



## 1. SUMMARY OF OVERALL RISK

This risk assessment was compiled according to terms of reference provided by the Scottish Government regarding time of delivery, title of veterinary risk assessment (VRA) and level of detail required. EPIC scientists have created a generic framework suitable for VRAs; collated and updated existing information on risks. This document may require updating as new information becomes available or legislation develops, or if more in-depth assessment is necessary.

### DEFINITIONS OF RISK LEVEL (OIE 2004, DEFRA 2011):

Negligible: So rare that it does not merit consideration

Very low: Very rare but cannot be excluded

Low: Rare but could occur

Medium: Occurs regularly

High: Occurs very often

Very High: Events occur almost certainly

### PURPOSE OF RISK ASSESSMENT:

This rapid qualitative risk assessment addresses the following question: What is the risk of an outbreak (i.e. at least one infected premises) of Highly Pathogenic (HP) H5N8 Avian Influenza (AI) in domestic poultry or captive birds in Scotland through direct or indirect transmission from infected wild birds? It updates an existing risk assessment undertaken by EPIC (EPIC 2016) on 6 December 2016 at the start of the current Avian Influenza outbreak. It was undertaken by EPIC Centre of Expertise on Animal Disease Outbreaks at request of the Animal Health and Welfare Division of Scottish Government.

**LIKELIHOOD: MEDIUM (HIGH UNCERTAINTY).** In light of the ongoing outbreak conditions and known presence of infected wild birds in the UK, the overall likelihood of disease incursion via direct or indirect contact with infected wild birds or contaminated fomites is medium. There is high uncertainty around this likelihood due to the dearth of available evidence for different components of the risk pathway.

### CONSEQUENCES: HIGH (HIGH UNCERTAINTY)

The potential for severe disease and welfare impacts for the poultry industry has not diminished since the beginning of the outbreak. The likelihood of infection of new premises results in the extension of the duration of international market restrictions. Interventions that effectively reduce the likelihood of new infected premises are likely to reduce the overall economic impact of these restrictions. However, it is anticipated that there are likely to be additional socio-economic impacts for certain sectors of the industry in the near future. Given the duration of the ongoing AI outbreak and the subsequent extension of the Avian Influenza Prevention Zone, there is an increased likelihood that free-range producers will lose their free-range status and eggs will be downgraded to 'barn-produced' resulting in considerable financial losses to producers and an uncertain impact on the sector as a result of retailer and consumer choices. There is uncertainty regarding the scale of these losses to the free-range sector. A cost-benefit analysis is outwith the scope of this VRA.

**OVERALL RISK (LIKELIHOOD \* CONSEQUENCES): HIGH with HIGH UNCERTAINTY.** Note that this risk level is estimated in the absence of implementation of feasible and effective biosecurity measures.

## 2. LEGISLATION, DEFINITIONS and ASSUMPTIONS

European Commission Council Directive 2005/94/EC. Legislation on Control Measures.

The Poultry Breeding Flocks and Hatcheries (Scotland) Order 2007

Article 6(1) of the AI order (S.S.I. 2006/336) provides that after carrying out a risk assessment, Scottish Ministers can consider declaring an AI prevention Zone if he/she is of the view that this is necessary to reduce the risk of transmission of AI to poultry or other captive birds from wild birds or from any other source.

Current EU Regulations for marketing of poultry meat (EC/543/2008) and eggs (EC/589/2008) allows poultry reared as free-range (chickens, capon, ducks, guinea fowl, geese and turkeys) and free-range laying hens to be housed inside for not longer than a period of 12 weeks without losing their free-range status if Government issues a housing restriction. A housing restriction (Avian Influenza Prevention Zone) was issued on December 6<sup>th</sup> 2016 and extended on 5<sup>th</sup> January 2017 to remain in force until 28<sup>th</sup> February 2017. Extending the AI prevention one beyond 12 weeks will lead to loss of free-range status. See also (EC) No 89/2006 amending Regulation (EC) No 2295/2003 marketing eggs where the access of hens to open-air runs is restricted (page 1, para 6,8,9) and (Article 1).

