Department
for Environment
Food & Rural Affairs

Risk assessment on the likelihood of spread of highly pathogenic avian influenza H5Nx associated with bird fairs, shows, markets, sales and other gatherings

Qualitative risk assessment

10 November 2026

We are responsible for improving and protecting the environment. We aim to grow a green economy and sustain thriving rural communities. We also support our world-leading food, farming and fishing industries.

Defra is a ministerial department, supported by 34 agencies and public bodies.



© Crown copyright 2026

This information is licensed under the Open Government Licence v3.0. To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available at www.gov.uk/defra

Any enquiries regarding this publication should be sent to us at iadm@apha.gov.uk

Contents

Qualitative risk assessment 1

Executive summary 5

Background 8

Trends and risk levels in the current epizootic 8

Captive bird orders glossary 10

Hazard identification 10

Risk question 10

Scope 11

Terminology related to the assessed level of risk 11

Entry assessment 11

Probability of captive bird being infected prior to being taken to gathering 12

Psittaciformes and Passeriformes 16

Columbiformes 17

Birds of prey (Accipitriformes and Falconiformes) 19

Ratites 19

Galliformes 19

Anseriformes 20

Probability of HPAIV H5Nx not being detected prior to gathering 20

Psittaciformes 21

Columbiformes 21

Birds of prey 21

Passerines 22

Galliformes 22

Anseriformes 23

Ratites 24
Exposure assessment 24
Spread of disease within the gathering 24
Qualitative risk assessment 25
Consequence assessment 28
Spread of disease from the gathering 28
Mitigation measures 29
Conclusions 29
Uncertainties 31
References 31
Annex 1 33

Executive summary

The hazard is high pathogenicity avian influenza (HPAI) virus H5Nx. Here, a rapid risk assessment (RRA) is undertaken to reassess the risk of HPAI H5Nx introduction from poultry and captive birds taken to bird fairs, shows, markets, sales and other gatherings (henceforth referred to as “gatherings”). The subsequent risk of spread of HPAI H5Nx to other birds at the gathering and then spreading to different establishments has been assessed this 2026 to 2027 season in previous RRAs as medium or high (depending on the bird species) and this risk assessment uses the same methodology as previous iterations. Critical to this RRA therefore is the probability that captive birds are infected prior to their transport to a gathering, together with the probability that any infected birds are not detected (and hence movement restrictions are not applied to the flock) before reaching the gathering.

For the purpose of this RRA a simplified risk pathway is used comprising three steps each described by a qualitative risk as set out below:

1. Probability captive bird is infected prior to gathering;
2. Probability infected bird is not detected prior to entering gathering; and
3. Probability transmission occurs at gathering given infected bird introduced.

The 3 qualitative probabilities in the pathway for each bird order are combined to the give the overall probability of spread of HPAIV H5Nx from bird gatherings in Great Britain currently.

The main route of exposure of captive birds prior to transport is through contact with wild birds (either direct or indirect contact). At the present time (10 November 2026) the wild bird risk for HPAI H5Nx in Great Britain has just been increased from medium to **high** (occurs very often) (HPAI in Europe #7). So far in the 2026 to 2027 season (started 1 October 2026) 20 cases of HPAI H5Nx in found dead wild birds have been reported. These have been spread across much of England and some of Scotland with many cases inland and include 4 cases of HPAI H5N5 in gulls and corvids in northern Great Britain and 16 cases of HPAI H5N1. Of interest only 3 of the H5N1 cases were in waterfowl, the rest being in a range of resident species including raptors, finches, corvids and doves suggesting an ongoing widespread disease process for HPAI H5N1 in wild birds in Great Britain. Reports of HPAI H5N1 are increasing in both northern and southern Europe with many cases now in migratory ducks including wigeon, pintail and teal and it is anticipated that the wild bird risk will remain elevated in Great Britain for the coming months as more migratory waterfowl arrive through northern Europe. The infection pressure in poultry is increasing in line with the increasing wild bird risk level. There have been 3 poultry infected premises (IPs) in Great Britain since 1 October 2026 with H5N1 and 1 in northern Scotland with H5N5 (to 6 November 2026). These are documented in our outbreak assessment on 6 November 2026 (HPAI in Europe #7). However (to 10 November 2026) there have been

a further 3 IPs in England this week, taking the total to 7. All 7 IPs were considered as non-stringent or suboptimal biosecurity. The risk level for poultry with suboptimal biosecurity was therefore (on 6 November 2026) increased from low to MEDIUM with medium uncertainty (HPAI in Europe #7). The risk level for poultry with stringent biosecurity has been increased from very low to low with low uncertainty.

In terms of the bird species considered in this RRA, those poultry and bird species that are most likely to be taken to gatherings include 7 bird orders, namely Psittaciformes (parrots), Columbiformes (doves and fancy pigeons including racing pigeons if taken to a gathering), birds of prey (Accipitriformes and Falconiformes), Passeriformes (finches), Galliformes (poultry and game birds), Anseriformes (ducks and geese) and Ratites (ostriches, emus and rheas). The baseline risk of those birds being infected prior to the gathering for this RRA is based on that of poultry in Great Britain taking into account whether the biosecurity is more in line with sub-optimal biosecurity (Galliformes, Anseriformes and Ratites) or stringent biosecurity (Psittaciformes, Columbiformes, birds of prey, and Passeriformes). As with the previous gathering's RRA, the risk for each of the 7 bird orders is then refined based on specific differences in access to the environment where residual infectivity from wild birds may be present.

Captive ducks and geese (Anseriformes) kept outside or in un-netted ponds are highly likely to have contact with wild ducks, geese and swan species particularly if kept at premises near to where wild waterfowl gather. In previous iterations of this RRA, the risk of infection of captive Anseriformes prior to attending the gathering or show was considered to reflect the wild bird risk level. Despite the small number of cases detected in found dead wild waterfowl in Great Britain via the passive surveillance scheme since 1 October 2026 the risk level for captive Anseriformes prior to being taken to gatherings is assessed to be **high** (with medium uncertainty) across Great Britain reflecting not only the anticipated increase in cases in migratory waterfowl as seen with the many cases in migratory ducks in Europe in the last month but also the formation of winter aggregations of resident waterfowl species. Thus there will be increasing contacts of captive Anseriformes with infected wild waterbirds in the coming weeks in Great Britain.

The risk of infection for captive Galliformes and Ratites across Great Britain prior to attending the gathering is assessed to be **medium** (with medium uncertainty) in line with the risk level and its uncertainty for poultry with suboptimal biosecurity. The probability of infection prior to the gathering is assumed to be the same as that for poultry with stringent biosecurity for Psittaciformes, Columbiformes, and Passeriformes), namely **low** (with low uncertainty). However, in the case of birds of prey the probability of infection prior to the gathering is increased to **medium** (with medium uncertainty) because some falcons may be used to catch wild birds including ducks for which the risk level is currently high.

The results of the risk assessment are set out in the table below.

Summary table: Qualitative risk assessment for the probability of entry and subsequent spread of HPAI H5Nx at bird gatherings according to bird group (for 10 November 2026). The probability of entry and subsequent spread for each captive bird group in this table is a combination of 3 different assessments, namely the probability of infection of a captive bird prior to the gathering, the probability of not detecting an infected captive bird prior to being taken to the gathering and the probability of spread given an infected bird has entered the gathering itself.

Captive bird group taken to gathering	Probability of entry and subsequent spread	Uncertainty
Psittaciformes	Low	Low
Columbiformes	Low	Medium
Birds of Prey	Low	Medium
Passerines	Low	Medium
Galliformes	Medium	Low
Anseriformes	High	Low
Ratites	Low	Medium

The overall probability of entry and subsequent spread is now at **high** (with low uncertainty) for captive Anseriformes reflecting the high risk level for wild birds across Great Britain and their probability of contact with wild waterbirds. The overall probabilities of entry and subsequent spread remain at **low** for the Psittaciformes, Columbiformes and Passerines captive bird groups reflecting the low risk level for poultry with stringent biosecurity across Great Britain. The overall probabilities of entry and subsequent spread remain at **low** for the Birds of prey and Ratites captive bird groups reflecting the low probability of an infected bird remaining undetected. The overall probability of entry and subsequent spread is now at **medium** (with low uncertainty) for captive Galliformes reflecting the medium risk level for poultry with suboptimal biosecurity.

