Surveillance Report

Wildlife

Quarterly Report Vol. No: 10.4 April 2009 Jan - March 2009

HIGHLIGHTS

- **Avian influenza surveillance in wild birds – summary**
- **Salmonellosis in wildlife**
- **Fasciolosis and other diseases in deer**
- **Buzzard deaths**
- **First record of new bacterium in Scotland; *Suttonella* in Scottish *Paridae***

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VLADoWs

VLADoWS - the **VLA Diseases of Wildlife Scheme has** provided wildlife disease investigation and surveillance in England and Wales since 1998. Go to www.vla.gov.uk and for reports, go to the VLADoWs Wildlife home page at: - <http://www.defra.gov.uk/vla/science/sci_wildlife.htm>

OVERVIEW

Wildlife are recognised as an important source of new diseases; it is clear that wildlife related emerging disease is a subject of increasing interest to scientists (see Jones and others, *Nature,* Feb 2008.

Bat White-nosed syndrome (BWNS) is a disease new to science which since 2006 has caused devastating losses to bat populations in North America. . Two incidents of suspected BWNS from Southern England were examined this quarter Some details of the incidents and information on the possible wider significance of the disease are given on page 4. The investigation entailed screening the animals for rabies and undertaking a combination of new tests in a short interval. This was only possible by working with bat conservationists and collaborating with several UK and international organisations.

National weather during the quarter, Jan-March 2009

Temperatures were about 1°C below the monthly average (for 1971-2000) in England and Wales in January but slightly higher than the average in Scotland. In February, temperatures were average for England and Wales but slightly higher in Scotland, while in March, temperatures were almost 1°C above average in all of GB.

It was a very dry quarter in most of GB: rainfall was close to the monthly average in January but well below it in February and March. In March, the rainfall pattern was different in Scotland, where close to average rain fell, compared to about only 60% of average in February.

NOTIFIABLE DISEASE

GB Avian Influenza Wild Bird Surveillance (AIWBS). Results: January – March 2009

H5N1 Highly Pathogenic Avian Influenza (HPAI) was not detected from any of the 923 wild birds sampled and tested during the last quarter in Great Britain. However, evidence of infection with other avian influenza (AI) viruses was confirmed in three wild birds that had been legally trapped and sampled. An H1N1 AI virus was detected from a Pintail (*Anas acuta*) and evidence of influenza A virus infection was found in a Teal (*Anas crecca*) and one further Pintail (Table 1).

Surveillance activity	Number of birds examined*	Positive AI virus result and species of bird	Comments
Legally trapped (ringing)†	809 *(840)*	H1N1, Pintail (*Anas acuta*) x1	Seasonal targeted surveillance.
Legally shot	Nil *(11)*	Nil	Surveillance activity ceased.
Found dead	114 *(599)*	Nil	Scan. surveillance - all-year-round.

***** Number of birds examined: figures for January to March 2008 are shown in brackets.

† Of the Legally trapped bird samples tested, two further wild birds (a Teal and a Pintail) tested positive for influenza A virus infection by matrix (M) gene RRT-PCR. H5 RRT-PCR and virus isolation were negative for these birds.

Table 1 above : Number of wild birds tested and results, January – March 2009.

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H5N1 HPAI events in wild birds in Europe (January – March 2009)

During the first two months of 2009 there were no reported detections of H5N1 HPAI in Member States of the European Union (ADNS, 2009). However, during March H5N1 HPAI was found in samples collected from a mallard duck (*Anas platyrhynchos*) that had been shot at Lake Starnberg, Bavaria (OIE, 2009). The mallard was one of 39 wild birds that had been shot and sampled during January 2009. The detection of H5N1 HPAI in wild bird species in Europe (2005 to date) has been most frequent from samples collected from wild birds found dead. AI wild bird surveillance activities undertaken by EU Member States have shown that swans have been a key species in this regard (Hesterberg *et al*., 2009). Several other species of waterfowl have also been involved in wild bird mortality incidents associated with the detection of H5N1 HPAI (ADNS, 2006; ADNS, 2007). In comparison, the detection of H5N1 HPAI from so-called 'healthy' wild birds in Europe has been much less common. Globally, there have been other sporadic detections of H5N1 HPAI from 'healthy' wild birds species reported, largely from regions where disease has been previously detected and/or established.

