

# The Eurasian African bird migration atlas – a dream coming through and a step towards the CMS Global Migration atlas

Fernando Spina<sup>1</sup>, Roberto Ambrosini<sup>2</sup>, Stephen Baillie<sup>3</sup>, Franz Bairlein<sup>4</sup>,  
Niccolo' Fattorini<sup>2</sup>, Sam Franks<sup>3</sup>, Caterina Funghi<sup>1</sup>, Tom Romdal<sup>5</sup>,  
Kasper Thorup<sup>5</sup>

1: ISPRA Italy – 2: University Milano Italy – 3: BTO UK – 4: IFV Vogelwarte Germany – 5: SNM Denmark



# Euring

Co-ordinating bird ringing throughout Europe

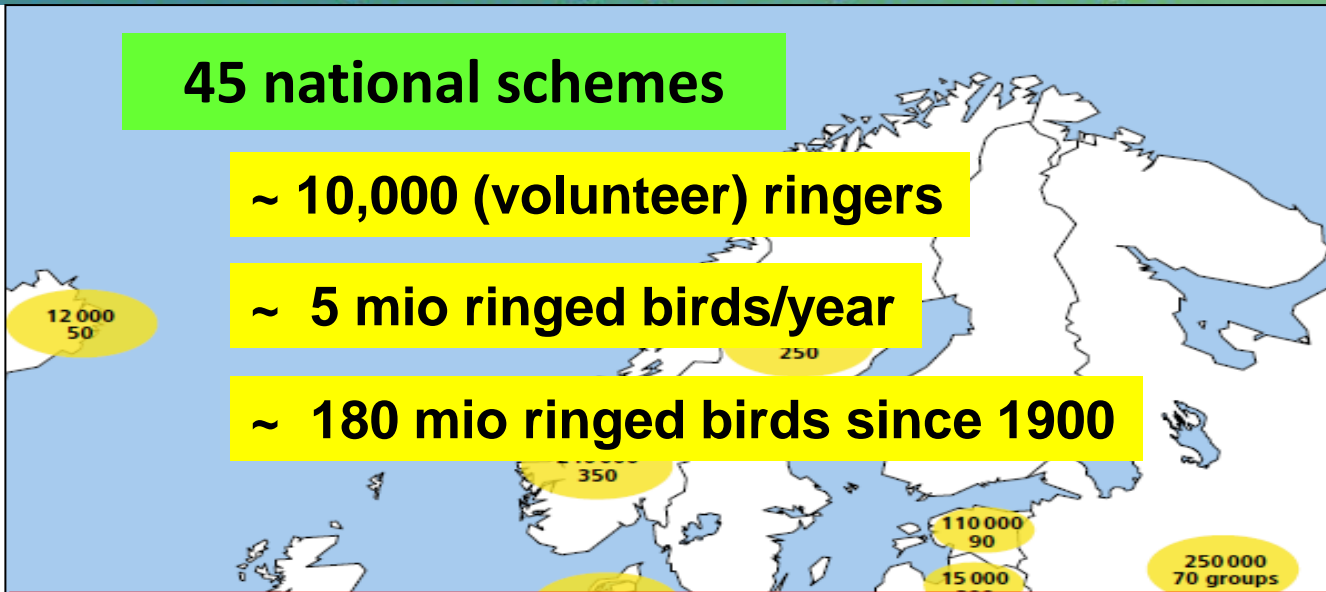


45 national schemes

~ 10,000 (volunteer) ringers

~ 5 mio ringed birds/year

~ 180 mio ringed birds since 1900



***Hans Christian Mortensen  
Viborg (DK), 5.6.1899,  
'aluminium ring Viborg 1'***

## EURING Databank

Total number of records: 24,870,819

Total number of species 621

- many (most) species
- wide geographical coverage
- historical data
- recovery details (causes)



**A unique data set, an amazing potential for analyses**

**movement ecology, connectivity...**

**...phenology, distribution, habitat use.....**

**...demography, survival, dispersal....**

**...migration vs climate change....**

**...conservation....**

**...management...**

**... BIG HOPES....  
FOR....  
A BIG ATLAS!**

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# European Bird Migration Atlases

