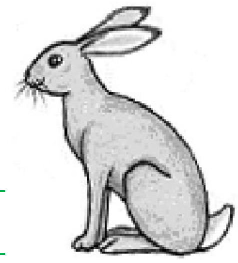
Great Britain Wildlife Disease Surveillance Partnership quarterly report

Disease surveillance and emerging threats



Volume 36: Quarter 1 – January to March 2022

Highlights

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Introduction and overview

The Great Britain Wildlife Disease Surveillance Partnership, comprising the Animal and Plant Health Agency (APHA), Scotland's Rural College (SRUC) Veterinary Services, Institute of Zoology (IoZ), the Centre for Environment, Fisheries and Aquaculture (CEFAS), the Wildfowl and Wetlands Trust (WWT), Natural England (NE), Forestry England (FE) and the Garden Wildlife Health (GWH) project, produces the Great Britain Wildlife Disease Surveillance Partnership Quarterly Reports:
https://www.gov.uk/government/publications/wildlife-gb-disease-surveillance-and-emerging-threats-reports

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

The highly pathogenic avian influenza (HPAI) outbreak in Great Britain continues to be the primary issue in wildlife this quarter. A wide variety of species, and far-reaching distribution of cases, in both wildlife and captive birds remains a concern. An update on the barnacle geese (*Branta leucopsis*) mass mortality event, reported in the last quarter, is given on page 22 of this report. In addition, as the temperatures increase so does the risk of West Nile Virus or Usutuvirus in wild birds. Testing for both viruses has been recommenced in wild bird submissions from the start of Quarter 2, in line with the vector season.

Notifiable diseases

Great Britain AI Wild Bird Surveillance (AIWBS): Quarter 1 January to March 2022

Total wild bird surveillance

HPAI H5N1 continues to be the dominant circulating strain during the first quarter of 2022 with detections in all devolved administrations of the United Kingdom (UK), including Northern Ireland. From a Great British perspective, the current avian influenza (AI) season continues to be the largest that GB has experienced, from both a wild bird and poultry disease perspective.

During the first quarter of 2022 a total of 1090 birds were tested under the Wild Bird Avian Influenza Surveillance scheme in Great Britain.

HPAIV H5 was detected in 435 wild birds, across 264 locations involving 45 species in 56 counties. Species infected were barnacle goose (n=10), Berwick's swan (n=1), black-headed gull (n=13), black swan (n=13), Canada goose (n=48), common buzzard (n=87), coot (n=2), grey heron (n=1), cormorant (n=1), goshawk (n=1), eider duck (n=1), gadwall (n=1), greylag goose (n= 23), gull (n=6), herring gull (n=14), kestrel (n=3), hybrid duck (n=1), Indian runner duck (n=1), magpie (n=3), kittywake (n=1), mallard duck (n=8), moorhen (n=2), mute swan (n= 63), peregrine falcon (n=3), pheasant (n=1), pied wagtail (n=6), pink-footed goose (n=56), red kite (n=2), sparrow hawk (n=11), teal (n=1), tufted duck (n=3), white-tailed eagle (n=2), white-fronted goose (n=1), whooper swan (n=12), wood pigeon (n=1), unspecified gull (n=2), unspecified goose (n=35), unspecified dove (n=2), unspecified swan (n=10), unspecified bird of prey (n= 3), feral pigeon (n=2), henharrier (n=1), guillemot (=1), and blackbird (n= 1).

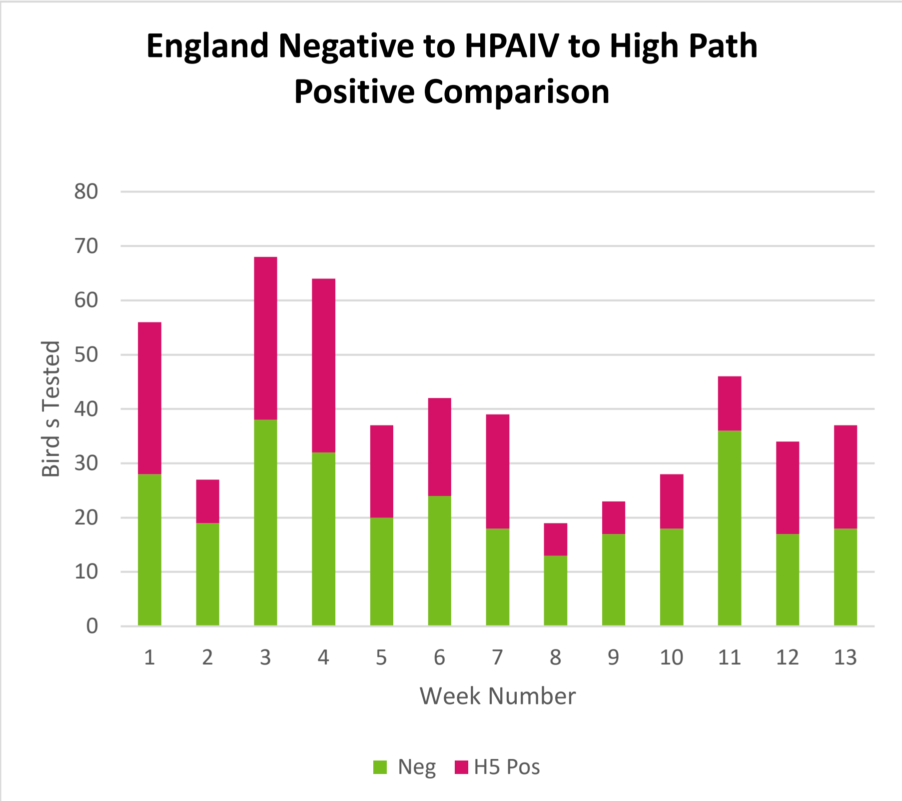

Figure 1: Quarter 1 comparison between negative and H5 AIV positive submissions in England