With the increasing wild bird risk and the accompanying increase in poultry risks, the uncertainty in the overall low probabilities of entry and spread predicted for Columbiformes, birds of prey, passerines and ratites has increased to medium. The uncertainty in the overall probability of entry and spread at gatherings is now much more dependent across these bird groups on the probability of infected birds not being detected in each group prior to the gathering. This is because the current increasing probabilities for captive birds actually being infected prior to the gathering in effect puts more emphasis on the detection of infected birds in protecting gatherings. **Reporting any suspicion of infection by the owner prior to the gathering is now the critical protective barrier for gatherings.**

Background

Here, a rapid risk assessment (RRA) is undertaken to reassess the probability of high pathogenicity avian influenza (HPAI) H5N1 introduction and spread from poultry and captive birds taken to bird fairs, shows, markets, sales and other gatherings (henceforth referred to as “gatherings”). Gatherings of birds involve the coming together and subsequent dispersal of live kept birds (as well as people, vehicles and equipment) and for this reason can facilitate the introduction and spread of avian notifiable disease including HPAI to different locations across Great Britain. The magnitude of this probability is influenced by the number and types of different groups of birds brought together and the probability of their being already infected at their point of origin. Movements of birds out of an SZ or PZ around a confirmed IP (infected premises) are not permitted but other than this, traceability of poultry is lightly regulated so most moves outside a restriction zone are of uncertain origin and status.

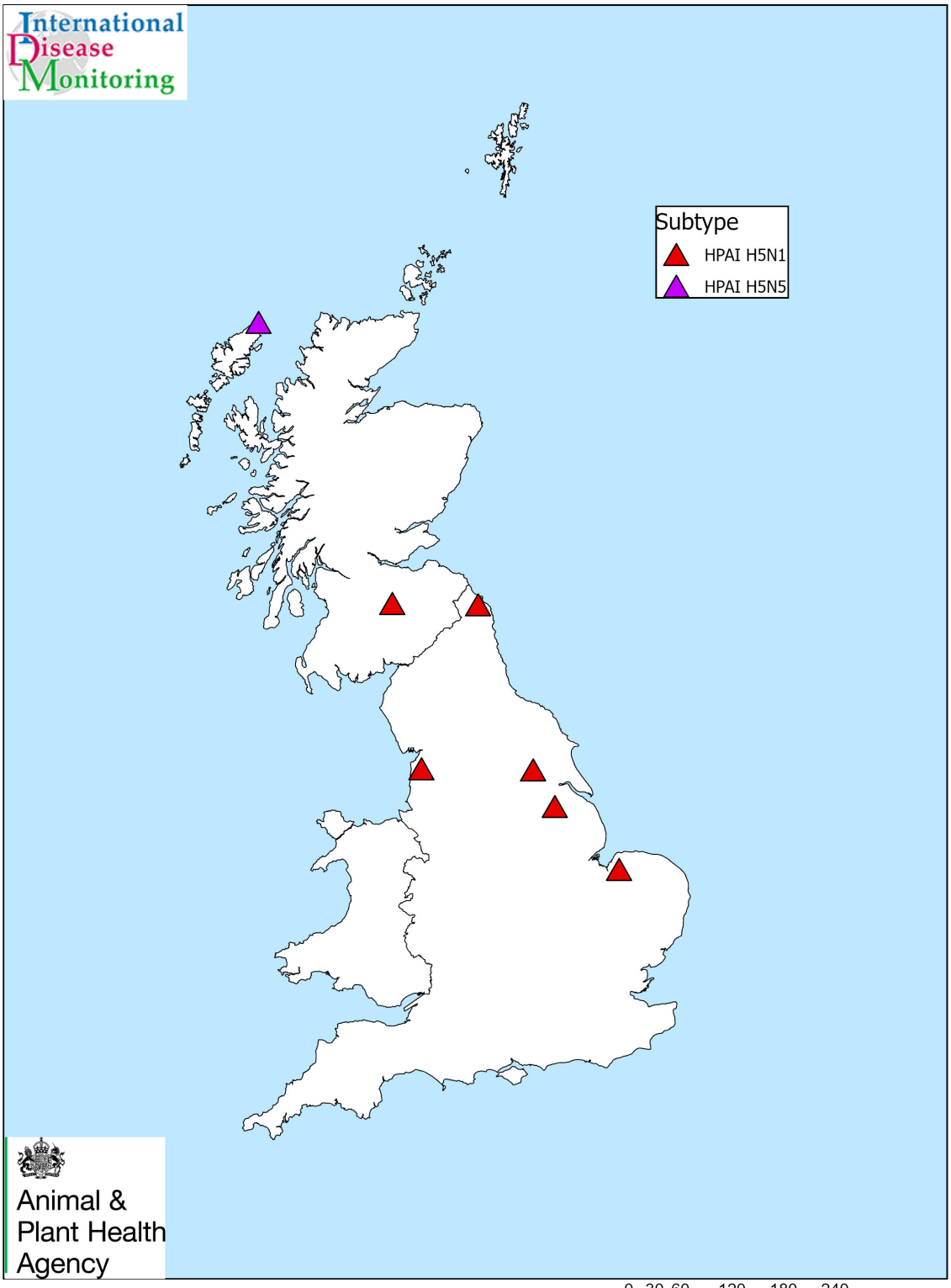
Previous Defra risk assessments (Defra, 2016) were used as a basis for the general licence allowing bird gatherings to take place while minimising the probability of introduction of avian notifiable diseases to these events and mitigating the risk and impact of any subsequent spread. Here the risk assessment is updated (from our previous assessment on 2 June 2026) to accommodate the risk levels for HPAI H5N1 in wild birds and poultry in November 2026.

Trends and risk levels in the current epizootic

Please see our updated outbreak assessment for 6 November 2026 for details. In summary, there have been 16 cases of HPAI H5N1 in wild birds in England and Scotland since 1 October 2026. In addition there has been 1 wild bird case with H5N5 in Scotland and 3 wild bird cases of H5N5 in northern England. The range of species infected with HPAI H5N1 is interesting and notably included only 3 waterfowl species namely 1 whooper swan in Lancashire, 1 Canada goose in Suffolk and 1 unidentified duck in Norfolk. Unusually there were 2 cases in pigeons and 1 case in a greenfinch. Birds of prey included 2 red kites and 2 sparrowhawks. Other waterbirds include 1 case in a herring gull and 1 curlew. There was also 1 barn owl and 3 pheasants. The 4 poultry IPs also indicate an ongoing and increasing disease process in wild birds. The wild bird case in Scotland with H5N5 was a corvid which had presumably scavenged an infected waterbird arriving from Iceland where H5N5 has been spreading in gulls and skuas this autumn (Map 3). There were 3 cases of H5N5 in great black-backed gulls in Northumberland. These are typically marine gulls. On 6 November 2026 the risk level for wild birds in Great Britain was increased from medium to HIGH.

The increased wild bird infection pressure naturally increases the risk to poultry with 4 IPs all with non-stringent biosecurity reported from 1 October 2026 to 6 November 2026 in Great Britain. There were a further 3 IPs in the week to 11 November 2026 namely 1,200 turkeys and 200 geese in Lancashire, 14,000 free range laying hens in North Yorkshire,

28,000 free range broiler chickens in Norfolk. All 3 were free range and or had suboptimal biosecurity and are not reported in our updated outbreak assessment for 6 November 2026. The 7 IPs are shown in the map below.



The risk level for poultry with suboptimal biosecurity was therefore increased from low to MEDIUM (on 6 November 2026) with medium uncertainty. Although the last IP with stringent biosecurity was on 01 December 2025 and the risk level for poultry with stringent biosecurity was increased from very low to LOW with low uncertainty on 6 November 2026.

Captive bird orders glossary

The bird orders of captive birds considered are set out in Table 1.