The purpose of this risk assessment is to assess the likelihood (probability) and consequences of exposure of domestic poultry to HPAI H5N8 via infected wild birds and contaminated fomites, and does not specifically consider the risk of introduction into wild birds in Scotland. The consequence assessment does not include a cost-benefit analysis.

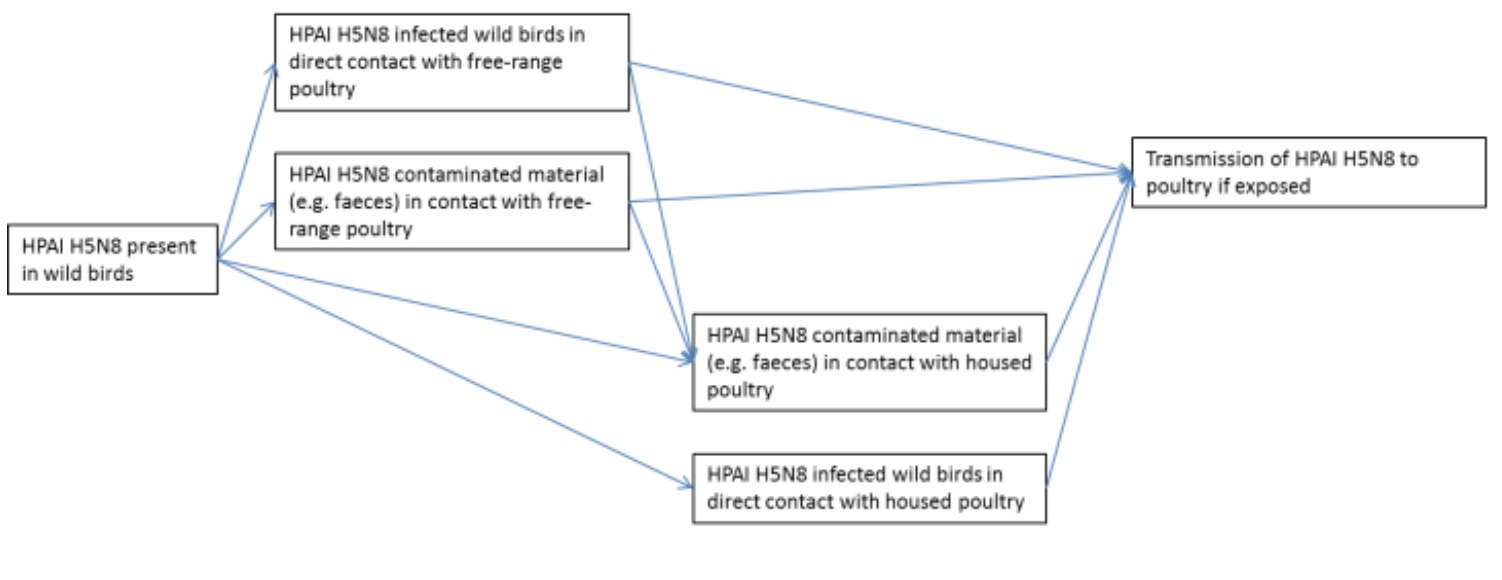
## 3. HAZARD IDENTIFICATION

(a) The hazard is: High Pathogenic Avian Influenza. The current circulating strain H5N8. However, the principles of the pathway in this risk assessment could extend to other HPAI or LPAI strains. The H5N8 HPAI virus has been isolated from outbreaks and wild birds in the EU during the current epizootic. The current epizootic is spreading rapidly in a wide range of migratory and non-migratory wild waterfowl in Europe causing mortalities in these birds. This is different to previous years and indicates a change in the virus pathogenicity for certain species of bird. It is unknown whether there are species of wild waterfowl, which do not show clinical signs of infection, or whether the virus can circulate in non-migratory wild birds. Expert opinion is that the virus will retain infectivity in the environment at low temperatures, for up to 55 days at 4°C (Ian Brown, EURL, *pers. comm.* to APHA). This means the environment could remain contaminated for several weeks at least." (APHA internal communication).

