



Avian influenza overview for 2024 and other activities

Lisa Kohnle
Scientific Officer
EFSA

SCIENTIFIC REPORT    JOURNAL

APPROVED: 22 March 2024
doi: 10.2903/j.efsa.2024.8754

Avian influenza overview December 2023–March 2024

European Food Safety Authority,
European Centre for Disease Prevention and Control,
European Union Reference Laboratory for Avian Influenza, Alice Fusaro, José L Gonzales, Thijs Kuiken, Gražina Mirinavičiūtė, Éric Niqueux, Karl Ståhl, Christoph Staubach, Olov Svartström, Calogero Terregino, Katriina Willgert, Francesca Baldinelli, Roxane Delacourt, Alexandros Georganas and Lisa Kohnle

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2024.8754>

SCIENTIFIC REPORT    JOURNAL

APPROVED: 3 July 2024
doi: 10.2903/j.efsa.2024.8930

Avian influenza overview March–June 2024

European Food Safety Authority,
European Centre for Disease Prevention and Control,
European Union Reference Laboratory for Avian Influenza, Leonidas Alexakis, Alice Fusaro, Thijs Kuiken, Gražina Mirinavičiūtė, Karl Ståhl, Christoph Staubach, Olov Svartström, Calogero Terregino, Katriina Willgert, Roxane Delacourt, Sonagnon Martin Goudjihounde, Malin Grant, Stefania Tampach and Lisa Kohnle

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2024.8930>

SCIENTIFIC REPORT    JOURNAL

APPROVED: 2 October 2024
doi: 10.2903/j.efsa.2024.9057

Avian influenza overview June–September 2024

European Food Safety Authority,
European Centre for Disease Prevention and Control,
European Union Reference Laboratory for Avian Influenza, Leonidas Alexakis, Hubert Buczkowski, Mariette Ducatez, Alice Fusaro, Jose L Gonzales, Thijs Kuiken, Karl Ståhl, Christoph Staubach, Olov Svartström, Calogero Terregino, Katriina Willgert, Roxane Delacourt and Lisa Kohnle

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2024.9057>

SCIENTIFIC REPORT    JOURNAL

APPROVED: 17 December 2024
doi: 10.2903/j.efsa.2025.9204

Avian influenza overview September–December 2024

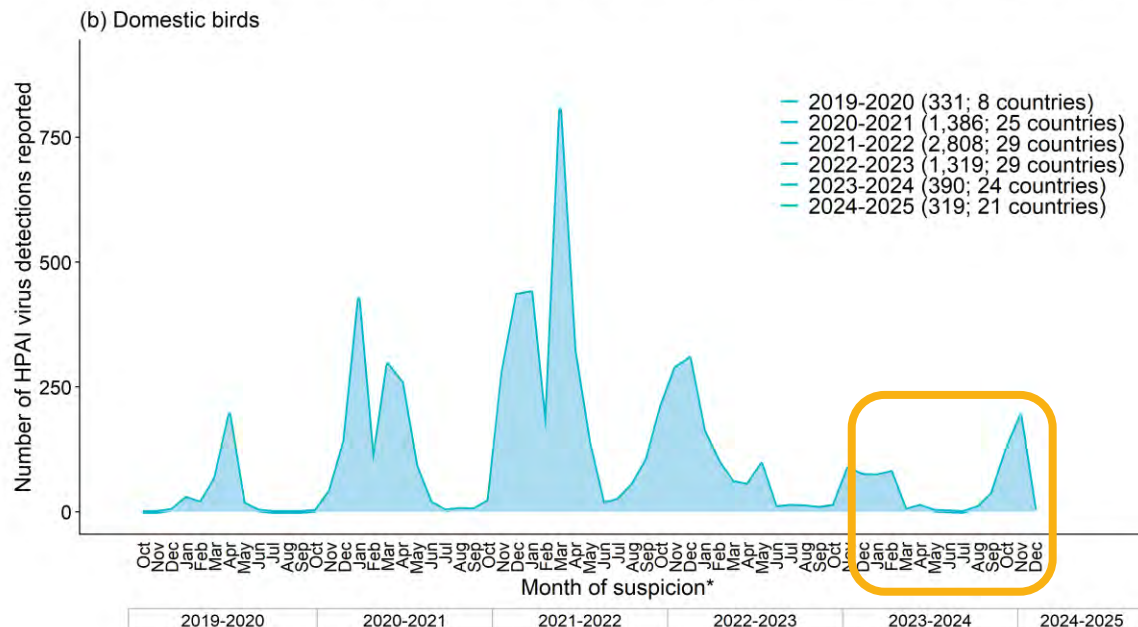
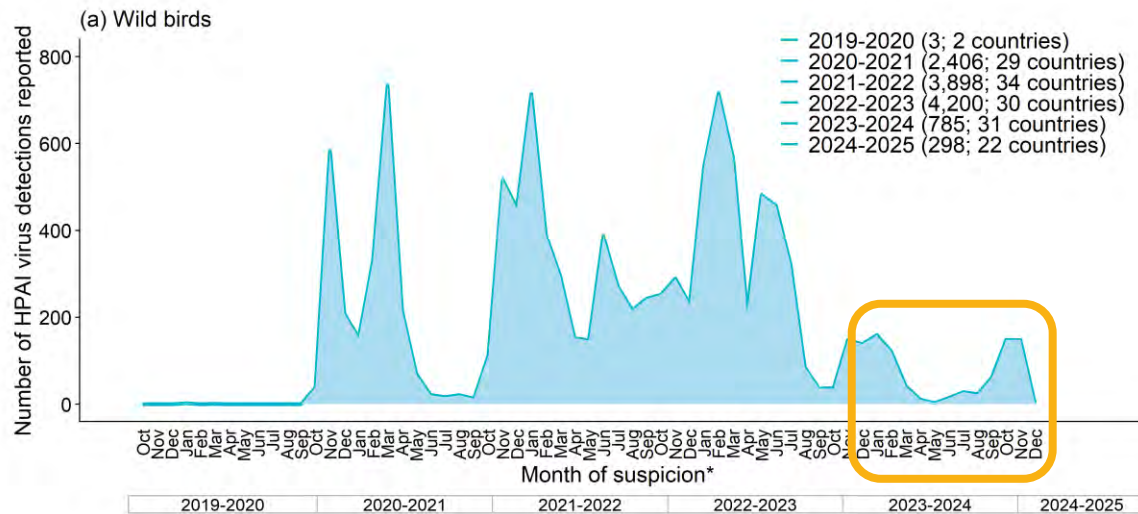
European Food Safety Authority,
European Centre for Disease Prevention and Control,
European Union Reference Laboratory for Avian Influenza, Leonidas Alexakis, Hubert Buczkowski, Mariette Ducatez, Alice Fusaro, Jose L Gonzales, Thijs Kuiken, Karl Ståhl, Christoph Staubach, Olov Svartström, Calogero Terregino, Katriina Willgert, Miguel Melo and Lisa Kohnle

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2025.9204>

Quarterly monitoring reports



HPAI IN BIRDS IN EUROPE



Epidemic curve in 2024

- Decrease in detections at the end of winter
- Relatively quiet summer
- Sharp increase in detections from September onwards

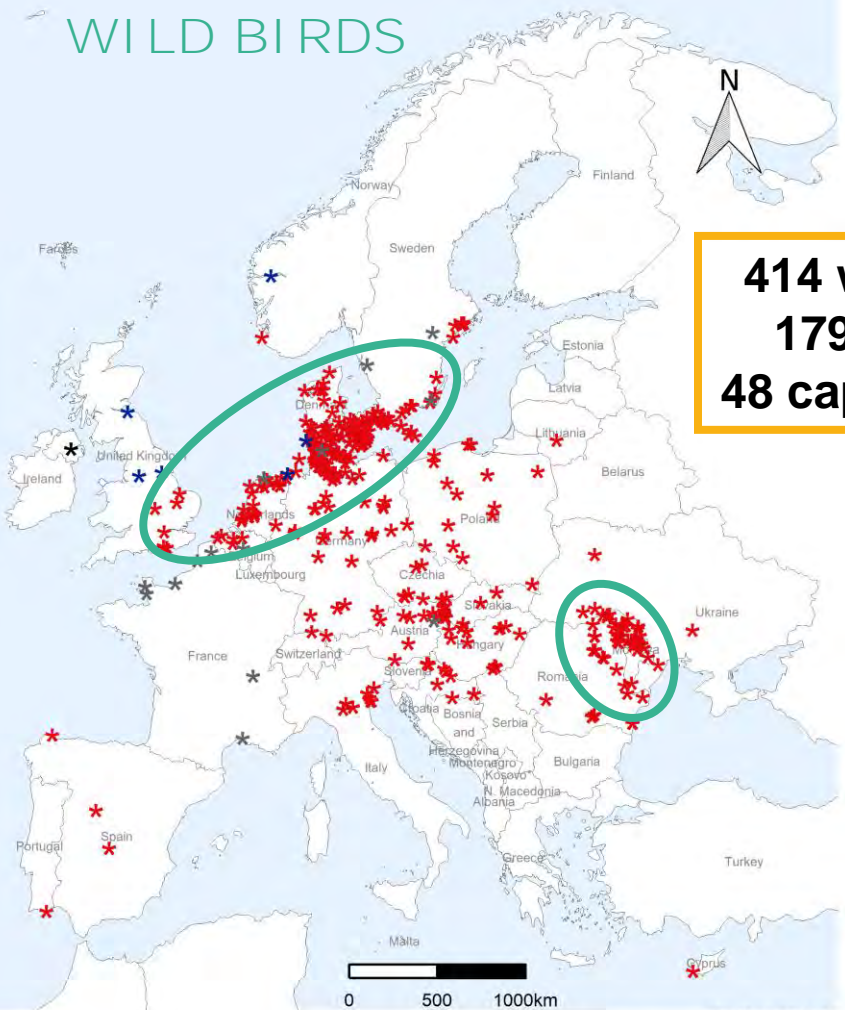


HPAI IN BIRDS IN EUROPE | WINTER 2023 – 2024

WILD BIRDS

HPAI virus subtype detections in wild birds
2 December 2023 - 15 March 2024

- ★ A(Not typed) (1)
- ★ H5N1 (393)
- ★ H5N5 (6)
- ★ H5Nx (14)



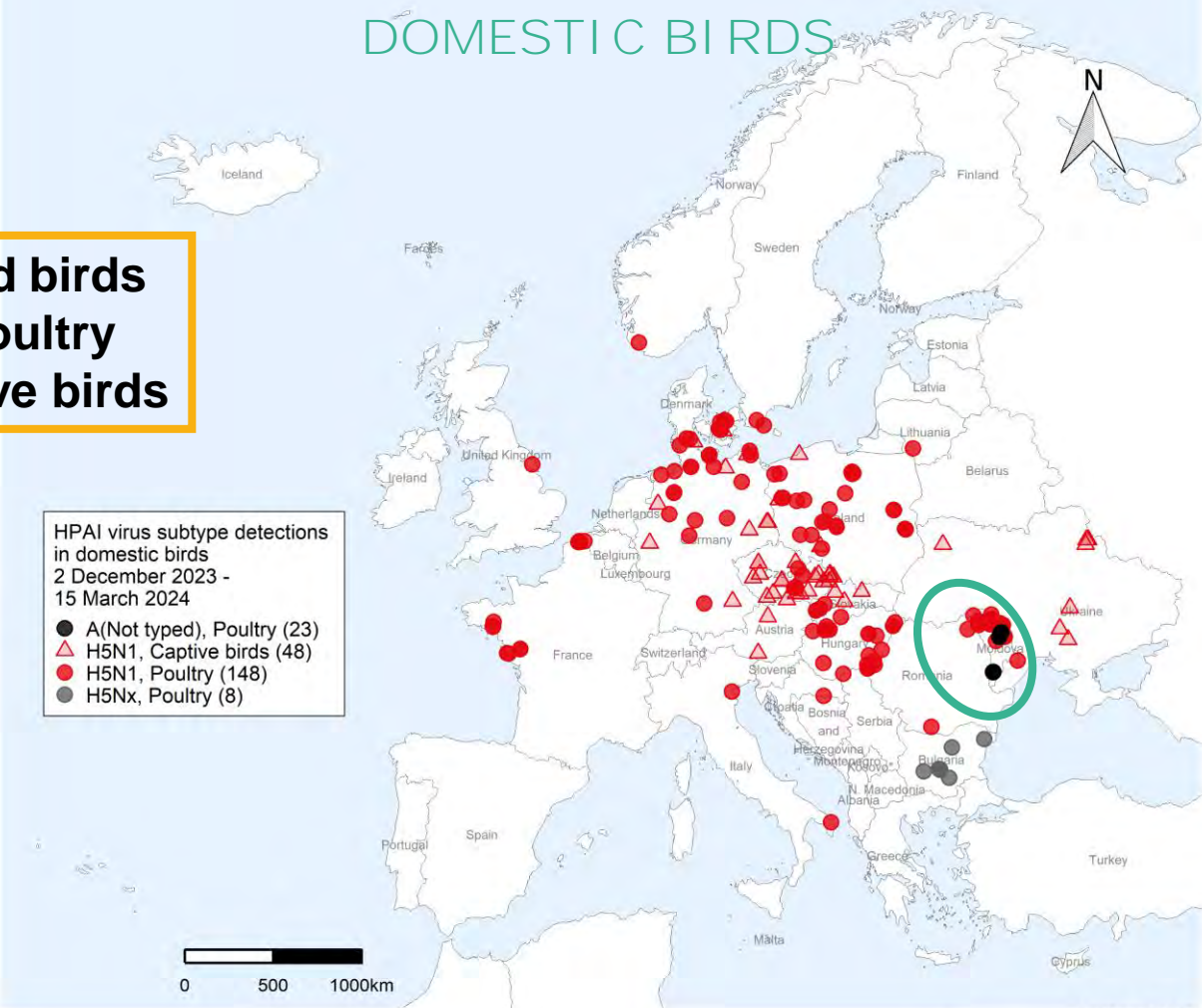
414 wild birds
179 poultry
48 captive birds