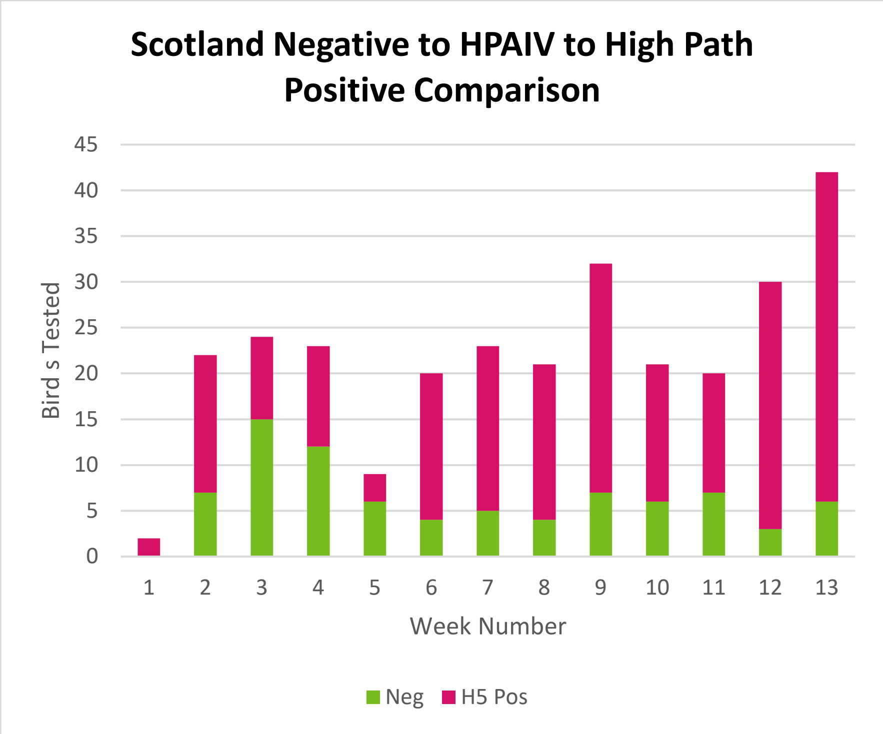

Figure 2: Quarter 1 comparison between negative and H5 AIV positive submissions in Scotland

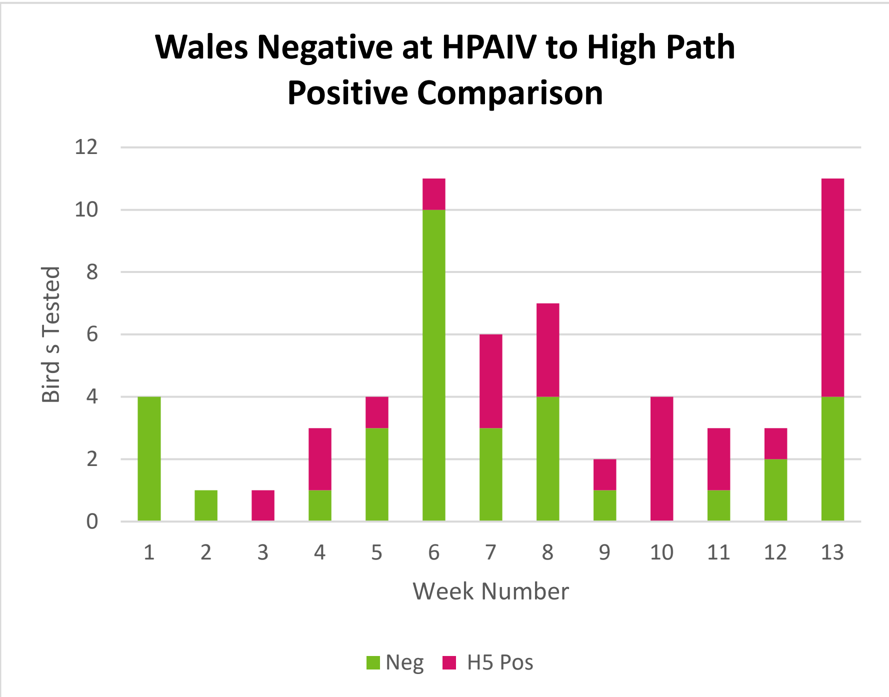

Figure 3: Quarter 1 comparison between negative and H5 AIV positive submissions in Wales

Table 1: Number of wild birds tested for HPAIV and results in Great Britain - Quarter 1

Surveillance activity	Number of birds tested (figures for January to March 2021 are shown in brackets)	Positive H5 HPAI virus result and species of bird	Comments
Found dead/injured	*1090* *(894)*	447	Scanning surveillance All-year-round

Table 1 shows the number of wild birds tested under the Wild Bord Avian Influenza surveillance scheme. The number of birds tested under the scheme in the first quarter (January - March) of 2022 was 1090 as compared with 894 for the same period in 2021. Scanning surveillance continues year-round and all birds tested were found dead or injured.

Figure 4 shows the distribution of wild birds collected, with findings of negative and positive HPAIV detections. Specific areas experiencing mass mortality events include Stratford-upon Avon in the early weeks of the incursion, where a number of mute swans were reported; and then in November on the Solway Firth and surrounding areas, where many barnacle geese, and other species succumbed.