Table 1:1 Glossary of captive bird orders considered here with examples.

Order	Examples
Psittaciformes	Parrots
Columbiformes	Pigeons and doves
Birds of prey (Accipitriformes and Falconiformes)	Hawks and falcons
Passeriformes	Perching birds (finches and canaries)
Galliformes	Turkeys, pheasants, chickens, guineafowl.
Anseriformes	Ducks and geese
Ratites	Ostriches, emus and rheas

Hazard identification

The hazard identified is highly pathogenic avian influenza virus, (HPAI) H5Nx.

Risk question

1) *What is the risk of the introduction of highly pathogenic avian influenza H5Nx into bird fairs, shows, markets, sales and other gatherings?*

2) *What, if any, management options are available to reduce the likelihood and the impact of introduction and subsequent spread of avian notifiable disease through the abovementioned gatherings?*

Scope

This qualitative risk assessment covers the risk of introduction and subsequent spread of avian notifiable disease to and from bird gatherings organised in Great Britain that were legally moved to the event from within the UK.

This risk assessment does not assess the risk related to illegal movements, failure to report clinical disease, false certification, breaches in biosecurity etc. Any risks potentially presented by (or to) wild birds are also not assessed here.

Terminology related to the assessed level of risk

For the purpose of the risk assessment, the following terminology will apply (OIE, 2004):

- **Negligible**: So rare that it does not merit to be considered
- **Very low**: Very rare but cannot be excluded
- **Low**: Rare but does occur
- **Medium**: Occurs regularly
- **High**: Occurs very often
- **Very high**: Event occurs almost certainly

It should be noted, however, that the risk terminologies here do not represent how often an event will occur but more indicate the probability of the event occurring.

Entry assessment

The Defra (2016) assessments concluded that the overall probability of the introduction of avian notifiable diseases including HPAI to a bird gathering is related to the ongoing disease situation in Great Britain, both in domestic poultry and in wild birds.

It is important to note that the wild bird surveillance figures for Great Britain are based on passive surveillance of found dead birds reported to Defra by the general public and as such, may be affected by several factors including frequency of visitors accessing areas with bird populations, the potential for immunity in the wild bird population (which may result in fewer birds developing clinical disease and or dying with HPAI), variable surveillance system sensitivity, as well as the size, location and accessibility of carcasses. Thus, this wild bird surveillance does not necessarily capture all the cases that occur, although the current number of cases reported fully supports the current (10 November 2026) high risk level for wild birds.

As adopted in previous RRAs for gatherings, the probability of those birds which may attend gatherings being infected with HPAIV H5Nx is based on the official risk levels for poultry in Great Britain being infected through background environmental contamination from infected wild birds. This probability is currently (10 November 2026) **medium (with medium uncertainty)** for poultry where biosecurity is sub-optimal and **low (with low uncertainty)** for poultry where biosecurity is stringent**.**

It is assumed that keepers of any birds participating at a gathering are doing so in full compliance with the legal requirements for movements of live birds, and that birds are not coming from areas under disease control restrictions.

Probability of captive bird being infected prior to being taken to gathering

Captive birds should be kept separate from wild birds and wild waterfowl in particular..

Due to the varying level of biosecurity (considered lower than stringent in many cases) and ability to be tracked, those birds being taken to gatherings and shows will be of a more uncertain infection status than commercial poultry with stringent biosecurity. Also monitoring and data for commercial production means that commercial birds can be tracked more easily than for those birds at gatherings and shows. Birds from non-commercial settings carry greater uncertainty. The baseline probability of those birds being infected prior to the gathering for this RRA is based on that of poultry in Great Britain taking into account whether the biosecurity is more in line with sub-optimal biosecurity (Galliformes, Anseriformes and Ratites) or stringent biosecurity (Psittaciformes, Columbiformes, birds of prey, Passeriformes).

Table 2: Probability of HPAI H5Nx infection in each group of captive birds prior to attending the gathering

Order	Examples	Probability of being infected currently (10 November 2026) prior to going to gathering	Uncertainty
Psittaciformes	Parrots	[b]Low – reflecting that the probability for poultry with stringent biosecurity is low.	Medium - Mostly kept in aviaries or indoors. Probability may be at the higher end of low if keep in outdoor aviaries given wild bird risk is now high.
Columbiformes	Pigeons and doves	Low – low probability level is consistent with relatively low susceptibility of Columbiformes to HPAI H5Nx and the relatively few cases in wild Columbiformes	Medium – Wild bird risk is high and there have been 2 dove cases in Great Britain since 1 October 2026 (discussed in text), hence medium uncertainty in the low probability level.

Order	Examples	Probability of being infected currently (10 November 2026) prior to going to gathering	Uncertainty
Birds of prey	Hawks and falcons	Medium – probability would be elevated if birds of prey allowed to catch wild waterfowl at the current time (10 November 2026) because wild bird risk is high.	Medium – There is uncertainty in how many captive birds of prey are used to catch wild birds. The risk will increase as the disease spread to waterfowl.
Passerines	Finches and canaries	[b]Low - kept in aviaries or indoors reflecting that the risk for poultry with stringent biosecurity is low.	Medium - Probability may be at higher end of low if keep in outdoor aviaries where wild birds are attracted. It is noted that a case of HPAI H5N1 has been reported in a greenfinch in Suffolk this season.
Galliformes	Turkeys, pheasants, chickens, guineafowl	[a]Medium - based on current risk to poultry with suboptimal biosecurity.	[a]Medium – captive Galliformes likely to be outdoors with greater opportunity of exposure to wild birds for which risk level is now high.

Order	Examples	Probability of being infected currently (10 November 2026) prior to going to gathering	Uncertainty
Anseriformes	Ducks and geese	High – reflecting the high wild bird risk. Ducks are highly susceptible to HPAI H5N1 challenge and captive ducks and geese are likely to be outdoors with access to ponds where HPAI H5N1 could be introduced if present in local wild waterfowl.	Medium. It is noted that there have only been 3 wild bird cases in waterfowl although there has been an outbreak in commercial ducks (to 10 November 2026) Furthermore, cases in migratory ducks are increasing in Europe and some will fly over to Great Britain in coming weeks.
Ratities	Ostriches, emus and rheas.	[a]Medium – kept outdoors with access to wild birds.	[a]Medium

[a]Based on the current risk level (10 November 2026) to poultry with suboptimal biosecurity.

[b]Based on the current risk level (10 November 2026) to poultry with stringent biosecurity.

The risks for the 7 bird orders considered here (Table 1) are refined in Table 2 based on specific differences in access to the environment where residual infectivity from wild birds may be present. This is now described for the 7 bird orders considered here.

Psittaciformes and Passeriformes

Passerine species infected with HPAI H5Nx globally include several species of finch, sparrow, thrush and myna (Bird & mammal species affected by H5Nx HPAI). In March 2022 there were 6 cases of HPAI H5/H5N1 in pied wagtails in Crewe. In the 2022 to 2023 season in Great Britain there were 4 cases of HPAI H5 in passerines, namely a reed warbler and 3 carrion crows. However, since the beginning of the 2023 to 2024 season, there have been no detections of HPAI H5Nx in found dead wild passerines in Great Britain. This may partly reflect the character of this citizen-science based surveillance scheme, where dead small passerines are relatively unlikely to be found by members of the public and may not remain available for collection and analysis. In Europe, according to WOAH, passerine cases reported in the 2025 to 2026 season included 2 chaffinches in Belgium, 1 thrush in the Netherlands, 5 blackbirds (Belgium, France and Poland), 1 robin in Belgium, 1 blue tit in Belgium, 1 redwing in Belgium, a Sylvia warbler in Austria and single unidentified passerines in Germany and Poland. In addition, some 30 cases were reported in corvid species in Europe in the 2025 to 2026 season. It is noted in Great Britain that a case of HPAI H5N1 has been reported in a greenfinch in Suffolk this season.

