disease and the new fungal pathogen Batrachochytrium salamandrivorwns (Bsal) are still causing concern in Europe.

NOTIFIABLE DISEASES

Avian Influenza Virus
RISK: Exotic notifiable disease; threat to UK farming, international trade and potential zoonosis

H5N1 Highly Pathogenic Notifiable Avian Influenza (HPNAI) was not detected from any of the 122 found dead wild birds tested in Great Britain (GB) during the quarter. Evidence of other influenza A virus infections was also not detected (Table 1). This included investigations of wild bird mass mortalities such as eight juvenile cormorants found dead in March. The last detection of H5N1 HPNAI in wild birds in GB was during January-February 2008, from ten Mute swans and one Canada goose (Branta canadensis) in South Dorset (Defra, 2008).

Table 1: Number of wild birds tested and results in GB – 1st 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>122 (140)</td>
<td>Nil</td>
<td>Scanning surveillance All-year-round</td>
</tr>
</tbody>
</table>

*Number of birds tested: figures for January – March 2015 are shown in brackets.

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.

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. 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:

https://www.gov.uk/guidance/avian-influenza-bird-flu
During the period 01 January to 31 March 2015 (Q1-2016), a total of 360 Warden Patrols were performed at sites across GB. This compares with a total of 344 Warden Patrols performed during the same period in 2015 (Q1-2015) in GB. During Q1-2016, the Warden Patrols were mainly performed by two organisations; Natural England (n=164) and the Wildfowl and Wetlands Trust (WWT; n=137). Warden Patrols were also carried out by seven other voluntary organisations. In total during Q1-2016, 45 wild birds found dead were tested, with no evidence of influenza A virus infection detected. This compares with a total of 47 wild birds found dead and tested during Q1-2015, again, all with negative AI results.

Overall, during the Warden Patrol season from 01 October 2015 to 31 March 2016, 87 birds have been found through patrols, of which 59 have been sampled. This is 11 fewer birds found (n=98) and 32 fewer birds sampled (91) than for Oct 14 – Mar 15 when there was increased activity associated with the H5N8 HPAI outbreak in East Yorkshire in the East region. Whooper Swans (n=17) were the most common target species found and birds were most commonly found in the North West region with the lowest numbers in Scotland, Wales, North East and the Midlands. In March, eight juvenile cormorants were found dead on a reserve in the North West of England and submitted to Penrith Veterinary Investigation Centre (VIC). Avian Influenza virus was not isolated from tissues of the birds and the findings indicated that the birds had died of starvation, or starvation associated with hypothermia (see page 10). As double-crested cormorants (P. auritus) in North America suffer sporadic mass mortality due to Newcastle Disease virus infection, although this was regarded as highly unlikely in this case, samples were additionally tested for Avian Paramyxovirus-1, also with negative results.

**Horizon-scanning**

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). As a result, Defra currently considers there is an ongoing, low risk of introduction of notifiable avian influenza to the UK via a number of routes, including wild birds (Defra, 2015a and b).

During January 2016 an outbreak of H5N1 LPAI was confirmed in a broiler breeder flock in Dunfermline, Fife. Results of genetic analyses of the causative virus indicated that it was of avian origin, closely related to contemporary European H5 strains and clearly distinguishable from viruses associated with the epidemic in France, and from the group of HPAI viruses that have caused a global panzootic in the last 10 years. The epidemiological investigation has concluded that the most likely source of the outbreak is considered to be indirect contact with wild birds (Defra 2015c).

All 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. 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): [http://ahvla.defra.gov.uk/vet-gateway/nad/index.htm](http://ahvla.defra.gov.uk/vet-gateway/nad/index.htm).
Avian influenza and Newcastle disease/PPMV-1 events, including H5 HPAI internationally, are also summarised in previous GB Wildlife Disease Surveillance Partnership quarterly reports: https://www.gov.uk/government/publications/wildlife-disease-surveillance-reports-2015.

References


Jane Clark, Avian Virology, APHA Weybridge

Wildfowl and Wetlands Trust's (WWT) role in GB Avian Influenza Wild Bird Surveillance (AIWBS):- January – March 2016

RISK: AIIV, targeted active surveillance of wetland birds

WWT’s avian influenza surveillance was carried out between January and March 2016 by conducting at least weekly warden patrols of its eight well established GB wetland reserves and ad hoc patrolling of the new WWT-managed wetland, Steart Marshes in Somerset. Forty nine dead birds from 12 species were found from eight reserves, 37 of these were suitable for cloacal and buccal swab sampling for virological examination. No AIIVs were found.