Wild bird submissions and cases positive for HPAI H5N1 Winter 2021

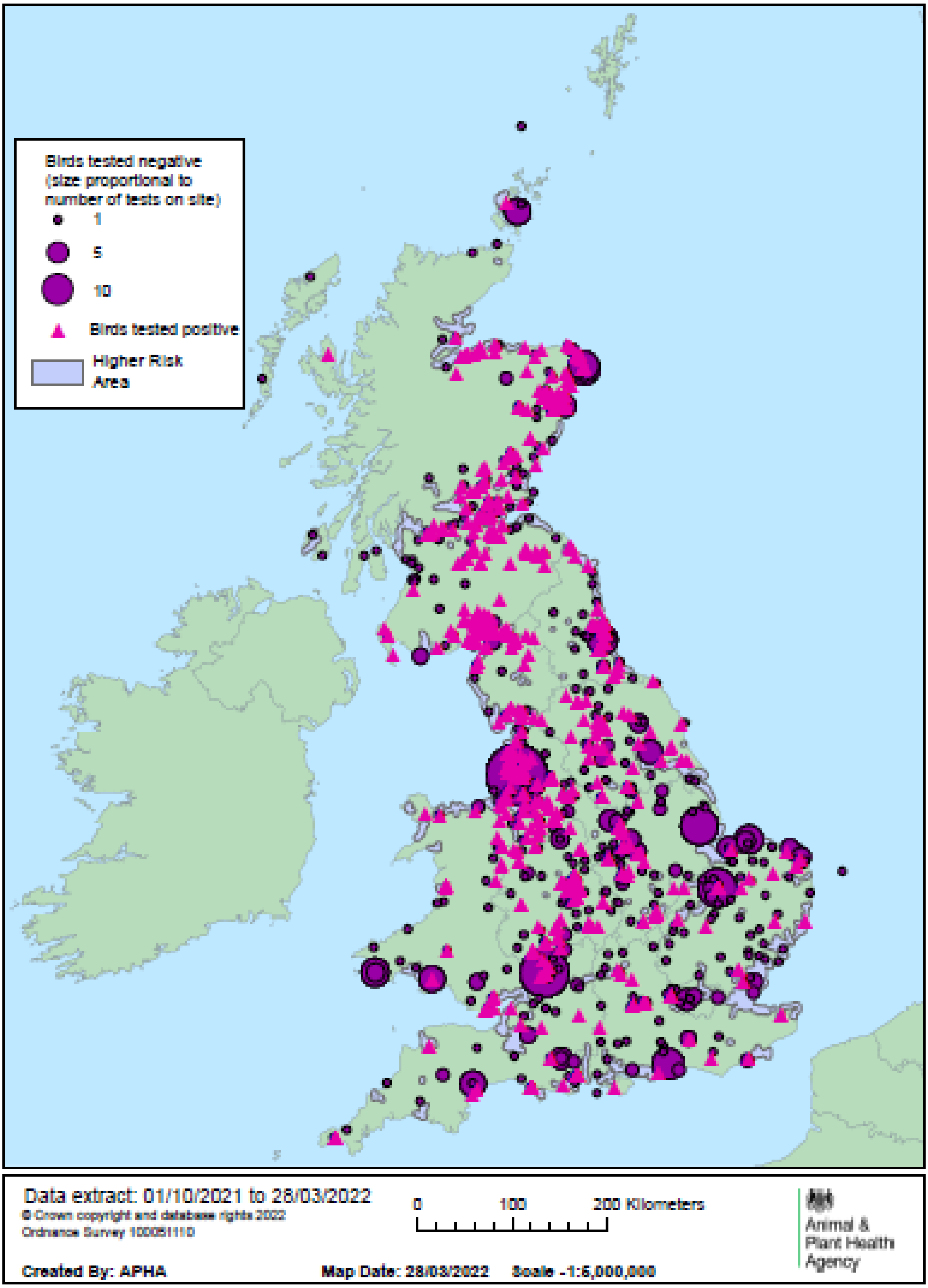

Figure 4: wild bird submissions and cases positive for HPAI H5N1 Winter 2021-2022

Postmortem examinations (PME) were conducted on selected wild birds following confirmation of HPAI detection. This included common buzzards, goshawks, sparrowhawks, white-tailed sea eagle, black-headed gulls, great black backed gull, eider ducks, tawny owl and pied wagtails. Lesions suggestive of notifiable avian disease (NAD) were lacking. Other non-specific changes such as mild splenic and renal swelling were infrequently noted from common buzzards and black-headed gulls. Nevertheless, the state of autolysis and variably scavenged carcases could impact on obtaining meaningful interpretation at PME. Further evaluation by histopathology and viral immunohistochemistry is currently underway to reveal the pathological profile.

Current EU situation

Wild bird along with poultry detections of predominantly HPAI H5N1 are still considered high. The current EU and UK outbreak situations can be found here:

Avian influenza (bird flu) in Europe, Russia and the UK - GOV.UK

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

Animal diseases: international and UK monitoring - GOV.UK

Current UK Situation

Numbers of reports of wild birds to the Defra Helpline by members of the public have decreased considerably (15/05/2022 – date of writing of this report) and the percentage of positive wild birds in comparison to the baseline tested is showing signs of reducing. The UK risk status is being evaluated on a weekly basis. At the present time the official risk level of HPAI H5 in wild birds is therefore maintained at MEDIUM across Great Britain.

The housing order which came into force on 29th November 2021 remained in force until 2 May 2022. 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: Contact APHA - GOV.UK (www.gov.uk)

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

- Avian influenza (bird flu) guidance - GOV.UK
- Biosecurity information, avian influenza - GOV.UK

- When and how to register your poultry flock, and which species must be registered in Great Britain: [Poultry (including game birds): registration rules and forms - GOV.UK]
- Information about the chargeable testing scheme offered in Great Britain 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): [APHA Vet Gateway: Testing for exclusion of notifiable avian diseases (defra.gov.uk)].

References

Gibbens N, Brown IH, Irvine RM. Testing for exclusion of notifiable avian disease. *Veterinary Record* 2014;**174**:534-535. http://dx.doi.org/10.1136/vr.g3412

Avian influenza in wild birds - GOV.UK

Madalina Zamfir, Scott Reid, Craig Ross, Avian Virology, APHA Weybridge
Lee Goolding, DES, APHA Weybridge
Fabian Lean, Veterinary Pathology, APHA Weybridge

Wildfowl and Wetlands Trust's (WWT) role in Great Britain Avian Influenza Wild Bird Surveillance (AIWBS):- January to March 2022

Throughout this first quarter of 2022, WWT continued to carry out passive surveillance of avian influenza across the reserves. Between January and March, 51 dead wild birds were found across six WWT sites located in Gloucestershire, West Sussex, Greater London, Norfolk, Lancashire and Carmarthenshire. Of the birds found, 46 were sampled for avian influenza virus, with five carcases being too heavily predated or in advanced decomposition to swab.

12 priority target species were sampled during this quarter. These included species of swan, geese, ducks, gulls, rails and waders.

Low pathogenic avian influenza (LPAIV not H5) was confirmed by PCR in four wild dead birds, collected at two surveillance sites. Highly pathogenic avian influenza (HPAIV H5Nx) was confirmed by PCR in 10 wild dead birds, collected at four surveillance sites. (Table 2).

All carcases were swabbed and collected following recommended health and safety guidelines with full personal protective equipment (PPE), including FFP3 masks and goggles or face visors. Positive AI carcases were disposed of using an approved high capacity incinerator for Category 1 ABP.

