



Updated target list of wild bird species for passive surveillance



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CONTEXT

Passive surveillance in **dead and moribund wild birds** is a fundamental part of the surveillance programmes implemented by EU Member States and other European countries

Targeting 'relevant' wild bird species is of utmost importance, but how can we make decisions when resources are limited?



First list of target wild bird species for passive surveillance was published by EFSA in 2017



The list has now been updated and considers both **epidemiological** and **ornithological** data



DATA USED

Epidemiological data	Ornithological data
<p>Passive surveillance data submitted by reporting countries between 2005 and 2022</p> <p>For each wild bird species, a detection rate was calculated:</p> $\textit{Detection rate} = \frac{\text{No. positive}}{\text{No. tested}} * 100$	<p>Literature review</p> <p>Expert knowledge elicitation</p>



METHODOLOGICAL APPROACH

Listing all wild bird species that ever tested positive for HPAI A(H5) viruses

Adding all wild bird species that are closely related to those already on the list

Assigning each wild bird species with **individual scores** per trait, and calculating a **total score** for each wild bird species

Structuring the list into **ecological groups**

Sorting of wild bird species within each ecological group

- At least once between 2005 and 2022
- Removal of cases for which wild birds were not identified to the species level
- Removal of domestic birds
- Removal of wild birds that do not naturally occur in Europe

- From the same family
- Sharing the same habitat

- 4 ecological traits
- HPAI history

- 5 groups

- According to total scores assigned to each wild bird species



ECOLOGICAL TRAITS

Habitat

- Waterbirds are known to play an important role in the epidemiology of HPAI
- Wild bird species that frequent agricultural lands may be considered high-risk species for the transmission of HPAI viruses to poultry
- Different assessments for breeding and migration/wintering season

A = agricultural land
 F = freshwater
 M = marine
 L = littoral zone (including salt marshes)
 N = freshwater marsh habitat
 Sal = salinas
 O = other habitat types (urban areas, woodland, etc.)

Gregariousness

- Many wild bird species affected by HPAI live in dense groups at certain times of the year, as recently exemplified by mass mortality events
- Different assessments for breeding and migration/wintering season

Group size L = large (often several hundreds to thousands of birds)
 M = medium (often several tens to a few hundred birds)
 S = small (often up to a few tens of birds)
 O = usually solitary or a few birds together

Group density H = high density (often less than 2 m between individuals)
 M = medium density (often between 2–5 m between individuals)
 L = low density (often more than 5 m between individuals)
 O = (near) solitary, or in pairs, or very small (family) groups (usually < 10 individuals)

Mixing behaviour

- Occurs during foraging, at mixed roost sites or moulting areas
- Assessment only for the migration/wintering season

1 = high degree
 0.66 = medium degree
 0.33 = low degree
 0 = hardly any mixing

Predator/scavenger

- Some wild bird species may become infected by feeding on infected prey

0 = no predation or scavenging behaviour
 0.33 = almost no predation/scavenging or only either/both predation and scavenging on non-waterbirds/non-poultry
 0.66 = low probability of either/both predation and scavenging on waterbirds/poultry
 1 = large probability on either/both predation or scavenging on waterbirds/poultry

RESULTS: SCORING SYSTEM

- **4 ecological traits** relevant for spreading HPAI viruses among wild birds
 - Habitat type
 - Gregariousness
 - Mixing behaviour
 - Predator or scavenging behaviour
- **HPAI history:** detection rate and total number of individuals tested
- Scores for ecological traits were scaled (0 to 1) → giving more weight to HPAI history

Column name	Scoring rule	
HPAI history	0 = No HPAI recorded 1 = No. of sampled birds < 20, detection rate < 1% 2 = No. of sampled birds ≥ 20, detection rate 1–10% 3 = No. of sampled birds ≥ 20, detection rate ≥ 10%	
Habitat breeding	0 = Habitat score does not contain A 1 = Habitat score does contain A	
Habitat migration/winter	0 = Habitat score does not contain A 1 = Habitat score does contain A	
Gregariousness breeding	For group size: 0 = S or O 0.25 = M 0.5 = L	For density: 0 = L or O 0.25 = M 1 = H
Gregariousness migration/winter	For group size: 0 = S or O 0.25 = M 0.5 = L	For density: 0 = L or O 0.25 = M 0.5 = 1
Mixing degree	As described in Section 2.2.2	
Predator/scavenger behaviour	As described in Section 2.2.2	



RESULTS: ECOLOGICAL GROUPS

Group 1

Waterbirds whose habitat includes agricultural land

- Swans, geese, ducks, waders and gulls, species
- Often found in large foraging and/or roosting flocks

Group 2

Birds predating/scavenging on waterbirds

- Especially raptors, owls and crows
- Species that spend much time foraging in water-rich areas or are easily attracted by large numbers of sick or dead waterbirds

Group 3

Waterbirds restricted mostly to wetlands, coastal areas or open sea

- Especially colony-breeding seabirds
- Sometimes in contact with species from Group 1 → spread to more inland locations possible