Author: EFSA
Data sources: ADIS, WOAH
Date updated: 15/03/2024

DOMESTIC BIRDS

HPAI virus subtype detections in domestic birds
2 December 2023 - 15 March 2024

- A(Not typed), Poultry (23)
- ▲ H5N1, Captive birds (48)
- H5N1, Poultry (148)
- H5Nx, Poultry (8)



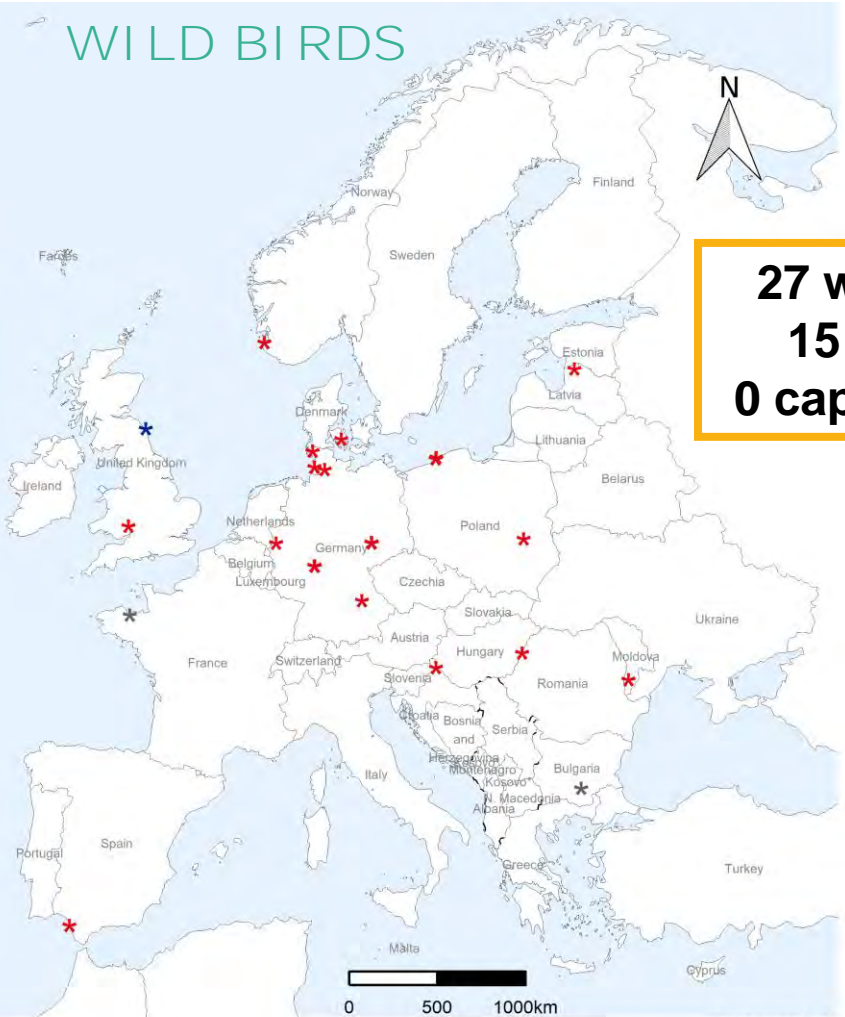
Author: EFSA
Data sources: ADIS, WOAH
Date updated: 15/03/2024

HPAI IN BIRDS IN EUROPE | SPRING 2024

WILD BIRDS

HPAI virus subtype detections in wild birds
16 March 2024 - 14 June 2024

- * H5N1 (24)
- * H5N5 (1)
- * H5Nx (2)

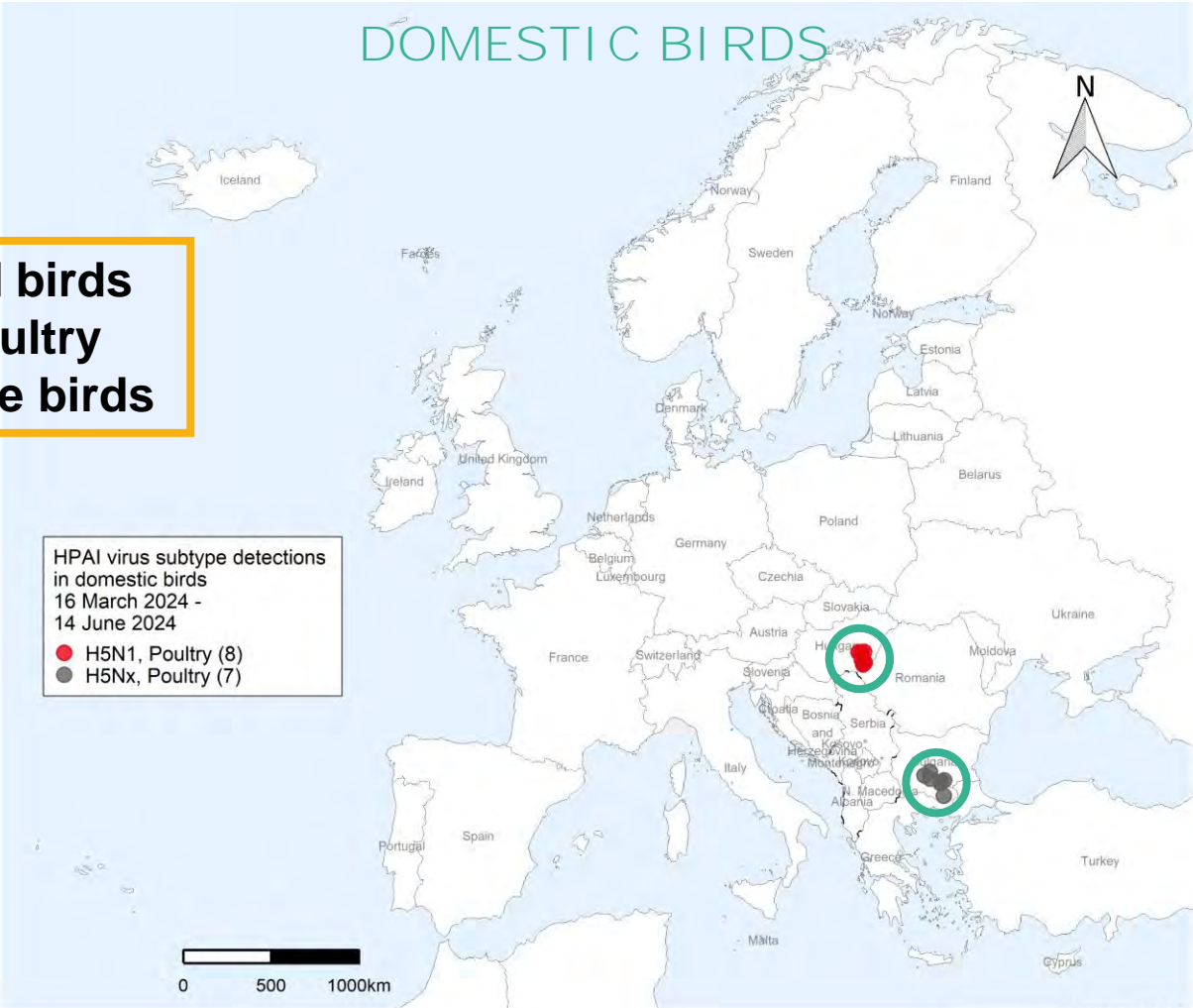


**27 wild birds
15 poultry
0 captive birds**

DOMESTIC BIRDS

HPAI virus subtype detections in domestic birds
16 March 2024 - 14 June 2024

- H5N1, Poultry (8)
- H5Nx, Poultry (7)

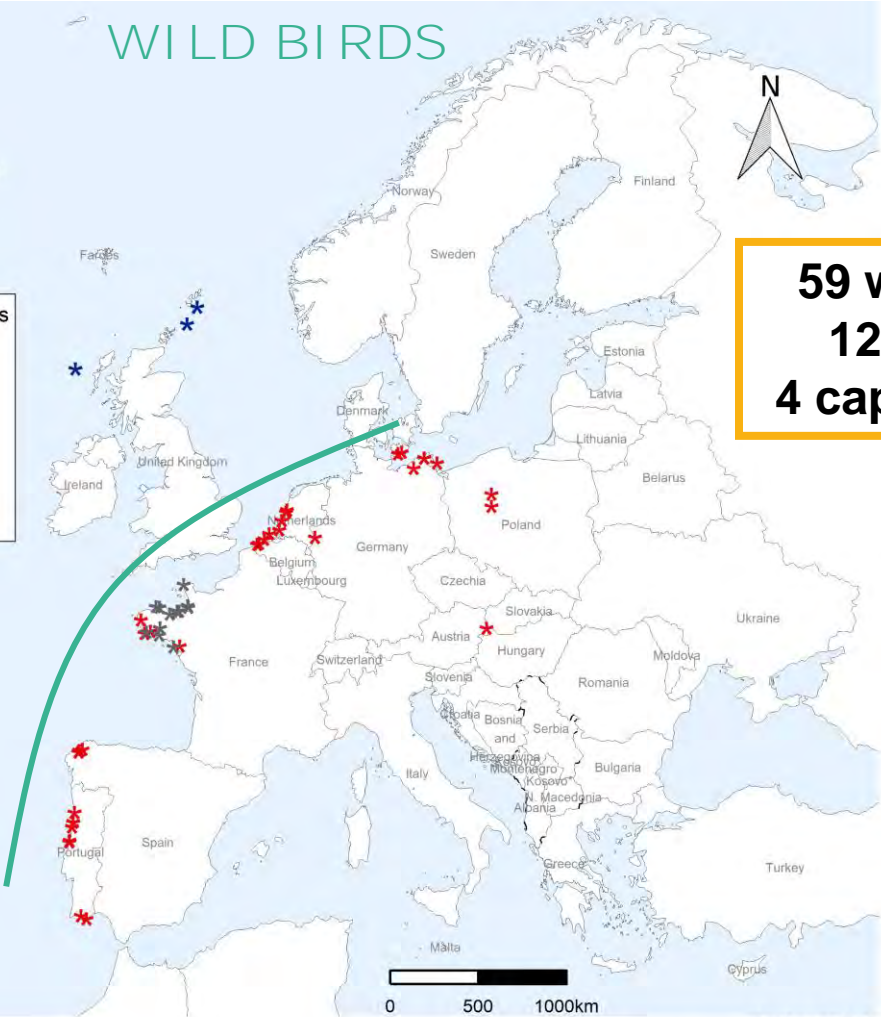


HPAI IN BIRDS IN EUROPE | SUMMER 2024

WILD BIRDS

HPAI virus subtype detections in wild birds
15 June 2024 - 20 September 2024

- * H5N1 (44)
- * H5N5 (3)
- * H5Nx (12)