Table 2: confirmed avian influenza cases in wild birds at different surveillance sites, detected between January and March 2022

Site location	Total AI positive	Species	Subtype
West Sussex	2	Mallard Moorhen	H5N1 H5Nx
Carmarthenshire	1	Tufted Duck	LPAIV (Not H5)
Lancashire	3	Pink-footed Goose Whooper Swan Whooper Swan	H5N1 H5N1 H5Nx
Gloucestershire	4	Mallard Greylag Goose Mute swan Pink-footed Goose	LPAIV (Not H5) LPAIV (Not H5) LPAIV (Not H5) H5N1
Norfolk	4	Whooper Swan Whooper Swan Whooper Swan Grey Heron	H5N1 H5N1 H5Nx H5Nx
Total	**14**		

For further details of HPAI surveillance from across Great Britain, please refer to the APHA report for this quarter.

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

Zoonotic Diseases

APHA Diseases of Wildlife Scheme (DoWS); 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. Occasionally it is isolated from small-scale surveys.

One isolation of *Salmonella* species was made in Quarter one of 2022. A monophasic type B *Salmonella* 4,12:-:- was isolated from a swab from a harbour porpoise (*Phocoena phocoena*) submitted by a private laboratory for serotyping. Unfortunately, additional information regarding clinical findings or pathology are unavailable. Monophasic group B *Salmonella* have previously been reported in porpoises found in British waters (Davison et al 2010).

References

Davison NJ, Simpson VR, Chappell S, Monies RJ, Stubberfield EJ, Koylass M, Quinney S, Deaville R, Whatmore AM, Jepson PD. Prevalence of a host-adapted group B *Salmonella enterica* in harbour porpoises (*Phocoena phocoena*) from the south-west coast of England. *Veterinary Record* 2010;**167**(5):173-176. https://doi.org/10.1136/vr.c3760

Catherine Man, APHA Diseases of Wildlife Scheme

Report from Wildlife Zoonoses and Vector Borne Disease Research Group

Passive surveillance for lyssaviruses in UK bats

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

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

Rabies diagnosis

One dog and one bat 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 surveillance and Usutu virus surveillance in wild birds

Brain and kidney tissue samples from four wild birds collected during this period and submitted via APHA, SRUC and IoZ were tested by PCR for West Nile Virus (WNV) with negative results.

Tissues from three wild birds were also tested by PCR for Usutu virus with negative results.

West Nile virus surveillance in Equids

Serum from 18 horses were received for WNV serology testing. 16 horses were screened for export using an IgG ELISA, five of these submissions were positive. Follow-up investigation using an IgM ELISA on the positive samples showed no evidence of IgM antibodies. Consequently, the IgG positive results were most likely to be historic vaccination status. Two serum submissions were for testing to exclude (one from Dorset and one from Kent) in horses that had shown neurological signs. Both were tested by IgM ELISA for WNV with negative results as part of differential diagnosis.

Dr Arran Folly, Vector-borne diseases, APHA Weybridge

Garden Wildlife Health summary

Institute of Zoology (IoZ) staff have continued to conduct scanning disease surveillance of garden birds, hedgehogs, reptiles, and amphibians through the Garden Wildlife Health project (GWH).

Table 3: shows the numbers of Garden Wildlife Health disease incident reports and postmortem examinations for Quarter 1 of 2022

Taxon	No. of disease incident reports (No. of sites)	Total No. of animals observed (sick/dead)	No. of postmortem examinations (No. of sites)
Amphibians	77 (60)	554 (111/443)	10 (6)
Birds	1080 (551)	1395 (1123/272)	24 (19)
Hedgehogs	40 (40)	44 (9/35)	12 (12)
Reptiles	1 (1)	1 (0/1)	0 (0)
Total	**1198 (652)**	**1994 (1243/751)**	**46 (37)**

Table 4: compares the numbers of Garden Wildlife Health disease incident reports for Quarter 1 of 2021 and 2022

Taxon	No. of disease incident reports in Q1 (no. sick/dead)	
	2021	2022
Amphibians	125 (108/378)	77 (111/443)
Birds	1904 (1886/600)	1080 (1123/272)
Hedgehogs	38 (8/32)	40 (9/35)
Reptiles	1 (0/1)	1 (0/1)
Total	**2068 (2002/1011)**	**1198 (1243/751)**

No unusual trends in GWH disease incident reports (DIRs) were observed this quarter, and whilst the overall number of DIRs was reduced in Quarter one 2022 in contrast to Quarter one 2021, it is comparable to the DIRs received over the same period in 2019 (1242 DIRs involving 1368 sick and 850 dead garden wildlife) and 2020 (1171 DIRs involving 1222 sick and 571 dead garden wildlife), reflecting pre-COVID-19 pandemic numbers. Since the high number of DIRs received last year is considered likely, in large part, to be a result of increased observer effort during the pandemic restrictions, with people spending more time at home and in their gardens, with restrictions now removed, the reduction of DIRs to usual numbers is not unexpected.