Brown et al. (2009) demonstrated that house sparrows are highly susceptible to HPAI H5N1 with low doses required to initiate infection and cause mortality. The house sparrows excreted virus at high titres (up to 10^4 to 10^5 $TCID_{50}$s/ml) via the oropharynx and cloaca for several days prior to the onset of clinical signs. Forrest et al (2010) elucidated the role of sparrows as intermediate hosts of HPAI H5N1 concluding that, "the sparrows shed virus for several days, and their drinking water was rapidly contaminated with virus. The long-term shedding we observed in sparrows was also seen by Brown et al. (2009) in house sparrows infected with A/whooper swan/Mongolia/244/05 (H5N1) HPAI virus. These findings, in view of the widespread intermingling of land-based wild birds with wild and domestic waterfowl and poultry, suggest that passerine birds can facilitate the spread of H5N1 virus."

The key point in Forrest et al. (2010) is that they demonstrate that the sparrows are readily infected with HPAI H5N1 and that those infected sparrows shed very high titres with a mean peak titre of $>10^6$ EID_{50} per ml. Thus taking infected sparrows shedding such high doses to a gathering would be a major concern. It is also worth noting that the sparrows' mean time to death was 4.1 days with shedding starting 1 day post infection, so infected sparrows can shed a lot of virus before they die. Although in the experiment of Forrest et al. (2010) none of the n = 5 chickens were infected by the sparrows through water it is considered that not detecting infection in just n = 5 chickens is not sufficient to rule out transmission from sparrows. Forrest et al (2010) tried to infect the n = 5 chickens with 1 litre of water that the infected sparrows had used for drinking. They diluted this 1 litre with 2 litres of water and gave it to the chickens. While they did mix the water, it is not known if

the n = 5 chickens actually ingested any virus particularly if the virus was in particulate lumps of oropharyngeal secretion that dropped to the bottom of the dish (spatial heterogeneity or clustering).

A paper by Nemeth et al. (2010) studied LPAI H3N8 (not H5) and did demonstrate infection and shedding particularly in the oropharyngeal route for up to 5 days. Swabs from three house sparrows on 3 to 4 dpi were 10^2 to 10^3 EID_{50}/ml with a cloacal swab on 5 dpi of 10^4 EID_{50}/ml. The authors concluded "the results from the present study do not strongly support the involvement of two common and abundant passerine species in LPAIV maintenance and transmission to captive or wild birds, although the demonstrated susceptibility to infection and subsequent oropharyngeal shedding of infectious virus cannot rule out their involvement."

Ellis et al. (2021) have studied the susceptibility, infection and transmission of low pathogenicity avian influenza (LPAI) in starlings. In the experiment, 4 naive starlings placed in a cage with 5 starlings infected by inoculation were not infected (in 4 replicate experiments) suggesting starling to starling transmission is not efficient and that starlings do not act as maintenance hosts. However, starlings were infected by drinking water used by an experimentally infected mallard duck and those infected starlings shed viral RNA for around 7 days. Starlings experimentally infected did shed viral RNA at high levels and it must be assumed could therefore infect poultry and Anseriformes. Thus, starlings could act as a bridging species to poultry in the case of LPAI at least.

Psittaciformes and collections of ornamental passerines are kept in aviaries, and some may even be kept indoors where there is less probability of direct wild bird contact. The probability of infection of Psittaciformes and kept passerines prior to being taken to the gathering is considered to be the same as that for the risk to poultry with stringent biosecurity, namely **low**. It is noted that those Psittaciformes and passerines kept in outside aviaries will be at higher risk and at the higher end of the low risk level range. The uncertainty is medium because of the variation in how these birds are kept, i.e., ranging from a single bird kept indoors to outdoor aviaries with larger collections and the fact that individual species susceptibilities across these two captive bird groups are poorly defined. This is more important now the wild bird risk is high.

Columbiformes

Racing pigeons competing within Great Britain or Europe are not considered here (they are the subject of a separate and specific risk assessment). However, racing pigeons taken to other gatherings are included here together with related Columbiformes of other species or breeds. There have been relatively few reports of cases in wild Columbiformes to WOAH over the last few years of the epizootic although the number of cases increased in the 2025 to 2026 season and there have been two cases of H5N1 in doves in the 2026 to 2027 season.

Studies with HPAI H5N1 whooper swan/Mongolia strain showed that pigeons were relatively resistant to HPAI H5N1 requiring a high dose of virus to produce infection and death (Brown et al. 2009). In a study of domestic pigeons, inoculated oculo-nasally with HPAI H5N8 (Clade 2.3.4.4 sub-group icA3) of Korean origin, Kwon et al, (2017) concluded that, though pigeons have lower susceptibility than some other species, they can be infected with HPAI H5N8 when exposed to high doses and could excrete the virus in sufficiently high doses to infect other species of birds. Pigeons could also be mechanical transmitters of the virus. A study in which 18 pigeons were inoculated intranasally with HPAI H5N8 (clade 2.3.4.4 subgroup B) from South Africa reported viral shedding in medium and high-dose pigeons for up to 8 days (Abolnik et al, 2018). Infected pigeons successfully transmitted virus to contact pigeons and seroconversion was observed in 2 of the chickens in the high-dose group (Abolnik et al, 2018).

More recent experimental research with Clade 2.3.4.4b H5N1 viruses has provided further evidence for the low level of susceptibility of these birds to HPAI (Di Genova et al. 2025). Thus, following direct inoculation, pigeons did not develop clinical signs, and only those inoculated with the highest dose shed viral RNA or seroconverted to H5N1, revealing a 50% minimum infectious dose of 10^5 50% egg infectious dose (EID_{50}). Even in the high-dose group, only low-level shedding and environmental contamination were observed, and low-level viral RNAs were present in the tissues of directly inoculated pigeons, with no distinct pathological lesions. A single pigeon in the medium-dose group (10^4 EID_{50}) exhibited a single subthreshold level of viral RNA being detected in the oropharyngeal cavity. In contrast, viral RNA was shed by 7 of the 8 pigeons in the high dose group (10^6 EID_{50}) between 1 and 7 days post infection. However, despite shedding in the high dose group, pigeons did not transmit the virus to other pigeons or chickens placed in direct contact (Di Genova et al. 2025).

Columbiformes may be kept in aviaries outside where direct contact with waterbirds might occur. Between October 2025 and June 2026 there were 6 cases of HPAI H5N1 in collared doves, 5 cases in unidentified Columbiformes and 18 cases of HPAI H5/H5N1 in woodpigeons in Europe according to IZSVe (2026). Similarly on WOAH from 1 October 2025 to 08 April 2026 there have been 40 cases of HPAI H5/H5N1 in pigeons, including 19 woodpigeons, 6 feral pigeons and 9 Eurasian collared doves in Europe. In Great Britain in the 2025 to 2026 season there were 4 wood pigeon cases, 5 rock doves and 1 unidentified dove. Those cases in the 2025 to 2026 season may have reflected the very high wild bird infection pressure in Great Britain and Europe together with the abundance of pigeons as wild birds. However, there have been two cases already in doves in Great Britain this 2026 to 2027 season. It should be noted that just because in an experimental setting the “infectious dose” for pigeons is high (see Di Genova et al. 2025), does not mean that lower doses do not cause infection in at least one pigeon when large enough numbers of pigeons are each exposed to low doses. Comorbidities and health status are also likely to impact upon infection outcome. While infected pigeons may only shed at low levels, low levels may be sufficient to infect more susceptible species at a gathering including Anseriformes (James et al. 2023).

Given the current (10 November 2026) high risk level for infection of wild birds but allowing for the relatively low susceptibility of Columbiformes to HPAI H5Nx and the relatively few cases in wild Columbiformes (discussed above), the probability of Columbiformes being infected prior to being taken to the gathering is assumed to be **low**. The uncertainty is medium due to the high wild bird risk.