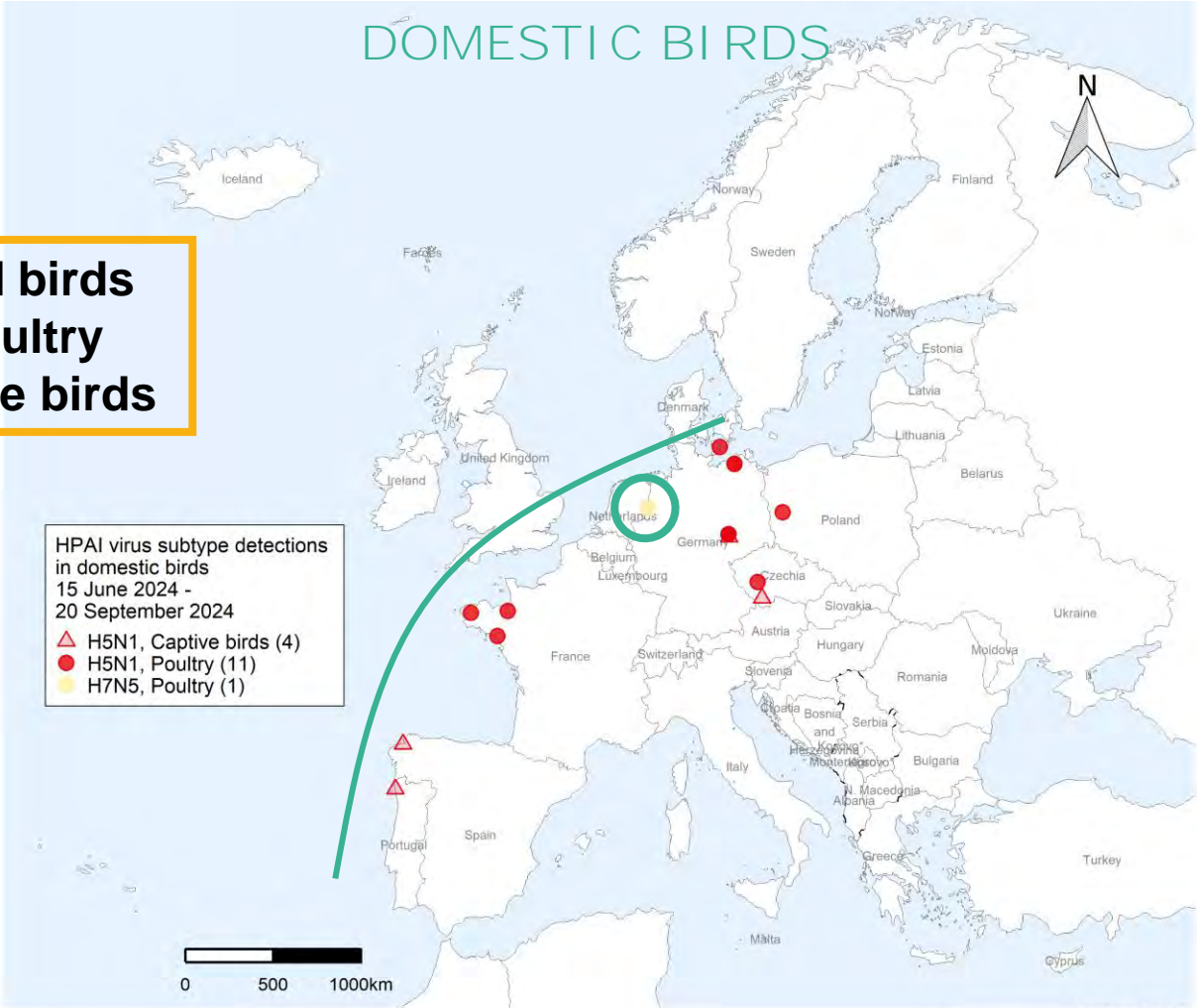


**59 wild birds
12 poultry
4 captive birds**

DOMESTIC BIRDS

HPAI virus subtype detections in domestic birds
15 June 2024 - 20 September 2024

- △ H5N1, Captive birds (4)
- H5N1, Poultry (11)
- H7N5, Poultry (1)



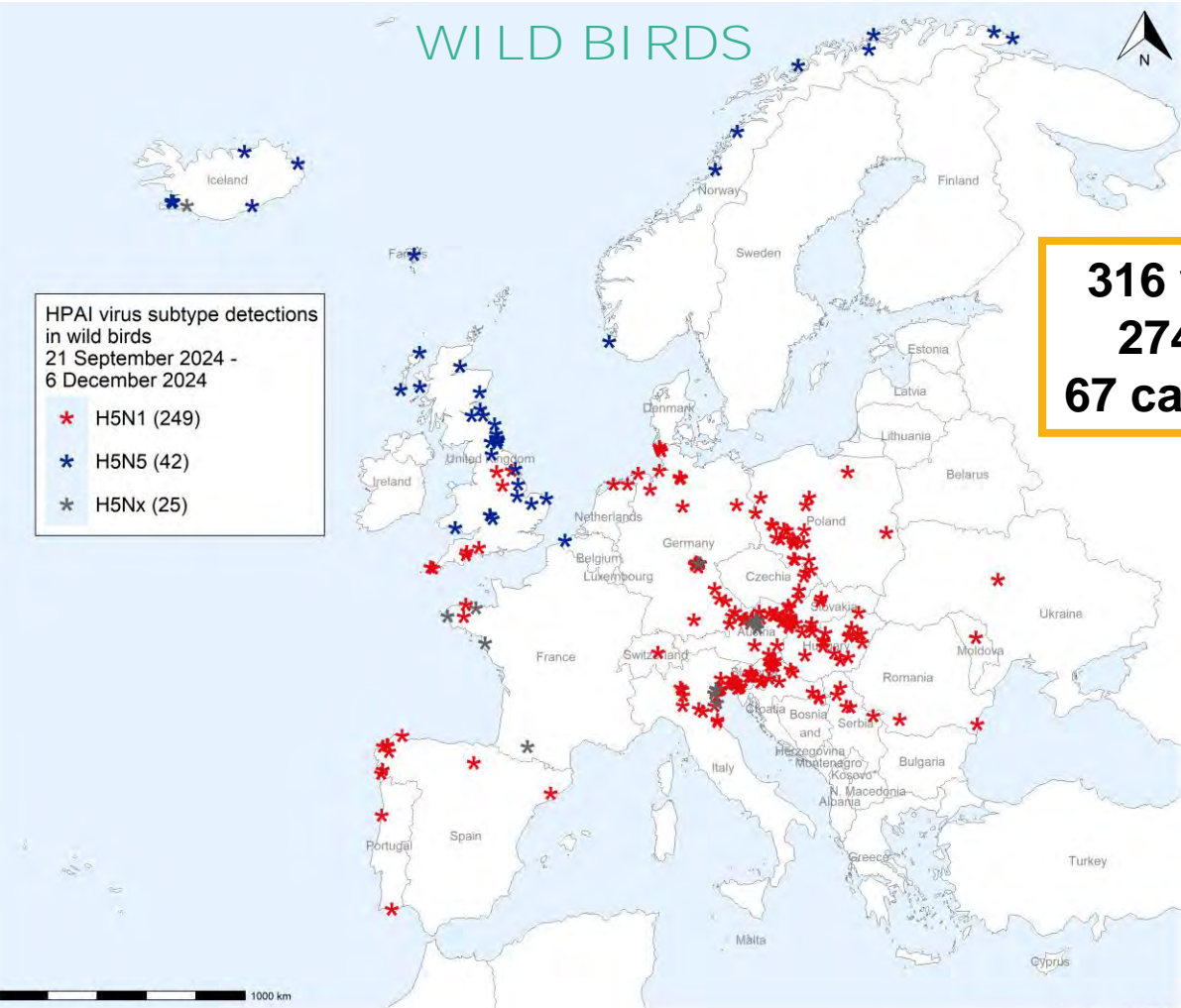
HPAI IN BIRDS IN EUROPE | AUTUMN 2024

WILD BIRDS

HPAI virus subtype detections in wild birds
21 September 2024 - 6 December 2024

- * H5N1 (249)
- * H5N5 (42)
- * H5Nx (25)

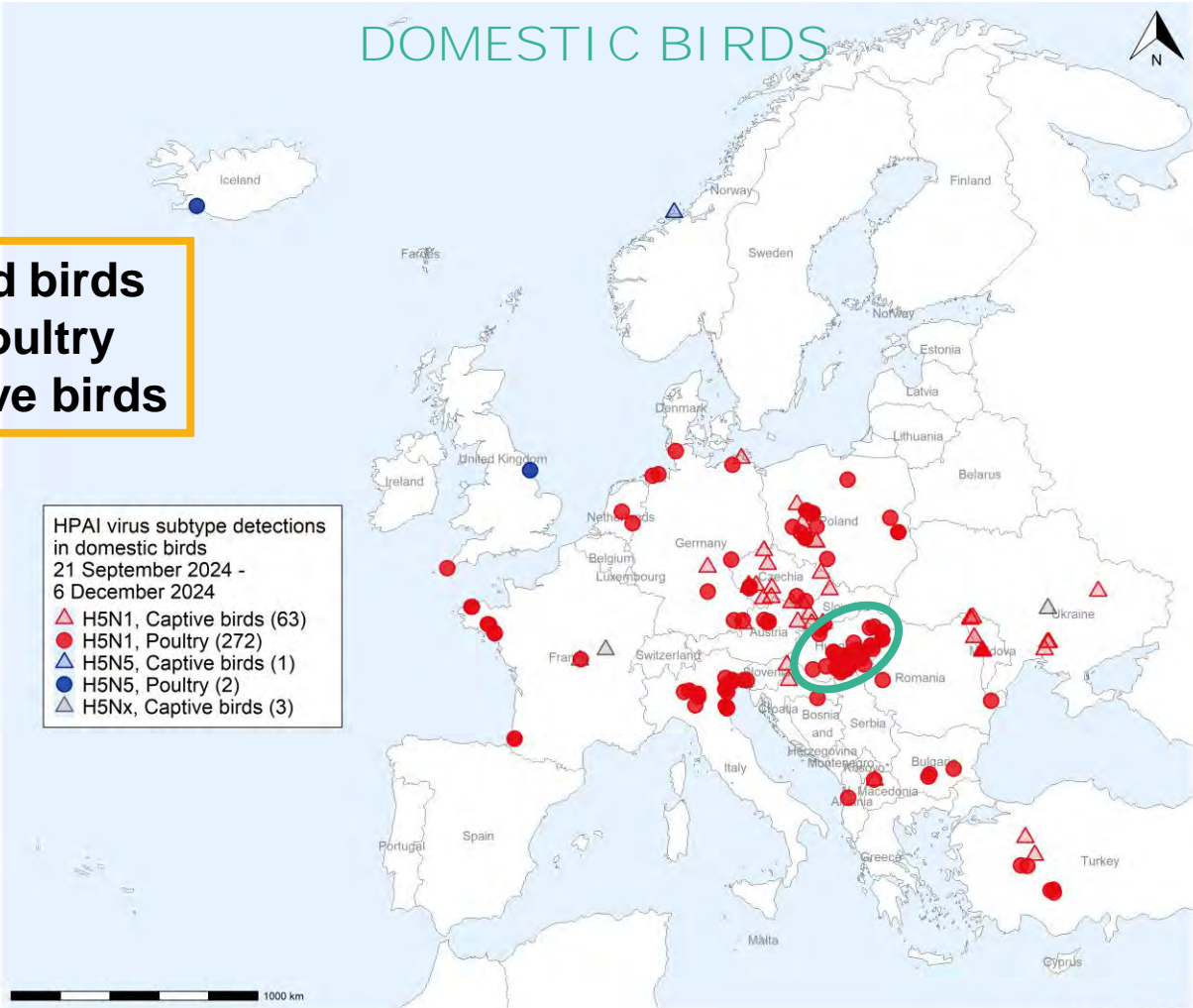
**316 wild birds
274 poultry
67 captive birds**



DOMESTIC BIRDS

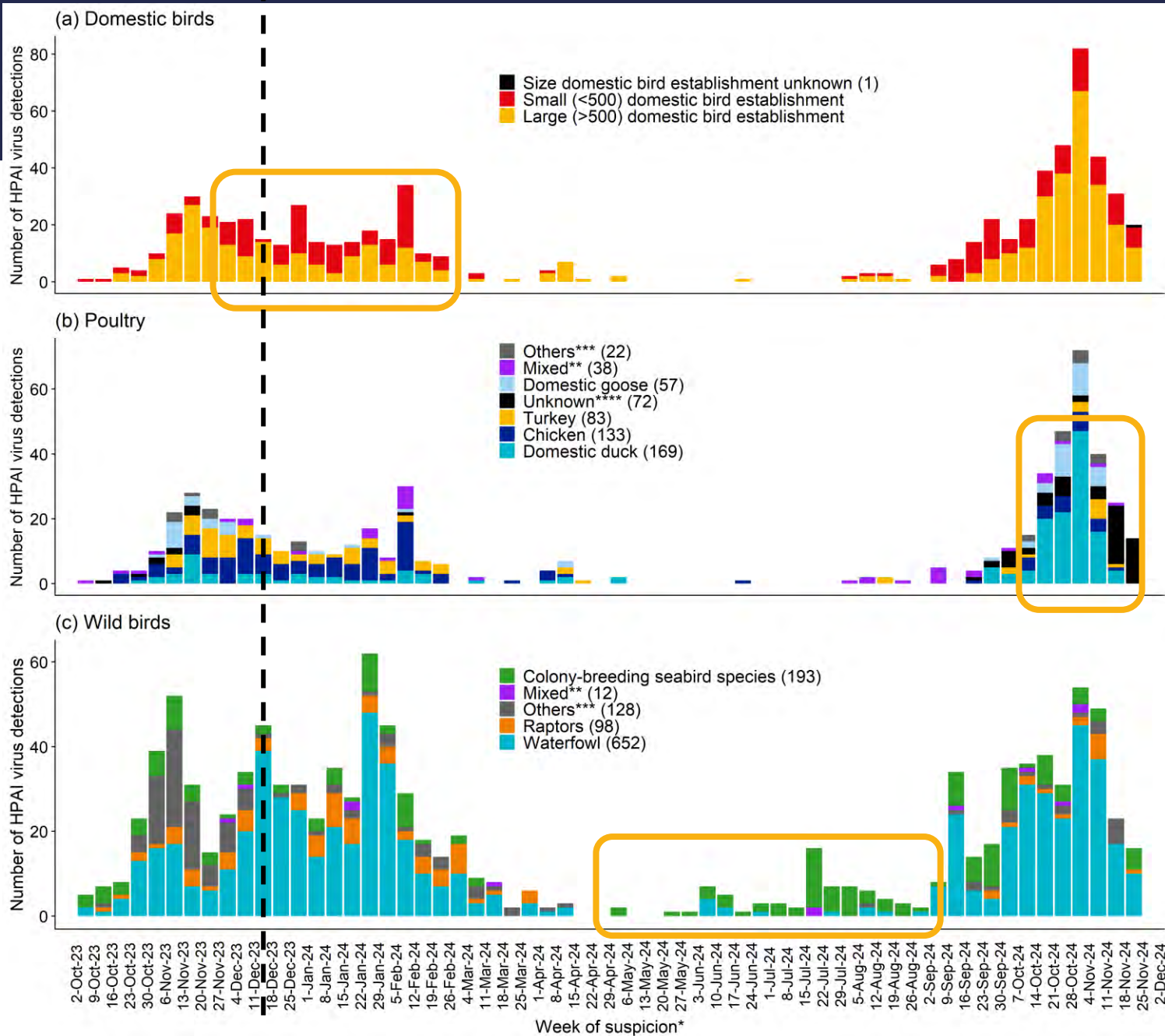
HPAI virus subtype detections in domestic birds
21 September 2024 - 6 December 2024

