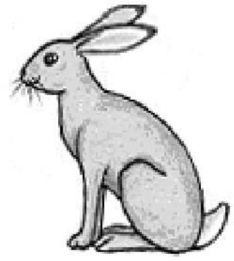
GB Wildlife Disease Surveillance Partnership quarterly report



Disease surveillance and emerging threats

Volume 28: Q1 – January-March 2020

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Introduction and overview

The GB Wildlife Disease Surveillance Partnership comprising the Animal and Plant Health Agency (APHA), SRUC Veterinary Services, Institute of Zoology (IoZ), the Centre for Environment, Fisheries and Aquaculture (CEFAS), the Wildfowl and Wetlands Trust (WWT), Natural England (NE), the Forestry Commission England (FCE) and the Garden Wildlife Health (GWH) project produces the GB Wildlife Disease Surveillance Partnership Quarterly Reports:

https://www.gov.uk/government/publications/wildlife-disease-surveillance-reports-2018.

A full explanation of how data is analysed is provided in the annexe available on GOV.UK https://www.gov.uk/government/publications/information-on-data-analysis

Issues and trends

SARS-COV-2 (Covid-19) from a wild animal host, probably a *Rhinolophus* sp. bat, has within recent months infected humans and more recently from man, infected animals, namely felines and mustelids. This was predicted (Ryser-Degiorgis, 2012) and for the past two decades wildlife disease scientists have demonstrated that wild species are an important source of new and emerging disease (N+ED) with AIDS, Ebola, MERS and SARS being just some examples of wildlife related diseases and zoonoses (WiREDZ) with wildlife origins. These scientists stress that man should not persecute wild animals for this reason and they emphasise that surveillance for wildlife disease is essential in our understanding of these processes. The most recent example, SARS-COV-2, an RNA corona virus with a predisposition for the human respiratory tract and aerosol transmission, has, in the five months since recognition in December 2019, become a global pandemic, responsible, at the time of writing (13.05.2020) for 4,098,018 human cases of infection including 283,271 human deaths worldwide (data from Epintel@phe.gov.uk). One message arising from the study of emerging infectious disease (EIDs) in wildlife is that the human utilisation of natural ecosystems and their wild animals can stimulate unpredictable events, such as SARS-COV-2 infection in novel hosts.

Wildlife Quarterly Reports periodically provide ongoing wildlife VIDA diagnostic data, this will appear in the form of an on-line dashboard which should be available later in 2020. Further information will be included in WQR Q2 for 2020.

Reference

Ryser-Degiorgis, M-P (2012) Coronavirus infections in bats, pp 238-239. *In* Infectious Diseases of Wild Mammals and Birds in Europe. Editors, Gavier-Widen, D., Duff, J.P. and Meredith, A. ISBN 978-4051-9905-6. Wiley-Blackwell, Sussex, England.

Notifiable diseases

Avian Influenza (AI) Virus

Great Britain AI Wild Bird Surveillance (AIWBS): January – March 2020

Total wild bird surveillance

The first quarter of 2020 saw a flurry of highly pathogenic avian influenza (HPAI) activity in Europe; most notably HPAI H5N8, but also HPAI H5N2 (Bulgaria). The first case of HPAI H5N8 was declared in Poland on 31st December 2019, in a turkey holding. Since then, scores of cases have been recorded in domestic, commercial, and small holdings containing poultry across Poland, Slovakia, Romania, Hungary, Bulgaria, Germany, Ukraine and the Czech Republic. HPAI H5N8 was recorded within a zoo setting in Slovakia in January, affecting a selection of captive Anseriformes, and also in Germany in March. At the end of March, Hungary reported a surge in HPAI H5N8 in commercial poultry settings. Initial incursions are thought to be associated primarily with wild birds, and International Disease Monitoring maps prepared by Defra colleagues shows cases aligned with commonly used flyways. Despite this, reports of HPAI H5N8 in wild birds have been relatively few, including a greater white-fronted goose (*Anser ablifrons*) and common buzzard (*Buteo buteo*) in Germany, and a hawk (*Accipitridae*) in Poland. There is evidence that fewer wild birds were tested in this period than the same period from previous years. In the UK, there were no positive wild bird cases detected during the first quarter.

Surveillance activity	Number of birds tested*	Positive AI virus result and species of bird	Comments
Found dead/injured	138 *(155)*	There were no positive cases found.	Scanning surveillance All-year-round
*Number of birds tested: figures for January-March 2019 are shown in brackets.			

Table 1 shows the number of wild birds tested and results in GB – 1st Quarter

Table 1 shows the number of wild birds tested under the Avian Influenza surveillance scheme. The number of birds tested under the Avian Influenza surveillance scheme in the first quarter (January – March) of 2020 was 138 as compared with 155 for the same period in 2019. Scanning surveillance continues year-round and all birds tested were found dead or injured.

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

Warden Patrol Scheme

The main emphasis of the warden patrol scheme 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 January to 31st March 2020 (Q1-2020), a total of 344 Warden Patrols were performed at sites across GB. This compares with a total of 427 Warden Patrols performed during the same period in 2019 (Q1-2019) in GB. During Q1-2020, the Warden Patrols were mainly performed by Natural England and the Wildfowl and Wetlands Trust. Warden Patrols were also carried out by one other voluntary organisation. In total during Q1-2020, 66 wild birds were reported found dead under the Warden Patrol Scheme of which 61 were tested, with no AI detections. This compares with a total of 68 wild birds found dead of which 63 were tested during Q1-2019, with no AI detections.

In Q1-2020, Whooper Swans (13) and Black-headed Gulls (12) were the most common target species found, and birds were most commonly found in the South West region with none found in the Midlands and Wales. Moorhens (13) were the most common target species found in Q1-2019 and birds were most commonly found in the North West region with none in the Midlands and 1 in Scotland.

Current EU situation

The current EU and UK outbreak situations can be found here: https://www.gov.uk/government/publications/avian-influenza-bird-flu-in-europe

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.

Current UK Situation

There were no detections of HPAI in wild birds so far in 2020. The last detection of HPAI in a wild bird in the UK was a buzzard (*Buteo buteo*) found in the east of England, in April 2018. In light of the evolving HPAI European situation, the UK risk status has been evaluated on a weekly basis. At the present time the official risk status is deemed to be LOW.

There were also no detections of HPAI in poultry in the UK in Q1 of 2020. However, there have been cases of low pathogenic AI (LPAI) in poultry premises in Scotland and England which, by way of genetic analysis and epidemiological assessment, were suspected to be introduced from wild birds. In all cases, notifiable avian influenza (HPAI or H5/H7 lineages) was ruled out.

The LPAI cases in GB and the presence of HPAI in Europe serves as a reminder that at all times, poultry keepers should maintain robust biosecurity measures, be vigilant for clinical signs of disease and 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.

- In Wales, the helpline number is 0300 303 8268.