Birds of prey (Accipitriformes and Falconiformes)

There are many reports of wild raptors being infected both in Great Britain and globally with HPAI H5N1 and also with HPAI H5N5, perhaps because they are exposed to very high viral doses when scavenging infected bird carcases. Raptor cases in Great Britain accounted for 33% of wild bird cases in Great Britain in March 2026 and 42% in April 2026 (QRA_Gatherings_for_Licensing_June_26_.pdf). Further in the current 2026 to 2027 season there have been 2 cases in red kites and 1 case in a sparrowhawk in southern England. Most captive birds of prey will be fed on commercial feed considered to be low risk for infection (such as day-old chicks and reared small rodents) but some may still be fed shot game, including wild duck, which increases the risk of infection through feeding. Some captive birds of prey are used for hunting waterfowl. Given the recent increase to high in the risk level for wild birds in Great Britain (on 6 November 2026) together with the increase in cases in migratory ducks in Europe, the risk level for captive birds of prey having disease prior to being taken to a gathering is considered to be **medium** with medium uncertainty.

Ratites

Ratites are always kept outside and it may not be possible to house them given their large size. In 2025 there were 3 reported cases of HPAI H5N1 in ratites including a captive emu in Brazil, a captive ostrich in Mexico and most recently in a captive rhea species in Portugal according to WOAH. HPAI H5N1 has also been detected in a captive Greater Rhea in Great Britain (Coombes et al 2025). With wild bird infection pressure increasing, the probability that a ratite is infected prior to a gathering is assumed to be **medium** (with medium uncertainty). This reflects the current (10 November 2026) risk level and uncertainty for poultry with suboptimal biosecurity in Great Britain.

Galliformes

It is well documented that chickens are highly susceptible to HPAI H5, and whilst experimental data has suggested that higher doses of HPAI H5N1 are needed to productively infect chickens compared to ducks, once infected, chickens develop severe disease with high mortalities whilst ducks generally exhibit reduced infection outcomes (James et al. 2023). The probability of captive Galliformes being infected prior to being taken to the gathering is assumed to be the same as that currently (10 November 2026) for poultry with suboptimal biosecurity namely **medium** with medium uncertainty.

Anseriformes

Ducks in experimental challenges are infected by much lower titres of HPAI H5N1 clade 2.3.4.4 virus than chickens (James et al 2023) and must be considered highly susceptible to infection although infection outcome can vary significantly. Captive ducks and geese kept outside or in un-netted ponds are likely to have contact with wild duck, geese and swan species at premises near where wild waterfowl gather.

Captive ducks and geese (Anseriformes) kept outside or in un-netted ponds are highly likely to have contact with wild ducks, geese and swan species particularly if kept at premises near to where wild waterfowl gather. There has already been 1 IP in a commercial duck farm in Lincolnshire this November. In previous iterations of this RRA, the probability of infection of captive Anseriformes prior to attending the gathering or show was considered to reflect the wild bird risk level. The number and intensity of contacts of captive Anseriformes with wild waterbirds will be increasing through November as more migratory birds arrive for the winter and the resident waterbirds form large wintering aggregates. Although there have only been 3 cases so far (to 6 November 2026) this 2026 to 2027 season in waterfowl (see above), it is anticipated that there will be an increase in cases in migratory ducks (pintail, wigeon and teal) in the coming weeks in Great Britain as is occurring in Europe over the last month where over a third of the wild bird cases are now in migratory ducks. The probability level for captive Anseriformes (ducks and geese) prior to being taken to gatherings is now therefore assessed to be **high** (with medium uncertainty) across Great Britain (Table 2) reflecting the current (10 November 2026) high risk level for wild birds. The uncertainty in this high probability is medium because although there are still relatively few cases in wild waterbirds in Great Britain the numbers of cases are expected to increase in coming weeks particularly in migratory duck species such as wigeon.

Probability of HPAIV H5Nx not being detected prior to gathering

The level of awareness of avian notifiable diseases in Great Britain is thought to be generally high and suspicions of clinical disease in poultry and other captive birds would be reported reasonably quickly, generally within a few days, particularly with the current awareness in the sector of HPAI H5Nx in wild birds. Movement restrictions for disease control purposes would be uniformly implemented based on domestic and retained EU Community legislation. The length of the virus incubation period as well as the possibility of virus shedding during this time is an important factor to be considered while assessing these risks. However, no official incubation period for avian influenzas is established for bird species other than poultry and the actual length of the incubation period is affected by numerous factors including the disease, the virus load, the actual virus strain, the species, and immune status.

The probability of infected birds not being detected (and hence movements restricted) prior to the gathering is now discussed for each of the 7 captive bird groups. It is considered here that infection of captive birds is more likely to be detected in parrots and birds of prey than in passerines. This is because there are often more passerines in a cage than parrots and birds of prey, so if 1 or 2 passerines in a larger group die they may not be suspected to be avian influenza so much as if a single parrot or bird of prey on its own in a cage dies.

Psittaciformes

Cases of HPAI H5N1 infection in wild parrots have been reported on WOAH mainly in South America in recent seasons. A range of species have been reported, including blue-and-yellow macaw, budgerigar, burrowing parrot, Mealy parrot, red-and-green macaw, scarlet macaw, slender-billed parakeet, white-winged parakeet, and yellow-headed Amazon parrot. There has been a case where budgerigars were infected at a premises in Norfolk in mid-December 2024. The probability of HPAI infection being undetected for Psittaciformes is unknown, but given the multiple detections in wild parrots in South America and the cases in zoos, including the captive bird establishment in Great Britain, is assumed to be **low** with medium uncertainty.

Columbiformes

In the study of Abolnik et al (2018) with HPAI H5N8 there were no clinical signs observed in any of the pigeons involved despite viral shedding in medium and high-dose pigeons for up to 8 days. The study of Kwon et al. (2017) with domestic pigeons inoculated oculo-nasally with HPAI H5N8 (Clade 2.3.4.4 sub-group icA3) of Korean origin, showed no clinical signs or mortality even though relatively high levels of shedding were observed in half of the pigeons. Pigeons do not show clinical signs when infected with H5N8 (Abolnik et al, 2018, Kwon et al, 2017). Similarly, 6 of 6 pigeons given high doses of HPAI H5N1 survived infection to 14 days post infection despite shedding virus (Di Genova et al. 2025). Therefore it is assumed here that there is a **high** probability (medium uncertainty) of not detecting Columbiformes infected with HPAI H5.

Birds of prey

The probability of disease not being detected prior to the gathering is **low** for birds of prey. This is because birds of prey seem particularly susceptible to morbidity and mortality from HPAI H5Nx with many affected in the wild in both Great Britain and globally. It is known that birds of prey generally develop overt clinical signs if infected with the H5N8 HPAI virus, and HPAI H5N1 positive found-dead birds of prey have been a feature in Great Britain in recent weeks and previous seasons (along with captive birds of prey in previous seasons). The infected birds of prey would show clinical signs within 2-3 days of feeding and are likely to be detected prior to taking to a gathering, hence the low probability. However, this may not be the case of all birds of prey, for example white-tailed eagle, and hence the uncertainty is medium.

Passerines

Passerines, including starlings (see above), canaries and finches are known to be susceptible to low pathogenicity avian influenza (LPAI) H5 and they can shed large amounts of viral RNA through the respiratory route (Marché et al 2018; Ellis et al 2021). While they do not show clinical signs or mortality with LPAI, if infected with HPAI H5 then a proportion would be expected to show mortality and there have been reports of mortality of wild passerines both globally and in Great Britain from HPAI H5N1 strains.

In experiments with house sparrows infected with HPAI H5N1 (Brown et al. 2009) the house sparrows excreted virus via the oropharynx and cloaca for several days prior to the onset of clinical signs. Thus sparrows infected with low challenge doses shed up to 10^5 $TCID_{50}$/ml at 4 days post infection with 60% of the birds still alive at 9 days post infection. Most sparrows in all three challenge doses (low, medium, high) either exhibited no clinical signs or had a brief duration of sickness prior to death. Clinical signs, when detected, included weakness, lethargy, puffed up feathers, imbalance and severe neurologic signs such as head tremors and seizures. The probability of infected passerines not being detected is therefore assumed to be **medium** with medium uncertainty.