WWT Slimbridge

ZOONOTIC DISEASES

APHA Diseases of Wildlife Scheme (DoWS); Salmonellosis in wildlife January – March 2016

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 notable salmonella infections were identified by DoWS this quarter.
S. Typhimurium Copenhagen phage type 56 was isolated from a horse. No clinical details were supplied. It is suggested that host adapted salmonellae from garden birds may be a source of infection for domesticated species (Horton and others, 2013). There were no reports of S. Typhimurium Copenhagen DT40 or S. Typhimurium DT56 variant from wildlife or domestic species.

References

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.

There were no notable Salmonella isolations from wild species by the APHA Diseases of Wildlife Scheme during the period covered by this report.

Alex Barlow, APHA Diseases of Wildlife Scheme

Passive surveillance for lyssaviruses in UK bats
1st Quarter Jan - March 2016

Fifteen wild bats and 3 zoo bats were tested at APHA in this quarter for lyssaviruses. All were negative.

Rabies surveillance in terrestrial wildlife

Vigilance continues for this notifiable disease in UK wildlife but no samples from terrestrial wildlife were submitted for testing this quarter.
Four dogs which had died in quarantine were tested for rabies with negative results.

West Nile Virus surveillance in wild birds

No wild bird tissue samples were tested during the period 1st January – 31st March 2016. West Nile Virus (WNV) surveillance in dead birds will recommence on 1st April 2016 to coincide with candidate vector activity season.

WNV surveillance in Equids

No serum samples from horses showing neurological signs were received for WNV cELISA testing between 1st January and 31st March 2016.

Paul Phipps, Wildlife Zoonoses and Vector Borne Disease Research Group, APHA Weybridge
ONGOING NEW AND RE-EMERGING DISEASES, UNUSUAL DIAGNOSES AND HORIZON SCANNING

WILD BIRDS

Wild bird report from the IoZ

Trichomonosis and salmonellosis in British Garden Birds

Threat: Public health, livestock animal health, companion animal health, biodiversity, animal welfare

Mortality in garden birds during the winter months may be caused by a number of infectious diseases including trichomonosis, salmonellosis and less commonly infection with *Yersinia pseudotuberculosis*. These diseases tend to predominantly affect gregarious seed-eating garden birds, such as finches (Fringillidae), sparrows (Passeridae) and buntings (Emberizidae). Since its emergence in 2005, finch trichomonosis has caused a significant decline of the UK breeding greenfinch (*Chloris chloris*) population (Lawson and others 2012) which appears to be ongoing (Robinson and others 2015). Finch trichomonosis mortality incidents occur year round with a seasonal peak in the late summer months compared to passerine salmonellosis and yersiniosis which have a marked seasonality, occurring principally during the winter months.

In the first quarter, we received reports of avian morbidity and mortality incidents involving one or more finches from 149 sites. In comparison, incidents of sparrow ill-health were received from five sites and reports involving buntings from three sites. Post-mortem examinations were performed on a subset of 30 birds which comprised 28 finches, one house sparrow (*Passer domesticus*) and one cirl bunting (*Emberiza cirlus*).

Trichomonosis was confirmed or suspected in 79% (22/28) of finches from 20 sites occurring in seven English government office regions, Scotland and Wales. In three cases, finch trichomonosis was confirmed in bullfinches (*Pyrrhula pyrrhula*), a UK Biodiversity Action Plan listed species. The cirl bunting is a species of conservation concern in GB for which a recovery programme in South West England was conducted in 2006-2011. A post-mortem examination was conducted on a cirl bunting found dead in a garden in Devon in February. The bird was in good body condition and evidence of trauma was present, consistent with predation as the cause of death. Whilst no macroscopic lesions typical of trichomonosis were observed, routine culture isolated a *Trichomonas* sp. from the oesophagus. PCR of the ITS region and Fe-hydrogenase gene and sequencing confirmed the parasite identity as the A1 European finch epidemic strain of *T. gallinae*. Isolation of the parasite may reflect an early stage of disease with trichomonosis or a carrier state in this case.

Two salmonellosis cases were diagnosed this quarter which is similar to the low number we have investigated in recent years. Both cases involved siskins (*Carduelis spinus*) (one in England, one in Scotland). *Salmonella* Typhimurium DT 56(v) was isolated from both birds. Passerine salmonellosis may pose a threat to public, companion animal and livestock health. The risk of human infection is considered low and these garden bird-associated strains accounted for only 0.2% of *Salmonella* infections diagnosed in humans by Public Health England between 2000 and 2010 (Lawson and others 2014).