- △ H5N1, Captive birds (63)
- H5N1, Poultry (272)
- H5N5, Captive birds (1)
- H5N5, Poultry (2)
- △ H5Nx, Captive birds (3)



Author: EFSA
Data sources: ADIS, WOAH
Date updated: 06/12/2024

Author: EFSA
Data sources: ADIS, WOAH
Date updated: 06/12/2024

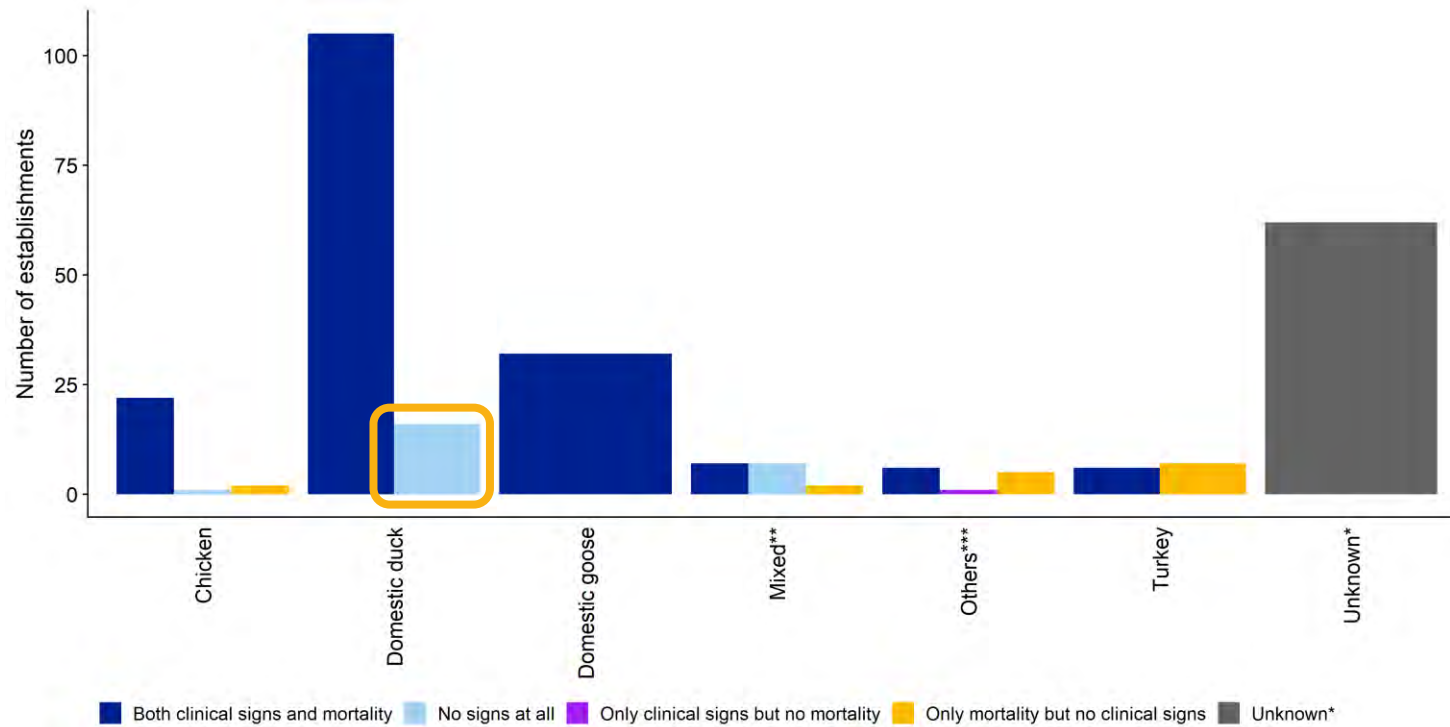


Species and production systems affected

- Less small-scale establishments affected now than at the beginning of the year
- Poultry: mostly ducks and chickens
- Wild birds: mostly waterfowl and some colony-breeding seabirds



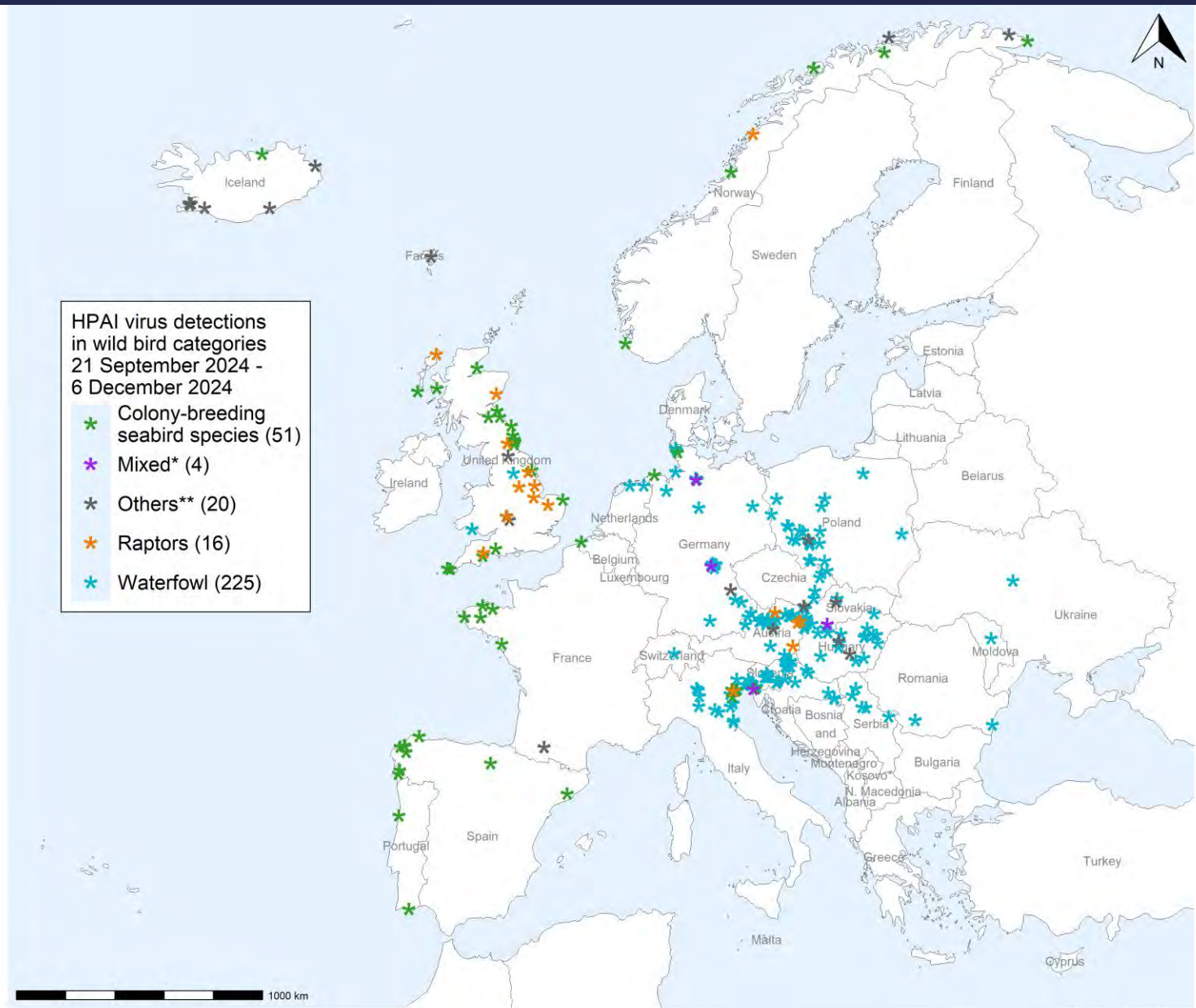
HPAI IN BIRDS IN EUROPE | SIGNS OF THE DISEASE



Species and production systems affected

- All poultry species showed both clinical signs and mortality
- Ducks had the highest likelihood of not showing any signs of the disease → **no or only mild signs in vaccinated birds**





Spatial distribution of HPAI virus detections in wild birds

- Mostly colony-breeding seabirds along the coastlines
- Waterfowl concentrated in Southeast Europe