The key points from the paper on LPAI transmission to starlings by Ellis et al. (2021) for assessing the risks from passerines at gatherings are that captive passerines would be infected if exposed to infected wild ducks for example if kept outside in an aviary where flooding could cause ingress of water containing virus shed by wild birds. Furthermore, those starlings infected through exposure to water from infected ducks shed sufficient quantities of viral RNA to infect poultry and Anseriformes at a gathering (although the authors have not demonstrated this and suggest this as further work). The fact that starling to starling spread did not occur efficiently means that only a small proportion of passerines in an aviary would be infected if one were to be infected, so reducing the chances of the owner realising HPAI was present in the flock. So if passerine to passerine transmission were efficient the whole aviary would become infected and the owner would notice. This further supports our conclusion here that the probability of not detecting infected passerines prior to going to a gathering is **medium**.

The studies by Forrest et al. (2010) and Brown et al. (2009) with HPAI H5N1 clearly demonstrate the potential risk of onward spread from passerines as the infected house sparrows shed so much virus over several days before mortality. It is worth noting that there is considerable uncertainty here. Within the captive passerine family there is a range of species so there could also be considerable variation in the risk depending on the susceptibility of different passerine species. In addition, there will be variation between holdings, husbandry comorbidities and biosecurity that we cannot assess.

Galliformes

Galliformes show high mortality in the poultry outbreaks. Similarly, pheasants are susceptible to H5 HPAI infection and rapidly show clinical signs although those birds

infected recently would still be in the incubation period. However, whilst pheasants are considered strong indicator species (Liang et al 2022) partridges may not show clinical signs and could be missed (Seekings et al. 2024). Furthermore, although Galliformes show high mortality it is considered that detection or reporting could be low in backyard poultry.

In the study of James et al. (2023) infection of chickens always resulted in death, and the mean death time was just 3.1 days in the high-dose chicken group which was shorter than the 4.3 days for the high-dose duck group. Three of the five chicken deaths were characterised by a rapid clinical deterioration as no obvious clinical signs were observed at earlier time points. The chickens that were infected in the challenge dose experiments shed high levels of virus (up to 10^5 relative equivalent units (REU) ml^{-1}) after 1 or 2 days post infection and well before the mean death time of 3.1 days. Given clinical signs were not often observed before death, for the purpose of this risk assessment it is assumed the probability of disease not being detected in Galliformes which could be taken to gatherings is **medium** with medium uncertainty. The probability of disease detection also depends on the size of the flock from which the birds are selected for the gathering. For very large flocks, the large numbers of clinically affected or dead birds is likely to raise suspicion of HPAI, and so facilitate detection of infection in the flock. In smaller flocks, the presence of 1 clinically affected or dead bird may not raise suspicion of HPAI and so disease could go undetected, which is again consistent with the **medium** probability assumed here for detection in small flocks of captive Galliformes.

Anseriformes

While there have been many dead HPAI H5-infected Anseriforme wild bird cases reported both in Great Britain in previous years and globally, many wild ducks and geese have survived, and given the level of exposure and virus circulation in recent years there is a possibility of immunity, though this is unknown. In the study by James et al. (2023) ducks infected by low (10^3 EID_{50}), medium (10^4 EID_{50}), or high (10^5 EID_{50}) doses of HPAI H5N1 all shed very high levels of virus (10^6 REU ml^{-1}) through the oropharyngeal route. The levels shed through the cloacal route were around 1,000-fold lower, but still high at 10^3 to 10^4 REU ml^{-1}. The higher the challenge doses, the earlier shedding peaked particularly in the oropharyngeal route. Thus shedding peaked in ducks at 6 days for the low dose group, at between 3 and 6 days for the medium dose group and at 4 days for the high dose group. Mean death times (including euthanased) in the ducks decreased with increasing dose at 7.2, 5.6 and 4.3 days for the low, medium and high challenge doses, respectively. In the low dose group 85% of the ducks were still alive at day 6 when shedding peaked at $10^{4.5}$ to $10^{6.5}$ REU ml^{-1} although all were dead by day 8. More importantly all were still alive at day 4 when shedding 10^2 to 10^4 REU ml^{-1}. In the high dose group, all ducks were dead by day 5 but 85% were still alive at day 3 when they were shedding 10^4 to 10^5 REU ml^{-1}. Therefore for both low and medium challenge doses, a high proportion of ducks were shedding high doses at least 1 day before they died. The timing of shedding relative to showing clinical signs is of key importance in whether infected birds are detected and hence the flock is not taken to a gathering where they could infect other birds. James et al.

(2023) in Table S2 of the Supplementary Material list the frequency of clinical sign occurrence in infected ducks with huddling/ruffled feathers, conjunctivitis, and lethargy scoring frequently but tremors and closed eyes less frequent. This raises the question of whether the ducks show clinical signs before shedding so that infected birds can be detected prior to the being taken to the gathering. However, 3 of the 18 infected ducks displayed lower clinical signs in the study of James et al. (2023) with clade 2.3.4.4.b 2021 H5N1. It should be noted that this is one study involving a small sample of well-monitored birds and that non-neurological clinical signs are not always obvious or specific to HPAI infection. On the basis that infected ducks can shed high levels of virus at least 1 day before death and that some ducks may not show obvious clinical signs it is concluded that the probability of infected ducks and geese not being detected prior to the gathering event is **high**. The uncertainty is medium.

Ratites

Elsayed et al. (2022) reported mortality rates of 90% in ostrich flocks in South Africa infected with HPAI H5N8. The birds suffered loss of appetite, dropped production, and oculo-nasal discharges with bleeding from natural orifices. The probability of not being detected is therefore **low**, with medium uncertainty.

Exposure assessment

This section deals with the probability that an infected bird entering a gathering will spread disease to other birds at that gathering. If infection were to be introduced to a bird gathering, the probability of its spread depends on a number of factors such as the pathogenicity and transmissibility of the virus, the amount of virus being shed by the infected bird, the nature and layout of the gathering such as the housing and proximity of the participating birds, whether the birds are mixing, access to common water sources and whether they are in direct contact with visitors.

Spread of disease within the gathering

Spread through a gathering is based on the aggregated probability from multiple contacts between the infected bird introduced to the gathering and the other birds from different origins and hence going to different destinations after mixing at the gathering. From an epidemiological point of view, the probability of one or more birds actually being exposed to infection (and hence infected) at the gathering is defined as “$1-(1-p)^n$”, where p is the probability that an infected bird introduced to the gathering infects another bird given a contact, and n is the number of such contacts. There are no data on p and n at gatherings. However, even if p were low then just ten contacts with the infected bird at the gathering would be sufficient to give an aggregated probability of medium that at least one exposed bird at the gathering would be infected. If p were medium, then just one contact would be sufficient to give a medium aggregated probability that at least one bird would be exposed.

Therefore, the probability of disease spread, if introduced to a gathering would be at least medium. This is increased to high in the case of Anseriformes and Galliformes because more individual birds of these 2 groups may be taken to gatherings and because infected Anseriformes and Galliformes shed relatively high titres of virus (James et al 2023).

Pigeons infected experimentally with HPAI H5N1 did not transmit the virus to n = 8 pigeons or n = 8 chickens placed in direct contact (Di Genova et al. 2025) although pigeons with HPAI H5N8 did infect contact pigeons (Abolnik et al, 2018). Although Columbiformes and Passerines may have lower susceptibilities and do not transmit HPAI readily to each other (as shown for starlings with LPAI (Ellis set al 2021)), they could transmit to more susceptible species such as Anseriformes or Galliformes at the gathering through fomite routes for example. Also the low risks from a single passerine or pigeon escalates with increasing number of birds so justifying the medium aggregated probability assigned to birds from these 2 groups spreading HPAI within a gathering.

Qualitative risk assessment

For the purpose of this RRA a simplified risk pathway is used comprising three steps each described by a qualitative risk as set out below:

1. Probability captive bird is infected prior to gathering;
2. Probability infected bird is not detected prior to entering gathering; and
3. Probability transmission occurs at gathering given infected bird introduced.

The 3 qualitative probabilities in the pathway for each bird order are combined using the matrix of Gale et al. (2009) to the give the overall probability of spread of HPAIV H5Nx from bird gatherings in Great Britain currently.

Incursions at gatherings from wild birds are not considered here.

The risk assessment for the current situation (10 November 2026) is set out in Table 3.

