GUIDANCE ON THE MANAGMENT OF WILDLIFE REHABILITATION CENTRES IN AN AVIAN INFLUENZA OUTBREAK

1. Introduction

Avian influenza (AI) is a notifiable disease when identified in captive birds and mammals. It readily circulates in wild bird populations and is of importance for several reasons:

- It has zoonotic potential.
- It can result in morbidity and mortality in a wide range of avian taxa, with significant impacts on some taxa in particular.
- AI is a notifiable disease in captive birds and mammals and the legislative response to a confirmed case includes prompt culling, cleansing and disinfection of the premises, movement restrictions and the creation of disease control zones:
    - There are likely to be significant economic costs to all infected premises (IPs); either directly through losses of stock if a bird rearing/farming facility, or indirectly through site closure and suspension of business activity (for example, veterinary practices, zoological collections, etc.).
    - Currently for restrictions to be lifted in less than 12 months, an extensive process of cleansing, disinfection and restocking with sentinel birds is required which can be costly.
- The current outbreak has resulted in a sustained global-level impact on wild bird populations, with severe conservation and welfare implications.

1.1 Need for Guidance

Wildlife rescue and rehabilitation centres that treat birds in the UK are, by their very nature, at an increased risk of encountering AI. Although 'triage' of birds at the point of admission can help prevent introduction of the pathogen to a site, not all infected birds will show overt clinical signs at that time. Testing for AI (see below) poses legal difficulties and our ability to detect the virus is limited using current commercially available tests. Isolation of birds on a site for a period consistent with the viral incubation period (see below) may help to limit transmission on a site but can pose serious practical difficulties on sites with limited space and resources.

Where AI outbreaks have occurred in zoological collections, and AI has been promptly diagnosed, losses have been limited, with rapid reopening to the public also possible. The same cannot be said for wildlife rehabilitation centres, where the consequences of confirmed infection have comprised large scale culling of birds, costly disinfection procedures and protracted closures. The main relevant difference between zoological collections and wildlife rehabilitation centres is not just the admission of wild birds, but the licencing conditions of zoos and their ability to enact AI contingency planning and maintain very high standards of biosecurity. This includes being able to readily demonstrate 'epidemiological units' (EUs) on their premises which are sufficiently separate in the epidemiological context of the disease.

An EU is a piece or part of the site which is sufficiently separate from the remainder of the locale such that, if infection were to occur, it is expected to be contained with the EU due to biosecurity barriers. This could be a room, a building, or a larger area within a site. Both the physical space and the management practices within that space are important in defining the EU.

With every wildlife rehabilitation centre being unique in its geography, staffing, resources, structure, wildlife taxa admitted and volume of intake, current published guidelines produced by The Department for Environment, Food and Rural Affairs (Defra) and Animal and Plant Health Agency (APHA) are not able to be specific to individual centres. Guidance is therefore needed to help wildlife centres protect themselves, limit potential losses and minimise disruption in the event of the admission of a bird infected with AI. This guidance can also help for future-proofing locations by providing guidance to assist with the construction of new facilities.

1.2 Aims of Guidance and disclaimer

This document aims to provide wildlife rescue and rehabilitation centre-specific advice within Great Britain. It makes use of other guidance provided by other veterinary and zoological organisations, and wherever possible aims to complement these documents.

The guidance is aimed at veterinary surgeons working in, or in collaboration with, wildlife rehabilitation centres. We hope that other wildlife rehabilitation professionals will also find it useful.

As explained above, every wildlife rehabilitation centre is different, and this document cannot predict all eventualities for all sites. It aims to provide help and guidance, with decisions made being the responsibility of those concerned. It is important to note that whatever guidance is followed, it is vital to ensure that any practices conducted are in line with current UK legislation, which in some instances is devolved.

This guidance is intended to be general advice based on the experience, data and situation of the authors as of July 2023. It is not intended to provide definitive advice for other sites and organisations or to replace individual site assessments and veterinary advice. It must be understood that in the event of confirmed notifiable disease infection at a wildlife centre, decisions will be taken by APHA. The authors of this guidance urge all wildlife rescue and rehabilitation centres to constantly review the latest Defra guidance (or that of the Scottish or Welsh Governments, or DAERA) as this is subject to frequent change. It is up to individual wildlife and rehabilitation centres to ensure they are following the most up-to-date legislation and guidance.