References

ADNS, (2006). Highly Pathogenic Avian Influenza (HPAI) Cases in Wild Birds in 2006 Notified by Member States to the Animal Disease Notification System (ADNS).
http://ec.europa.eu/food/animal/diseases/adns/adns_wildbirds2006.pdf

ADNS, (2007). Highly Pathogenic Avian Influenza (HPAI) Cases in Wild Birds in 2007 Notified by Member States to the Animal Disease Notification System (ADNS).
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http://ec.europa.eu/food/animal/diseases/adns/adns_wildbirds2009.pdf
http://ec.europa.eu/food/animal/diseases/controlmeasures/avian/docs/pres6_jam2006.pdf
OIE, (2009). Immediate notification (Final report) - Highly pathogenic avian influenza, Germany.
http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=7874
Avian Virology, VLA

ZOONOTIC DISEASE

Salmonellosis in Wildlife: -

January – March 2009

11 Carcases of eight species were sampled for salmonella during this quarter under the Diseases of Wildlife Scheme. No *Salmonella* species were isolated or associated with the deaths of these wild birds and mammals. There was only one salmonella isolate, from a harbour porpoise (*Phocoena phocoena*) found dead on the North Cornish Coast and submitted under the collaborative UK Cetacean Strandings Investigation Programme (CSIP). This was a sub-adult female that had been extensively scavenged. Parallel linear wounds were seen over the dorsal surface of the caudal peduncle and the right pectoral flipper had been cleanly amputated. These findings are suggestive of by-catch. This animal also had a parasitic and bacterial pneumonia. The Salmonella, a Group B serotype 4, 12: A: - was isolated from a lungworm found in the airways but not from the lung. It has previously been suggested that Brucella is transmitted between cetaceans by lungworm and this might indicate that Salmonella also could be transmitted in the same way.

A wild bird strain of Salmonella, *S.* Typhimurium DT 56 variant was isolated during this quarter from a preweaned calf with diarrhoea and also from a horse from an equine hospital.

VLA Langford, VLA Truro

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

EMERGING AND ENDEMIC DISEASES

SUBMISSIONS: Wild bird submissions this quarter to VLA DoWS -

Month	Number of ED1600 wild bird submissions	Number of ED1600 birds submitted	Number of wild birds examined	Wild birds examined for West Nile Virus
January	6	12	12	Testing commences in April
February	4	13	13	
March	9	10	10	

Wild Mammal submissions January – March 2009 VLADoWS 2009

Month	Number of ED1600 wild mammal submissions	Number of ED1600 mammals submitted	Number of wild mammals examined
January	3	3	3
February	10	10	10
March	10	13	13

Deer fasciolosis and yersiniosis

A roe deer (*Capreolus capreolus*) kid from the Somerset moor was culled because it was in very poor bodily condition. The carcase was examined and the liver had a number of raised white fibrous foci of approximately 1 cm in diameter. Haemorrhagic tracts were seen under the capsule and in cut sections. There was fibrosis of the bile ducts. Large numbers of fluke of varying sizes were identified indicating chronic active fasciolosis as the cause of ill thrift of this animal. *Comment* - Fascioliosis has been a problem in farmed animals in this area in recent years.

Livers from 4 culled Fallow deer (*Dama dama)* from the West country had similar lesions to those described above but of varying severity. *Comment* - It was noted that with two wet summers and mild winters there had been a build up in the population of liver fluke with considerable outbreaks in sheep and cattle in the area where the Fallow deer were shot. It was possible that these deer were picking up fluke from livestock or they may have maintained a fluke population on their own. The snail intermediate host lives in wet conditions such as ditches, so the land and the number of field ditches that these culled deer frequented may be more conducive to the survival of the intermediate host compared to other deer populations. There was little prospect of parasite control in these wild deer but it was possible that effective control of fluke on pastures adjoining the woodland would help.

A survey of fluke (*Fasciola hepatica*) in wild deer over the last 5 years from VLADoWS diagnostic VIDA data showed that 11 cases were identified in 4 species (including the 2009 cases);
Fallow (*Dama dama*) 8 cases
Red deer (*Cervus elaphus*) single
Roe (*Capreolus capreolus*) single
Muntjac (*Muntiacus reevesi*) single.
Year distribution (number of animals affected) - 2004 (1), 2007 (1), 2008 (4) 2009 (5).
All cases occurred in the first 6 months of the year.
Comment From this scant data we cannot answer such pertinent questions as – is wildlife a significant reservoir of fluke for livestock; or, in a year such as 2009 with increased fluke in livestock is this reflected in increased prevalence in wild animals. Some anecdotal information from Ireland suggests that wildlife (rabbits *Oryctolagus cuniculus*) may maintain fluke on islands many years after sheep were removed. These reports do reflect however the potential for transmission of significant disease between livestock and wildlife, how difficult it is to demonstrate which is the more important reservoir and source of infection, and how agricultural practices can influence disease epidemiology in wildlife.
VLA Starcross and VLA Langford