Author: EFSA
 Data sources: ADIS, WOAH
 Date updated: 06/12/2024



HPAI IN BIRDS IN EUROPE | WILD BIRD SPECIES AFFECTED

SWANS



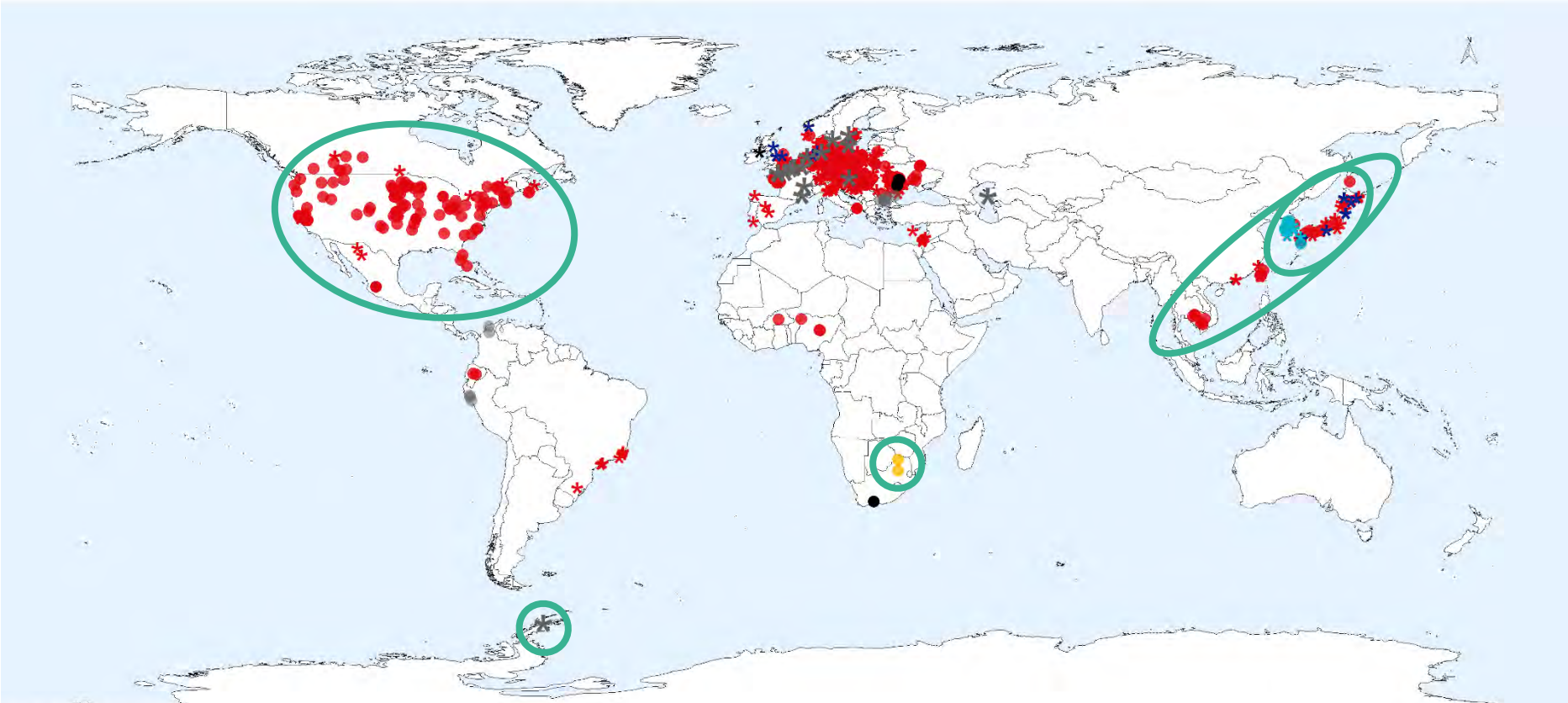
GULLS



GEESE



HPAI IN BIRDS WORLDWIDE | WINTER 2024 – 2025



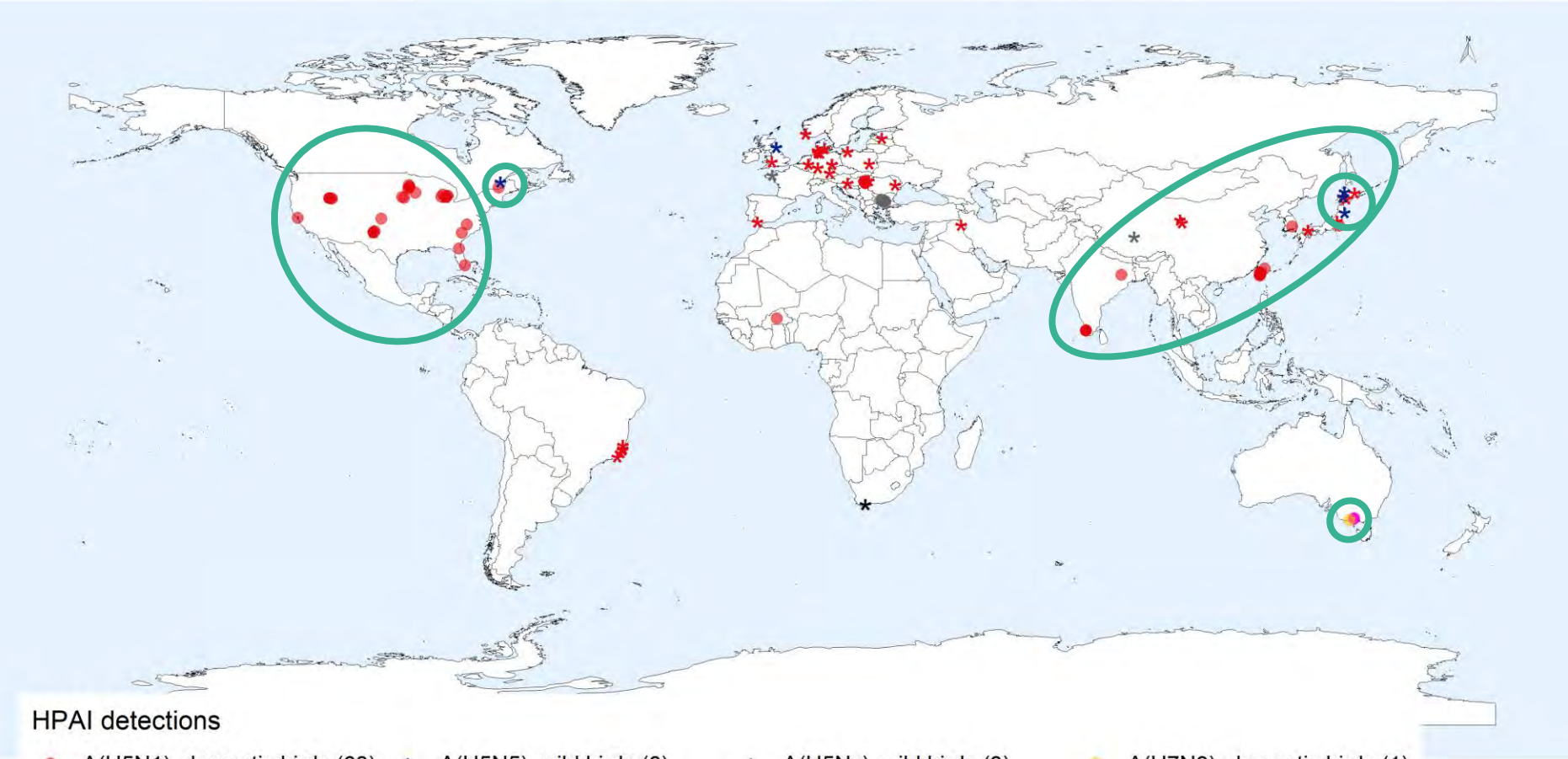
HPAI detections

- A(H5N1), domestic birds (365)
- A(H5N1), wild birds (477)
- A(H5N5), wild birds (29)
- A(H5N6), domestic birds (27)
- A(H5N6), wild birds (12)
- A(H5Nx), domestic birds (13)
- A(H5Nx), wild birds (16)
- A(H7N6), domestic birds (2)
- A(Not typed), domestic birds (24)
- A(Not typed), wild birds (1)

Author: EFSA
 Data sources: ADIS, WOAH
 Date updated: 18/03/2024



HPAI IN BIRDS WORLDWIDE | SPRING 2024

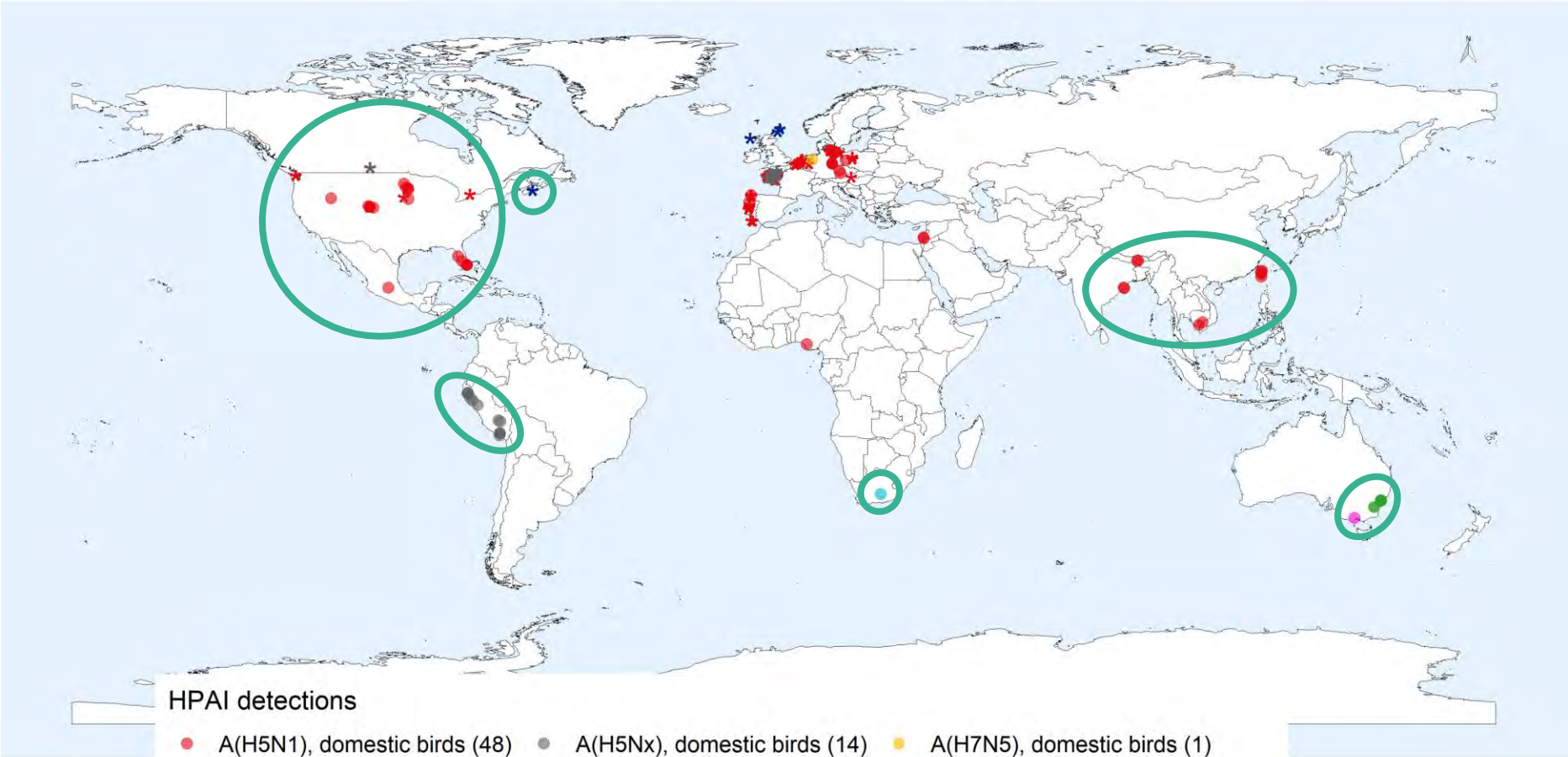


HPAI detections

- A(H5N1), domestic birds (63)
 - ★ A(H5N1), wild birds (48)
 - ★ A(H5N5), wild birds (6)
 - ★ A(H5Nx), wild birds (3)
 - A(H5Nx), domestic birds (7)
 - A(H7N3), domestic birds (3)
 - A(H7N9), domestic birds (1)
 - ★ A(Not typed), wild birds (1)
- Author: EFSA
Data sources: ADIS, WOAH
Date updated: 17/06/2024



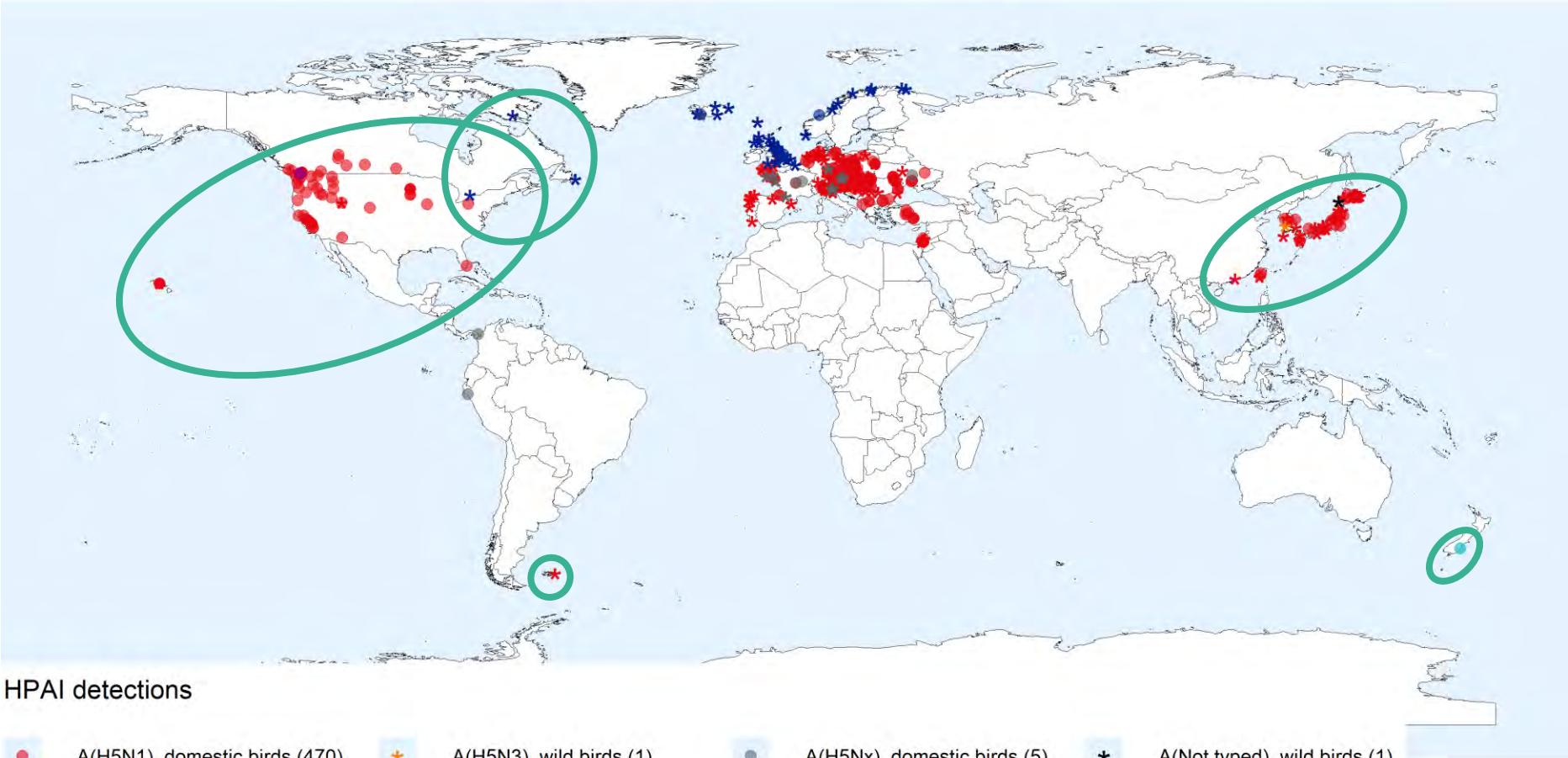
HPAI IN BIRDS WORLDWIDE | SUMMER 2024



Author: EFSA
 Data sources: ADIS, WOAH
 Date updated: 20/09/2024



HPAI IN BIRDS WORLDWIDE | AUTUMN 2024



HPAI detections

- A(H5N1), domestic birds (470)
- ★ A(H5N1), wild birds (316)
- A(H5N2), domestic birds (2)
- ★ A(H5N3), wild birds (1)
- A(H5N5), domestic birds (3)
- ★ A(H5N5), wild birds (45)
- A(H5Nx), domestic birds (5)
- ★ A(H5Nx), wild birds (25)
- A(H7N6), domestic birds (1)
- ★ A(Not typed), wild birds (1)