Table 3: Qualitative risk assessment for entry and subsequent spread of HPAI H5Nx at bird gathering according to bird group based on risk levels for 10 November 2026. Uncertainty in parentheses.

	Psittaciformes	Columbiformes	Birds of Prey	Passerines	Galliformes	Anseriformes	Ratites
Probability of infection prior to gathering (10 November 2026) see Table 2	Low (Medium)	Low (Medium)	Medium (Medium)	Low (Medium)	Medium (Medium)	High (Medium)	Medium (Medium)
Probability of infected bird not being detected prior to gathering	Low (Medium)	High (Medium)	Low (Medium)	Medium (Medium)	Medium (Medium)	High (Medium)	Low (Medium)
Probability of spread of disease at gathering	Medium	Medium	Medium	Medium	High	High	Medium
[a]Overall probability of entry and subsequent spread	Low ([b]Low)	Low ([c]Medium)	Low ([c]Medium)	Low ([c]Medium)	Medium ([b]Low)	High ([b]Low)	Low ([c]Medium)

[a]Overall probability of entry and spread of HPAIV H5Nx at bird gathering calculated as lowest probability in the column according to matrix of Gale et al. (2009).

[b]The low uncertainty in the low overall probability level reflects the fact that the two lowest probability terms are the same, hence the low overall uncertainty that the probability is not higher as the two probability levels in effect reinforce each other.

[c]The uncertainty reflects the uncertainty in lowest probability level term.

Consequence assessment

Spread of disease from the gathering

If undisclosed avian notifiable disease were to be introduced to a bird gathering by live birds, there is a possibility that unless disease is confirmed during the event, it would remain undisclosed until after the gathering – and therefore there is a potential for further spread. The probability of this depends on the length of the event as with longer events the possibility that birds show signs of disease becomes greater, although it may also increase the number of potential contacts between birds at the gathering.

The extent of onward geographical spread depends on the extent of contact and spread between birds at the gathering itself and also where the birds are transported to following the event. The most effective way of preventing such spread would be to detect suspicion of disease at the time of the gathering, while the birds are still together. However, if the source of infection is a (group of) birds with subclinical infection, this increases the probability of onward spread. The size of the gathering, levels of biosecurity and length of the gathering would directly affect the number of potential contacts between infected and susceptible birds.

The consequence of avian influenza being detected in birds either at or having attended a gathering during the risk period is a serious matter for not only industry but also for the competent authorities. This could lead to a multi-focal outbreak in birds which have moved to different parts of the country, which are difficult to trace.

Any outbreak of notifiable avian disease has a significant impact on the UK poultry industry, through the trade and economic impacts on the producer. This is the same for any notifiable avian influenza virus. Average costs to government may be between £2 million and £4 million per outbreak, depending on the number of birds involved and complexity of the investigation.

If disease is detected at a gathering before it concludes and before the birds are dispersed, Government would face a complex challenge relating to disease control at the gathering, including dealing with a large number of owners who may be resistant to the need to cull their birds.

Whilst spread from a gathering may not lead to widespread disease into the commercial sector and may be restricted to small producers, the case in 2007 in the UK involving a market showed that there is a potential scenario for this occurrence. While for the majority of shows and gatherings involve birds classified as not destined for the food chain (as breeders or producers) it is important to note that even one outbreak in backyard premises would still lead to implementing disease control measures, as specified in the current regulations.

The risk assessment presented here addresses the probability of transmission at gatherings and does not consider how many other establishments could be infected, which would depend on the size of the gathering and individual bird keepers who attend them. In the 2020 to 2021 epizootic of HPAIV H5Nx in Europe, there was evidence that many captive bird and poultry outbreaks could be traced to a single dealer in southern Germany emphasizing the potential consequence that gatherings could have.

A reasonable worst-case outcome for multiple outbreaks to occur would be for an infected but apparently healthy bird to be taken to a gathering where it infects some, but not all, of the other birds present, but disease is not detected. The birds at the gathering are then taken to widely distributed premises. One or more of the infected birds is then detected through passive surveillance leading to at least one outbreak being confirmed with consequent disease control zones, impacts on industry and a costly tracing exercise. There has been one comparable case in recent years but this involved LPAI so the consequences were limited and again, for certain species of birds this is less likely.

Mitigation measures

Measures to mitigate the risk of disease entering a gathering and the potential impact include disease vigilance and prompt reporting of any suspicion, high levels of biosecurity and accurate record keeping to assist in any possible tracing exercise following the event. A table has been provided in previous versions of the document (ANNEX1). The risk of further (cross) contamination and onward spread occurring at and beyond the gathering could be mitigated by maintaining high levels of biosecurity, including reducing the number of potential contacts between infected and susceptible birds and informing livestock keepers about the need for vigilance for clinical signs of avian notifiable disease. However, there is a significant infection pressure currently, with HPAI widely circulating in wild bird populations and poultry premises with varying levels of biosecurity implemented. A quarantine or standstill period on holdings prior to attendance at gatherings and also after return of birds from gatherings could also be considered, although may be impractical, particularly for backyard premises and against the backdrop of the current infection pressure and anticipated trajectory which is expected to continue until after aggregations disperse and environmental conditions are less suitable for survivability.

Conclusions

Currently (10 November 2026) the probability of entry to and subsequent spread of HPAI H5 to other birds at gatherings is assessed still to be **low** for Psittaciformes, Columbiformes, Passerines, captive birds of prey, and Ratites. However, with the increasing wild bird infection pressure, the uncertainty in the low risk levels is increasing and is now at medium for all except Psittaciformes. In the case of captive Galliformes**,** the probability of entry to and subsequent spread of HPAI H5 to other birds at gatherings is

assessed now to be **medium**. The uncertainty is low because although the probability of Galliformes being infected prior to the gathering is medium, the probability of infected Galliformes not being detected is also medium. The probability of entry to and subsequent spread of HPAI H5 to other birds at gatherings is assessed now to be **high** for captive Anseriformes (ducks and geese). The uncertainty is low. The increase in the wild bird risk level to high, the anticipated increase in cases in migratory ducks (based on events currently in Europe) and the formation of winter aggregates of resident water birds all contribute to a high probability of infection of captive Anseriformes prior to the gathering with high probability that infected ducks may be missed.

The uncertainty in the overall low probabilities for entry and spread of HPAI H5N1 at gatherings from Psittaciformes, Columbiformes, Passerines, captive birds of prey, and Ratites is increasing as the wild bird infection pressure increases and the protection of gatherings and shows from infection becomes more dependent on infected birds being detected and reported by keepers prior to the show. It should be noted that the **detection of infected birds by the owner prior to the gathering is now the only protective barrier for gatherings**.

Therefore in response to the risk questions:

1) What is the risk of the introduction of HPAI H5Nx into bird fairs, shows, markets, sales and other gatherings?

   The probability currently (at 10 November 2026) is low for Psittaciformes, kept birds of prey, Ratites, Columbiformes and passerines, medium for Galliformes and also high for Anseriformes (ducks and geese).

2) What, if any, management options are available to reduce the likelihood and the impact of introduction and subsequent spread of avian notifiable disease through the above mentioned gatherings?

   Options include to ban gatherings altogether, to allow only certain species where the risk is considered to be lower, or allow everything with stricter controls and this is in order of increasing risk. Risk is heterogenous across time and space, currently with the majority of reports in England, a low number in Scotland and none in Wales at the time of writing. There are also biases with the passive surveillance system. In a typical year we see a process in England first, then Wales as birds continue to move westwards. Scotland is typically later in the season with the northward movement of birds, though we have seen H5N5 and H5N1 in poultry in Scotland already this season. When effective biosecurity measures are in place, housing is an additional barrier between poultry and pathogen prior to the transport to the gathering. However, there is a significant infection pressure currently and this may be difficult to achieve.