(b) Risk question: **What is the risk of an outbreak (i.e. at least one infected premises) of Highly Pathogenic (HP) H5N8 Avian Influenza (AI) in domestic poultry or captive birds in Scotland through direct or indirect transmission from infected wild birds?**

Wild birds are commonly infected with avian influenza viruses and hence present a risk to domestic poultry. Free-range poultry are at particularly high risk due to their potential to interact, directly or indirectly, with wild birds.

## 4. POTENTIAL RISK PATHWAYS



## 5. EXPOSURE ASSESSMENT

| Likelihood  | Risk factors   | Potential Control Measures   | Uncertainties/ Assumptions  | Likelihood Estimate (in absence of control measures) |
|---|--|--|---|--|
| <p>What is the likelihood that HP H5N8 is present in wild birds in Scotland?</p>  | <p>This depends on:</p> <ul style="list-style-type: none"> <li>- The location and species involved in outbreaks in GB and Europe. To date in GB, there have been 39 birds which have tested positive for H5N8 (2 buzzards, 2 blackheaded gulls, 2 Canada geese, 3 Greylag Geese, 1 White-fronted goose, 10 mute swans, 2 whooper swans, 1 peregrine falcon, 2 pochards, 1 mallard, 1 comorant, 1 teal, 1 tufted duck, 10 wigeon [APHA online]).</li> <li>- The likelihood HP H5N8 is now circulating in UK (native) wild bird populations.</li> <li>- The migration of high risk wild bird species to Scotland. Infected wild birds have been detected over a large area in England and Wales in areas where there are large wild-bird assemblages or over-wintering is likely to have occurred. Only one infected wild bird (a peregrine falcon) has been detected in Scotland (as of 20/02/17) (APHA online).</li> </ul> | <p>The risk of new disease incursions into domestic poultry via wild birds will be likely to decrease as the number of wild bird migrants decrease, but it is unlikely to disappear altogether when wild birds migrate (away) in spring as the virus has also been detected in sedentary birds (e.g. Mute swans and birds of prey). Wild bird migrations typically peak in December – January.</p>   | <p><b>MEDIUM UNCERTAINTY</b><br/>There is limited evidence about the prevalence and transmission of H5N8 between migratory and local wild bird populations. It is not known whether there is silent spread (i.e. no visible clinical signs) of H5N8 in some species of waterfowl which would permit continued, undetected circulation in wild birds even after winter migratory birds have departed UK.</p> | <p><b>HIGH</b></p>                                   |
| <p>What is the likelihood of at least one infected wild bird transmitting the infection directly to free-range, backyard or housed poultry?</p> | <p>This depends on:</p> <ul style="list-style-type: none"> <li>- The distribution of wild birds (and in particular, waterfowl) relative to free-range, backyard or housed poultry premises.</li> <li>- Proximity of appropriate habitat for wild birds (ponds, watercourses etc.)</li> <li>- Opportunities for direct interaction/contact.</li> <li>- Free-range, backyard or housed bird status and degree of housing/protection provided and used by birds in each.</li> <li>- Proportion of producers and poultry keepers that comply with the Avian Influenza Prevention Zone in place.</li> </ul>   | <ul style="list-style-type: none"> <li>- Housing birds.</li> <li>- Overhead netting in small flocks.</li> <li>- Other biosecurity practices to ensure wild birds are separated from flocks such as feeding birds indoors, discouraging wild birds from landing, removing wild bird contaminants, netting ponds and draining watercourses, removing feeders and water stations from the range, ensuring good building maintenance and regular inspections for signs of wild bird/rodent access.</li> <li>- See below for other biosecurity measures.</li> </ul> | <p><b>HIGH UNCERTAINTY</b><br/>There is historical evidence of transmission of AI infection between wild birds and domestic poultry in the UK (2014, 2015, 2016). There is also genetic evidence confirming the link between wild birds and domestic poultry infections.</p> <p>In this outbreak, a large proportion of disease breakdowns have occurred in housed birds</p>                                | <p><b>MEDIUM</b></p>                                 |