A gralloch was submitted from a juvenile roe doe fawn from the West Country as a suspect TB case. There was a large pus filled abscess in the mesentery of the small intestine and a smaller abscess within the liver. No acid fast bacilli (AFB) were seen in a ZN stained smear of the abscesses. Bacterial culture subsequently yielded *Yersinia pseudotuberculosis* which is a recognised cause of disease in young deer. *Comment* - The gross pathology was not atypical of tuberculosis and the case demonstrated that yersiniosis is a differential diagnosis when examining suspect deer TB carcases.
VLA Langford

Biodiversity Action Plan and conservation concern Mammal Species

Red Squirrel (*Sciurus vulgaris*)
Several red squirrels were examined from the North of England. Traumatic injury either due to road traffic accidents or predation, probably by domestic cats, accounted for most. There was one case of squirrel pox and 2 cases of Adenovirus enteritis. Other diagnoses included peritonitis, nephritis possibly as a result of an earlier septicaemia and a colonic intussusception in individual animals. The colonic intussusception was the second case that we have diagnosed and anecdotal information suggests that other groups have also identified this condition.

Comment - A clearer picture of causes of death in red squirrels is being built up. It is apparent that road traffic accidents and predation (often by cats) are significant causes of death in this BAP species. Squirrel pox is now established in the Scottish borders (see McInnes and others, *Veterinary Record*, 2009 **164,** 528-531) and the disease now has a widespread distribution in areas of suitable habitat south of the Scottish Border. The question is, will the considerable resources and efforts employed in red squirrel conservation in the area (at a level previously unprecedented), which are organised at village, parish and regional level, be able to save the species from extirpation in the far north of England? To date, good populations of red squirrels persist in North Cumbria, however in South Cumbria where the disease first occurred 12 years ago, populations are very small, very fragmented and increasingly looking unviable.
VLA Penrith

Grey Seal (Halichoerus grypus); *Mycoplasma phocicerebrale* infection
Mycoplasma phocicerebrale was isolated from a swab of a wound on an immature grey seal. This is a recognised seal pathogen, which has been described in association with subdermal and intramuscular abscessation, septic arthritis, lymphadenopathy, pneumonia and polyarthritis. It is capable of causing the zoonotic infection “seal finger” a cellulitis, which follows bites from seals or contamination of previous open wounds.
VLA Bury St Edmunds

Harbour porpoise (*Phocoena phocoena*); Bycatch casualty, extensive parasitism and orthopoxvirus infection
A juvenile female harbour porpoise was submitted under the collaborative UK Cetacean Strandings Investigation Programme (CSIP) after stranding on the North Cornwall coast. A distinctive notch in the trailing edge of the dorsal fin, consistent with entanglement in monofilament netting, haemorrhage over the masseter muscles and right thorax were suspicious of bycatch-type injuries. Unusually in this case there was no evidence of recent feeding. Additional findings included severe lungworm infestation, gastric, hepatic and pancreatic parasitism. The carcase also had a number of circular, well-circumscribed ‘tattoo’ lesions on the right mandible and electron microscopy and initial PCR testing has confirmed the presence of an orthopoxvirus in one of the lesions.
VLA Truro

Suspect Bat White-Nose Syndrome in Greater Horseshoe bat (*Rhinolophus ferrumequinum*)
13 Greater Horseshoe bats were found dead in early February in an hibernaculum in a barn in Somerset. Two of these had a small area of white fungal growth on the nose leaf around one nostril. Three further similarly affected bats were in found dead in early March. The presence of fungal hyphae was confirmed by electron microscopy and histology. This revealed branching septate fungal hyphae invading submucosal tissues of the nose but there was no evidence of an inflammatory response. These bats