No cases of *Y. pseudotuberculosis* infection were diagnosed in wild birds this quarter.

References


Wild bird report from Scotland: January – March 2016

Spontaneous atrial rupture was diagnosed in a male buzzard (Buteo buteo) which was found dead in a field. At necropsy, the bird was in good condition and the remains of a small mammal were present in the oral cavity and crop. Blood was seen over the surface of the lungs, and examination of the heart revealed rupture of the right atrium. Histopathology confirmed haemorrhage at the ragged margins of the perforation, but there was no evidence of an underlying pathology in the heart. Very low residues of brodifacoum, bromadiolone and difenacoum were found in liver tissue from the bird. Whilst these residues were indicative of exposure to the chemicals, anticoagulant rodenticide poisoning was not thought to be involved in the death.

Obstructive ingluvitis due to Trichomonas gallinae infection was diagnosed in a thirteen-year-old (ringed) buzzard (Buteo buteo) which was found dead. It was in very poor body condition, and a large, firm, pale grey mass was found in the crop which extended through the wall into adjacent tissue, surrounding the trachea. There was a large adherent blood clot on the right side of the mass. A small matted ball of fibrous material was present in the crop, the gizzard was empty and there was only very scant mucoid content in the small intestine. The kidneys were firm with a granular appearance and gritty white urates adjacent to the kidneys and close to the vent. Histopathology revealed the crop mass to be composed of necrotic tissue. Where inflammatory tissue adjoined the crop mucosa, and in many other places throughout the lesion, there were multiple vascular spaces containing large numbers of protozoa consistent with trichomonads. A nephropathy with acute focal nephrosis/nephritis and urinary retention was also seen, consistent with damage caused by severe dehydration. The large blood clot may have been caused by damage to a cervical blood vessel following local invasion.

Avian tuberculosis was diagnosed in an adult buzzard (Buteo buteo), which was found dead on a riverbank in Perthshire. Body condition was very poor, and the oral cavity showed two caseous plaques on the tongue and a small one on the hard palate. The skin of the medial aspect of the left metacarpophalangeal joint showed a soft tissue abscess filled with caseous pus. The liver showed small pale miliary lesions throughout the parenchyma and the mesentery showed several gritty caseous spherical nodules. Acid alcohol fast bacilli were seen on a ZN smear prepared from the caseous material.

Mycotic pneumonia was diagnosed in a feral pigeon (Columba livia domestica) which was one of three sick pigeons seen on a high street in a Borders town. One died, while the other two were dull, lethargic, ataxic and weak. At necropsy, a submitted bird was in poor to fair bodily condition. Testing for PPMV-1 infection returned a negative result. Histopathology revealed severe mycotic pneumonia with vascular invasion. There were foci of active necrosis and inflammation in the liver, although no fungal elements were seen in H&E stained sections of liver tissue.

Amyloidosis was found in a female mute swan (Cygnus olor) of around two years old found dead on a loch in Glasgow, one of approximately 100 mixed mute and whooper swans in the park. At necropsy, body condition was good, and the spleen showed a grey mottled appearance. The intestinal contents were dark and watery. Histopathology revealed marked amyloidosis in the spleen, which showed extensive replacement of the parenchyma with amorphous eosinophilic material, and moderate amyloidosis of the liver. Although in some cases amyloidosis may develop as a sequel to chronic infection or inflammation, it may also develop spontaneously in the absence of obvious inflammation - so-called idiopathic amyloidosis. No obvious predisposing chronic lesions were seen in the samples from this swan.
Lead poisoning was diagnosed in two female mute swans (*Cygnus olor*) which were two of six dead swans found over one week on a lake where other swans were showing lethargy and an unusual neck position, with the head tucked back under a wing. Body condition in the first swan was moderate, and in the second was poor. Pasty green liquid was found in the gizzards of both, and tan coloured pasty content in the small intestines. The caecal contents were thick in one bird and watery in the other. Cloacal contents were copious and watery in one bird and pasty and green in the other. Liver lead levels were 22 mg/kg and 13 mg/kg respectively. Liver lead levels of over 2.07 mg/kg are consistent with a diagnosis of lead poisoning.  