Author: EFSA
 Data sources: ADIS, WOAH
 Date updated: 06/12/2024



HPAI IN MAMMALS IN 2024

EUROPE

A(H5N1)

- Red fox (5-Germany, 1-Denmark)
- Cat (1-Hungary)
- Eurasian otter (1-Sweden)
- Raccoon (1-Germany)

A(H5N5)

- Red fox (2-Norway)
- European pine marten (1-Netherlands)

Increased surveillance ongoing, but **no new HPAI virus detections since spring 2024**



HPAI IN MAMMALS IN 2024

WORLDWIDE

United States of America

- **Farmed mammals:** cattle (> 900 farms in 16 states), goat (10), alpaca (4), pig (2)
- **Pet/peri-domestic mammals:** house mouse (86), cat (58), deer mouse (17)
- **Wild mammals:** Red fox/other foxes (15), mountain lion (12), striped skunk/other skunks (11), raccoon (7), serval (6), Amur/Bengal/hybrid tiger (5), bobcat (5), bottlenose dolphin (3), Virginia opossum (2), African lion, American mink, Canada lynx, coyote, desert cottontail, ermine, Geoffroy's cat, harbour seal, prairie vole, Savannah cat (1 each)

Canada

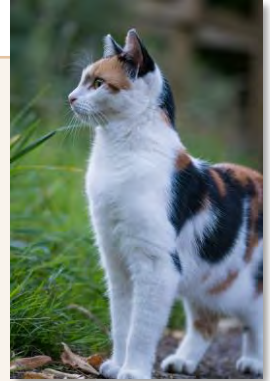
- Raccoon (3), striped skunk (3), red fox (2) A(H5N5)
- Striped skunk (8), red fox (1) A(H5N1)

Viet Nam

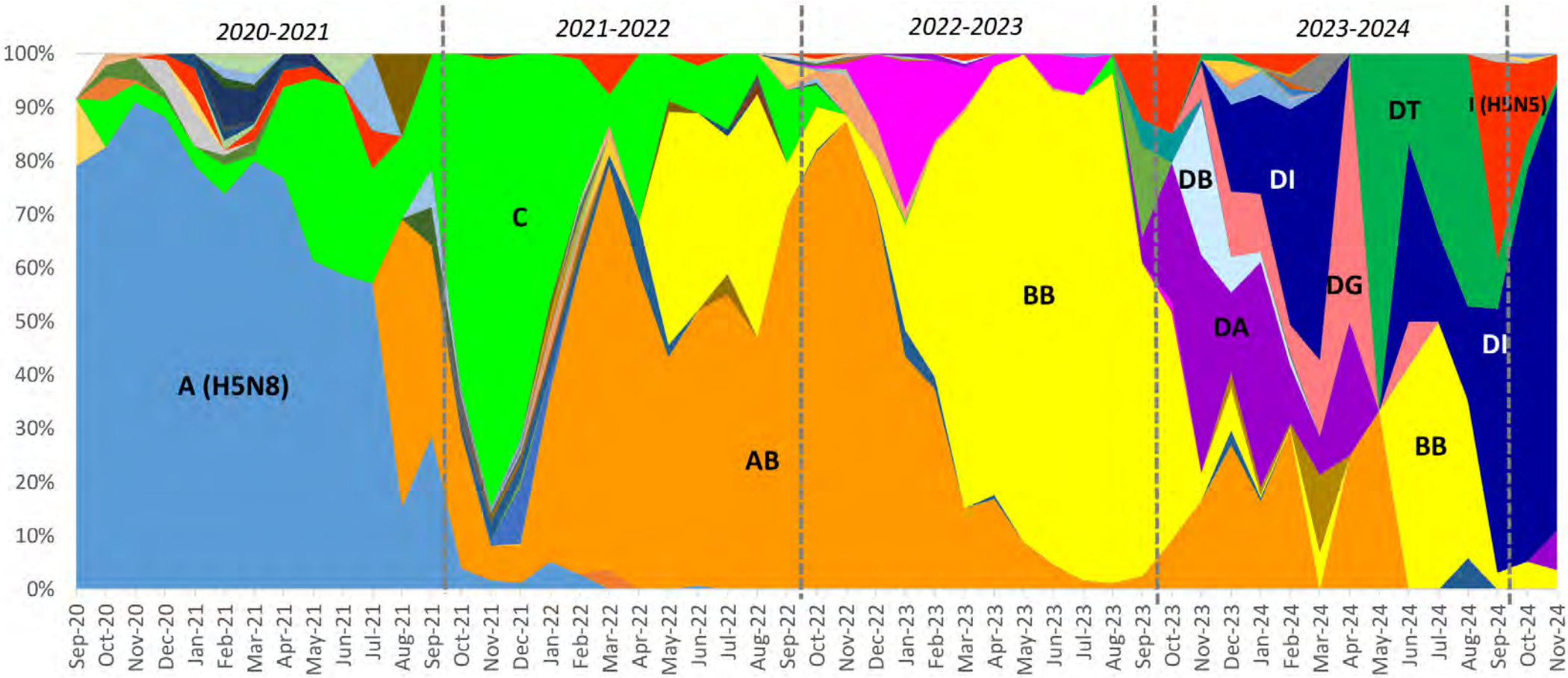
- Tiger (41), African lion (2), leopard (1)

Antarctic region

- South American fur seal
- Southern elephant seal



GENOTYPE DISTRIBUTION IN EUROPE IN 2024



Alice Fusaro, EURL



OPTIONS FOR RESPONSE IN ANIMALS

- **Biosecurity** to prevent HPAI virus introduction from wild birds into poultry establishments and further farm-to-farm spread
 - Sharing farm equipment and personnel, particularly when farms have the same ownership, should be avoided or at least kept to a minimum
- Increased and more targeted **surveillance**
 - In poultry, surveillance efforts should also include **small-scale establishments**, as these may be at higher risk due to lower biosecurity and the provision of outdoor access
 - **Active surveillance in vaccinated flocks** is of utmost importance to promptly detect infected birds without or only mild clinical signs
 - Due to the recent emergence of new HPAI subtypes in poultry, **LPAI viruses of the A(H5) and A(H7) subtypes** should be closely monitored
 - **Active surveillance in wild birds** to estimate viral prevalence and seroprevalence (to assess whether some level of flock immunity has been acquired)
 - Increased surveillance in **wild and free-roaming domestic carnivores** as well as **domestic and farmed mammals** exposed to highly contaminated environments or in close contact with HPAI virus-infected poultry or wild birds



OPTIONS FOR RESPONSE IN ANIMALS

- Accurate and comprehensive recording, investigation and reporting of HPAI-associated **mortality events** in **wild birds** and **mammals**
- **Inclusion of HPAI among the differential diagnoses** for undiagnosed or unresolved clinical signs in ruminants during periods of HPAI virus circulation → **testing** is recommended under certain conditions
- National reference laboratories should consider the **procurement of tests and reagents** to be prepared for carrying out diagnostic activities targeting mammals to allow for rapid escalation of testing capacity → liaison with the EURL is recommended to ensure that appropriate virological and serological tests are used
- Pet and other captive mammals should not be fed with meat or other animal products (e.g. raw milk) from potentially HPAI virus-infected animals





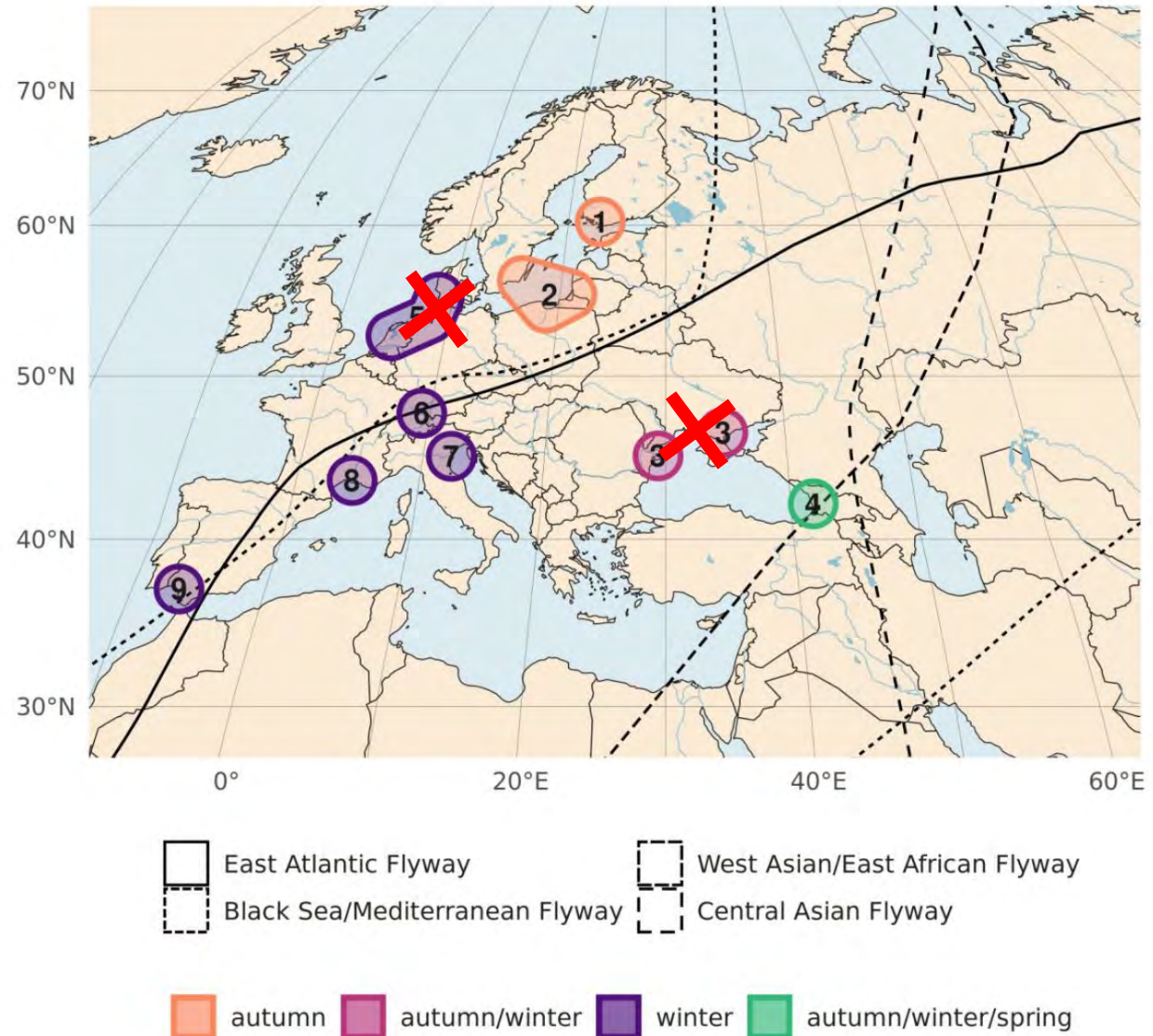
SENTINEL: Active surveillance in wild birds



ACTIVE SURVEILLANCE IN WILD BIRDS

- Establishment of a coordinated **network of surveillance nodes**
- Building **capacities** and **long-term partnerships** for active surveillance of HPAI in wild birds in those locations
- **Rapid diagnostic testing** and **whole genome sequencing** for early warning
- Increasing the **pool of genome sequences** available for risk assessment and research
- Testing the **added value** of this surveillance component in complementing already existing surveillance efforts

- **9 → 7 surveillance nodes** (geographic locations to be covered)