- In Scotland, contact your local APHA Field Services Office: https://www.gov.uk/government/organisations/animal-and-plant-health-agency/about/access-and-opening

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

- Avian influenza guidance: https://www.gov.uk/guidance/avian-influenza-bird-flu.

- When and how to register your poultry flock, and which species must be registered in Great Britain: https://www.gov.uk/guidance/poultry-registration.

- Information about the chargeable testing scheme offered in GB by APHA that enables veterinarians to request ‘Testing for Exclusion of notifiable avian disease’ in chicken and turkey flocks, in circumstances that would not require the implementation of statutory disease control measures (Gibbens and others, 2014): http://ahvla.defra.gov.uk/vet-gateway/nad/index.htm.

References

https://www.gov.uk/guidance/avian-influenza-bird-flu

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/608529/ai-birdflu-factsheet-170413.pdf

https://www.gov.uk/government/publications/avian-influenza-in-wild-birds

https://veterinaryrecord.bmj.com/content/174/21/534.3

Rowena Hansen, Avian Virology, APHA Weybridge

Joanna Tye, DES, APHA Weybridge

Wildfowl and Wetlands Trust’s (WWT) role in GB Avian Influenza Wild Bird Surveillance (AIWBS):- January - March 2020

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

Throughout this quarter WWT continued to carry out passive surveillance of avian influenza across our reserves. Between January and March 2020, 68 dead wild birds were found across seven WWT sites located in Gloucestershire, West Sussex, Greater London, Norfolk, Tyne and Wear, Lancashire, and Dumfries and Galloway. Of the birds found, 63 were sampled for avian influenza virus, with five carcases being too heavily predated or decomposed to swab.

A total of 12 priority target species were sampled during this quarter. These included species of swans, geese, ducks, gulls, and rails. In addition, samples were also obtained from a pied avocet (*Recurvirostra avosetta)* and a suspected mallard (*Anas platyrhynchos)* x domestic duck hybrid.

A total of 53 samples were tested for highly pathogenic avian influenza (HPAI) viruses, for which all tested negative. Ten samples were unable to be sent for testing due to the impact of the Covid-19 outbreak on routine operations; however, measures have been put in place in order to resume with the surveillance as soon as possible. All untested samples have been frozen and will be stored until special delivery arrangements are made. For further details of HPAI surveillance from across Great Britain, please refer to the APHA report for this quarter.

WWT

Zoonotic Diseases

APHA Diseases of Wildlife Scheme (DoWS); Salmonellosis in wildlife; 4th Quarter; January - March 2020

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.

There were no reports of *Salmonella* in wildlife for this quarter.

Catherine Man, APHA Diseases of Wildlife Scheme

Report from Wildlife Zoonoses and Vector Borne Disease Research Group; 4th Quarter; January - March 2020

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

Passive surveillance for lyssaviruses in UK bats

Twenty nine bats were tested for lyssavirus under passive surveillance during this quarter. All were negative.

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

Rabies diagnosis

One dog as a suspect case as well as 2 guinea pigs, 1 squirrel monkey and 1 cat that died in quarantine were tested for rabies with negative results.

Rabies surveillance in terrestrial wildlife

Vigilance continues for this notifiable disease in UK wildlife but no samples from terrestrial wildlife were submitted for testing this quarter.

West Nile virus and Usutu virus surveillance in wild birds SV3045

No wild birds were tested for West Nile virus (WNV) or Usutu virus (USUV) during this quarter.

Forty three accipitriformes, 47 strigiformes and 3 falconiformes collected during 2019 and submitted under the Predatory Bird Monitoring Scheme have yet to be tested for WNV and USUV. Testing will recommence once Coronavirus restrictions have been lifted.

West Nile virus surveillance in Equids

As part of notifiable disease investigations following the euthanasia of a horse exhibiting neurological signs including ataxia, a serum sample from the horse was tested by IgM ELISA for WNV with a negative result. Brain, spinal cord and cerebrospinal fluid samples were also tested for WNV by real time PCR, all with negative results.

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

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

Wildlife Diseases, horizon scanning; points for interest and potential threats associated with wildlife and wildlife disease. Very brief summaries are given, including possible wildlife disease threats to human, livestock and biodiversity health

SARS-COV-2 (Covid-2) shares 96.2% nucleotide identity with virus from a Chinese bat. Importance of prevention of exposure of humans to wildlife viruses through ‘wet markets’. Some authorities recommending that bat rehabilitators do not release captive bats to the wild. Early evidence of infection in zoo tigers and lions:

References: (1) Shi et al. Susceptibility of ferrets, cats, dogs, and different domestic animals to SARS-coronavirus-2. *bioRxiv* 2020; 015347 https://www.biorxiv.org/content/10.1101/2020.03.30.015347v1.

(2) Promed 7.04.2020, COVID-19 update (84): USA, tigers; provides link to Bronx Zoo statement.

New developments in relation to lead ammunition toxicity to humans consuming game shot with lead, and toxicity to wildlife. As of Jan 2020, UK shooting community preparing for voluntary phase-out of lead ammunition. Two supermarkets commit to selling game shot with non-toxic ammunition.

Reference: Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Wetland restrictions:
https://chemycal.com/news/ce2d7f46-cfd9-4250-a1e6a01683378be5/Draft_Commission_Regulation_restricting_lead_in_gunshot_in_or_around_wetlands

Climate and environmental changes may lead to the 6th mass extinction event; the importance of wild species extinction to the Extinction Rebellion group.

References: Extinction Rebellion website https://rebellion.earth/
The Guardian:
https://www.theguardian.com/environment/2019/sep/27/climate-crisis-6-million-people-join-latest-wave-of-worldwide-protests.

Salmonella Hessarek cause of occasional mortality events in wild birds in continental Europe as a cause of death in two woodpeckers in the UK.

Reference: Wilkinson et al. Novel salmonella variant associated with mortality in two great spotted woodpeckers. *J. of Wildlife Diseases* 2019; **55(4)**:874-878 https://doi.org/10.7589/2018-08-191.

Publication suggesting that use of neonicotinoid insecticides may be having a detrimental impact on wild bird populations.

Reference: Lennon et al. Using long-term datasets to assess the impacts of dietary exposure to neonicotinoids on farmland bird populations in England. *PloS ONE* 2019; **14(10)**:e0223093 https://doi.org/10.1371/journal.pone.0223093

Potential for the occurrence of a third phocine distemper virus (PDV) outbreak in UK seals. No reference, hypothetical risk based on timing of previous two outbreaks.

Garden Wildlife Health summary

Summary

In response to the Covid-19 pandemic, the Garden Wildlife Health (GWH) team suspended wildlife postmortem examinations (PMEs) from March 16th 2020 during the period of lockdown restrictions. Syndromic surveillance continued unchanged during Q1: members of the public reported sightings of sick and dead garden wildlife, comprising garden birds, hedgehogs, reptiles and amphibians, to www.gardenwildlifehealth.org. The disease incident reports (DIRs) received, and PMEs conducted by the Garden Wildlife Health team during Q1 2020 are summarised in Tables 2 and 3, and Figure 1.