**THREAT:** unusual/new disease presentation  
**THREAT:** threats to biodiversity from wildlife poisoning  
**THREAT:** wildlife welfare  

*Caroline Robinson, SAC Consulting Veterinary Services*
Wildfowl and Wetlands Trust (WWT) report
January – March 2016

Surveillance of waterbirds
Between January and March 2016, 54 wild birds of 12 species from seven WWT sites (Slimbridge, Gloucestershire; Martin Mere, Lancashire; Arundel, West Sussex; Welney, Norfolk; Caerlaverock, Dumfriesshire; Washington, Tyne and Wear and Steart; Somerset), were submitted for post mortem examination (Table 1). The birds examined were: Eurasian crane *Grus grus* (2), whooper swan *Cygnus cygnus* (20), mute swan *Cygnus olor* (3), Canada goose *Branta canadensis* (2), mallard *Anas platyrhynchos* (10), common shelduck *Tadorna tadorna* (1), European green-winged teal *Anas crecca* (2), tufted duck *Aythya fuligula* (1), common shelduck *Tadorna tadorna* (1), black-headed gull *Chroicocephalus ridibundus* (9) and rook *Corvus frugilegus* (1).

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Total</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma</td>
<td>16</td>
<td>7 x whooper swan (1 x juv), 2 x mute swan, Canada goose*, mallard, 2 x green-winged teal, tufted duck, 2 x coot</td>
</tr>
<tr>
<td>Avian mycobacteriosis</td>
<td>8</td>
<td>Eurasian crane*, 2 x whooper swan*, 4 x mallard*, shelduck</td>
</tr>
<tr>
<td>Aspergillosis</td>
<td>5</td>
<td>mute swan*, 2 x whooper swan (2 juv), 2 x black-headed gull</td>
</tr>
<tr>
<td>Lead poisoning</td>
<td>4</td>
<td>3 x whooper swan (1 x juv), Canada goose*</td>
</tr>
<tr>
<td>Haemorrhagic enteritis</td>
<td>4</td>
<td>whooper swan, 2 x black-headed gull, rook</td>
</tr>
<tr>
<td>Necrotic enteritis</td>
<td>4</td>
<td>4 x whooper swan (3x juv)</td>
</tr>
<tr>
<td>Visceral gout</td>
<td>3</td>
<td>3 x black-headed gull</td>
</tr>
<tr>
<td>Drowned</td>
<td>2</td>
<td>mallard</td>
</tr>
<tr>
<td>Cloacal impaction</td>
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<td>black-headed gull</td>
</tr>
<tr>
<td>Renal failure</td>
<td>1</td>
<td>mallard</td>
</tr>
<tr>
<td>Septicaemia</td>
<td>1</td>
<td>mallard</td>
</tr>
<tr>
<td>Other/no diagnosis</td>
<td>5</td>
<td>whooper swan*, 2 x mallard, cormorant, black-headed gull</td>
</tr>
</tbody>
</table>

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Table 1. Primary causes of wild bird mortality found at WWT reserves Jan-Mar 2016. * denotes one individual euthanased.

During this quarter traumatic injuries were the most common cause of death (30%; n=16/54) with flying accidents accounting for the majority (n=11). Of these, seven (13%; 7/54) were powerline related - five whooper swans being killed in one powerline incident near WWT Welney. Fence collisions caused fatalities in two European green-winged teal and one of the captive bred and released Eurasian cranes from the Great Crane Project – which was found to be otherwise healthy.

A case of avian mycobacteriosis was found in a six year old crane from the Great Crane Project, an individual which had had a history of episodes of poor health. The disease had been highlighted in the disease risk analysis (Sainsbury and Vaughan-Higgins 2012) and has been a cause of mortality in reintroduced cranes in North America (Ellis and others, 1992).

Four (7%; 4/54) whooper swan deaths (including three juveniles) were due to necrotic enteritis, this may have been related to feeding on high carbohydrate root crops such as potatoes and sugar beet (Pritchard and others, 2004).
Lead poisoning caused the death of four (7%; n=4/54) birds at four WWT centres (Welney, Arundel, Martin Mere and Caerlaverock): the whooper swans and Canada goose has between 1 and 7 eroded lead shot pellets in their gizzards, (the former being particularly prone to ingestion of shot, Newth et al. 2012).

Three black-headed gulls (6%; n=3/54) were found to have died at Slimbridge of visceral gout.

