



UNDERSTANDING THE CONNECTIVITY
AND DYNAMICS OF AVIAN INFLUENZA

D1.1 Datasets for movements of waterbirds

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COMPILATION OF DATASETS ON INDIVIDUAL MOVEMENTS OF RELEVANT WATERBIRDS

SUMMARY

We have compiled individual **movement data** of relevant bird species. As relevant waterbird species, we consider those species that play a key role in the maintenance and dispersal of HPAI H5 viruses of clade 2.3.4.4, mainly waterbirds such as ducks, geese, and swans. Due to the dynamic situation of the current epidemic, the list of ‘relevant’ species needs to be constantly updated.

We have used the repository MoveBank (<https://movebank.org/>) - dedicated to individual movement data - to identify the datasets available, and if specific datasets were not freely accessible, contacted the data owners for access. Combining own data with data that has either been shared already, or been committed by collaborators has thus far resulted in data from 1,764 individuals of 16 priority species.

INTRODUCTION, METHODS AND KEY FINDINGS

To identify how migrations influence the spread and dynamics of HPAI, our first aim was to identify the waterbird species relevant to the spread and dynamics of avian influenza. For these species, we compiled existing movement data that will later on be analyzed with regard to their relations with environmental variables and for which simulation models will be run for predicting changes in migrations in response to changes in environmental variables.

We selected the following species within the respective groups:

- **Ducks:** Mallard, Eurasian wigeon, Eurasian teal, Northern pintail
- **Geese:** Greylag goose, Greater white-fronted goose, Pink-footed goose, Barnacle goose, Brent goose
- **Swans:** Bewicks’ swan, Whooper swan
- **Shorebirds:** Black-tailed godwit, Red knot, Curlew
- **Cranes:** Eurasian crane
- **Gulls:** Black-headed gull, Lesser black-backed gull, European herring gull

This list contains species that are representative for their species group, and includes partial migrants, short-distance, medium-distance, as well as long-distance migrants. All of them occur in Europe and are well-studied, providing us with the possibility of using existing movement and ornithological data that have been collected by various researchers.

We have used the data repository – MoveBank <https://www.movebank.org/cms/movebank-content/data-repository> to identify suitable existing datasets for each of these species. The following table gives an overview of movement datasets each species that have been compiled for use in KAPPA-FLU, or where a data-sharing agreement are in the process of being established. Note that all data are located on the Movebank database, and will be published alongside studies arising from KAPPA-FLU.

Table 1 contains an overview over these species, including samples sizes of individuals for which we have acquired remote tracking data as of April 26, 2024. These tracking data sets have either been collected by participants in WP1 as part of previous projects, or by collaborators who are not part of KAPPA-FLU. These



collaborators have either already signed a data sharing agreement and given us access to the respective data or have committed to do so. We further listed published data sets for which author consent will be acquired. Note that the amount of data available for the species in Table 1 over the course of the KAPPA-FLU project as new collaborations are established.

Table 1 Compilation of datasets on individual migration of relevant waterbirds. Shown are the species group, binomial and common name for each species, as well as the number of individuals from which remote tracking data have either been collected by participants in WP1, or have been shared with us by collaborators. Numbers in parentheses indicate published data sets. Data on additional species for a comparative study of waterfowl on the Northern hemisphere are also available.

Group	Binomial name	Common name	Sample size
Ducks	<i>Anas acuta</i>	Northern pintail	153
	<i>Anas crecca</i>	Eurasian teal	83
	<i>Anas platyrhynchos</i>	Mallard	288
	<i>Mareca penelope</i>	Eurasian wigeon	142
Geese	<i>Anser albifrons</i>	Greater white-fronted goose	312
	<i>Anser anser</i>	Greylag goose	235
	<i>Anser brachyrhynchus</i>	Pink-footed goose	60
	<i>Anser fabalis</i>	Bean goose	22
	<i>Branta bernicla</i>	Brent goose	105
	<i>Branta leucopsis</i>	Barnacle goose	66
Swans	<i>Cygnus columbianus</i>	Bewick's swan	35
	<i>Cygnus cygnus</i>	Whooper swan	77
Cranes	<i>Grus grus</i>	Common crane	(0)
Gulls	<i>Chroicocephalus ridibundus</i>	Black-headed gull	62
	<i>Larus argentatus</i>	European herring gull	(70)
	<i>Larus fuscus</i>	Lesser black-backed gull	276
Waders	<i>Calidris canutus</i>	Red knot	(33)
	<i>Limosa limosa</i>	Black-tailed godwit	(30)
	<i>Numenius arquata</i>	Eurasian curlew	(244)