| Likelihood   | Risk factors  | Potential Control Measures  | Uncertainties/ Assumptions  | Likelihood Estimate (in absence of control measures) |
|--|---|---|---|--|
| <p>What is the likelihood of HP H5N8 contaminated material coming into contact with free-range backyard or housed birds?</p> | <p>This depends on:</p> <ul style="list-style-type: none"> <li>- Virus survival in the environment</li> <li>- Environmental temperatures and weather conditions. Cold weather conditions enable longer survival times (<i>pers. comms.</i> Ian Brown). Expert opinion is that the virus will retain infectivity in the environment at low temperatures, for up to 55 days at 4°C (Ian Brown, EURL, <i>pers. comm.</i> to APHA). This means the environment could remain contaminated for several weeks at least.” (APHA internal communication).</li> <li>- Location under the flight pathway and proximity to wild bird and in particular, waterfowl habitats.</li> <li>- Number of movements of potential fomites (such as personnel, equipment and feed) in and out of the bird housing (in particular for housed birds). Greater numbers of movements increase the risk of introduction of contaminated material. Layer flocks (table eggs and breeders) are likely to have more movements than broiler units as staff need to pick up eggs several times per day.</li> </ul> | <p>Biosecurity measures on farms to separate live domestic poultry/captive birds from contact with faecal material and fomites on outdoor areas, staff, vehicles, feed, bedding, collection of fallen stock and equipment will reduce the likelihood. These measures may include:</p> <ul style="list-style-type: none"> <li>- Housing birds if possible.</li> <li>- Netting, fencing or other measures (removal of wild bird contamination) to prevent access of domestic poultry/captive birds to watercourses, ponds and other habitats frequented by wild birds (especially aquatic species).</li> <li>- Reduced access by birds to the range during daylight hours (e.g. opening pop-holes at 12 noon and shutting back in at dusk).</li> <li>- Discouraging wild bird visits (i.e. not putting out feeders for wild birds near domestic poultry/captive birds, appropriate use of bird scarers or policing areas for wild birds).</li> <li>- Keep domestic waterfowl and poultry separate.</li> <li>- C&amp;D and biosecurity protocols for staff, equipment and vehicles. These include effective and routine use of boot dips, dedicated house boots and overalls.</li> </ul> | <p><b>HIGH UNCERTAINTY</b></p> <p>In this outbreak, a large proportion of disease breakdowns have occurred in housed birds.</p> <p>The likelihood will be reduced if effective measures are put in place. However, there is great uncertainty and variability about the effectiveness of biosecurity measures and the degree of compliance with recommended best practices (including for feed, water, by-products and waste products) for different types of poultry producers.</p> <p>There is also some uncertainty over the welfare impacts of bird scarers on layers or free-range broilers.</p> | <p><b>MEDIUM</b></p>                                 |

| Likelihood   | Risk factors  | Potential Control Measures  | Uncertainties/ Assumptions   | Likelihood Estimate (in absence of control measures) |
|--|---|---|--|--|
| <p>What is the likelihood of HP H5N8 contaminated material coming into contact with free-range backyard or housed birds? Contd.</p>  | <p>See above.</p>   | <p>Biosecurity measures contd.</p> <ul style="list-style-type: none"> <li>- Restriction of unnecessary visitors and auditable records of necessary visits.</li> <li>- Limited on-site movement of farm or hired vehicles for feed and water supply and biosecure sourcing of feed and equipment.</li> <li>- Appropriate routine C&amp;D of drains and gutters to prevent rainwater run-off contaminating feed, bedding or water supplies</li> <li>- Dispatch of fallen stock off-site through collection at site perimeter.</li> <li>- Knowledge of staff history and contact with birds (e.g. hobby flocks, pigeons etc.), or locations where wild birds may be present.</li> <li>- Effective vermin and pest control and measures to prevent access by vermin, wildlife or domestic pets to poultry feed, water supplies or poultry housing (i.e. covered bins, appropriate storage methods and location, building maintenance).</li> </ul> | <p>See above.</p>  | <p>See above.</p>                                    |
| <p>Assuming contaminated fomites are present on site: what is the likelihood of transmission of AI H5N8 within poultry premises?</p> | <p>Depends on:</p> <ul style="list-style-type: none"> <li>- Survival and transport of infected material into areas where there are birds present despite C&amp;D protocols and biosecurity measures</li> <li>- Susceptibility to infection: <ul style="list-style-type: none"> <li>o Presence of susceptible species</li> <li>o Stocking density</li> <li>o Stress (in housed birds, particularly in free-range birds such as geese, ducks that are not normally housed)</li> </ul> </li> </ul> | <p>See above</p> <ul style="list-style-type: none"> <li>- Ensure that all staff are aware of potential transmission routes ('risk pathways'); audit compliance with biosecurity measures and C&amp;D protocols</li> <li>- Facilities to prevent over-crowding</li> <li>- Measures to reduce environmental and other stressors to improve welfare of housed birds.</li> </ul>  | <p><b>HIGH UNCERTAINTY</b></p> <p>The current IPs (which include housed birds) in England suggest that indirect contact via fomites is plausible and likely. There is both uncertainty and variability about the standards of biosecurity measures in place for different poultry producers in Scotland.</p> | <p><b>MEDIUM</b></p>                                 |