References
Ruth Cromie, WWT

APHA DoWS – WILD BIRDS
Mass mortality of juvenile cormorants

The carcasses of 8 immature cormorants (Phalacrocorax carbo) were submitted to Penrith V IC in March from a reserve in Lancashire. All the birds had been found on an island and the deaths may have occurred over several days. The reserve has a large roost of cormorants (most of which are immatures) each autumn and numbers decline as the winter progresses. The birds fly in from the nearby coast at dusk and roost on trees but they use the tree-less island to dry feathers and preen and then leave this island for the tree roost. Sick cormorants were not seen and other species were not affected. Avian Influenza virus (AIV) was not isolated from tissues of the birds. The consistent findings in all were thin body condition and an almost complete lack of ingesta in stomachs and intestines suggesting that the birds had not eaten recently. Each of the 7 birds examined had a heavy proventriculus/gizzard infestation of large nematodes, possibly Contracaecum spp. however identification is being checked. The history and consistent findings indicated that the birds had died of starvation, or starvation associated with hypothermia, at the reserve. Double-crested cormorants (P. auritus) in North America suffer sporadic mass mortality due to Newcastle Disease virus infection. This was regarded as highly unlikely in this case and tests for Avian Paramyxovirus-1 gave negative results.

Threats – possible notifiable disease (AIV and Newcastle Disease/Paramyxovirus infection).

Winter mute swan and waterbird mortalities
DoWS examined many mute swans (Cygnus olor) from several sites through the winter and into the current reporting period. Causes of death included starvation (the most frequent cause of death), trauma (including collision with power lines), peritonitis and pericarditis, necrotic enteritis, egg peritonitis, starvation, visceral gout, amyloidosis, Staphylococcus aureus septicaemia and avian tuberculosis. Traumatic injury consistent with being shot was seen in two Canada geese (Branta canadensis). Abnormal liver pathology in one goose was confirmed as hepatic amyloidosis.

UK Priority and Conservation Concern Species

MAMMALS

Listeria monocytogenes isolated from European hedgehogs (Erinaceus europaeus)
Threat: Public health, animal welfare
Listeria monocytogenes is a bacterium which may infect mammals, causing the disease listeriosis. It is a zoonotic pathogen and is often contracted from contaminated food sources. Since 2013, we have isolated L. monocytogenes from three free-living hedgehogs examined at post-mortem. The first case
involved a hedgehog found dead in Wiltshire in 2013 from which we isolated the pathogen from liver and lung samples. The second hedgehog was from Merseyside in 2015 and the pathogen was isolated from the liver, skin and a mandibular abscess. The third hedgehog was from Bedfordshire during this quarter and *L. monocytogenes* was isolated from the liver, throat and a uterine abscess. All of the isolates were subtyped by the Gastrointestinal Bacteria Reference Unit, Public Health England. The 2013 case was identified as type faFLP I.60, serogroup 4. The case examined in 2015 was subtyped as serotype 4b and the third case was identified as serotype 1/2a. There are 13 described serotypes of *L. monocytogenes*, with serotypes 4 and 1/2a accounting for the majority of human infections in England and Wales (Public Health England 2015). Serogroup 4 has been detected commonly in GB since 2009 from human cases and food sources such as uncooked chicken (personal comm. Dr Corinne Amar). *Listeria monocytogenes* has been isolated from a wide range of wildlife hosts but is rarely associated with disease (Ferroglio 2012). Infection occurs particularly in domestic ruminants such as dairy cows which can shed the bacterium in their milk. The frequency of *L. monocytogenes* infection in hedgehogs is unknown but precautionary hygiene measures for hedgehog handlers, especially those handling sick hedgehogs, are recommended as a routine.

**References**


IoZ and Public Health England

**APHA Diseases of Wildlife Scheme: Mammals**

The carcase of a female adult fallow deer (*Dama dama*) was found on the roadside in South Shropshire. The liver was described by the finder as enlarged and firm. Histological examination confirmed the presence of an adenocarcinoma (presumptive cholangiocellular carcinoma). It was thought likely to be of hepatic origin rather than metastatic and likely to be an isolated case. **Threat** – no specific threat; unusual disease presentation.