2. General Precautions Regarding AI in Wildlife

2.1 Zoonotic risks and Personal Protective Equipment (PPE)

AI is a zoonotic disease, although human infection is rare, and the H5N1 strain of infection currently circulating in the UK and elsewhere is considered to carry a very low risk for public health. The British Veterinary Association (BVA) asked for the advice of Defra, APHA and the UK Health Security Agency (UKHSA) and was referred to the PPE requirements for dealing with infected birds or potentially infected birds.

These include:

- Use of an FFP3 mask (or full or half-face respirator). It is considered best practice for masks to be face fit tested.
- Coveralls worn over clothing.
- Protective eye wear.
- Rubber/polyurethane boots (or disposable shoe covers).

- Disposable nitrile/latex/vinyl/heavy duty rubber gloves.

For wild birds, difficulties arise around defining when and for how long a bird should be considered potentially infected. The *BVA Avian influenza (AI) advice for vets dealing with wild birds and backyard poultry* [https://www.bva.co.uk/media/5094/ai-guidance-for-vets-may-2023.pdf] suggests full PPE should be worn when dealing with all wild birds. In poultry, the typical incubation period for AI has been shown to be 2-8 days, with a maximum incubation period of 14 days (WOAH, 2022). Similar data is unavailable for non-domestic birds and is likely to vary according to host susceptibility as well as other factors relating to the host, environment and pathogen. It therefore seems prudent to adopt full PPE for at least 14 days.

2.2 Admission of birds

AI has been isolated in a wide range of free ranging avian taxa (ESFA *et al*., 2023, https://www.gov.uk/government/publications/avian-influenza-in-wild-birds).

The most common taxa recently testing positive for AI are waterfowl (such as swans, ducks and geese), seabirds (including gulls) and birds that may feed on carrion, specifically dead birds (some birds of prey, in particular common buzzard [*Buteo buteo*] and Peregrine Falcon [*Falco peregrinus*]*).* During the most recent H5N1 outbreak, previously unprecedented mortality events have been reported in seabirds, including gulls, during their summer breeding periods.

Surveillance data can be useful to identify taxa recently exhibiting a high incidence of infection. However, it must be borne in mind that there is inherent bias in this data in that larger, more conspicuous birds, birds of taxa specifically targeted by the surveillance scheme and those from more populated areas are more likely to be submitted for AI testing. Surveillance has also varied, in both the type and number of birds investigated, throughout the outbreak, according to the availability of resources. A national risk level for wild birds as calculated by DEFRA and APHA is published in periodic outbreak assessments. These are based on the recent AI detections in wild birds in the United Kingdom and Europe and range from "low" to "very high".

https://www.gov.uk/government/publications/avian-influenza-bird-flu-in-europe

During periods of 'medium' to 'very high' risk in wild birds, it may be prudent to cease admissions of species of birds at the highest risk of infection. There should also be awareness that in periods of exceptionally high disease incidence in a localised area, species usually considered to be of an unknown or low risk will be more likely to be exposed to and subsequently carry infection. During periods of "high" to "very high" risk in wild birds, post admission quarantine of all bird species is the safest course of action where facilities can be adapted to permit this, as detailed below.

It is essential for admission policies based on species risk to be regularly reviewed and updated. Admission policies should be constructed in such a way that wildlife rehabilitation centres can easily react to changes in national or local disease risk with respect to AI with appropriate and timely changes in all aspects of biosecurity protocols (species admitted, PPE, segregation, disinfection, etc.).

Control zones

In the event of a wildlife centre being within a protection or surveillance zone, there will be restrictions placed on the movement of captive birds. Guidance should be sought from APHA as to whether birds within the wildlife centre can be released whilst the zones are in place. Negative polymerase chain reaction (PCR) swabs may be required prior to release of some species.