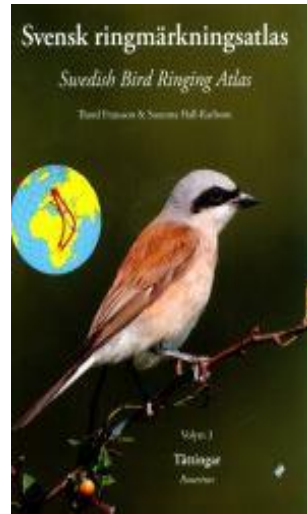
<https://euring.org/research/migration-atlases>



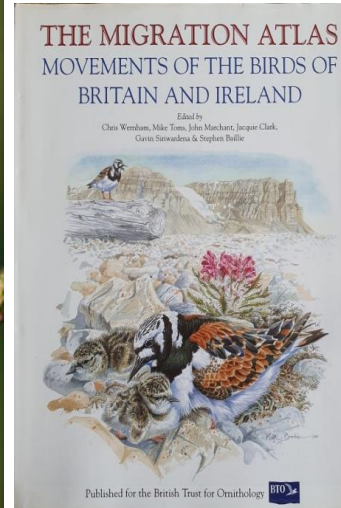
Germany 1931



Songbirds 1973-1995



Sweden 2001-2008



Britain & Ireland 2001



Norway 2003-2006



Denmark 2006



Italy 2008-2009



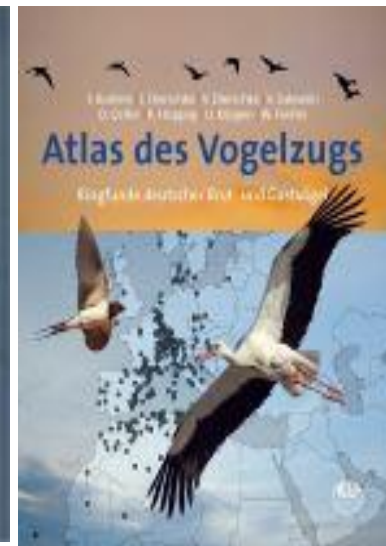
Hungary 2009



Finland 2013-2015



Croatia 2013



Germany 2014



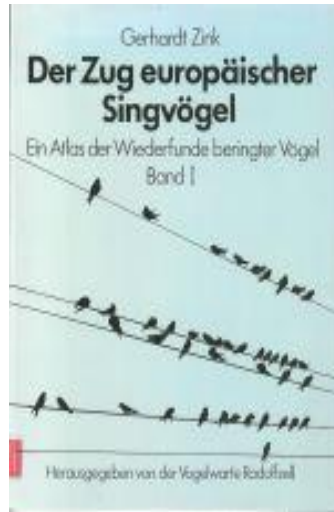
Serbia 2018

# European Bird Migration Atlases

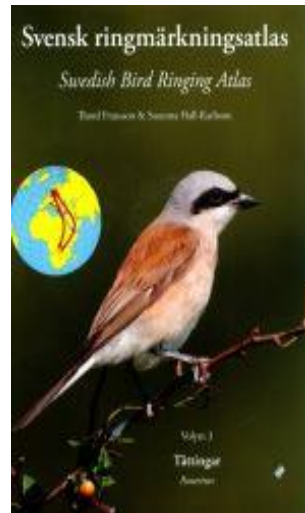
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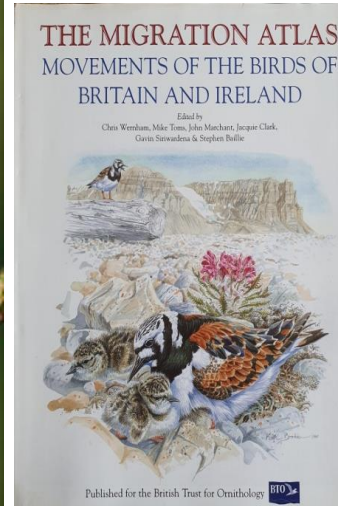
Germany 1931



