

HPAI-lessons learned from the field: Wadden Sea World Heritage Site

Dr. Kristine Meise
Common Wadden Sea
Secretariat (CWSS)
26 April 2024



United Nations
Educational, Scientific and
Cultural Organization



The Wadden Sea
World Heritage Site
since 2009



HPAI outbreak summer 2022

Large outbreak in **colonially** breeding birds in **coastal areas**.

Sandwich terns among the most affected species:

~17.000 birds found dead in colonies

Estimated: 17% mortality among adults (likely higher)

Minimal breeding success



United Nations
Educational, Scientific and
Cultural Organization



The Wadden Sea
World Heritage Site
since 2009

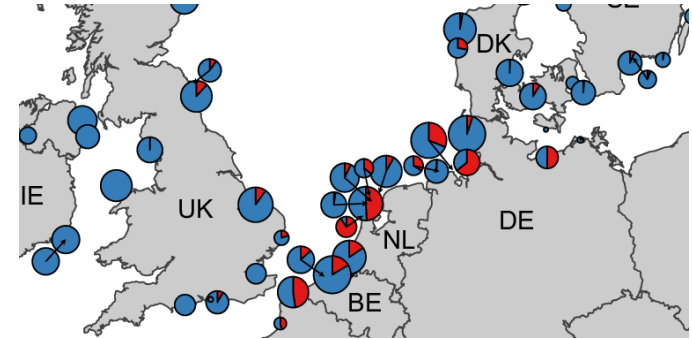


HPAI – responses

2022 Early **exchange** among researchers and site managers.

Workshop with experts from 9 affected countries to assess scale of the outbreak.

-> [Knief et al. 2024](#)



Reactive

2023 Joint ecological **risk assessment** with virologists, veterinarians, ornithologists and site managers.

→ Identify **exposure and risk pathways** to contain future outbreaks of HPAI in Sandwich terns.

Proactive

Risk questions

- 1) What is the likelihood of at least one breeding colony of sandwich terns (ST) in the Wadden Sea being exposed to HPAIV H5 through **direct contact with infected wild birds** between April and July this year?
- 2) ... through **indirect contact** (contaminated products/equipment) ... ?
- 3) ... through **contaminated environmental substrates** ... ?



Interdisciplinary risk assessment

Pathways for **entry** into a ST breeding colony

Pathways for **exposure** within the ST breeding colony

Likelihood of occurrence

Origin	Entry		
	Factor	Explanation	Likelihood
Conspecifics	Infected Sandwich tern from wintering ground	Infected sandwich terns migrate to the colony	Low (2)
	Infected Sandwich tern from another colony	Infected sandwich tern from another colony (prospecting behaviour)	Very high (5)



United Nations
Educational, Scientific and
Cultural Organization



The Wadden Sea
World Heritage Site
since 2009



Identification of highest risks

Origin	Entry		Exposure		Risk (score)
	Factor	Likelihood	Factor	Likelihood	
Conspecifics	Migrating bird (infected)	Low (2)	Sick bird	Very high (5)	Medium (3)
			Dead bird	Very high (5)	Medium (3)
	Visiting bird (infected)	Very high (5)	Sick bird	Very high (5)	Very high (5)
			Dead bird	Very high (5)	Very high (5)

Other **potentially high-risk** factors for ST:

- Heterospecifics, e.g. Black headed gulls (RQ1)
- Scientific equipment used during outbreaks (RQ2)
- Freshwater bodies / Faeces (RQ3)



Measures based on assessment

- 1) Prevent birds from breeding
- 2) Increase number of alternative sites and attract birds to sites
- 3) Remove carcasses
- 4) Establish compartments in the colony
- 5) Removing sick birds
- 6) Exchange about planned measures

Other important steps to consider
(health and safety, data collection)