Wild bird movements are not subject to restrictions within protection and surveillance zones, so wildlife centres can legally admit wild birds from these areas irrespective of whether the site is within

the control zones. However, caution should be exercised by careful assessment of the risk posed by birds found near to an infected premises.

2.3 Reporting obligations

Suspicion of AI infection must be reported, by law, to APHA in captive and "other-captive" (see below) birds. Reporting of infection in wild birds is voluntary and can be done following DEFRA's guidance for reporting for wild birds, which is updated periodically:

https://www.gov.uk/guidance/report-dead-wild-birds

Wild birds taken into rehabilitation are classified as "other-captive" birds and thus suspicion of infection must be reported.

However, DEFRA/APHA have clarified that animals remain 'wild' rather than 'captive' for the first 14 days in care, as long as they are fully isolated from all captive birds on the premises. As soon as contact (including indirect contact through staff or equipment movement) occurs, then they will be classed as captive birds. Where high level isolation cannot be achieved, birds will be classed as captive from the point of admission. Biosecurity and epidemiological separation is therefore essential (see below).

The legislation (see above) clearly distinguishes the legal actions taken by DEFRA/APHA in response to a positive case according to the wild or captive status of the bird. The definition of when a wild bird is considered captive, and therefore what time period is appropriate for segregation, is not currently included in legislation.

2.4 'Triage'

Every potentially infected bird admitted to a wildlife rehabilitation centre poses a risk to the continued operation of the centre and potential exposure of all other birds and susceptible mammals within that centre. As such, triage of birds is an essential part of protecting the centre from an AI outbreak.

Triage should ideally comprise of two parts:

1. Initial telephone triage – reception staff asking questions of the finder, with use of photos and videos where appropriate. Any suspicious birds should be left *in situ* and reported to Defra. Appropriate advice should be provided to the public around the handling of all birds.
2. In-person triage **outside** the wildlife centre – examination of the bird outside the premises by staff wearing appropriate PPE. Any suspicious birds should be euthanased and reported to DEFRA as appropriate.

Clinical signs of AI in wild birds vary according to pathogen, host and environmental factors. The most common clinical signs reported include lethargy, recumbency, neurological signs (incoordination or loss of balance, head or body tremors, weakness) and respiratory signs (mouth breathing, sneezing, rattling or gurgling). For more information see: https://www.gov.uk/guidance/avian-influenza-bird-flu

There have also been reports of black irises in recovered northern gannets, and corneal oedema in waterfowl with active infection.

The use of AI testing as part of the triage process is discussed in Section 6 of this document below.

2.5 Biosecurity

AI is transmitted either by direct contact with an infected bird, or indirectly through contaminated body fluids and faeces. It can also be spread via fomites such as contaminated feed and water, contaminated vehicles, clothing, footwear, and equipment. It is not an airborne virus, however there is a risk of droplet transmission, and only a very small number of viral particles may be needed for

transmission and infection. Biosecurity, hygiene and use of appropriate PPE are all critical in both avoiding zoonotic infection and limiting transmission.

Biosecurity advice that must be followed by all bird keepers has been published jointly by DEFRA, the Scottish Government and the Welsh Government:

https://www.gov.wales/sites/default/files/publications/2022-10/biosecurity-and-preventing-welfare-impacts-in-poultry-and-captive-birds-update.pdf

It is essential for wildlife rehabilitation centres to have robust written biosecurity protocols and written contingency plans, to demonstrate biosecurity is being maintained between quarantine areas and the rest of the centre, and ideally between EUs within the centre.