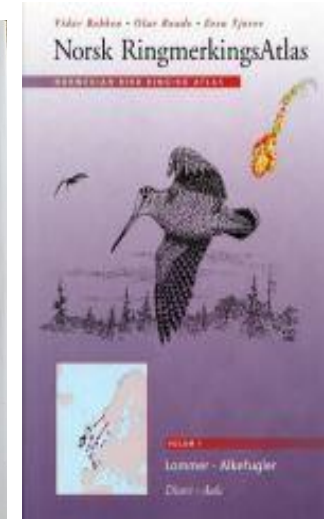
Songbirds 1973-1995



Sweden 2001-2008



Britain & Ireland 2001



Norway 2003-2006



Denmark 2006

**But the „big one“ still a dream.....**

**....however, a growing expertise in recovery atlases across the EURING community**



Italy 2008-2009



Hungary 2009



Finland 2013-2015



Croatia 2013



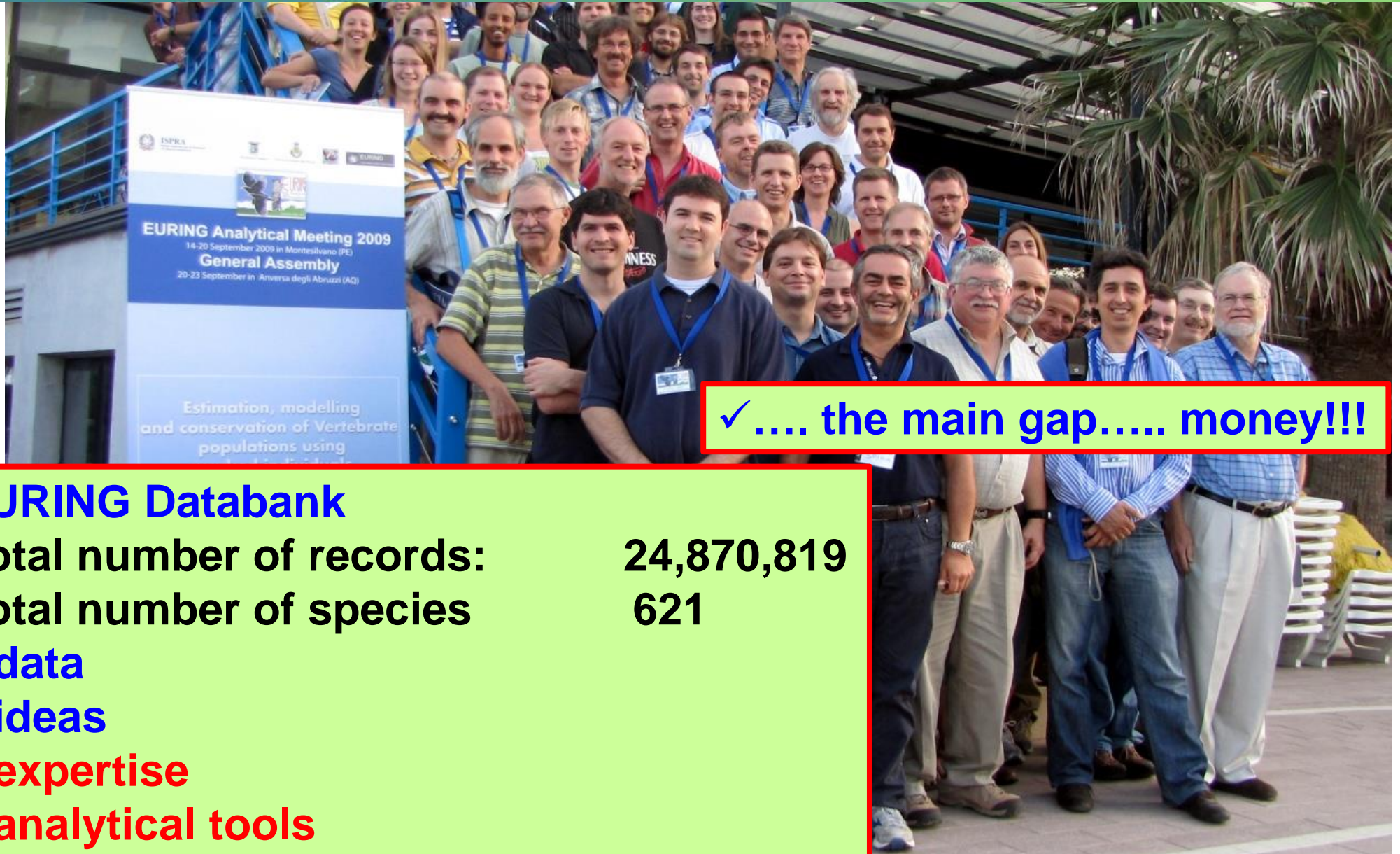
Germany 2014



Serbia 2018

# Euring

Co-ordinating bird ringing throughout Europe



✓ .... the main gap..... money!!!