Group 4

Other species whose habitat includes agricultural land

- Especially grouses, doves and passerines
- To a lesser extent also swallows, starlings and thrushes
- Some 'bridge' species

Group 5

Other species rarely found on agricultural land

- Especially grouses, woodpeckers, leaf warblers and wren families



NEW LIST OF TARGET WILD BIRD SPECIES

- **241 wild bird species** → much longer than the old list, but no increase in the variety of wild bird species groups
 - Expanded host range
 - Changing epidemiological patterns
- Wild bird species are ordered by ecological group and by rank within each ecological group
- HPAI A(H5) viruses have been detected at least once in about 62% of those 241 wild bird species
- The other 38% refer to wild bird species that are closely related to those 62%
- Species from Group 5 were finally omitted, as the risk of spreading HPAI A(H5 viruses) to poultry was considered negligible



NEW LIST OF TARGET WILD BIRD SPECIES

Group	English name	Scientific name	HPAI history	Habitat breeding	Habitat migration & winter	Gregariousness breeding	Gregariousness migration & winter	Mixing degree migration & winter	Predator & scavenger behaviour	Total score
1	Barnacle Goose	<i>Branta leucopsis</i>	3	1	1	0.5	1	1	0	7.50
1	Black-headed Gull	<i>Larus ridibundus</i>	2	1	1	1	0.75	1	0.67	7.42
1	European Herring Gull	<i>Larus argentatus</i>	3	0	1	0.75	0.5	1	1	7.25
1	Greylag Goose	<i>Anser anser</i>	3	1	1	0.25	1	1	0	7.25
1	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	3	1	1	0	1	1	0	7.00
1	Gadwall	<i>Mareca strepera</i>	3	1	1	0	0.75	1	0	6.75
1	Northern Shoveler	<i>Spatula clypeata</i>	3	1	1	0	0.75	1	0	6.75
1	Eurasian Spoonbill	<i>Platalea leucorodia</i>	3	1	1	0.5	0.5	0.67	0	6.67
1	Mediterranean Gull	<i>Larus melanocephalus</i>	3	0	1	0.75	0.25	1	0.67	6.67
1	Canada Goose	<i>Branta canadensis</i>	3	1	1	0	0.5	1	0	6.50
1	Eurasian Curlew	<i>Numenius arquata</i>	3	1	1	0	0.5	1	0	6.50
1	Greater White-fronted Goose	<i>Anser albifrons</i>	3	0	1	0.5	1	1	0	6.50
1	Caspian Gull	<i>Larus cachinnans</i>	2	0	1	0.75	0.5	1	1	6.25
1	Lesser Black-backed Gull	<i>Larus fuscus</i>	2	0	1	0.75	0.5	1	1	6.25
1	Mute Swan	<i>Cygnus olor</i>	3	1	1	0	0.5	0.67	0	6.17
1	Eurasian Wigeon	<i>Mareca penelope</i>	3	0	1	0	1	1	0	6.00
1	Yellow-legged Gull	<i>Larus michahellis</i>	2	0	1	0.75	0.25	1	1	6.00
1	Black Swan	<i>Cygnus atratus</i>	3	1	1	0	0.25	0.67	0	5.92
1	Brent Goose	<i>Branta bernicla</i>	3	0	1	0.25	1	0.67	0	5.92
1	Ruddy Turnstone	<i>Arenaria interpres</i>	3	0	1	0	0.25	1	0.67	5.92
1	Mallard	<i>Anas platyrhynchos</i>	2	1	1	0	0.75	1	0	5.75
1	Tufted Duck	<i>Aythya fuligula</i>	3	1	0	0	0.75	1	0	5.75
1	Cattle Egret	<i>Bubulcus ibis</i>	2	1	1	0.5	0.5	0.67	0	5.67
1	Mew gull	<i>Larus canus</i>	2	0	1	0.5	0.5	1	0.67	5.67
1	Glossy Ibis	<i>Plegadis falcinellus</i>	2	1	1	0.5	0.5	0.67	0	5.67
1	Lesser White-fronted Goose	<i>Anser erythropus</i>	3	0	1	0	1	0.67	0	5.67
1	Pink-footed Goose	<i>Anser brachyrhynchus</i>	3	0	1	0	1	0.67	0	5.67



HOW TO USE THIS LIST?

- Depends on needs and economic considerations (budget and other resources available)
- Recommendation to **focus on Groups 1–3** and, within each group, to **focus on higher-ranked species**
- Recommendation to **focus on mortality events** involving multiple individuals
- If the primary objective is to identify early warning signals with regard to possible transmission to poultry, recommendation to focus on emerging outbreaks instead of continued sampling at one location



The list may be further restricted to a certain region or country by repeating the assessment for only a subset of the data available (regional outbreaks and regional wild bird species presence) with the help of local ornithologists



FINAL CONSIDERATIONS

Assessment would be more robust if more **data on negative test results** were available

Non- or misidentification of wild bird species remains a problem

Degree of morbidity and mortality varies greatly between wild bird species and outbreaks → some wild bird species show only few or no clinical signs at all



Active surveillance remains an important surveillance component in combination with passive surveillance