## 6. CONSEQUENCES/IMPACTS

**Disease impacts:** Contamination or infection of domestic poultry via contact (direct or indirect) with infected wild birds or fomites may increase the possibility of further transmission and spread of Avian Influenza within and between flocks in Scotland, extending the timeline for any existing international trade restrictions and increasing demand for veterinary resources to bring the outbreak under control.

**Welfare impacts:** An Avian Influenza Prevention Zone was put into place on the 6<sup>th</sup> December to house outdoor birds to reduce the potential for contact between wild birds and domestic poultry. This was extended on the extended on 5<sup>th</sup> January 2017 to remain in force until 28<sup>th</sup> February 2017. This may reduce direct contact between wild birds and domestic poultry and reduce the likelihood of new incursions via direct or indirect contact with wild birds or contaminated fomites. However, housing birds may also increase stress (particularly in birds unused to housing), susceptibility to infection and viral shedding increasing within-flock transmission and potential for environmental contamination with virus within sheds. The impact of welfare concerns for housed birds will vary depending on the availability of adequate facilities (e.g. appropriate stocking density, availability of perches, suitable space- and material to express natural behaviours, appropriate air temperature and ventilation to avoid overheating).

### **Socio-economic impacts:**

**Continuing costs:** There are continued opportunity costs from loss of international markets and direct losses for producers whose premises become infected (i.e. loss of revenue from eggs, birds, by-products, costs of secondary C&D and replacement stock – particularly if high value breeding stock are affected).

**New costs:** The long duration of the outbreak means that free-range producers are likely to face additional socio-economic impacts (if the Avian Influenza Prevention Zone or 'housing order' is extended beyond the maximum 12 week period permitted under derogation). This includes loss of free-range status and downgrading of the value of eggs to 'barn-produced'. This is likely to cause significant "disruption in the supply chain", because of "the repackaging and re-labelling which this change will require, not just for fresh eggs, but for all products ranging from sandwiches to pasta using free range eggs." (Copa Cogeca 31.01.17)

### **OVERALL IMPACT: HIGH (HIGH UNCERTAINTY)**

The potential for severe disease and welfare impacts for the poultry industry has not diminished since the beginning of the outbreak. The likelihood of infection of new premises results in the extension of the duration of international market restrictions. Interventions that effectively reduce the likelihood of new infected premises are likely to reduce the overall economic impact of these restrictions. However, it is anticipated that there are likely to be additional socio-economic impacts for certain sectors of the industry in the near future. Given the duration of the ongoing AI outbreak and the subsequent extension of the Avian Influenza Prevention Zone, there is an increased likelihood that free-range producers will lose their free-range status and eggs will be downgraded to 'barn-produced' resulting in considerable financial losses to producers and an uncertain impact on the sector as a result of retailer and consumer choices. There is high uncertainty regarding the scale of these losses to the free-range sector. A cost-benefit analysis is outwith the scope of this VRA.

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