PARTNERS INVOLVED

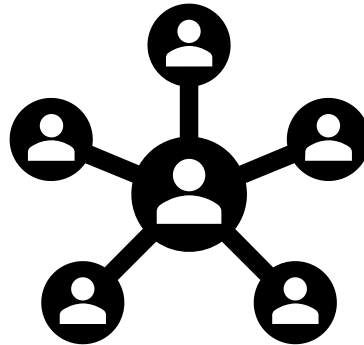
Coordination	Procurement	Linnaeus University (Sweden) + Francis Crick Institute (United Kingdom)
Node 1: Gulf of Finland	Grant	Ruokavirasto/Finnish Food Authority (Finland) + LABRIS/National Centre for Laboratory Research and Risk Assessment (Estonia) + Linnaeus University (Sweden)
Node 2: Southern Baltic Sea	Grant	SVA/National Veterinary Institute (Sweden) + Linnaeus University (Sweden) + BIOR/Institute of Food Safety, Animal Health and Environment (Latvia) + NMVRVI/National Food and Veterinary Risk Assessment Institute (Lithuania) + VMVT/State Food and Veterinary Service (Lithuania) + PIWet-PIB/National Veterinary Research Institute (Poland)
Node 4: Eastern Black Sea	Grant	Linnaeus University (Sweden) + Ilia State University (Georgia)
Node 6: Lake Constance region	Grant	AGES/Austrian Agency for Health and Food Safety (Austria) + FLI (Germany) + Institut für Virologie und Immunologie, Bundesamt für Lebensmittelsicherheit und Veterinärwesen (Switzerland) + Nationales Referenzzentrum für Geflügel- und Kaninchenkrankheiten (Switzerland) + Max Planck Institute of Animal Behavior (Germany) + Amt der Vorarlberger Landesregierung (Austria) + Naturschutzverein Reheindelta (Austria)
Node 7: Veneto region	Grant	IZSve/Istituto Zooprofilattico Sperimentale delle Venezie + Ispra/Italian Institute for Environmental Protection and Research (all Italy)
Node 8: Camargue region	Grant	ANSES/French Agency for Food, Environmental and Occupational Health & Safety + ENVT (National Veterinary School of Toulouse) + INRAE (French National research institute for agriculture, food and environment) + Conservatoire d'espaces naturels d'Occitanie (CEN) + Office français de la biodiversité (OFB) + Laboratoire départemental d'analyse du Gard + Fondation Tour du Valat (all France)
Node 9: Gulf of Cadiz	Grant	CSIC (Spanish National Research Council) – represented by many different subunits (Spain)



SCOPE, TIMELINE AND TASKS

Tasks

- **Establishment** and **maintenance** of **infrastructure** (e.g. wild bird traps, transport vehicles) and **capacities** (e.g. manpower, laboratory benches, IT systems)
- Active **participation** in the **network** (e.g. training, annual meetings)
- Following a harmonised **sampling plan** and **data collection/sharing** framework developed together with the coordination team



SCOPE, TIMELINE AND TASKS

Tasks

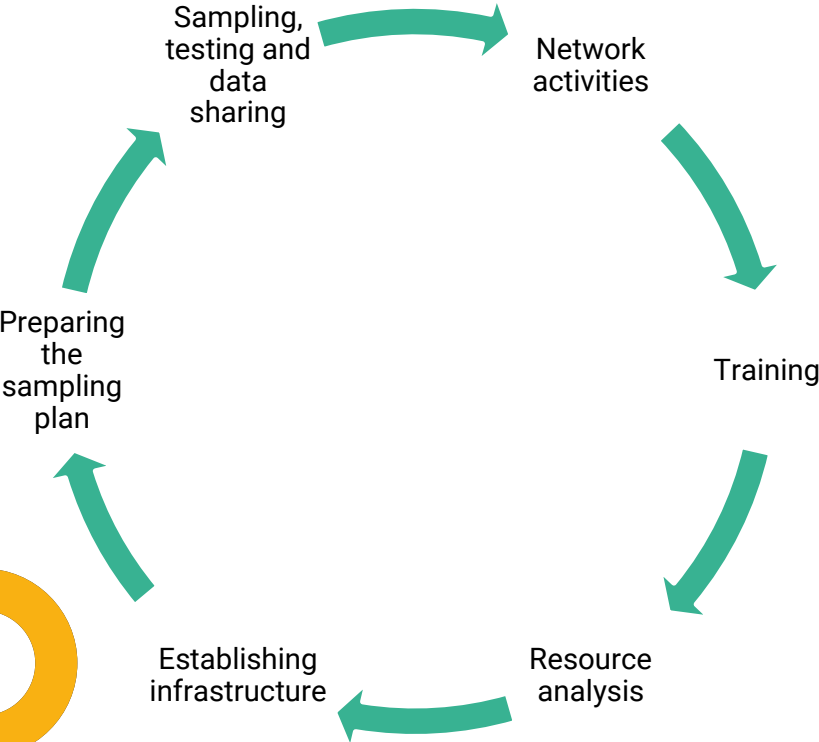
- Evaluating the established surveillance node by sampling and testing according to the developed sampling plan (hosts, sampling volumes, times of the year)
 - **Field work** (i.e. trapping/hunting and sampling wild birds/the environment)
 - **Screening** for HPAI viruses by rapid diagnostic methods (e.g. PCR)
 - **Whole genome sequencing**
- Real-time **data collection** and **submission** to the coordination team
- Preparation of a communication plan to keep national authorities involved and/or informed



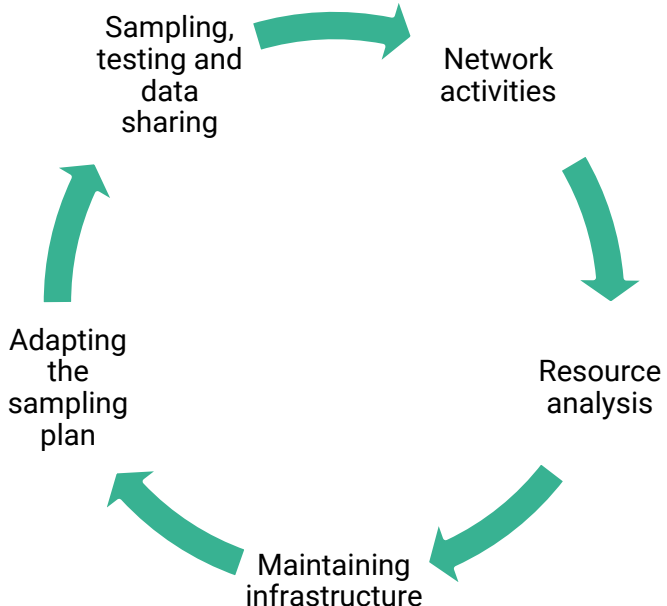
SCOPE, TIMELINE AND TASKS

Timeline

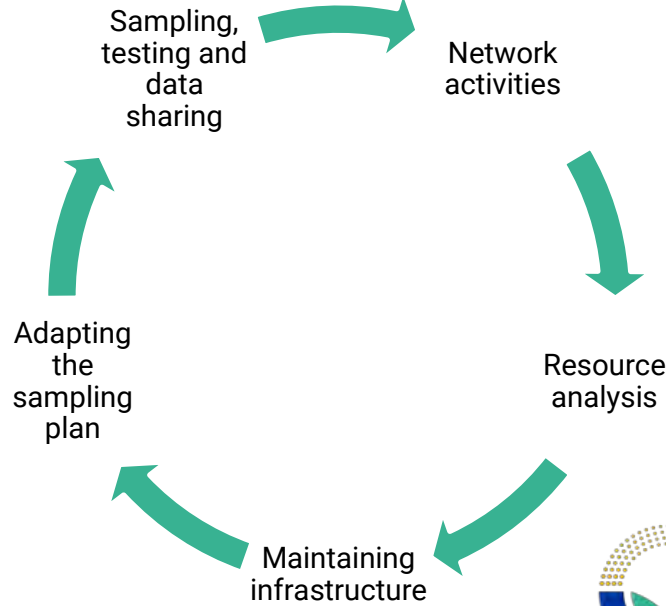
Year 1



Year 2



Year 3



SCOPE, TIMELINE AND TASKS

Coordination

- Management of network exchange and communication
- Organisation of annual network meetings
- **Training** and **guidance**
- Support in preparing **sampling plans**
- **Harmonisation** of sampling, testing and data collection across all surveillance nodes
- **Interpretation** and **communication** of **surveillance results**
- Regular **publication** of outputs on an open-access online platform and on EFSA's Knowledge Junction on Zenodo



FIRST MILESTONES



**KICK-OFF
MEETING,
FIELD
VISITS and
TRAINING**



FIRST MILESTONES



FIELDWORK



FIRST MILESTONES

NAME

SENTINEL Wild Birds

Surveillance Enhancement: reflects the project's focus on improving surveillance methods for avian influenza

Network: highlights the establishment of a collaborative network across Europe

Timely Influenza Notification: emphasises the early warning aspect of the system, crucial for preparedness and rapid response

Early Learning: captures the educational and research components aimed at understanding virus diversity and circulation patterns

SENTINEL Wild Birds

Home | Contact us | Sign in

Enhancing Avian Influenza preparedness in Europe

The European Food Safety Authority's (EFSA) Biological Hazards & Animal Health and Welfare (BIOHAW) Unit continuously collects data from European countries regarding detections of highly pathogenic avian influenza (HPAI) viruses in both domestic and wild birds, as well as in mammals. To enhance preparedness for HPAI in Europe, EFSA h... knowledge of circ...
DOCS CONTACT BLOG LOGIN

SENTINEL Wild Birds built

Nextstrain

Real-time tracking of pathogen evolution

- About us**
An open-source project to harness the scientific and public health potential of pathogen genome data
- Core pathogens**
Continually updated views of a range of pathogens maintained by the Nextstrain team
- SARS-CoV-2**
Up-to-date analyses and a range of resources for SARS-CoV-2, the virus responsible for COVID-19 disease
- Open source tooling**
Automated workflows, analysis tools and documentation for use by the community
- Nextclade**
In-browser phylogenetic placement, clade assignment, mutation calling and sequence quality checks
- Nextstrain Groups**
Datasets and narratives shared by research labs, public health entities and others

WEBSITE and ANALYTICAL APPROACH

<https://sentinelwildbirds.lnu.se/>



FIRST MILESTONES

Sampling results

Between August and November 2024, a total of 720 individual birds from 14 different species have been sampled in six countries (four different nodes) around Europe (Table 1). All samples were tested for HPAI. A total of 1101 samples were collected of which 479 were tracheal/oropharyngeal swabs, 378 cloacal swabs, 155 faeces, 81 feathers, 5 pooled organs, and 3 blood serum. Of all samples, 115 samples (10.4%) were positive for avian influenza of which 19 were positive for HPAI (1.7%; Figure 1; Table 2). All HPAI samples were sampled in Italy between September 24th and October 2nd.

The overall bird-level prevalence of avian influenza in sampled birds in the period was 14.2 %. The highest bird-level prevalence was found in Sweden (29.2 %; Table 1), and the Mallard was the species with most positive tested birds, however, all HPAI samples were found in the Eurasian Teal (Table 1 & 2).

Table 1 Total number of individual wild birds sampled (including recaptures of same birds), as well as number of individuals tested positive for avian influenza in the respective country (August-November 2024). The instar indicates the HPAI samples.

Group/species	Node 1 Finland		Node 1 Estonia		Node 2 Sweden		Node 2 Poland		Node 6 Austria		Node 7 Italy		Total	
	Ind.	Pos.	Ind.	Pos.	Ind.	Pos.	Ind.	Pos.	Ind.	Pos.	Ind.	Pos.	Ind.	Pos.
Waterfowl														
Mallard (individuals)	29	1	33	0	196	61	10	0			1	0	269	62
Eurasian Teal	1	0			84	21					77	18*	162	39
Eurasian Wigeon					1	0							1	0
Greater White-fronted Goose			81	0									81	0
Bean Goose			34	0									34	0
Greylag Goose			2	0									2	0
Barnacle Goose			147	0									147	0
Cormorants														
Great Cormorant					1	0			10	0			11	0
Rails														
Common Moorhen											3	0	3	0
Larids														
Black-headed Gull							4	0	1	0			5	0
Great Black-backed Gull					1	1		1	0				2	1
Lesser Black-backed Gull							1	0					1	0
Waders														
Common Ringed Plover					1	0							1	0
Eurasian Curlew									1	0			1	0
Total	30	1	297	0	284	83	16	0	12	0	81	0	720	102

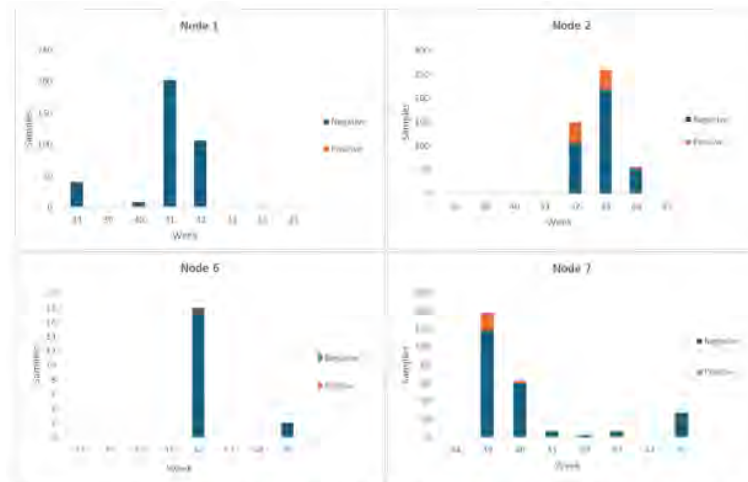


Figure 2 Weekly summary of samples collected from week 34 to 45, 2024. A total of 1101 samples (negative samples in blue; positive samples in orange) were collected at four nodes between August and November 2024, yielding 102 samples positive for avian influenza.