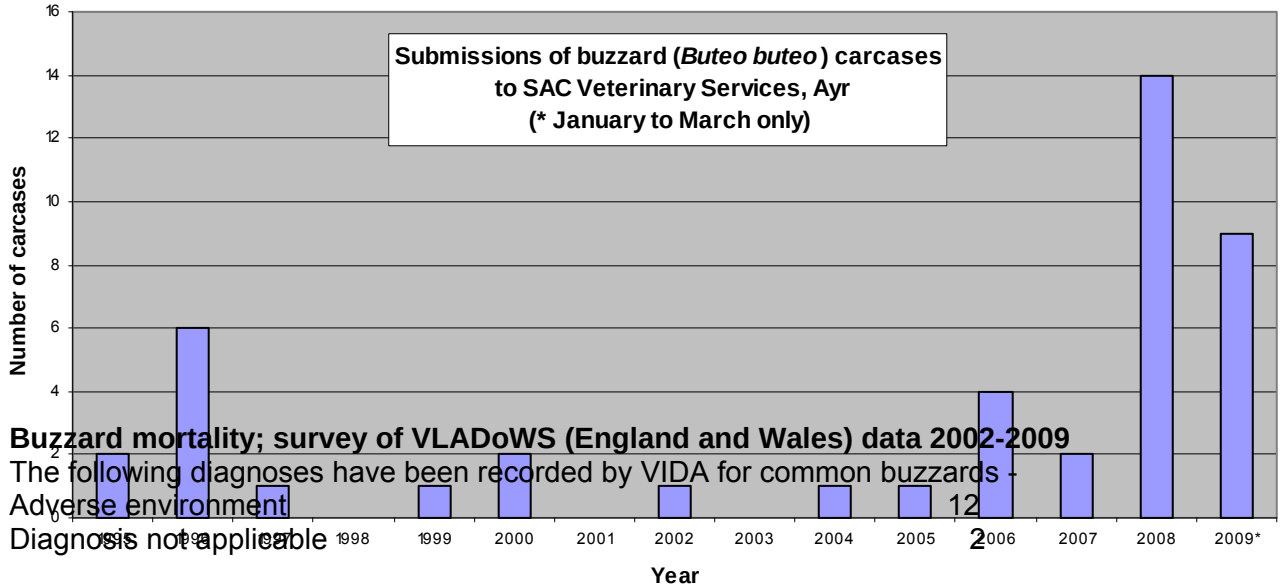
had been frozen before submission, which might explain why fungal cultures failed. However PCR carried out by the Leibniz Institute for Zoo and Wildlife Research indicated that the fungus was not *Geomyces* species. All these bats were immature and underweight and this together with the prolonged cold winter was likely to have been the cause of death. *Comment* - Bat White-Nose syndrome has caused mass mortalities in hibernating bats in the North-east USA with at least 0.5 million dead animals being counted. The precise aetiology and cause of death are not known however a consistent finding is that affected bats are malnourished and many search in vain for food before dying. This has lead some researchers to ask if climate change may be disturbing and interfering with hibernation. Rabies screening and the examinations were undertaken quickly which was only possible following collaboration between several UK and international organisations. This is the type of collaboration that is hoped to underpin the forthcoming wildlife disease surveillance partnership.
VLA Langford

Wildlife Diseases in Scotland; SAC VETERINARY SERVICES

***Suttonella ornithocola* in birds of the tit family**
Suttonella ornithocola was recovered from the lung of an adult blue tit (*Parus caeruleus*) found dead in a garden in Scotland in February 2009. Grossly the lungs appeared congested, but histopathology revealed multifocal areas of acute necrosis associated with the presence of Gram-negative bacilli. Several weeks later the same organism was isolated from the lung, liver and heart of a coal tit (*Parus ater*) found dead in another garden approximately 15 miles distant from the first site. Both sites had reported multiple deaths in birds of the tit family. This bacterium has been associated with mortality incidents in tit species in England and Wales (Kirkwood and others 2006, *Veterinary Record* 158, 203-205) but these are believed to be the first reported incidents from Scotland.

Increased submissions of buzzard (*Buteo buteo*) carcases December 2008 to March 2009
From December 2008 to March 2009 there was a substantial increase in the submission to SAC VS of carcases of buzzards (*Buteo buteo*) by members of the general public concerned about possible poisoning (see chart). Postmortem examination however showed that most of the birds had died from starvation, sometimes with concurrent parasitism. Tissues were screened for avian influenza virus but no viral RNA was detected. The increased mortality most likely reflected the rise of the buzzard population in recent years coupled with the very cold weather from December 2008. Prolonged frosts result in limited access to earthworms, an important aspect of the diet of buzzards. Similarly, vole numbers have reduced, and carrion may have been unavailable due to the freezing conditions. The deaths probably represented “natural” limitations on buzzard numbers.

Chart 1 - submission of buzzard carcases to SAC Veterinary Services , Ayr, 1995-2009
Image – buzzard carcase



Buzzard mortality; survey of VLADoWS (England and Wales) data 2002-2009
The following diagnoses have been recorded by VIDA for common buzzards -
Adverse environment 12
Diagnosis not applicable 2

Diagnosis not listed	6	
Diagnosis not reached	25	
Malnutrition (including starvation)	8	
Mycotic pneumonia	3	
Poisoning (chemical- not specified	4	
Poisoning (agrochemicals)	5	
Poisoning (industrial oil pollution)	1	
Trauma/fracture	8	
Trauma RTA	3	
Trichomoniasis	1	
Avian tuberculosis	1	Total 80

Comment - It can be seen that malnutrition, including starvation, accounted for the deaths of approximately 10% of the submitted buzzards, suggesting that it is a significant cause of death in this common (national population not under threat) bird of prey.