Routine testing of wild animals examined postmortem included microbiological screening of the liver and small intestinal contents in all bird and mammalian species; parasitological examination of the small intestinal contents in all animals; culture of a crop sample from birds to screen for the presence of *Trichomonas gallinae*; molecular testing (PCR) for ranavirus, *Batrachochytrium dendrobatidis* and *Batrachochytrium salamandrivorans* in all amphibian species, as well as for *Ophidiomyces ophiodiicola* (the causative agent of snake fungal disease) in snakes. Additional diagnostic tests, including histopathological examination, are conducted when indicated.

Taxon	No. of disease incident reports (No. of sites)	Total No. of animals observed (sick/dead)	No. of postmortem examinations (No. of sites)
Amphibians	67 (58)	234 (48/186)	10 (5)
Reptiles	3 (3)	3 (0/3)	2 (2)
Hedgehogs	28 (26)	29 (2/27)	14 (11)
Birds	1073 (509)	1527 (1172/355)	20 (17)
Total	1171 (596)	1793 (1222/571)	46 (35)

Table 2 shows the numbers of Garden Wildlife Health disease incident reports and postmortem examinations for Q1 2020

Taxon	No. of disease incident reports in Q1 (no. sick/dead	
	2019	2020
Amphibians	63 (129/570)	67 (48/186)
Reptiles	3 (0/3)	3 (0/3)
Hedgehogs	26 (4/23)	28 (2/27)
Birds	1150 (1235/254)	1073 (1172/355)
Total	**1242 (1368/850)**	**1171 (1222/571)**

Table 3 compares the numbers of Garden Wildlife Health disease incident reports for Q1 2019 and 2020

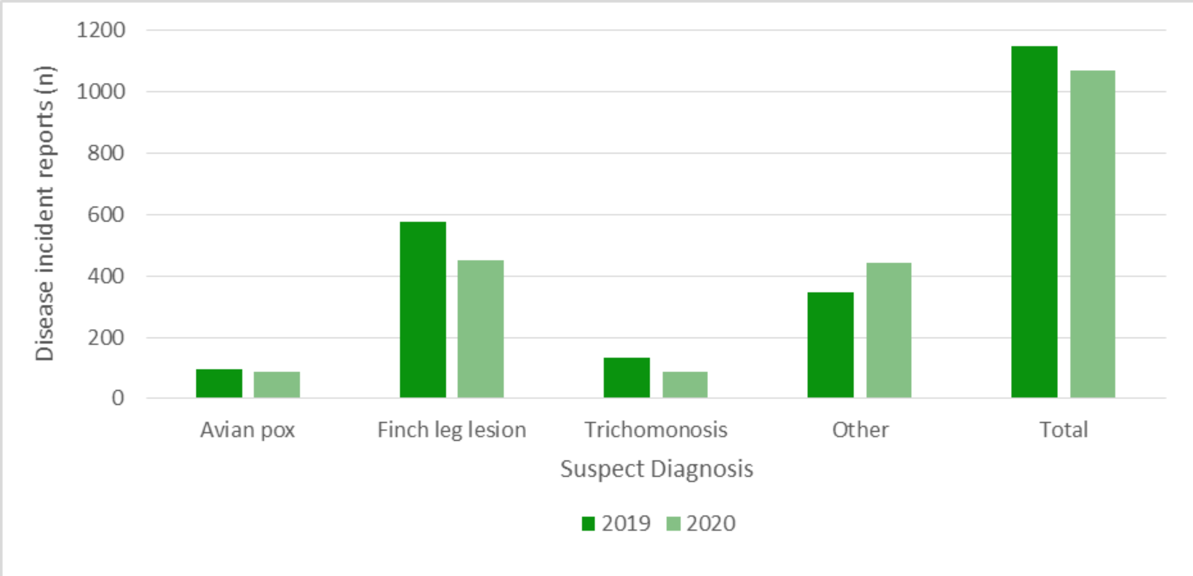

Figure 1 compares the numbers of Garden Wildlife Health avian disease incident reports allocated suspect diagnoses for Q1 2019 and 2020. Further information on avian pox, finch leg lesions and trichomonosis is available by following the respective links.

IoZ

Mammal reports

Wild mammal reports from Scotland

Suspected herpesvirus-associated fibrosing and necrotising pneumonia was found in submitted viscera from two fallow deer (*Dama dama*) which had been shot wild, but suspected to have escaped from a farm in Dumfries and Galloway. Firm grey masses were found in the right cranial and caudal lobes of one lung, with a very firm core to one of the lesions. In the other set of lungs, the caudal half of the caudal lung lobes had been almost completely replaced by firm grey masses, with large areas where hard, bony tissue was present.

Histopathology on lung tissue from both animals found some similarities to multinodular pulmonary fibrosis (associated with gammaherpesviruses EHV-5 and AHV-5 – Williams et al, 2007 and Back et al, 2012) in equines. In addition, intranuclear inclusion bodies were seen in the lung tissue of the deer, consistent with herpesviral infection. However, it was noted that there were also some differences between the pathology seen in the deer and that observed in horses: although horses can present with a multinodular form resembling neoplasia, as in these deer, there was here the additional presence of numerous multinucleated cells and mineralisation/woven bone formation, and a relative lack of preservation of alveolar structures.

Herpesvirus DNA was detected in the lung tissue by pan-herpesvirus PCR, and PCR product sequencing showed 100% identification as fallow deer lymphotropic herpesvirus. It was noted that this virus has not previously been reported in the literature in conjunction with this clinical presentation. It is a rhadinovirus (grouped with other viruses such as MCF), so is capable of causing severe disease, but not usually in the primary host. SRUC Veterinary Services noted that there are exceptions to this, and this may be one, given the similarity to herpesvirus associated disease in horses. At present, investigations are ongoing.

This case was of interest due to the lack of previous records of this presentation associated with the herpesvirus.

References

Williams KJ, Maes R, Del Piero F, Lim A, Wise A, Bolin DC, Caswell J, Jackson C, Robinson NE, Derksen F, Scott MA, Uhal BD, Li X, Yousself SA, Bolin SR. Equine multinodular pulmonary fibrosis: a newly recognized herpesvirus-associated fibrotic lung disease. *Vet Pathol* 2007; **44(6)**; 849-62 http://doi.org/10.1354/vp.44-6-849

Back H, Kendall A, Grandon R, Ullman K, Treiber-Berndtsson L, Stahl K, Pringle J. Equine Multinodular Pulmonary Fibrosis in associated with asinine herpesvirus type 5 and equine herpesvirus type 5: a case report. *Acta Vet Scand* 2012; **54(1)**; 57 http://doi.org/10.1186/1751-0147-54-57

Caroline Robinson, SRUC Veterinary Services

Wild mammal reports from IoZ

Squirrelpox virus

Summary

Threat to wild squirrel health and welfare, to red squirrel conservation, and cause of public concern

Remnant red squirrel (*Sciurus vulgaris*) populations in the UK mainland are threatened by squirrelpox viral disease and the reservoir of the squirrelpox virus, the invasive grey squirrel (*Sciurus carolinensis*), which is expanding its range. Until this threat can be effectively mitigated, there is a high risk from disease outbreaks, following proposed conservation translocation of red squirrels within mainland UK.