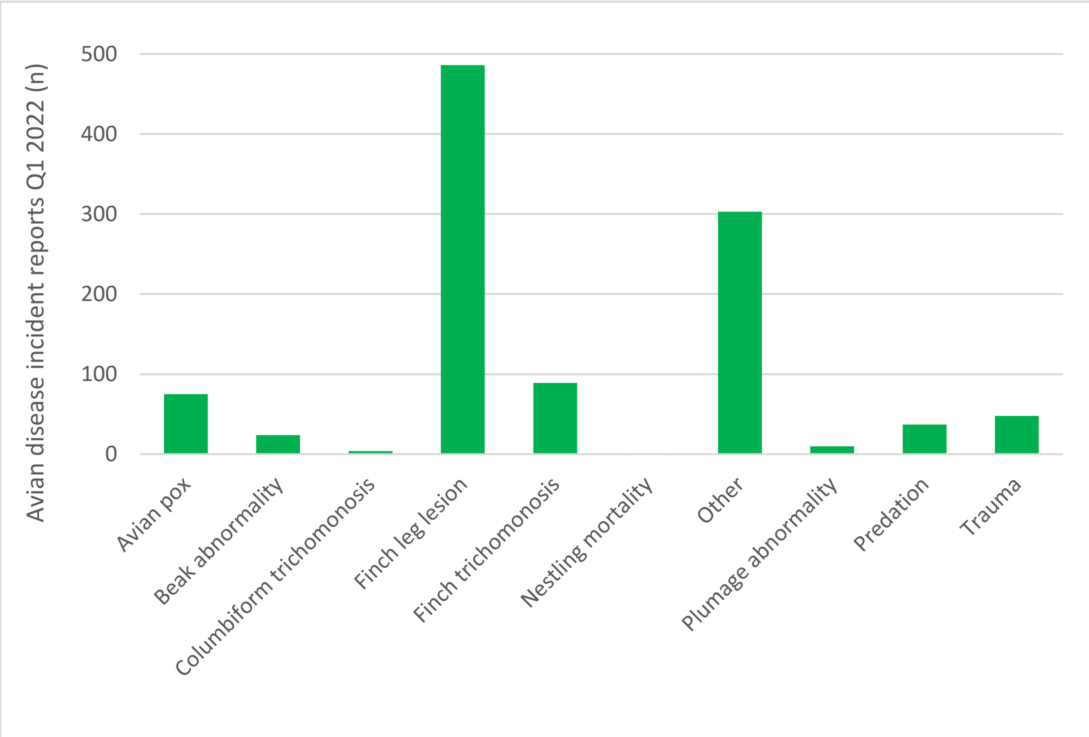

Figure 5: shows the numbers of Garden Wildlife Health avian disease incident reports allocated suspected diagnoses for Quarter one 2022 with the category of 'other' mostly comprising reports of birds exhibiting non-specific signs of ill health (e.g. fluffed-up plumage, lethargy). Further information on avian pox, beak abnormality, finch leg lesions, trichomonosis, and plumage abnormality is available by following the respective links.

Institute of Zoology (IoZ)

Mammal reports

Peritonitis and perforation in a grey seal pup

A moulted male grey seal (*Halichoerus grypus*) pup was picked up in apparent respiratory distress in Newquay, Cornwall, and, after appearing to initially respond to treatment, the pup died overnight at a rehabilitation facility. The cause of death was peritonitis caused by a perforation of the jejunum by what appeared to be a large fish operculum. A second operculum and several fish vertebrae were found impacted in the same length of jejunum as the perforation. No anatomical obstruction was detected in the length of gut immediately distal to the site of impaction. This is an unusual finding in grey seal pups and suggests naïve prey selection by a young pup still experimenting with different prey species.

Figure 6: weaned male grey seal pup with distended abdomen (Photo: Cornwall Marine Pathology Team)

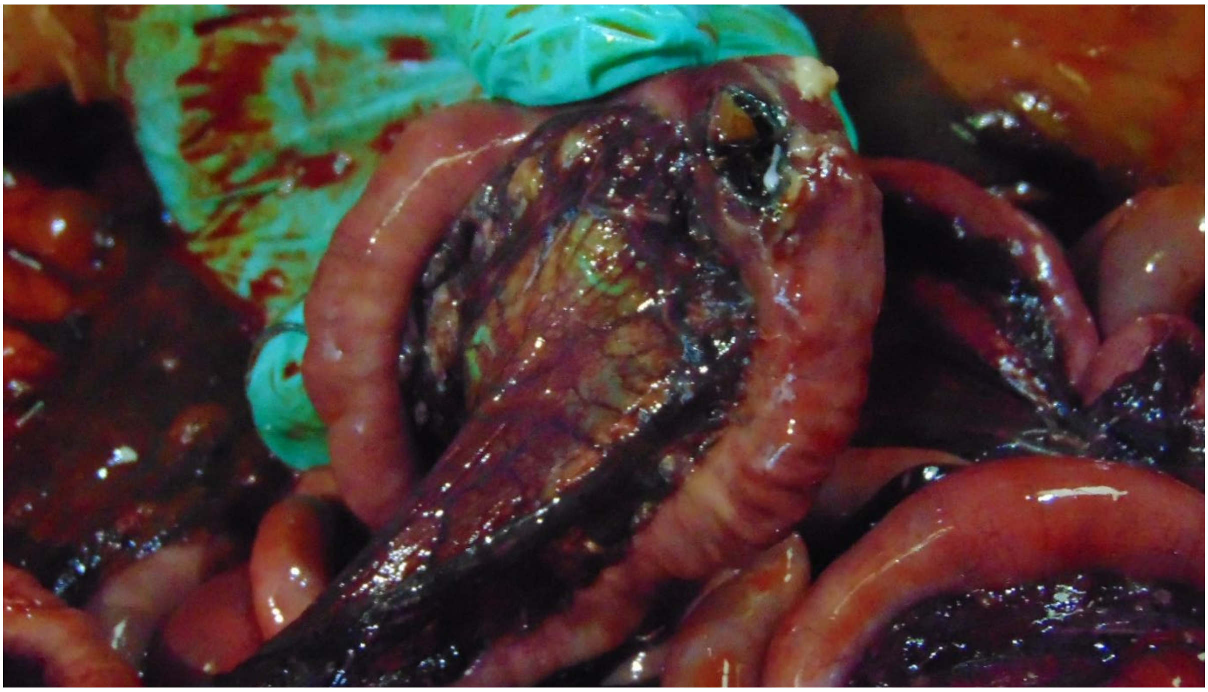

Figure 7: perforation of the jejunum by a fish operculum (Photo: Cornwall Marine Pathology Team)

James Barnett, Cornwall Marine Pathology Team

Wild mammal reports from Scotland

Viscera from three roe deer (*Capreolus capreolus*) carcases showed evidence of suspected *Vareostrongylus capreoli* infection. All three were shot during routine culls, one a 1.5-year-old male and two other submitted separately, a young male and female, all in Dumfries and Galloway.

The single male showed asymmetrical antler growth, poor fat reserves, and the lungs showed multiple grey raised solid lesions. Histopathology showed smooth muscle hyperplasia in association with the small bronchioles, with numerous areas of over inflation and areas of collapse and generalised smooth muscle hyperplasia under the pleura. In one section there was a large focus of infiltration by lymphocytes, plasma cells and eosinophils directed against parasitic worms, larvae and eggs in the alveoli. Parasitic structures were also present in bronchioles in several sections. The gross and microscopic findings were consistent with those described for the lung worm *Varestrongylus capreoli*, but no further identification was possible.