## EURING Databank

Total number of records: 24,870,819

Total number of species 621

- ✓ data
- ✓ ideas
- ✓ expertise
- ✓ analytical tools



**A long series of attempts during many years**

**by different scientific institutions within the EURING constituency**

**in e.g., CH, UK, DK, D, NLA, IT.....**

**towards Governments...**

**... Research Councils ...**

**... private Foundations....**


## **EURING Databank**

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# ENVIRONMENT

European Commission

European Commission > Environment > Nature & Biodiversity

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- Implementation
- Liability
- Crime
- Infringement cases
- Governance – Aarhus



**...the EU (ENV, RES)....**

**NATURE & BIODIVERSITY**

- EU Biodiversity Policy
- EU Nature Legislation

## Key Concepts document on Period of Reproduction and prenuptial Migration of huntable bird Species in the EU

The Commission and the Committee of representatives of Member States for the adaptation to technical and scientific



**EARLY '90IES FIRST PROPOSAL FOR A EURING ATLAS TO THE EU COMMISSION**

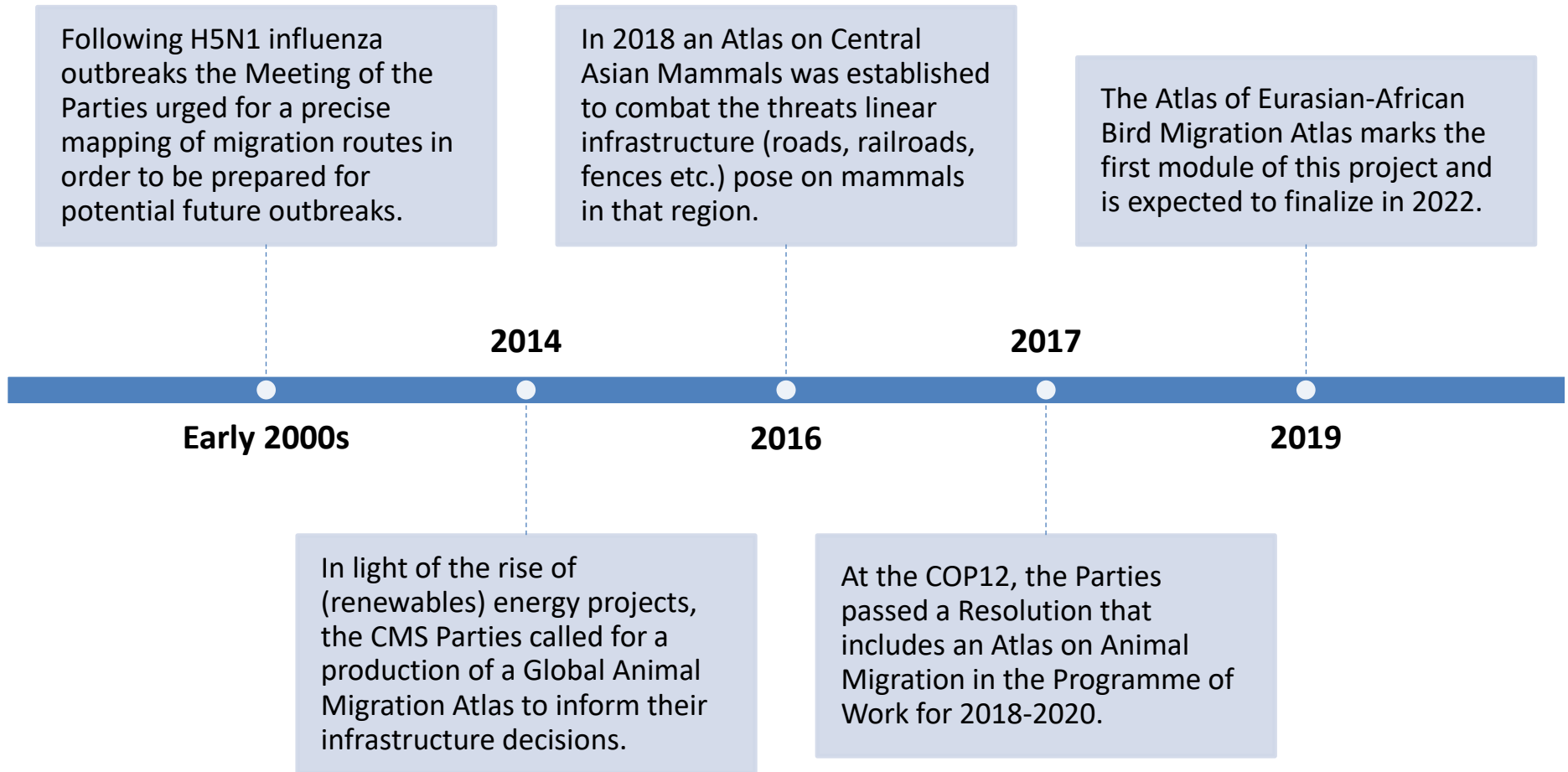
Invasive Alien Species  
22), which concluded that complete protection of huntable species must be guaranteed during these periods. A review of the best available information on the period of prenuptial migration and reproduction of each huntable species for each where that species occurs was first carried out in 2001 and approved by the ORNIS Committee; it provides