References

Sainsbury AW, Chantrey J, Ewen JG, Gurnell J, Hudson P, Karesh WB, Kock RA, Lurz PW, Meredith A, Tompkins DM. Implications of squirrelpox virus for successful red squirrel translocations within mainland UK. *Conservation Science and Practice* 2020; https://doi.org/10.1111/csp2.200

IoZ

Wild mammal reports from APHA DoWS

Neisseria animaloris in harbour porpoises

In a multidisciplinary study led by SRUC, and involving APHA and multiple European partners, systemic infections of *Neisseria animaloris* were identified in eight harbour porpoises from various locations around North Sea coasts. This organism is normally considered a commensal of the canine and feline oral cavities. This is the first isolation of *N. animaloris* from any marine mammal species. Extensive molecular analysis, carried out by APHA, demonstrated the isolates all belong to an identical clone of *N. animaloris,* distinct from those previously reported in companion animals. In all eight cases this organism was isolated in sole or dominant growth from lung abscesses with additional recovery from other tissues and from chronically infected bite wounds on fins and tails. Forensic microbiology indicated that the most plausible route of infection was via bites from grey seals, with the porpoises initially surviving a predatory attack, but ultimately succumbing to a disseminated *N. animaloris* infection. The findings further add to concerns regarding zoonotic infections of humans following seal bites and the handling of stranded seals and porpoises. *N. animaloris* has been associated with systemic infections in humans and other animals following cat and dog bites raising the possibility of similar potential in the seal isolates. Thus, *N. animaloris* should also be considered as a potential zoonotic organism when handling marine mammals.

Reference

Foster G, Whatmore AM, Dagleish MP *et al.* Forensic microbiology reveals that *Neisseria animaloris* infections in harbour porpoises follow traumatic injuries by grey seals. *Sci Rep* 2019; **9(1)**:14338 http://doi:10.1038/s41598-019-50979-3

Adrian Whatmore, APHA Weybridge

Pinnipeds as a potential source of pandemic Influenza A Viruses (IAV)

A recent published paper by Venkatesh and others (2020) describes the detection of H3N8 influenza A virus (IAV) with multiple mammalian-adaptive mutations in a four-month-old grey seal (*Halichoerus grypus*) pup that was rescued from St Michael's Mount, Cornwall in 2017. It was admitted to a rehabilitation centre but died despite nutritional support, fluid therapy and antibiotic treatment. Postmortem examination at APHA Starcross Veterinary Investigation Centre (VIC), under the APHA Diseases of Wildlife Scheme, revealed severe cellulitis and fasciitis affecting the right side of the neck and thorax (Figure 2) and a renal infarct (Figure 3). Various tissues were collected for virological and histopathological investigations. IAV RNA was detected by PCR in nasal tissues and IAV antigen was detected by immunohistochemistry in the nasal mucosa. Only trace amounts of viral RNA was detected within the lower respiratory tract and no IAV-derived damage was identified on histopathology suggesting sub-clinical infection only. Virus isolation from various tissues was unsuccessful. Bacterial septicaemia secondary to wound infection, a common cause of rescue seal pup fatalities, was deemed the most likely cause of death.

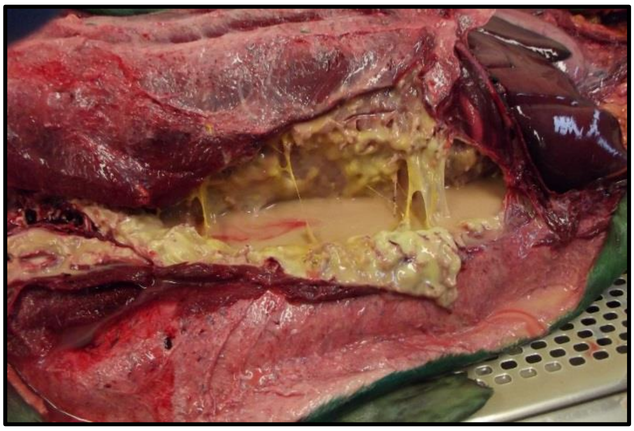

Figure 2 shows severe fasciitis and cellulitis found on postmortem examination of a four-month-old grey seal (Halichoerus grypus)

Figure 3 shows a kidney from a four-month-old grey seal (*Halichoerus grypus*) with renal infarcts

Phylogenetic analysis of the extracted viral RNA revealed the virus most likely originated from wild Anseriformes. Several mutations were also detected in the virus genome indicating mammalian genetic adaptations had occurred within the seal host. The significance of these findings were discussed in the paper and highlight the potential importance of marine mammals in the circulation and maintenance of avian-origin IAVs. The close contact between pinnipeds and wild waterfowl provides an opportunity for IAV exchange. As a result pinnipeds may act as an endemically infected reservoir of IAV and may help to drive mammalian adaptation of the virus. Furthermore, H3 IAV viruses are of particular interest due to their ability to cross species barriers and interestingly a H3N8 virus was implicated in the human 1889 influenza pandemic. Significantly, many pinnipeds are admitted to wildlife rehabilitation centres each year in the UK so there is a risk of potential zoonotic transmission of such viruses to humans. The findings reported in this paper therefore suggest that pinnipeds could act as potential sources of pandemic influenza viruses in the future.

Reference

Venkatesh D, Bianco C, Nunez A, Collins R, Thorpe D, Reid SM, Brookes SM, Essen S, McGinn N, Seekings J, Copper J, Brown IH, Lewis NS. Detection of H3N8 influenza A virus with multiple mammalian-adaptive mutations in a rescued Grey seal (Halichoerus grypus) pup. *Virus Evolution* 2020; **6(1)** https://doi.org/10.1093/ve/veaa016

Rachael Collins, APHA Starcross

The first racoon dog (*Nyctereutes procyonoides*) to be submitted to APHA Diseases of Wildlife Scheme (DoWS)

A racoon dog (*Nyctereutes procyonoides*) was submitted by the National Wildlife Management Centre to APHA Thirsk VIC under the Diseases of Wildlife Scheme. The carcase was a macerated road traffic victim found by the police near Matlock Derbyshire, from which salmonellae were cultured and a faeces sample removed for *Echinococcus multilocularis* examination. This is one of a number of raccoon dogs (up to 20 individuals) believed to have escaped or been illegally released in the area. A contingency response was mounted to recover any remaining animals; however none were located. It is illegal to release or allow the escape of this and other non-native animal species in England, because they pose a potential threat to biodiversity, human health and livestock, as novel predators, competitors and carriers of a range of pathogens. Despite this, sightings do occur, including an earlier report of a racoon dog in England (Northamptonshire July 2019) and sightings in Wales (August 2019). Landowners and vets may become aware of additional sightings of this and other species such as racoon (*Procyon lotor)* and Siberian chipmunk (*Tamias sibericus)*. Any such sightings should be reported as quickly as possible, ideally with a photograph, to alertnonnative@ceh.ac.uk.