The two younger deer (estimated 9-10 months) submitted together showed poorer fat reserves in the male than the female. Both showed grey, 2cm diameter, irregularly shaped lung nodules, and histopathology found similar pathological changes along with worms, larvae and eggs.

This case was of interest due to the concern that can be raised in cull operators by finding unfamiliar lesions in organs of deer, especially where some of the meat from a cull is intended for human consumption or where there is concern about the health of the deer, or of farm animals present in the same area.

Reference

Simpson VR, Blake DP. Parasitic pneumonia in roe deer (Capreolus capreolus) in Cornwall, Great Britain, caused by Varestrongylus capreoli (Protostrongylidae). *BMC Vet Res* 2018;**14**(1):198 https://doi.org/10.1186/s12917-018-1525-x

Avian Reports

Wild bird reports IoZ

Beak and claw overgrowth in a goldfinch (*Carduelis carduelis*)

In January 2022, a single adult goldfinch from Cheshire was found dead and submitted for postmortem examination (PME). The maxillary and mandibular beaks were in occlusion but severely overgrown with the maxillary beak measuring 31.8mm in length, compared to 12.4mm in an unaffected bird of the same species (Figure 8). Additionally, all eight claws were elongated (Figure 8). Upon PME, the goldfinch was in thin body condition and the ultimate cause of death was considered likely to be starvation; the overgrown beak probably interfered with the bird’s ability to feed properly. This is the first goldfinch with a severe beak abnormality that has been submitted for examination at IoZ. Results of histological examination and virus screening using molecular methods to investigate the cause are pending.

Figure 8: shows the lateral whole-body view of two goldfinches (Carduelis carduelis). A: Goldfinch with beak and claw overgrowth. B: Goldfinch with normal beak and claws in size and form. Images courtesy of ZSL/GWH.

Beak deformities have been documented in British birds for decades, and the British Trust for Ornithology's (BTO) citizen science project 'Big Garden Beak Watch' collates observations of such abnormalities in wild birds in Great Britain (BTO, 2022; Pomeroy, 1962). Whilst beak abnormalities have been observed in a range of wild bird species including goldfinches, they remain a relatively uncommon observation in Great Britain (BTO, 2022). There are multiple potential causes of beak abnormalities in wild birds, such as trauma, nutritional deficiencies, infectious agents or congenital malformation (GWH, 2018).

A single blue tit with marked beak overgrowth was examined postmortem in early 2017 (see report from Quarter one 2017). Histological examination revealed a fungal infection as the potential cause in this bird.

An emerging condition called avian keratin disorder was first documented in wild birds in Alaska, USA, in the late 1990s (Zylberberg and others, 2018). Affected birds have overgrown beaks, and sometimes claws, that occur as a result of accelerated keratin production. In 2016, a novel picornavirus (poecivirus) was detected in affected birds and is suggested as the causative agent of the condition (Zylberberg and others, 2018; 2020).

Scientists at the Institute of Zoology and United States Geological Service (USGS) Alaska are collaborating to compare observations of beak abnormalities in wild birds in North America and Great Britain, and to investigate their cause in British wild birds.

References

BTO Big Garden Beak Watch, https://www.bto.org/our-science/projects/gbw/about/background/projects/bgbw/results/species accessed April 2022

Garden Wildlife Health disease factsheet on beak abnormalities in garden birds: www.gardenwildlifehealth.org/portfolio/beak-abnormalities, published October 2018

Zylberberg, M, Van Hemert, C, Dumbacher, JP, Handel, CM, Tihan, T, DeRisi, JL. Novel Picornavirus Associated with Avian Keratin Disorder in Alaskan Birds. *MBio* 2016:**7**:4 https://doi.org/10.1128/mBio.00874-16

Zylberberg, M, Van Hemert, C, Handel, CM, DeRisi, JL. Avian keratin disorder of Alaska black-capped chickadees is associated with Poecivirus infection. *Virology Journal* 2018:**15**:100 https://doi.org/10.1186/s12985-018-1008-5

Garden bird trichomonosis - update

In Quarter one 2022, a suspected diagnosis of finch trichomonosis was assigned to 96 DIRs, involving 124 sick and 41 dead birds from 67 sites across the UK. Furthermore, trichomonosis was diagnosed in 57% (13/23) of passerines examined postmortem from 11 sites from England and Wales. These birds comprised five species, chaffinch (*Fringilla coelebs*) (n=4), greenfinch (*Chloris chloris*) (n=3), goldfinch (*Carduelis carduelis*) (n=3), siskin (*Spinus spinus*) (n=2) and yellowhammer (*Emberiza citronella*) (n=1). Trichomonosis remains the most frequently diagnosed infectious cause of death in passerines in Great Britain.

Our findings from Quarter one 2022 and previously illustrate how trichomonosis can affect a wide range of passerine species, and may pose an important additive threat to species already of conservation concern (e.g. the yellowhammer or, as diagnosed in Quarter two 2021, the lesser redpoll (*Acanthis cabaret*)). In 2021, the greenfinch was moved directly from the Green List to the Red List in the fifth review of Birds of Conservation Concern due to the 62% reduction in its UK breeding population since 1993 that has occurred as a result of finch trichomonosis (Stanbury and others, 2021). The UK chaffinch population has also declined by 30% from 2007-2018, according to the BTO/JNCC/RSPB Breeding Bird Survey (BBS; Harris et al, 2020), and investigations are underway to investigate whether this trend is also disease-mediated.

As part of GWH, we continue to provide the public with best practice advice on feeding garden birds and have, in collaboration with partner organisations, published garden bird feeding guidelines, which include mitigation strategies in case of disease outbreaks (www.gardenwildlifehealth.org/wp-content/uploads/sites/12/2021/04/Feeding-Garden-Birds-Best-Practice-Guidance.pdf).