Appendix 1
Diagnosis not reached Analysis Jan-March (Q1) 2009

The following is a summary of wildlife data analysed by the VLA from diagnostic submissions received by its 15 regional laboratories and 2 surveillance centres in England and Wales. The aim of this report is to review data where a diagnosis was not reached (DNR) despite the sample receiving testing which was deemed adequate to allow the potential of a diagnosis to be reached. This allows monitoring of this class of submission with the aim of providing information on, and the early detection of, new or emerging syndromes.

Overview

Data analysis revealed no changes thought to constitute evidence of emergence of new, undiagnosed disease

For the first quarter of 2009, a diagnosis was reached for all wildlife submissions (n=50) undergoing reasonable testing.

In the 12 month period Q2 2008 to Q1 2009 there was no significant change in the proportion of submissions from terrestrial mammals for which no diagnosis was reached despite reasonable testing (%DNR). This is compared with both prior 5 years (Q2 2003 to Q1 2008), and with the previous year (Q2 2007 to Q1 2008). See Table 1.

Likewise, there was no significant change in the proportion of submissions from wild birds for which no diagnosis was reached despite reasonable testing (%DNR), compared with prior years and the previous year. See Table 1 This analysis does not include Avian Influenza wild bird submissions which undergo limited testing.

Table 1. Changes in % of undiagnosed submissions for wild birds and terrestrial mammals.

	% of Submissions for which Diagnosis Not Reached (in brackets, total number of submissions for time period)						
	Latest 12 months Q 2 2008-Q1 2009	Prior 5 years (Q2 2003 – Q1 2009)	Z		Last year (Q2 2007 – Q1 2008)	z	
Terrestrial mammals	4.8% (125)	9.6% (280)	1.65	▼	7.1% (99)	0.72	▼
Wild birds	15.4% (78)	21.3% (1435)	1.44	▼	12.3% (106)	-0.51	▲

▲▲ or ▼▼ = Statistically significant increase or decrease (z >1.96 or z< -1.96);
▲ or ▼ = Not statistically significant increase or decrease.

For other wild species groups examined over the last 12 months, a significant increase in the proportion of submissions for which a *Diagnosis was Not Reached,* was not found.

Full Results for info

Methods

Because there were no DNR in the first quarter of 2009, the percentage of submissions recorded as DNR in the last 12 months was compared to 1) the last 5 years and 2) the previous year. A z test was used for the comparison.

For the whole dataset (Q1 2003-Q1 2009), 6165 submissions were excluded because they were not subjected to reasonable testing (LTD_TEST or NA). Most of these were Avian Influenza wild bird submissions. This left 1971 observations across all wildlife species and all years.

	Latest 12 months Q1 2008-Q4 2008		Prior 5 years (Q1 2003 – Q4 2007)				Last year (Q1 2007 – Q4 2007)			
	N	% DNR	N	% DNR	Z	p-value	N	% DNR	z	p-value
Wildlife	209	8.6%	1762	19.0	3.69	0.000	213	9.9	0.44	0.658
Wild mammals	131	4.6	323	9.0	1.59	0.111	104	7.7	1.00	0.317
Wild birds	78	15.4	1435	21.3	1.24	0.215	106	12.3	-0.61	0.542
Squirrels	87	3.4	81	3.7	0.09	0.929	58	3.4	0.000	1.000
Bap mammals	91	3.3	124				66	3.0	-0.09	0.925
Deer	13	0	29				7			
Other mammals	24	12.5	77	18.2	0.65	0.516	29	17.2	0.48	0.631
Swan	29	17.2	293	30.7	1.52	0.129	29	13.8	-0.36	0.717
Water birds	43	18.6	682	25.7	1.03	0.302	43	11.6	-0.90	0.366
Seabirds	8	0	21				3	-	-	-
Birds of prey	8	0	104				16	-	-	-
Other wild birds	19	21.1	628	17.2	-0.44	0.662	44	18.2	-0.27	0.790
Garden birds	13	23.1	264	15.1	-0.77	0.441	17	5.9	-1.37	0.170
Terrestrial mammals	125	4.8	280	9.6	1.65	0.100	99	7.1	0.72	0.470

Where no data too few observations were present

No significant differences were detected for any species but in some cases very few observations were available.