# THE UNEP/CMS CONVENTION ON MIGRATORY SPECIES



# Background and Timeline





4/9  
Nov  
2014  
Quito  
ECUADOR



**TIME FOR ACTION**  
**CMS·COP 11**



# CMS Birds of Prey MoU



*Proposal to Nick  
seed funds from Raptors MoU for a pilot study on  
human-related mortality along flyway*

*Fernando Spina, Franz Bairlein, Volker Salevski*



# **BIRD MIGRATION ATLAS (EURING, MOVEBANK)**

**as a first component of the**

## **CMS GLOBAL ANIMAL MIGRATION ATLAS**

**(analytical process and models, presentation of results, web tools)**

**and a contribution to several CMS instruments & initiatives**

**proposal made to and considered by CMS**

**Scientific Council**

**Standing Committee**

**Conference of the Parties**

**Included in CMS Strategic Plan**





# CMS Strategic Plan

## THE GLOBAL ATLAS OF ANIMAL MIGRATION

**some further years of stubbornness and a good dinner.....  
Italian Ministry of the Environment**





CMS

Convention on the Conservation of Migratory Species of Wild Animals

About

Documents

Activities

Species

Publications

CMS instruments

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## Italian Government Champion Animal Migration Atlas



Ms. Laura Cerasi, CMS Fundraising & Partnerships Programme Officer and Ms. Maria Carmela Giarratano, Director General for Nature and Sea Protection, Italian Ministry of the Environment, Land and Sea

**Spring 2017: direct and positive contacts with the Italian Minister and Ministry of the Environment**

**July 2017, Italy pledges CMS 1M€ for the Eurasian-African Migration Atlas**

Country:

**15 yrs after first attempts...**



**“To this end, the Eurasian-African Bird Migration Atlas will be based on bird movement data provided by EURING and will lay the foundation for the integration of further datasets”.**

African-Eurasian region over the course of three years. The atlas responds to the needs of the Convention and its family, and is expected to be a stepping stone to the creation of a Global Animal Migration Atlas. To this end, the African-Eurasian Bird Migration Atlas will be based on bird movement data provided by the EURING

**MANILA • PHILIPPINES  
23-28 OCTOBER 2017**

# CMS COP 13 – INDIA FEBRUARY 2020

## SLOGAN ON CONNECTIVITY - ATLAS FULLY AKNOWLEDGED

17 - 22 FEBRUARY  
**2020**  
GANDHINAGAR  
**INDIA**



**ITALY FLYWAY CHAMPION**

*"Migratory Species connect the planet and together we welcome them home"*



# CMS/EURING Migration Atlas - main components

- **Ring recovery collation and validation** - Sam Franks, Dorian Moss, Justin Walker, Stephen Baillie (BTO/EDB)
- **Tracking data – Movebank** – Wolfgang Fiedler, Sarah Davidson
- **Development of web tools and solutions** – Justin Walker, Mark Hammond, Daniel Higgins, William Skellorn, Sam Franks, Stephen Baillie (BTO)
- **Mapping** – Sam Franks, Stephen Baillie (BTO)
- **Species accounts** – Juan Arizaga (San Sebastian), Frédéric Jiguet (Paris), Boris Nikolov (Sofia), Henk van der Jeugd (NIOO)