Figure 4 – 'Raccoon Dog In The Sun' by orkomedix, licensed under CC BY_NC_SA 2.0

APHA DoWS

Avian Reports

Wild Bird report from the IoZ

Diplotraena sp. nematodiasis

Summary including possible threats – Point for Information (PFI)

Threat to wild bird health and welfare

In January 2020, a mortality incident involving an adult male great tit (*Parus major*) from Surrey, England, was reported. A single large (11mm diameter), pink, nodular skin lesion was located on the lateral aspect of the right wing, consistent with avian pox. Examination of the left caudal thoracic air sac revealed the presence of three nematode parasites, with local thickening and opacity of the air sac membrane. The parasites varied in size, with the largest individual measuring 124mm in length (Figure 5) and have been provisionally identified as *Diplotraena* sp., a genus of nematode previously detected in blackcaps (*Sylvia atricapilla*) submitted to GWH. Since 2005, 124 great tits have been examined postmortem at the Institute of Zoology, London and, to date, this is the first observed case of this parasite infection. However, *Diplotraena henryi* has been reported in a great tit in Slovakia (Literak et al., 2003). Parasite samples have been submitted to the Natural History Museum, London for species identification.

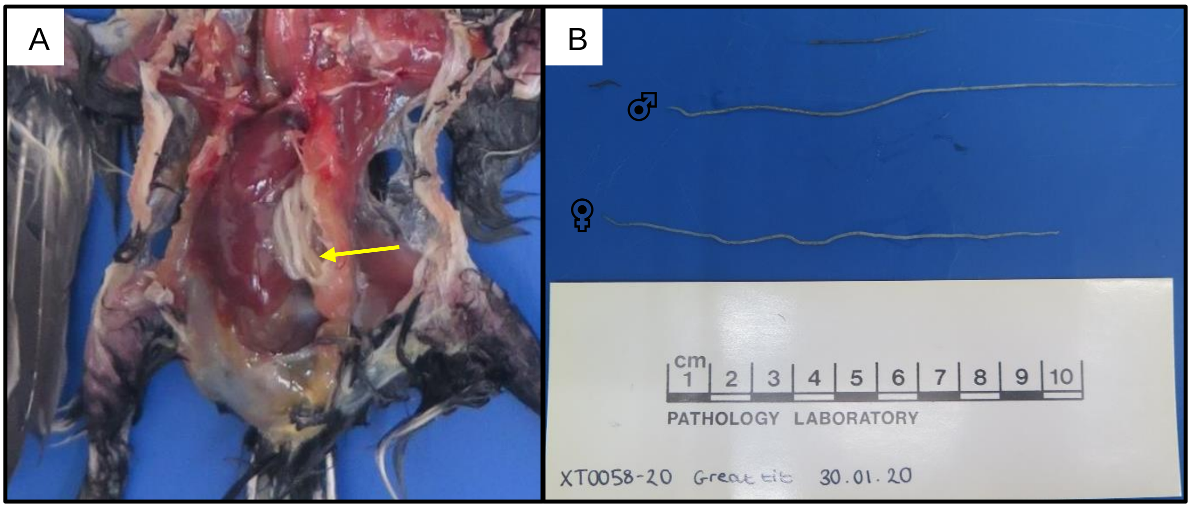

Figure 5 shows *Diplotraena* sp. nematodes observed in the left caudal thoracic air sac of an adult great tit (*Parus major*) *in-situ* (A, arrow) and *ex-situ* (B). Two individuals identified as females (B, beneath) and one as male (B, above).

Staphylococcus aureus was isolated from the wing skin lesion, liver, air sac, small intestinal contents and lung, which is a common pathogen on the skin of birds. The likely cause of death in this bird was therefore considered to be disseminated bacterial infection, originating from the presumed avian pox lesion. Histopathological examination is pending to confirm the aetiology of the wing skin lesion and to assess the significance of the *Diplotraena* sp. nematodes.

References

Literák I, Baruš V, Hauptmanová V, Halouzka R. The nematode *Diplotriaena henryi* (Nematoda: *Diplotriaenoidea*) as the possible cause of subcutaneous emphysema and respiratory insufficiency in a great tit (*Parus major*). *Helminthologia* 2003;**40**:23–25. DOI unavailable.

Cnemidocoptosis in garden birds – update

Summary

Threat to wild bird health and welfare and cause of public concern

Cnemidocoptes sp. mites are one of the known causes of proliferative leg skin lesions in finches (as well as an infection with *Fringilla* papillomavirus, or a combination of both), which are predominantly observed in chaffinches (Lawson and others, 2018) and are one of the most common conditions reported to GWH (see Figure 1). As reported in Q1 2019, GWH have recently also confirmed cnemidocoptosis associated with proliferative leg skin lesions in a dunnock (*Prunella modularis*).

In Q1 2020, GWH confirmed another case of cnemidocoptosis in a dunnock, this time affecting the skin over the entire head (Figure 6) with lesions of the same character observed on the dorsal neck and right shoulder (2-4mm in diameter) as well as the undercarriage (10mm in diameter). Microscopic examination of skin lesions identified *Cnemidocoptes* sp. mites (Figure 7). The bacterium *Staphylococcus aureus* was isolated from the head skin lesion, the liver, and the small intestinal tract contents. Histopathological examination confirmed parasitic dermatitis with epidermal hyperplasia and hyperkeratosis caused by *Cnemidocoptes* sp. with a secondary bacterial infection (Figure 8). These finding further highlight that cnemidocoptosis should be considered as a differential diagnosis for proliferative skin lesions in garden birds.

Traumatic injuries consistent with cat predation as the cause of death were present. As previously described, severe cases of cnemidocoptosis might predispose affected birds to trauma/predation or other secondary infections (Lawson et al, 2018).

Figure 6 shows a dunnock (*Prunella modularis*) with severe proliferative lesions caused by *Cnemidocoptes* sp. covering the entire head.