References

Harris SJ, Massimino D, Balmer DE, Eaton MA, Noble DG, Pearce-Higgins JW, Woodcock P, Gillings S. The Breeding Bird Survey 2020. *BTO Research Report*. 2021;**736**

Stanbury A, Eaton M, Aebischer N, Balmer D, Brown A, Douse A, Lindley P, McCulloch N, Noble D, Win I. Data from: The fifth review of Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk of birds for Great Britain, Dryad, Dataset, 2021;**114**:723-47 https://doi.org/10.5061/dryad.cc2fqz672

Institute of Zoology

Wildfowl and Wetlands Trust (WWT) report

Passive surveillance of water birds

Postmortem examinations were performed on 44 wild birds originating from six WWT sites (Arundel, West Sussex; Llanelli, Carmarthenshire; London Wetland centre, Greater London; Slimbridge, Gloucestershire; Martin mere, Lancashire and Welney, Norfolk). A total of 13 target species were examined, which included nine mallards (*Anas platyrhynchos*), seven moorhens (*Gallinula chloropus),* five black-headed gulls (*Chroicocephalus ridibundus*), five mute swans (*Cygnus olor*), three greylag geese (*Anser anser*)*,* three pink-footed geese *(Anser brachyrhynchus),* three whooper swans *(Cygnus cygnus),* three coots (*Fulica atra*), two pintails (*Anas acute*), one pochard *(Aythya ferina)* one teal (*Anas crecca*), one Bewick's swan (*Cygnus columbianus bewickii*), and one lesser black-backed gulls (*Larus fuscus*).

The primary causes of death are summarised below (Table 5).

The most notable postmortem finding was gross pathologic lesions related with trauma (20%). Mixed lesions observed within this group. Seven birds (two black-headed gulls, a pochard, a Bewick's swan, a pintail, a teal and a coot) suffered bruising, skin lesions, fractures and/or internal haemorrhages from collisions or traumatic accidents. A coot within this group also presented with signs of secondary drowning. One moorhen had to be euthanised due to an anthropogenic accident (wing mutilation from a horticultural machine). One lesser black-backed gull was shot and presented a focally extensive area of coelomitis with intestinal perforation, associated with a 9mm round pellet shot.

Predation was another predominant primary cause (18%). The majority of the predated birds collected presented with intact skeletal structure and skin, as well as, minimal soft tissue or missing sections, and absence or minimal presence of internal organs. High suspicion of a mixture of gull, bird of prey and, to a lesser extent, mustelid predation was suspected in many of these cases, with carcases being headless, presenting dorsal puncture wounds and/or degloving lesions.

Lesions compatible with avian mycobacteriosis were found in seven birds (16%): five mallards, one moorhen and one mute swan. Necropsy revealed a characteristic presentation of mutil-focal granuloma-like lesions throughout the intestinal mesentery and liver, renomegaly, purulent-mucoid free fluid in the coelomic cavity and a systemic infection causing swollen limb joints in one mallard.

Aspergillosis was detected in two mutes swans and a whooper swan. All carcases had extensive, invasive, and infiltrating nodular lesions affecting more than one area of the respiratory tract (pulmonary tissue, air sacs and trachea) and poor body condition, as well as, secondary air sacculitis.

Severe necrotising enteritis was detected in one mute swan, one whooper swan and one greylag goose (7% of total cases). All carcases presented congested intestinal loops, necrotic lesions within intestinal lining and pancreas, as well as, slightly congested lungs.

Other causes that were less prevalent during this quarter includes septicaemia in a greylag goose and a mute swan with swollen limb joints. A lack of availability of food was the most likely cause of death in another greylag, two mallards and a pink-footed goose, that were emaciated and had empty digestive tracts on postmortem examination. Within this group of mortalities, there was also a black-headed gull that, on the contrary, had a very large amount of ingesta in the oesophagus, crop, proventriculus and ventriculus. The diameter of the oesophagus and crop stretched over 3cm. No other lesions were detected. Overeating with secondary oesophageal-proventricular impaction is suspected.

Seven wild birds (16%) did not receive diagnostic due to advanced decomposition, lack of obvious gross abnormalities or multifactorial non-fatal lesions present.

Table 5: confirmed and suspected causes of wild bird mortality (including morbidity meriting euthanasia on welfare grounds) at WWT reserves between January and March 2022.

Primary cause of death/PM findings	Total	Species (and notes)
Trauma	9	2 x black-headed gulls, 1 x Bewick's swan, 1 x coot, 1 x lesser black-backed gull, 1 x moorhen, 1x pintail, 1 x pochard, 1 x teal
Predation	8	3 x moorhens, 2 x coots, 1 x black-headed gull, 1 x mallard, 1 x pink-footed goose
Avian mycobacteriosis	7	5 x mallards, 1 x mute swan, 1 x moorhen

Aspergillosis	3	2 x mute swans, 1 x whooper swan
Necrotic enteritis	3	1 x mute swan, 1 x whooper swan, 1 x greylag
Other	7	2 x mallards (emaciated, gastrointestinal), 2 x greylag geese (bacterial and viral infection), 1 x black-headed gull (proventricular impaction), 1 x mute swan (viral and septic joint), 1 x pink-footed goose (emaciated)
No diagnosis (due to decomposition or lack of or inconclusive gross abnormalities)	7	2 x moorhen, 1 x black-headed gull, 1 x mallard, 1 x pink-footed goose, 1 x teal, 1 x whooper swan

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

Wild bird reports from Scotland

An infiltrating lipoma in the lumbosacral spinal cord was seen in a raven (*Corvus corax*) which was found dull and unresponsive, but which became significantly brighter after supportive treatment. However, it never regained the ability to stand, and was unable even to sit upright for long, so was euthanased. At necropsy, body condition was good although peritonitis was observed, and on dissection of the spinal column to expose the cord a small, oval, smooth, white, mass protruded from the dorsal surface of the spinal cord lumbar intumescence. This mass was compressing the spinal cord within the canal and explained the leg weakness and inability to stand. On histopathology, the mass was found to be composed of morphologically normal fat cells. These were present within the white matter on the dorsal aspect, pushing the dorsal horns apart. At its most extensive, the fatty tissue surrounded the central canal, replacing the grey and white matter. The peritonitis was deemed an incidental finding.

SRUC Veterinary Services noted that there is a single report of an infiltrative lipoma in the lumbosacral spinal cord of a wild Canada goose which presented in the same way as this raven.