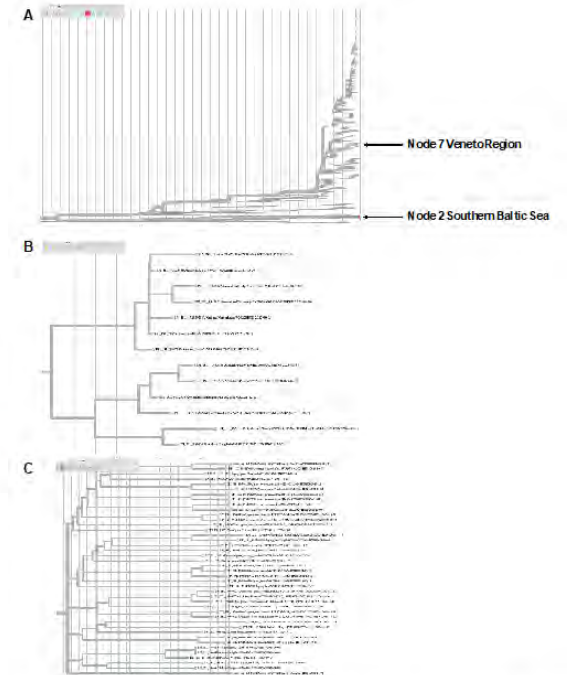
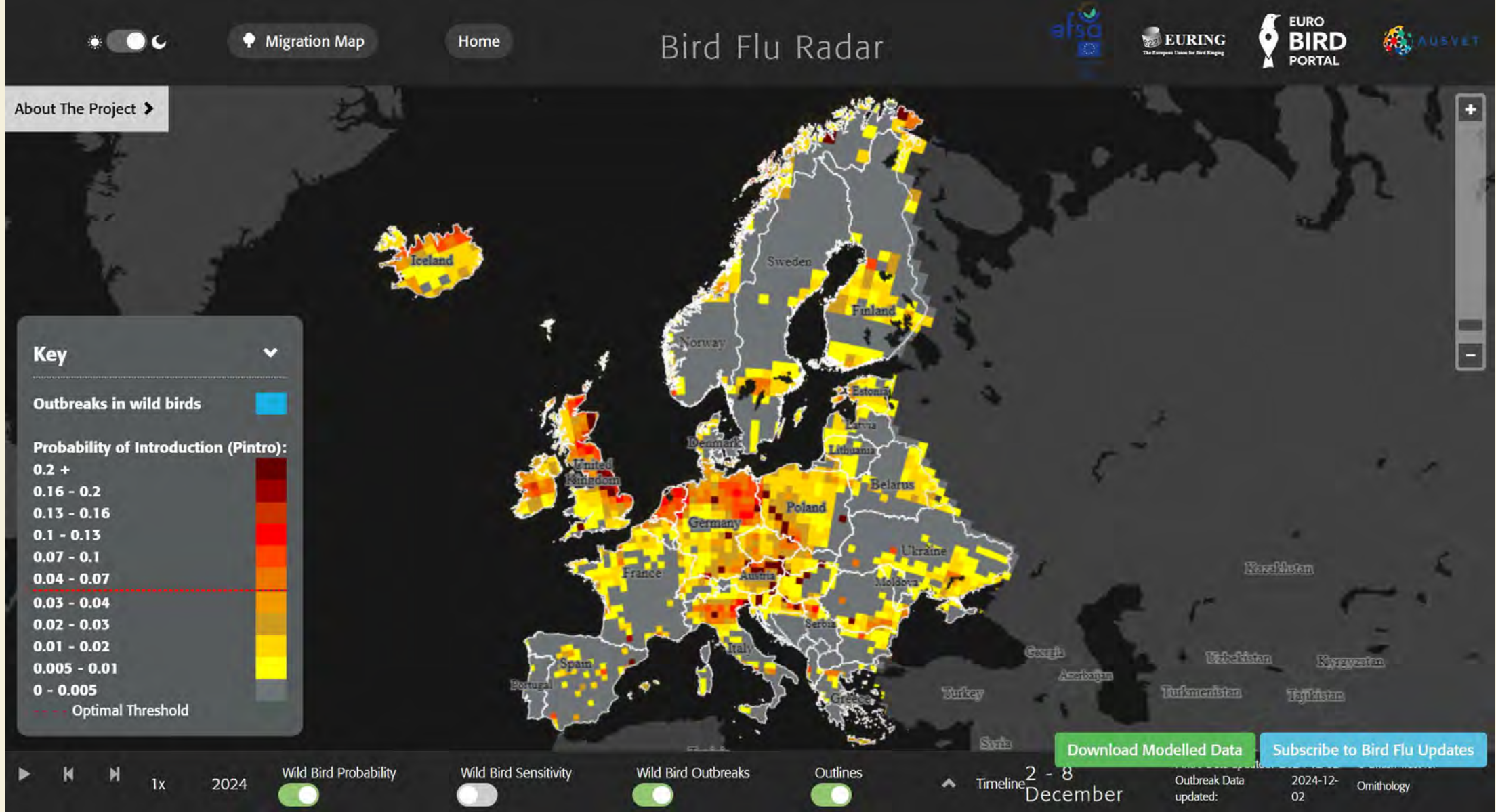


Figure 3 Phylogenetic analyses of the sequences generated by Node 2 Southern Baltic Sea and Node 7 Veneto Region. **A.** Image of the whole HA tree, with the sequences from Node 2 Southern Baltic Sea (EA-nonGsGd) and Node 7 Veneto Region (HPAIV 2.3.4.4b) highlighted. **B and C.** Zoom images of the HA tree showing the relatives of the sequences from Node 2 and Node 7, respectively.

MONTHLY REPORTS





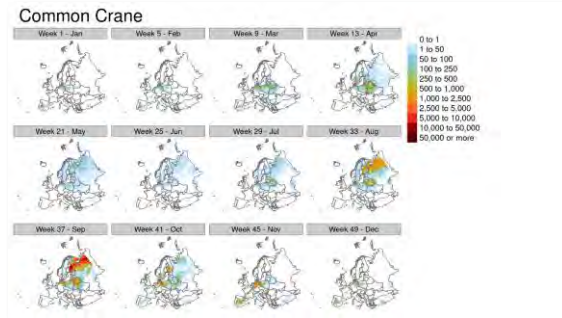
EFSA's Bird Flu Radar

<https://app.bto.org/hpai>



DEVELOPMENT OF THE BIRD FLU RADAR

Improvement of wild bird abundance and movement models



<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/sp.efsa.2024.EN-9114>

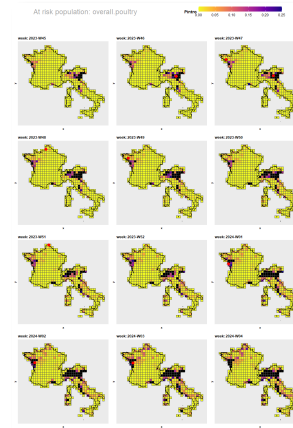
Development of the prototype version for poultry

October 2024

Testing the inclusion of weather and tracking data



Modelling of 13 additional wild bird species

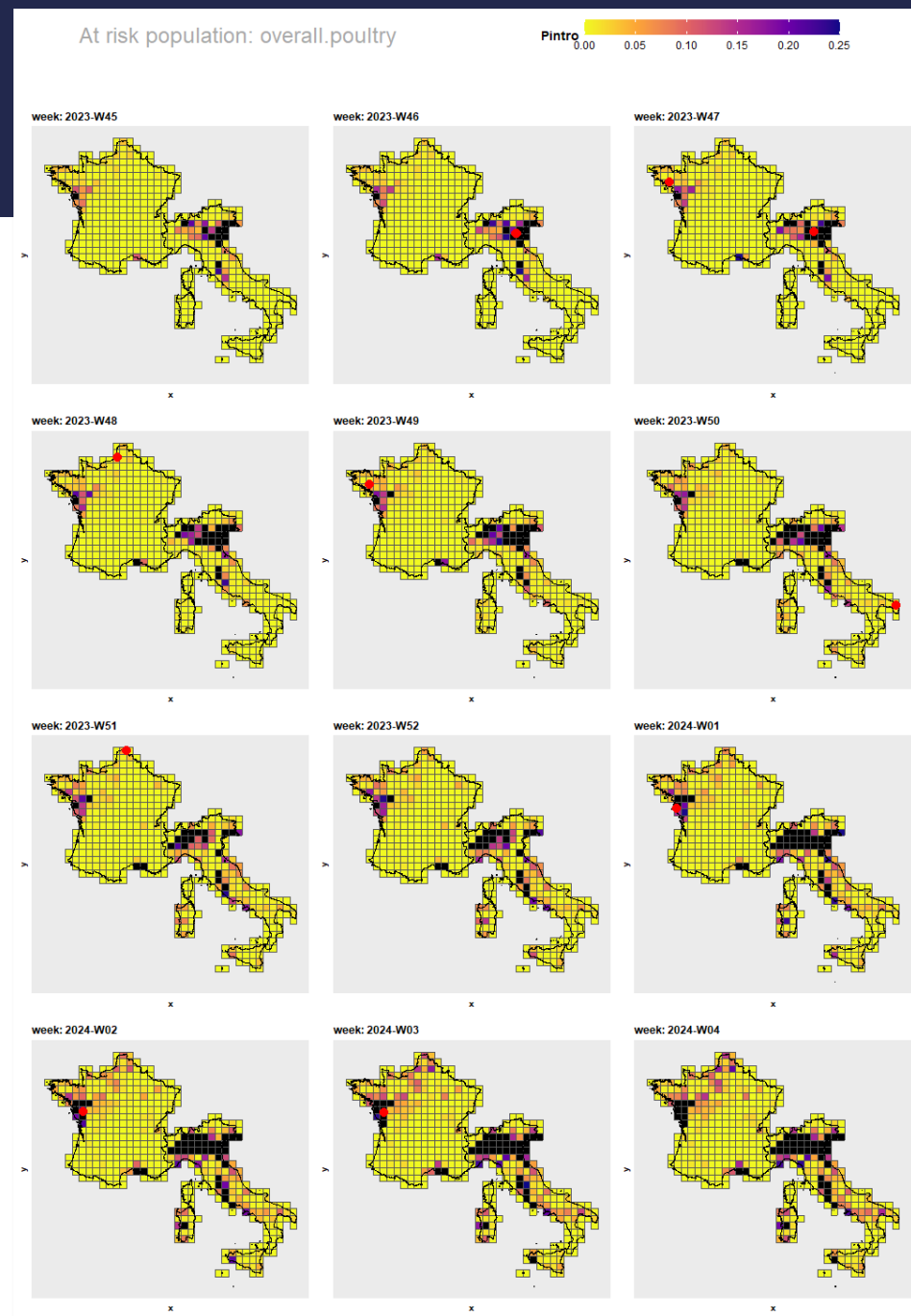


<https://efsa.onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2024.EN-9000>

PROTOTYPE POULTRY VERSION

Development of a risk assessment model for poultry

- **Italy** and **France** used as a case study to test the model performance over one year of data (February 2023 to March 2024)
 - Quality of the poultry population data submitted (information in indoor/outdoor access)
 - Number of HPAI outbreaks reported in poultry in the country during this time period
 - Geographical location



STAY CONNECTED

SUBSCRIBE TO

efsa.europa.eu/en/news/newsletters
efsa.europa.eu/en/rss
[Careers.efsa.europa.eu](https://careers.efsa.europa.eu) – job alerts



FOLLOW US ON TWITTER

[@efsa_eu](https://twitter.com/efsa_eu) [@methods_efsa](https://twitter.com/methods_efsa)
[@plants_efsa](https://twitter.com/plants_efsa) [@animals_efsa](https://twitter.com/animals_efsa)



FOLLOW US ON INSTAGRAM

[@one_healthenv_eu](https://www.instagram.com/one_healthenv_eu)



LISTEN TO OUR PODCAST

Science on the Menu – Spotify, Apple Podcast and YouTube



FOLLOW US ON LINKEDIN

[Linkedin.com/company/efsa](https://www.linkedin.com/company/efsa)



CONTACT US

efsa.europe.eu/en/contact/askefsa