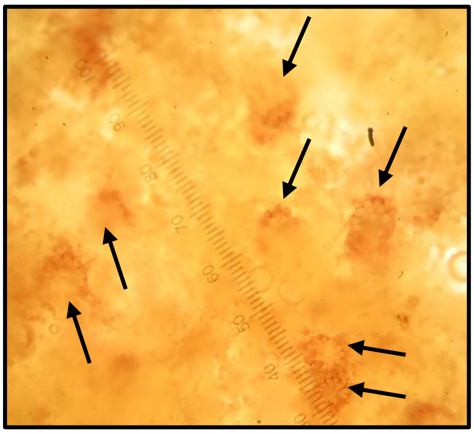

Figure 7 shows microscopic image of a head lesion crush preparation from a dunnock (*Prunella modularis*) revealing numerous *Cnemidocoptes* sp. (arrows).

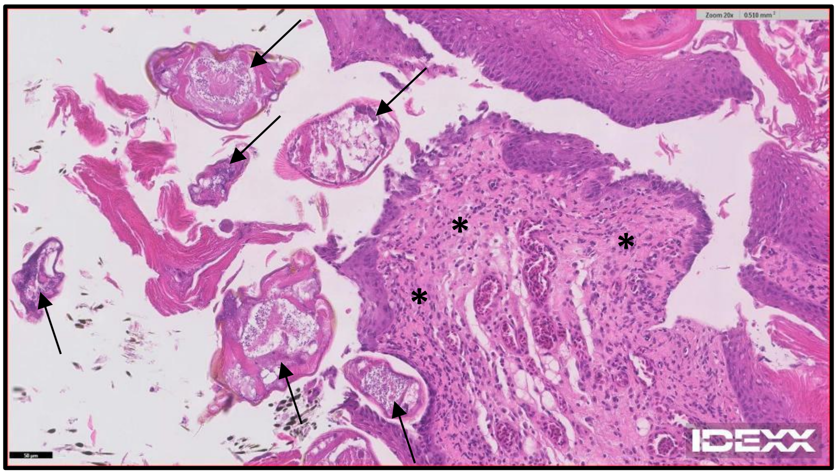

Figure 8 shows a photomicrograph of a head skin lesion in a dunnock (Prunella modularis). There is epidermal hyperplasia and hyperkeratosis and degenerated inflammatory cells (asterisks) within the dermis (dermatitis) and multiple sections of parasites consistent with *Cnemidocoptes* sp. (arrows). Bar 50µm.

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Blue tit epidemic mortality event in Germany

Summary

Threat to wild bird health and welfare and cause of public concern

In March 2020, the Nature and Biodiversity Conservation Union (NABU) reported a large cluster of reports of sick and dead blue tits (*Cyanistes caeruleus*) in northwestern Germany, with non-specific signs of ill health, such as lethargy and fluffed up plumage. In response, they issued a national public appeal for reports of tit disease incidents, which led to over 13,000 reports received by 22nd April 2020. Blue tits are the species most commonly affected, with others such as great tits rarely involved. Postmortem examination and microbiological examination of blue tits from multiple sites confirmed isolation of the bacterium, *Suttonella ornithocola*, which is considered the cause of the mortality. Investigations are underway to further investigate the outbreak in Germany, and to explore factors which might have influenced the epidemic occurrence.

Suttonella ornithocola was first identified following a cluster of tit mortality incidents that occurred in Great Britain in 1996, which affected multiple tit species, comprising blue tit, coal tit (*Periparus ater*), great tit and long-tailed tit (*Aegithalos caudatus*). Surveillance since 2005 has identified a small number of *S. ornithocola* infection incidents which have occurred with a widespread distribution across Great Britain. Blue tits remain the species most commonly affected and incidents typically occur in spring. These findings suggest that *S. ornithocola* infection is well-established (i.e. endemic) in the British tit population.

Ongoing disease surveillance through the GWH project has found no evidence of a seasonal change or unexpected increase in tit mortality reports to date in spring 2020.

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Nature and Biodiversity Conservation Union (NABU) *Suttonella ornithocola* bacterium causes blue tit deaths. *NABU Report 20* [Accessed April 22nd 2020] https://www.nabu.de/news/2020/04/27990.html

IoZ

Wildfowl and Wetlands Trust (WWT) report: January - March 2020

Passive surveillance of waterbirds

Postmortem examinations were performed on 39 wild birds originating from five WWT sites (Slimbridge, Gloucestershire; Arundel, West Sussex; Welney, Norfolk; Martin Mere, Lancashire; Caerlaverock, Dumfries and Galloway). A total of 10 target species were examined, including four mute swans *(Cygnus olor),* one bewick's swan (*Cygnus columbianus bewickii*), four whooper swans (*Cygnus cygnus*), two black-headed gulls (*Chroicocephalus ridibundus*), four eurasian coots (*Fulica atra*), three greylag geese (*Anser anser*), two pink-footed geese *(Anser brachyrhynchus),* five common moorhens (*Gallinula chloropus),* one mallard (*Anas platyrhynchos)*, and one pochard ***(****Aythya farina****).*** Additionally, three other swabbed species were also examined: one common crane (*Grus grus*), one common jackdaw (*Corvus monedula*) and one rook (*Corvus frugilegus*). The primary causes of death are summarised below (Table 4).

The most notable postmortem finding was gross pathologic lesions consistent with aspergillosis (17%), which affected, in its vast majority, species from the *Cygnus* genus. These birds were collected during the colder winter months (January and February), which although have not been the coldest of months, as suggested by the Met Office, there is evidence that they have potentially been the wettest, in comparison with previous years. This may have had an effect on the behaviour of the aspergillus spores and development of underlying immunosuppressive status in avian species (Calvo Carrasco et al, 2016). All carcases presented extensive, invasive, and infiltrating lesions affecting more than one area of the respiratory tract (pulmonary tissue, air sacs and trachea) with poor body condition and other concurrent issues. One whooper swan within this group was a juvenile, which presented with extensive external lesions to its limbs and metatarsal swelling. Others within the group presented with a high parasitic load within the gizzard.

Other postmortem findings include trauma cases with significant internal haemorrhaging (15%), most carcases revealed signs of an accidental occurrence (vehicle involved incident, collisions, etc.); except one pink-footed goose that presented lesions consistent with having been shot in mid-air and injuries from the fall. This goose was collected in the same area (Lancashire) as our three potential lead poisoning cases, one greylag goose and two whooper swans (7%) – all presented dilated proventriculus, extremely compacted grass content and variable number of small lead pellets within the gizzard. Despite the presence of these lead poisoning cases there does appear to have been considerable progress in recent years and some shooting stakeholders have switched (or are switching) to the use of non-lead ammunition (Pain et al, 2020).