Practical biosecurity in a wildlife rehabilitation centre should take consideration of:

- Immediate quarantine of all birds when first admitted, following triage, for up to 14 days. Birds can either be quarantined individually or in batches. If batch quarantine is undertaken then it should be an all in/all out system, with the quarantine period beginning from the day the final bird is admitted. Having two alternating rooms used for batch quarantine can be a practical option.
- Segregation of birds. It is prudent to try and create as many distinct EUs as practical within a centre, and clearly document where and how they are maintained. If AI is identified in one EU and robust biosecurity plans are in place, then the impacts of confirmed infection may be limited to that one EU.
- Drainage / water courses. Flow of water around the site may act as a route of transmission and prevent containment. Accurate plans showing which enclosures are linked by water courses will likely be requested by APHA in the event of an outbreak.
- Staff movement around the site. When staff move between enclosures they can act as fomites of infection and either separate staff for each EU or separate PPE (including footwear with footbaths) is recommended. Staff movements in and out of enclosures should ideally be kept to the minimum required level. Records of staff movement around the site are highly recommended.
- Animal movement around the site. Animal movements should be limited as much as possible and their movements documented. Animals should be transported in a suitable closed box or carrier.
- Storage of feed and bedding. Contaminated bedding and feed can act as a source of infection so this should be stored away from wild birds and rodents.
- Waste management. Waste from potentially infected birds should be considered contagious and disposed of as clinical waste. It is recommended to spray the outside of refuse bags with a DEFRA approved disinfectant or double bag waste before removing it from the quarantine or triage area.
- Limiting contact with wild birds. Covering enclosures with solid material or mesh of an appropriate size, preventing faecal contamination of food and drinking water from wild birds by placing these under cover, and preventing wild bird faeces entering bird enclosures by using enclosure specific footwear and/or foot dips is crucial.
  https://bpca.org.uk/test-news/the-ultimate-bird-control-netting-guide/210121
- Disinfectant use. A DEFRA-approved disinfectant approved for diseases of poultry should be used at the correct concentration to clean all enclosures and in footbaths at the entrance to each building and EU.
  http://disinfectants.defra.gov.uk/DisinfectantsExternal/Default.aspx?Module=ApprovalsList_SI
    - Removal of organic matter from footwear prior to using a footbath is essential, such as with the use of a boot brush and clean water. Footbaths must be changed when they are visibly contaminated to prevent inactivation of the disinfectant.

- Fogging rooms with disinfectant is known to be more effective than spraying.

Key requirements for effective quarantine

- Each separate EU or isolation block requires bird housing, food preparation and cleaning facilities, staff changing areas, and storage for PPE, equipment and waste prior to disposal.
- No transfer of birds, food, equipment or personnel can occur between units without suitable disinfection, decontamination or quarantine.
- Flowing water must not connect EUs (drainage routes are important).
- Air flow should not occur between EUs. For indoor rooms, ventilation systems should direct air out of the building and not into other bird housing areas. You should be able to present airflow diagrams to demonstrate this.
- Each EU should have foot dips at entrances and EU-specific footwear. EU-specific overalls or disposable coveralls should be used.
- Separate staff should operate in separate EUs where possible. If this is not possible, staff should fully change their PPE, including footwear, and in some instances a full uniform change may be recommended. If it is essential that staff work across multiple EUs, they should move chronologically from a lower risk EU (i.e. where taxa considered less likely to be infected with AI are housed, e.g. mammals, passerines) to higher-risk EUs (i.e. where taxa considered more likely to be infected with AI are housed, e.g. waterfowl, raptors, seabirds) and not vice versa, where possible.
- Detailed and up-to-date records should be kept of staff entry into each unit (sign in sheet at entrance), foot dip changing, animals' movements and biosecurity training.

2.6 Mammals

AI has been recently identified in red foxes, otters, seals, cetaceans and captive bush dogs in the UK during retrospective testing by APHA, with infection hypothesised to occur through ingestion of infected wild birds exposing the mammal to a very high viral load. There is no evidence of circulation in mammals, or suspicion of mammal-to-mammal transmission in the UK at present.

The suspected spread of AI from birds to mammals in a wildlife rehabilitation centre has been reported (Floyd *et al*., 2021).

AI in mammals is always notifiable and all suspected cases in mammals must legally be reported to APHA. It is therefore prudent to try and maintain good separation using biosecurity barriers, as discussed above, between mammalian species considered vulnerable (such as mustelids, carnivores and pinnipeds) and birds which might be infected (new admissions, those in post-admission quarantine, and wild birds on site). There is minimal evidence of the clinical signs of AI in mammals but clinical cases in Europe have presented with severe neurological signs including seizures (Rijks et al., 2021). As a result, care should be taken when admitting susceptible mammals with these clinical signs.