Uncertainties

The main sources of uncertainty in this work relate to the wild bird risk, which is currently (10 November 2026) at high. In particular, it is not clear as to the degree to which it is going to spread in migratory ducks and then into resident ducks, geese and swans. The detection of 7 IPs since 1 October 2026 suggests that the risk to poultry is increasing with the wild bird risk despite the relatively few cases in wild waterfowl to 6 November. The extent of the wild bird spread seems to be across much of England and Scotland with more wild bird cases and poultry outbreaks expected in the coming weeks although how this will manifest across the different captive bird groups considered here is not known, thus adding a source of uncertainty. Poultry with suboptimal biosecurity are a good indicator of risk levels to captive Anseriformes and Galliformes.

For those five groups of captive birds (Psittaciformes, Columbiformes, Passerines, captive birds of prey, and Ratites) with low probabilities predicted for entry and spread into gatherings, the overall uncertainty in that predicted low probability of entry and spread at a gathering is increasing, reflecting the uncertainty in the probability that a keeper actually detects infected birds and does not take them to the gathering.

As in previous autumns and winters, the uncertainty in the overall probability of entry and spread at gatherings is again very dependent on the uncertainty in the probability of a keeper detecting infection in the captive birds prior to the gathering. This is complicated by considerations of the flocks' sizes and how many dead or ill birds would need to be present before raising suspicion of HPAI. The increasing risk levels now for wild birds and poultry in Great Britain have increased the risks at gatherings and the uncertainty in the overall probability of entry and spread at gatherings is less dependent on the uncertainty that the captive bird is infected prior to the gathering.

References

Abolnik, C., Stutchbury, S. and Hartman, M. J. (2018) Experimental infection of racing pigeons (Columba livia domestica) with highly pathogenic Clade 2.3.4.4 sub-group B H5N8 avian influenza virus. Veterinary Microbiology 227:127-132.

Brown JD, Stallknecht DE, Berghaus RD, Swayne DE. Infectious and lethal doses of H5N1 highly pathogenic avian influenza virus for house sparrows (Passer domesticus) and rock pigeons (Columbia livia). J Vet Diagn Invest. 2009 Jul;21(4):437-45. doi: 10.1177/104063870902100404.

Coombes, H.A., et al (2025) Infection of ratites with clade 2.3.4.4b HPAIV H5N1: Potential implications for zoonotic risk | bioRxiv

Ellis JW, Root JJ, McCurdy LM, Bentler KT, Barrett NL, VanDalen KK, et al. (2021) Avian influenza A virus susceptibility, infection, transmission, and antibody kinetics in European starlings. PLoS Pathog 17(8): e1009879. https://doi.org/10.1371/journal.ppat.1009879. Avian influenza A virus susceptibility, infection, transmission, and antibody kinetics in European starlings | PLOS Pathogens

Defra (2016) Risk assessment on the likelihood of spread of avian notifiable disease associated with bird fairs, shows, markets, sales and other gatherings (publishing.service.gov.uk).

Di Genova C, Warren CJ, Johnson S, Riccio S, Roper K, Thomas SS, Schlachter AL, Jorge D, Ralh K, Hassan J, Billington E, Nunez A, Brown IH, Slomka MJ, Banyard AC, James J. Pigeons exhibit low susceptibility and poor transmission capacity for H5N1 clade 2.3.4.4b high pathogenicity avian influenza virus. J Gen Virol. 2025 Sep;106(9):002156. doi: 10.1099/jgv.0.002156.

Forrest HL, Kim JK, Webster RG (2010). Virus shedding and potential for interspecies waterborne transmission of highly pathogenic H5N1 influenza virus in sparrows and chickens. J Virol. 84(7):3718-20. doi: 10.1128/JVI.02017-09.

Gale, P., Brouwer, A., Ramnial, V., Kelly, L., Kosmider, R., Fooks, A.R. and Snary, E.L. (2009) Assessing the impact of climate change on vector-borne viruses in the EU through the elicitation of expert opinion. *Epidemiology and Infection* 138, 214-225.

James et al. (2023) Clade 2.3.4.4b H5N1 high pathogenicity avian influenza virus (HPAIV) from the 2021/22 epizootic is highly duck adapted and poorly adapted to chickens | Microbiology SocietyKwon, J.-H., Noh, Y.K., Lee, D.-H., Yuk, S.-S., Erdene-Ochir, T.-O., Noh, J.-Y., Hong, W.-T., Jeong, J.-H., Jeong, S., Gwon, G.-B., Song, C.-S., Nahm, S.-S. (2017). Experimental infection with highly pathogenic H5N8 avian influenza viruses in the Mandarin duck (Aix galericulata) and domestic pigeon (Columba livia domestica). Veterinary Microbiology 203: 95-102.

Nemeth NM, Thomas NO, Orahood DS, Anderson TD, Oesterle PT (2010) Shedding and serologic responses following primary and secondary inoculation of house sparrows (Passer domesticus) and European starlings (Sturnus vulgaris) with low-pathogenicity avian influenza virus. Avian Pathol. 39(5):411-8. doi: 10.1080/03079457.2010.513043.

Seekings AH, Liang Y, Warren CJ, Hjulsager CK, Thomas SS, Lean FZX, Nunez A, Skinner P, Selden D, Falchieri M, Simmons H, Brown IH, Larsen LE, Banyard AC, Slomka MJ. Transmission dynamics and pathogenesis differ between pheasants and partridges infected

with clade 2.3.4.4b H5N8 and H5N1 high-pathogenicity avian influenza viruses. J Gen Virol. 2024 Jan;105(1). doi: 10.1099/jgv.0.001946 (jgv001946.pdf).

Annex 1

Table 4. Comparison of measures available to regulate poultry gatherings and those applied in the current General Licence

Measure	In force
General licence permitting gatherings	Yes
Specific licences	No
Withdraw licence (ie ban)	No
Notify APHA at least 7 days in advance including: a) date the gathering will take place b) location of the gathering c) details of the licensee (including full name, contact address and telephone number) d) anticipated numbers and type(s) of birds	Yes
No sales allowed unless additional conditions are met (see below)	No
The licensee must make a record of all people who bring poultry or other captive birds to a gathering or take such birds from a gathering and keep the record for at least 3 months following the end of the gathering. The record must include at least the following information: a) full name b) home address c) telephone number d) number and type(s) of birds exhibited, raced, bought or sold	Yes
The licensee must not allow any cage, crate, basket or other container onto a gathering which is contaminated with bird droppings, bedding or other material of bird origin other than that from, or provided for, the birds brought to the gathering and must make this requirement known to all those bringing birds to the gathering in advertising, on entry forms or by any other means.	Yes
The licensee must ensure that any cages, crates, baskets or other containers not removed from the premises by those attending the gathering are cleansed and disinfected as soon as reasonably practicable after the end of the gathering and in any case before they are used again.	Yes
i) ensure that any feed to which poultry or other captive birds had access, and all bedding, droppings, other material of bird origin and other contaminants	Yes

derived from birds at the gathering and which are left on the premises when the gathering has ended are - a) destroyed b) treated so as to remove the risk of transmission of disease c) disposed of so that birds do not have access to them; or d) disposed of as Category 2 products under the Animal By-Products Regulations 2005 ii) where practicable, cleanse and disinfect those parts of the premises contaminated by such materials	
14 days' notice to APHA	No
A named veterinary surgeon must be available on site during the whole time of the event for advice in case of suspect disease or a welfare problem. The veterinary surgeon should be responsible to ensuring that only clinically healthy birds in clean cages are entering the event.	No
Biosecurity advice must be distributed at the event.	No
Written contingencies, held by the nominated responsible person, must be available in the event of a disease incident at the event or nearby the event.	No
All cages used in the show must be cleansed and disinfected prior to and after the show.	Implicitly yes
• For sales: A record of all sales taking place at the event should be kept for at least 3 months, this should include: the name, address and telephone number of both the vendor and buyer and any identifying features or individual identification of the purchased bird(s).	No
• For sales: Buyers must isolate the purchased bird(s) from any other birds (except those purchased at the same event) for at least 1 week. • Any signs of ill health observed in the purchased bird(s) during this period must be reported to a veterinary surgeon and such birds must not be mixed with any other birds until the presence of an avian notifiable disease has been ruled out	No
• Restrict to birds of certain species – columbiformes, passerines and psittaciformes	No
• Restrict to regions only	No