Avian mycobacteriosis was detected in 5 of the wild birds examined (12%), only two presented injuries attributable to predation or intraspecies aggression (5%), two renal disease cases (5%), one being a whooper swan which also presented with extensive urate disposition consistent with visceral gout. One whooper swan presented with changes to the morphology of the heart structure suggesting a cardiomyopathy (2%). Seven (17%) wild birds did not receive a diagnosis due to heavy predation, decomposition or lack of gross abnormalities. Eight cases (20%) include other causes that were of less prevalence, during this quarter, including mortality related to drowning, euthanasia in a severe bumblefoot case, splenic abnormalities, metatarsal joint swelling and one case of advanced egg peritonitis in a black headed gull.

Primary cause of death/PM findings	Total	Species (and notes)
Trauma causing internal haemorrhage	6	1 x whooper swan, 1 x moorhen, 1 x pink-footed goose, 1 x pochard, 1x black headed gull, 1 x hybrid mallard
Aspergillosis	7	1 x bewick's swan, 2 x mute swan, 4 x whooper swan^{†1}
Avian mycobacteriosis	5	2 x greylag^{*1}, 1 x mallard, 1 x pink-footed goose, 1 x whooper swan
Renal disease	2	1 x whooper swan (incl. visceral gout), 1 x jackdaw
Cardiac disease	1	1 x whooper swan
Lead poisoning	3	1x greylag, 2 x whooper swan ^{†1}
Other	8	1 x moorhen – drowned 1 x coot – predated (possibly by a mustelid) 1 x coot ^{*1} – advanced bumblefoot 1 x coot – splenic disease 1 x moorhen – splenomegaly 1 x moorhen – metatarsal swelling 1 x mute swan ^{†1} – drowned (intraspecies aggression) 1 x black headed gull – egg peritonitis
No diagnosis (due to heavy predation, decomposition or lack of gross abnormalities)	7	1 x coot, 1 x common crane ^{†1}, 1 x mute swan, 1 x rook, 1 x whooper swan, 1 x whooper swan ^{†1}, 1 x moorhen

Table 4 shows confirmed & suspected causes of wild bird mortality (including morbidity meriting euthanasia on welfare grounds) at WWT reserves between January and March 2020; $†^n$ denotes juvenile birds, and number of juvenile birds; $*^n$ denotes euthanased birds, and number of euthanased birds.

Sarcocystis surveillance project

In January 2020, the *Sarcocystis* surveillance project received a final nine reports from members of the hunting community. This brings the total number of submissions to 60 for the 2019-2020 hunting season. The majority of sarcocystosis cases were reported in mallards (*Anas platyrhynchos)* (33) and Eurasian wigeon (*Mareca penelope)* (19), representing 55% and 32% of cases respectively. Cases were also reported in Eurasian teal (*Anas crecca)* (6), northern pintail (*Anas acuta)* (1) and gadwall (*Mareca strepera)* (1).

Approximately 77% of cases were reported in males, possibly reflecting bias in the hunting bag rather than infection predilection. Most cases (75%) were reported in birds with good body condition which showed some fat and a plump breast muscle.

The data collected during both the 2018 and 2019 hunting seasons is now being compiled into a feedback report, which will be published online in due course. For further information on *Sarcocystis* surveillance in UK waterfowl and for previous reports, please refer to the Sarcocystis Survey website (http://www.sarcocystissurvey.org.uk/).

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Rosa Lopez, Veterinary Officer (Conservation), Wildfowl & Wetlands Trust (WWT)

Wild Bird reports from Scotland: January - March 2020

Suspected primary hepatitis and secondary air sacculitis and pneumonia was seen in a satellite-tagged seven-month-old male hen harrier (*Circus cyaneus*) that stopped moving one day in Sutherland, with no prior concerning patterns. The bird was in very poor body condition, and a red pasty deposit was found over the right lobe of the liver and the right lung, with the adjacent air sac thickened with similar material. Histopathology was hampered by autolysis, but necrosis and inflammation of the air sac, lung and liver could be seen, along with a chronic proliferative process in the liver which may have been a response to the necrosis and inflammation in the liver or could have been due to neoplasia. The lesions in the liver were more established than the changes in the lung, and a primary inflammatory liver lesion, originally walled off but eventually spreading to the air sac and lung, was suspected.

This case was of interest due to the red-listed species involved.

Avian tuberculosis and mycotic airsacculitis due to *Aspergillus fumigatus* were diagnosed in a dead buzzard (*Buteo buteo*) found by a dog walker in Midlothian. Very poor body condition was noted, with pale caseous lesions on both thoracic air sacs, on the epicardium and on the serosa of the gizzard, inside which a partially ulcerated mass also protruded into the lumen. *A. fumigatus*, and acid-fast bacteria consistent with avian tuberculosis were identified in the caseous material. Histopathology confirmed mycobacterial infection consistent with avian tuberculosis in the serosa, heart and lungs, and fungal infection of the air sacs. Routine toxicological screen found low residues of brodifacoum and difenacoum in liver tissue - whilst these residues were indicative of exposure, anticoagulant rodenticide poisoning was not the cause of death in this case. This is not an uncommon finding during postmortem examination of birds of prey (SASA, 2020).

This case represents a common cause of concern to members of the public, who not uncommonly find dead buzzards over the winter and report them to Police Scotland for investigation.

Reference: Science and Advice for Scottish Agriculture. Animal Poisoning Reports [online]. SASA.gov.uk. Last updated 17th April 2020. Available at: www.sasa.gov.uk/animal-poisoning-reports

Suspected chronic parasitism/schistosomiasis was seen in a seven-month-old mute swan (*Cygnus olor*) which was one of several swan deaths over a few months in Perthshire. At necropsy, body condition was very poor. Histopathology revealed chronic hepatitis and hepatic atrophy with suspected amyloidosis and metazoan parasite infection suggestive of schistosomiasis. There were sections of suspected degenerate schistosomes seen, and obliterative changes in some intestinal blood vessels were consistent with those which have been described in cases of schistosomiasis in mute swans. SRUC Veterinary Services commented that changes in water levels allowing birds to access the intermediate hosts of parasites has been suspected to contribute to increased mortality in mute swans, which could be a factor in this case (Pennycott,1998).

This case was of concern due to the swan deaths at various parks and popular walks close to Perth, usually reported by members of the public to the council.

Reference: Pennycott, TW. Lead poisoning and parasitism in a flock of mute swans (*Cygnus olor*) in Scotland. *Vet Rec* 1998**: 142:** 13-17 doi.org/10.1136/vr.142.1.13

Wood pigeons (*Columba palumbus*) with presumptive trichomonosis comprised several cases submitted for postmortem examination this quarter, in several locations around Scotland.

In one case, five dead pigeons were found in a garden over three weeks, with two more found near pheasant enclosures, in the Scottish borders. One was submitted for necropsy. In another case, there were reports of more than ten sick or dead pigeons in a forest in Dumfries and Galloway, and two pigeons were examined. In the third case, a dead pigeon was found at a pheasant feeding site in Ross and Cromarty. In all cases, either poor or moderate body condition was seen, and caseous or proliferative pale lesions were found in the upper alimentary tract, from the oral cavity down the oesophagus to the crop.