The DoWS and the University of East Anglia are investigating the possibility that Rabbit Haemorrhagic Disease 2 (RHD2) virus, first detected by APHA DoWS in 2010, is causing population declines in wild rabbits (*Oryctolagus cuniculus*) in England. This suspicion is supported by anecdotal information and observations. The help of falconers (working in the field), the BTO (British Trust for Ornithology) and Natural England has been appreciated. A juvenile wild rabbit was found sick in a grave yard in Lincolnshire and subsequently died, there was no information that other rabbits in the area had been affected. RHD2 virus was detected in liver by PCR and histopathology confirmed typical liver lesions (electron microscopy surprisingly was negative). RHD virus variants apparently are being considered by scientists in Australia, for release as a biological control for wild rabbits. Wild rabbits are generally seen as a pest in Australia while in the UK they have mixed effects; they are seen by some as an important agricultural pest; however they are also essential in the preservation of UK habitats such as chalk downland and East Anglian Brecks, where stone curlew have disappeared on some Brecks following recent rabbit population die-offs. Assessing populations and losses due to disease is difficult as it is considered that many rabbits die underground from RHD, in their warrens.

**Threats identified:** to special habitat ecology and maintenance; Threats to biodiversity – RHD2 virus has affected small numbers of hares in Italy but not, as yet, the European brown hare (*Lepus europaeus*) found in Britain; there is no known threat to human or livestock health, other than to the European rabbit. Threats to commercial rabbit farms from infected wild rabbits; financial savings to farmers from rabbit population reductions.

**Potential risks associated with release of RHD virus strains** as an agent of biological control in Australia

Working in conjunction with the University of Cardiff Otter project, led to the examination of tissues from otter (*Lutra lutra*) found dead in the wild. Possible tuberculosis-like lesions in several tissues were confirmed as being non-tuberculous. However, two animals had pulmonary adiaspiromycosis infections which are usually caused by *Emmonsia parva*, a saprophytic fungus. The lesions were mild in one animal and clinically severe in the second animal. Adiaspiromycosis is quite prevalent in otters and
heavy infection can give rise to pulmonary granulomatous lesions that may appear similar to tuberculous lesions (Simpson and Gavier-Widen, 2000). Very heavy infections with the fungi may lead to clinical disease as occurred in the second animal. In another case, colloid goitre of uncertain clinical significance was seen in an adult otter.

**Threat – excluding the possibility of tuberculous lesions** in wildlife. Disease in otter - threat to biodiversity however otter populations are generally increasing in Britain.

Several wild species were submitted in unusual circumstances and subsequently found to have died from trauma, including an otter exhibiting nervous signs in Wales before death and a stoat (*Mustela erminea*) thought, from pathology seen, to have been attacked by a cat.

**REFERENCES**

The Veterinary Record 147, 239-241.

**AMPHIBIAN REPORTS**

*Batrachochytrium salamandrivorans* surveillance

**Threat: Emerging, biodiversity, animal welfare**

This quarter we continued surveillance for the novel chytrid fungus *Batrachochytrium salamandrivorans* (Bsal) which is known to be lethal to the great crested newt (*Triturus cristatus*) and has caused dramatic population declines of wild fire salamander (*Salamandra salamandra*) in the Netherlands and Belgium (Martel and others 2013). Bsal has been detected in captive amphibian collections in the UK (Cunningham and others 2015) and is considered a significant threat to native species biodiversity and animal welfare.

No newt mortality or morbidity incidents were reported in this quarter. Anuran (frog and toad) morbidity and mortality incidents were described at 43 sites in the first quarter, the majority of which were reported in March when amphibians become active. Of these reports, 23 involved multiple mortalities of common frogs (*Rana temporaria*) (5-50 carcasses per site), however, there was only one multiple mortality event involving common toads (*Bufo bufo*) (eight carcasses at the site). Post-mortem examinations were conducted on 14 amphibians from 8 sites which comprised eight common frog, and six common toad carcasses. All cases were negative for the chytrid fungi, *Batrachochytrium dendrobatidis* (Bd) and Bsal using real-time PCR testing and ranavirus screening is underway. Evidence of trauma or predation was observed in five incidents. During spring, we typically receive many amphibian mortality incidents due to exhaustion and drowning during mating however, these are diagnoses of exclusion.

**References**


IoZ

**AMPHIBIANS APHA DoWS/IoZ**

We received a report in April (just outside the reporting period) of approximately 100 deaths of amphibians, those identifiable being common toads (*Bufo bufo*) along a 30 metre stretch of pond edge in Northern England, consistent with the characteristic predation of toads by otters (Duff and Hewitt 1999 – see also WQR 12.2, 2010).

**Threat – public concern** on finding mass mortality of wildlife. Toad predation incidents can be locally devastating but are currently sporadic and unlikely to constitute a biodiversity threat, however this may possibly change with increasing otter populations in Britain.

**References**


APHA Diseases of Wildlife Scheme