Reference

Rosenhagen N, Whittington JK, Hsiao SH. Infiltrative Spinal Lipoma in a Canada Goose (Branta canadensis). *J Avian Med Surg.* 2016;**30**(1):60-65 https://doi.org/10.1647/2015-102.

Caroline Robinson, SRUC Veterinary Services

Wild bird reports from APHA DoWS

Mass mortalities of conservation concern of barnacle geese (*Branta leucopsis*) due to Avian Influenza Virus (AIV) on the Solway Firth (England and Scotland) - update

This is an update to previous reports on the significant mortality caused by HPAIV infection in this important wintering site during the winter of 2021 to 2022. Recent estimates by ecologists in the area indicate that between 8,000 and 10,000 barnacle geese (*Branta leucopsis*) have died from the resident flock of 40,000 birds, from HPAIV H5N1 infection, in the three months between mid-November 2021 and mid-February 2022. Active infection (new cases) seemed to cease in mid-February. In early May between 5000-10000 birds remained on the main site. These birds usually stay on the site until mid-May, delaying departure to avoid arriving at their Svalbard breeding ground to find it snow-bound with no source of food.

No fresh carcases were found at the latest visit in early spring 2022, again indicating that active HPAIV infection was no longer occurring. However, the reserve warden reported that in the previous two weeks between 5 to 10 barnacle geese had been found singly with severe incoordination (video), unable to walk or even stand, feed or preen and yet still able to fly in straight lines, albeit tumbling on landing. Other similarly affected barnacle were seen at other Solway salt marshes in 2022. One possible explanation is that these birds have survived acute HPAIV infection (viral encephalitis) but residual nervous system pathology remains. Unfortunately, it has not been possible to obtain a typically affected bird for testing and examination, despite attempts. These birds showing incoordination will probably die or be killed by the local fox population, which is active in the area. Very small numbers of sick geese too ill to migrate, usually remain in the area each spring, presumably suffering from chronic conditions such as malnutrition, aspergillosis or avian tuberculosis, however consistent nervous signs such as were seen this year have not been noted before, although of course without the HPAIV focus they could have been missed.

Paul Duff, APHA Diseases of Wildlife Scheme

Starvation in an adult cormorant (*Phalocrocorax carbo*)

A single adult cormorant in fine plumage (figure 9) but poor body condition was found dead at a nature reserve in the North of England. At postmortem examination, the presence of enlarged testes indicated that the bird was in breeding condition however, the gizzard was empty and the intestines had collapsed around a thin bile-like fluid – the bird had not eaten for several days and had died of starvation. One possible explanation was that it arrived on the reserve’s large inland lake, known to be devoid of fish, and remained too long, seeking fish in vain. The bodyweight was 1.8kg whereas reference weights for the species are around 2.5kg, and the loss of a significant percentage of body mass could effectively have rendered the bird flightless. There was no evidence of gastro-intestinal parasitism with *Contracaecum* sp. nematodes, which DoWS usually associate with the seasonal syndrome and which primarily affects juvenile birds.

Figure 9: Adult emaciated cormorant with no food in the gastro-intestinal tract

During March 2020, APHA DoWS received three submissions of 5 cormorants (*Phalocrocorax carbo*) from three 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 seven submissions during March-April (with only a further two, 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 blood stained gizzard fluid with no solid foodstuffs (Figures 10 and 11). In one incident, in March 2016, seven juvenile cormorants (Figure 12) were submitted from a winter cormorant roost. All had findings as described, no other species on the reserve were affected. These cases have been predominantly from the northwest of England and Wales. This appears to be a seasonal starvation with parasitism syndrome, affecting all ages but predominantly identified in juvenile birds. Whether the seasonality relates to food (fish) availability, parasites reaching a particularly pathogenic stage or winter accumulation of these and other factors, is not known. In all these submissions avian influenza virus (AIV) infection was excluded. In the multiple bird incident in 2016, Newcastle disease virus (NDV) was also excluded. NDV was considered because cormorants in North America are important in the epidemiology of NDV in lake breeding colonies. Infection often involves mass mortalities and from these incidents, very occasionally, domestic fowl have been affected.

Figure 10: Typical findings with the cormorant starvation 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 11: Worms in the gizzard of a cormorant.

Figure 12: 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.

Cormorants are viewed as a pest species 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. Figure 13 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 14 shows a cormorant with a large pike in the gastro-intestinal tract. These photos demonstrate that cormorants, with remarkable physiological adaptation, are capable of eating large fish.

Figure 13: APHA DoWS archived photo (1995) 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 credits JP Duff, APHA DoWS).

Figure 14: Ingested fish within a comorant’s digestive tract.

Paul Duff, Paul Holmes, Caroline Fenemore, APHA Diseases of Wildlife Scheme

Avian tuberculosis and concurrent amyloidosis

Disease due to mycobacterial infection and amyloidosis were diagnosed in a gull, submitted for examination under the APHA wild bird avian influenza surveillance project. PME was conducted after avian influenza was negated by PCR. Within the coelomic cavity, a firm 1cm diameter mass was found adhered to the proventriculus by fibrous tissue. When incised this had a uniform texture throughout. The liver was covered in a thin layer of fibrin. Throughout the liver parenchyma were pinpoint white to yellow foci. Histopathology identified multiple granulomas within the mass adhered to the proventriculus with Ziehl-Neelsen staining identifying numerous acid-fast bacteria in many of the granulomas. In the liver there was a large amount of eosinophilic material in conjunction with the same granulomas as in the proventriculus associated mass. A severe, chronic, granulomatous infection consistent with avian tuberculosis was diagnosed with secondary amyloidosis.

Paul Duff, APHA Diseases of Wildlife Scheme

The material in this report has been compiled by the Animal and Plant Health Agency (APHA) Surveillance Intelligence Unit in collaboration with the APHA Surveillance and Laboratory Services Department.

The report is available on GOV.UK at:

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

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

More information about scanning surveillance reports is available on APHA's Vet Gateway at http://apha.defra.gov.uk/vet-gateway/surveillance/index.htm.

APHA is an executive agency of the Department for Environment, Food & Rural Affairs, and also works on behalf of the Scottish Government and Welsh Government.