Multiple deaths, deaths in gardens or near bird-rearing/feeding locations can cause concern in members of the public regarding disease, poisoning or risk to their stock.

Caroline Robinson, SRUC Veterinary Services

Wild bird reports from APHA DoWS

Suspected malnutrition, starvation and parasitism in cormorants in winter

Summary; possible emerging trend in cormorants; mortality incidents in this species require exclusion of Newcastle disease.

During March 2020, APHA DoWS received two submissions of 3 cormorants (*Phalocrocorax carbo*) from two separate sites in northwest England. All showed similar signs at postmortem examination. Analysis of APHA DoWS records for this species indicate that since 2015 there have been six submissions during March-April (with only a further 2 in other months). All these submissions revealed a similar picture; birds in poor body condition with parasitic worms (identified as *Contracaecum* sp. and *C. rudolphi*; with zoonotic significance, anisakidosis) in very heavily blood stained gizzard fluid with no solid foodstuffs (Figure 9). In one incident in March 2016, seven juvenile cormorants (Figure 10) were submitted from a winter roost (up to 1500 birds used the roost at one time). All had findings as described, no other species on the reserve were affected. These cases have been predominantly from northwest England and Wales. In summary, this appears to be a seasonal emaciation with parasitism syndrome, affecting all ages but predominantly identified in juvenile birds. Whether seasonality relates to food (fish) availability, parasites reaching a damaging stage or winter accumulation of these and other factors is not certain.

Examination of this species is important for several reasons. In all these submissions avian influenza virus (AIV) infection was excluded. It is also important to consider and exclude Newcastle disease virus (NDV) infection. Cormorants in North America are important in the epidemiology of NDV in inland-lake breeding colonies, from which domestic fowl are occasionally affected. Cormorants are also viewed as a pest in some UK fisheries (freshwater and marine). Birds have been legally shot in the past to see if they are feeding on commercial fish species. The attached photo from DoWS archives (1995) shows a bird which was shot after being seen to eat a fish. Examination revealed how an eel (almost as long as the bird’s body) was swallowed; the proventriculus had stretched back so the gizzard with the eel’s head was displaced distally from the normal mid-body area back to the pelvic area (Figure 11). This demonstrates that cormorants, with remarkable physiological adaptation, are capable of eating large fish.

Figure 9 shows typical findings with the cormorant emaciation and parasitism condition; the opened gizzard of an emaciated juvenile bird, without solid foodstuffs, multiple *Contracaecum* sp nematodes, many embedded in the gizzard lining, in a gastric milieu of heavily blood stained fluid.

Figure 10 shows seven juvenile cormorants found dead at an over-night roost on an island in a lake reserve in northwest England. All had pathology and findings as for the previous figure.

Figure 11 - APHA DoWS archived photo of a legally shot cormorant showing the extreme distal displacement of the gizzard enabling the swallowing of an eel of similar length to the body length of the bird. (Photo credit JP Duff).

JP Duff, APHA Diseases of Wildlife Scheme

Traumatic death of an Osprey

Summary

Potential public concern

A male osprey (*Pandion haliaetus*) had been seen around a motorway bridge over a river in the north of England for several days in April. It had been photographed catching fish and featured in the local press. It was reported unfortunately to have been seen in collision with a vehicle on the motorway. The carcase was received at APHA Shrewsbury VIC. It had been in good condition and recently feeding but it had multiple fractures, internal haemorrhage and soft tissue damage which will have led to its death (fractured left humerus, left side of pelvis, right radius and ulnar, and ruptured liver). This was consistent with the history of it being in collision with a vehicle. Samples from the bird will contribute to our avian influenza and West Nile virus surveillance projects and may be used for a scheme that monitors concentrations of contaminants in birds of prey.

Ospreys in the UK typically return from their wintering grounds in the west of Africa, eg Senegal and The Gambia, around the end of March with the males arriving first. This Osprey had a metal ring on its leg and the number has been reported to the British Trust for Ornithology via the euring website, https://app.bto.org/euring/lang/pages/rings.jsp. The information gained about the birds age and movement will help contribute to our knowledge of this spectacular fish-eating bird of prey.

Paul Holmes, APHA Diseases of Wildlife Scheme

Amphibian reports

Batrachochytrium salamandrivorans (Bsal) surveillance

Point for information - Potential threat to urodele health, welfare and biodiversity if Bsal becomes established in the wild in GB

A mortality incident involving an adult female fire salamander (*Salamandra salamandra*) from Norfolk, England, was reported in March 2020. The carcase was requested for postmortem examination due to the potential risk of *Batrachochytrium salamandrivorans* (Bsal) infection (i.e. with fire salamanders known to be highly susceptible to Bsal-associated infection and mortality; the high probability of this individual being an escaped/released pet; and escaped/released pets representing the most likely mechanism for Bsal entering free-ranging amphibian populations in the UK, based on current evidence (Martel et al., 2020; Fitzpatrick et al. 2018).

A full-thickness tail fracture (Figure 12) was present. No macroscopic skin lesions were detected and skin swabs, as well as skin samples, tested negative for both Bsal and *B. dendrobatidis* by qPCR. Based on history and gross findings, trauma was considered the most likely cause of death.

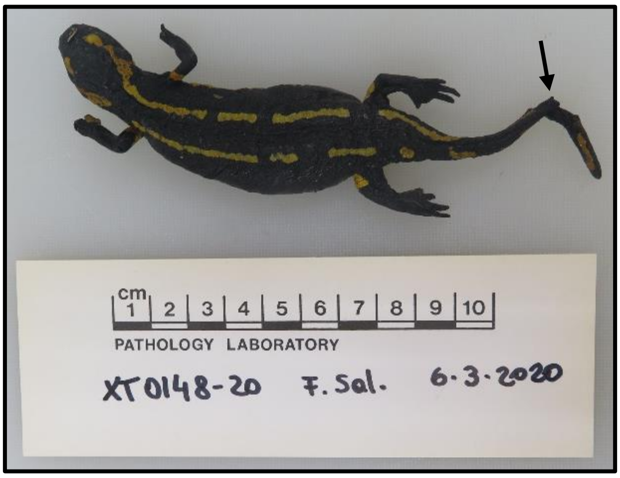

Figure 12 shows a full-thickness compound tail fracture (arrow) in an adult female fire salamander (*Salamandra salamandra*).

Bsal has not yet been reported in free-ranging amphibians in Great Britain (GB), despite its detection in captive amphibian populations (Fitzpatrick et al., 2018; Cunningham et al., 2019). All three species of native British urodele are susceptible to Bsal infection, with great crested newts (*Triturus cristatus*) being particularly susceptible to infection and subsequent mortality (Martel et al., 2014).

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Any enquiries regarding this report should be sent to APHA's Surveillance Intelligence Unit by emailing SIU@apha.gov.uk.

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