3. Background regarding APHA approach to suspected or confirmed AI cases/outbreak

On report of suspected AI in a captive bird or mammals, if the suspicion of disease cannot be negated over the phone, APHA will place restrictions on a site whilst conducting investigations. From the point

restrictions are placed, no movement in or out of people, animals or materials can take place without a licence. APHA field vets will attend the site and if suspicion of disease cannot be excluded based on the clinical picture, the APHA veterinarian will liaise with the Veterinary Exotic Notifiable Disease Unit which will issue sampling requirements to the onsite team.

If HPAI is confirmed, disease control zones are created with the location and requirements published online.

Initially, the entire centre will be designated an "infected premises" (IP). An epidemiological investigation will take place. The purpose of this is to define the EU containing the infected animal(s). They will consider direct and indirect contact with other animals and consider the movement of staff between areas, the movement of animals and biosecurity barriers between areas. If infection can be determined to be limited to one or more EUs, then the IP may be re-drawn to exclude the rest of the site. It is possible that the rest of the site may be able to continue operations under conditions instructed by APHA.

All birds within the IP normally will be promptly and humanely culled to rapidly reduce the risk of disease spread, irrespective of whether they are owned or captive wild birds (see below regarding derogation from culling).

After animals have been removed, APHA will perform a "preliminary cleansing and disinfection" which entails surface disinfection of all contaminated surfaces followed by a 24-hour period with no disturbance. This is to rapidly supress the amount of virus and reduce the risk of disease spread. No cleaning takes place prior to this.

Whilst the site is under restrictions, licences approved by APHA will be required prior to the entry of any people or items such as husbandry items for remaining animals, and cleaning materials that may be required. Licences are also required for the removal of any materials from the restriction zone. To enter the restriction zone PPE including an FFP3 mask, disposable body coverall, eye protection, rubber boots and protective eyeglasses should be worn.

Once the cleansing and disinfection process has been explained, the premises has 14 days to decide which of three options they wish to progress with. Option 1 involves undergoing "secondary cleansing and disinfection" as laid out in national legislation, followed by restocking which involves housing sentinel birds on site with the intention of exiting restrictions. Option 2 involves completing a secondary cleansing and disinfection process which meet the World Organisation for Animal Health (OIE) standard. This is followed either by no restocking, which allows some activities which do not involve animal intake to take place for the following 12 months, or a 3 month fallow period followed by restocking. Option 3 must be selected when secondary cleansing and disinfection cannot take place and no activity will be allowed for 12 months. Where flowing natural watercourses or extensive natural waterbodies are present, options 1 and 2 may not be possible.

For secondary cleansing and disinfection, a detailed schedule of work must be written and approved prior to beginning. Each area within the restriction zone must be cleared of any items which APHA determine cannot undergo the cleaning, which includes anything constructed of permeable material such as paper, cloth, or wood in poor condition. All material discarded must be disposed of as clinical waste, and water used during the cleaning process must be disposed of via an approved method. Each area must then be cleaned using a degreasing agent, rinsed and a disinfectant applied. This process is complex where variation exists in enclosures, particularly in indoor areas. All items within the restriction zone, including small items, must be cleaned and disinfected. This degrease, rinse, and disinfect cycle is repeated after seven days, and the site inspected by APHA.

21 days after the cleansing and disinfection process has been signed off, sentinel birds enter the enclosures which had housed birds and must remain for at least 21 days. The process of sentinel birds is easiest completed using domestic poultry. The restocking process involves a regime of inspection and testing via both APHA and your private vet. Restrictions are lifted once a satisfactory clinical

inspection and any negative results are received for any required sampling, at least 21 days after restocking took place.

This process will take several months to complete and entail considerable financial cost.

4. Portfolio/documentation required/advised regarding preparation for outbreak

4.1 Derogation from culling

The default legislative requirement, enacted by APHA will be to cull all captive birds inside the infected premises. Derogation from culling may be granted by the secretary of state via the DEFRA exotic disease policy team if individual birds on site can be demonstrated to be of high conservation value. Note financial or emotional value is not relevant.