Sandwich terns on Norderoog, Germany © Bernd Hillen/LKN SH

Management guidelines

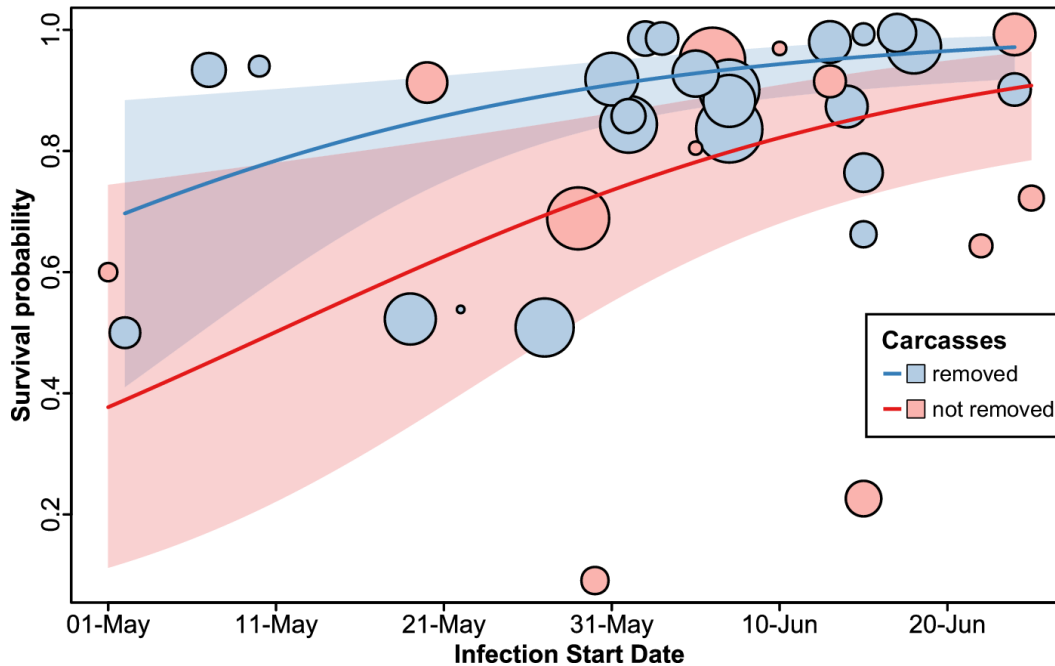
Mitigation and data collection strategies for avian influenza
in bird colonies in the Wadden Sea

Version: 1.0.2

Authors: Thomas Bregnballe, Kristine Meise, Florian Packmor

Bregnballe et al. 2023

Example: carcass removal in 2022



Mortality rates were 15% lower in sandwich tern colonies where carcasses were removed.

BUT: may not always be effective and biosecurity measures needed

Knief et al. 2024

Risk assessment and management

Species dependent: work with experts on the ecological and behavioural characteristics of the affected species.

Example: Open backyard chicken farms

Species	Entry		Exposure		Risk score
BHG	Direct contact with infected poultry at feeders	Medium (3)	depending on distance to colony and number of birds visiting farms	Medium (3)	Medium (3)
ST	Potential contact with infectious faeces unknowingly spread by farmers/tourists, bridge species foraging at farms	Very low (1)	Exposure risk depends on the number/behaviour of bridge species, proximity of farm to colonies	Low (2)	Low (2)

Site specific: different regulations and human behaviour

New information -> update risk assessment



United Nations
Educational, Scientific and
Cultural Organization



The Wadden Sea
World Heritage Site
since 2009



Current steps in the Wadden Sea

Explore population consequences for sandwich terns (Leyer 2024)

Exchange of information: ‚Avian Influenza‘ working group for partners along the East Atlantic Flyway

The screenshot shows the 'Wadden Sea World Heritage Exchange Platform' interface. At the top, there is a search bar, a user profile icon labeled 'KM', and a settings gear. Below the header, a navigation menu on the left lists 'Activities', 'Workgroups', 'Networks', 'News', 'People', and 'Materials'. A large blue icon with a document and a pencil is positioned below the menu. The main content area features a 'Back to workgroups overview' link, a circular profile picture of a bird, and the title 'Avian Influenza - updates'. The description states: 'This group provides a platform for site managers, researchers, conservationists, and veterinarians along the East Atlantic Flyway to exchange information about the Highly Pathogenic Avian Influenza (HPAI). This includes information about large mortality events as well as confirmed cases of HPAI, scientific results that help us to better understand the virus and its impact on waterbird populations, or the effectiveness of specific management measures. Please feel free to share links to publications and reports published recently, announcements of workshops and meetings or calls for collaborations.' Below the text, it says: 'If you have a colleague or collaborator who would like to become part of the group, please send an email to wsi@waddensea-secretariat.org with the name and contact details, and we will register the person to the exchange platform.' At the bottom of the post, there are two buttons: 'Leave group' and 'Unfollow'.



United Nations
Educational, Scientific and
Cultural Organization



The Wadden Sea
World Heritage Site
since 2009



THERE IS A PLACE – WHERE HEAVEN
AND EARTH SHARE THE SAME STAGE

Photo: Duff Development



OUR
WADDEN SEA
WORLD HERITAGE

Experience and help preserve a natural wonder
www.waddensea-worldheritage.org