Evidence must be provided that a species has high conservation value, this can include evidence from the following sources which indicates a risk of extinction:

- International Union for Conservation of Nature (IUCN) Red List Index
- Birds of Conservation Concern 5 (BOCC5)
- Evidence of local population declines or locally vulnerable populations (e.g. from British Trust for Ornithology (BTO) data)

Individual genetic value may be considered, for example merit in species recovery or disease reliance, or in zoological collection value in specific breeding programmes. It is worth collating this information in advance to have a simple document ready to present to the field vet if necessary.

If a bird is granted derogation from culling, they must be isolated within a biosecure facility and have two negative PCR tests 21 days apart. The cost of PCR tests in this circumstance is NOT met by APHA.

If the bird was within the infected enclosure, the bird may be required to be moved for the isolation period. They can potentially be moved back into the infected enclosure after secondary cleansing and disinfection as sentinel birds for that enclosure.

4.2 Other documentation recommended to be available for presentation to APHA in the event of an investigation:

- Biosecurity procedures and staff training.
- Animal admission records and movement records.
- Staff movement records and rotas.
- Risk assessments and Standard Operating Procedures for triage and animal housing areas.
- Waste management records and rodent control practices.

APHA have recommended that all centres produce a summary document detailing the admission procedures, triage, biosecurity protocols, centre management etc that are implemented at the centre, and how these might change as the risk changes. The aim is to have an easy document to hand to present to APHA in the event of an outbreak evidencing all the mitigation steps taken.

5. Contingency planning

Written contingency plans detailing the actions to be taken on suspicion of a case of AI infection in a wildlife centre can be helpful in ensuring all staff know how to proceed and that actions taken are appropriate. For example, in the event of a case in a triage area, in a quarantine area and in a non-quarantine area.

Details to consider include who will contact APHA or DEFRA and how, who within the organisation should be alerted, how and when euthanasia of suspect cases should be performed, and whether immediate cessation of new admissions should occur.

6. Testing

Bench-top lateral flow tests are commercially available, which test for AI viral antigen. PCR tests are only currently available in the UK for use by APHA in birds. PCR testing of mammals can be performed by some laboratories as detailed below:

https://www.gov.uk/government/publications/listed-diseases-in-animals-case-definitions-testing-and-reporting/influenza-a-h5n1-infection-in-mammals-suspect-case-definition-and-diagnostic-testing-criteria

Diagnosis of a notifiable disease can only legally be made by APHA. Suspicion of AI infection in a captive bird must be reported and attempts to diagnose AI is not permitted.

It is permitted to use antigen tests to screen birds not exhibiting clinical signs consistent with AI, provided this is done in a pre-determined, consistent manner. For example, that all wild birds are tested prior to admission at triage. If this practice is to be employed by a wildlife centre, it is imperative that the process is formally documented to demonstrate the method and application of routine screening testing. However, the following limitations must be borne in mind when deciding whether this is appropriate:

- The sensitivity and specificity in wild birds in field conditions is unknown and it is widely accepted that a sensitivity of 100% is unrealistic. False positives are likely (which would necessitate notification of APHA).
- There is a risk of false negatives, particularly from birds in the incubation stage of infection. Therefore, a negative antigen test does not reduce the need for biosecurity and quarantine of newly admitted wild birds.
- The available antigen tests are not specific to HPAI H5N1 and will detect antigen from other variants, including those of low pathogenicity.
- A positive test must be reported in the same manner as suspicion of clinical disease. This may result in the imposition of a restriction zone by APHA whilst investigations take place.
- APHA has produced Briefing Note (47/22) on the use of Influenza Antigen Tests for Detecting Avian Influenza: http://apha.defra.gov.uk/documents/ov/Briefing-Note-4722.pdf

Wildlife Avian AI Working Group

Amy Colling RSPCA

Joseph Heaver Scottish SPCA

Joanna Mihr RSPCA

Elizabeth Mullineaux BVZS

Liam Reid Scottish SPCA

Elliott Simpson-Brown BVZS

August 2023

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