## CMS/EURING Migration Atlas – analysis modules

- **Migration seasons of hunted species** – Franz Bairlein (IAR), Roberto Ambrosini (Milano University)
- **Analysis of killing of birds by man** – Caterina Funghi, Fernando Spina (ISPRA)
- **Connectivity analysis** – Niccolò Fattorini, Roberto Ambrosini (Milano University)
- **Changes in migration patterns** – Tom Romdal, Kasper Thorup (Denmark)



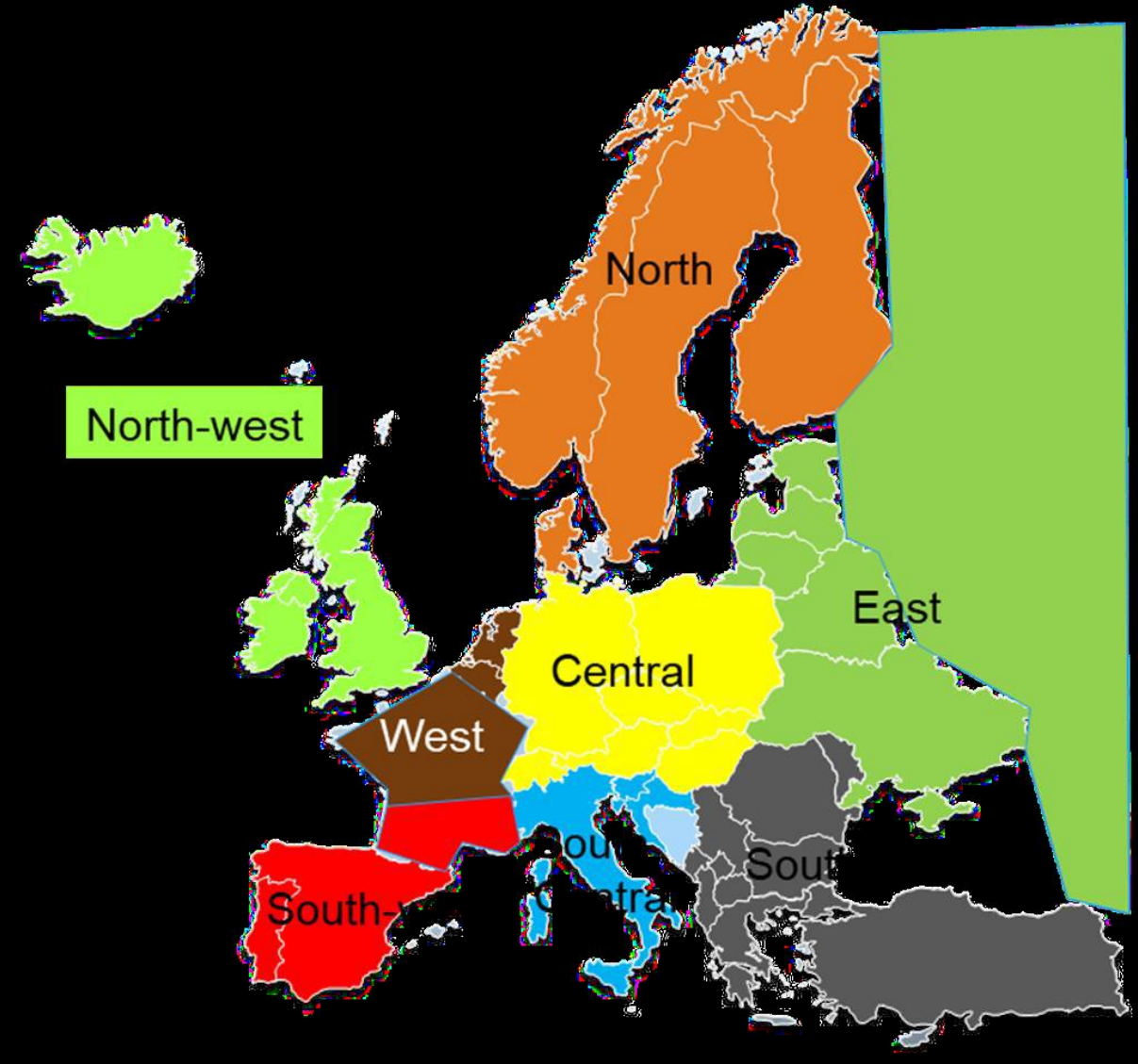
# CMS/EURING Migration Atlas - main components

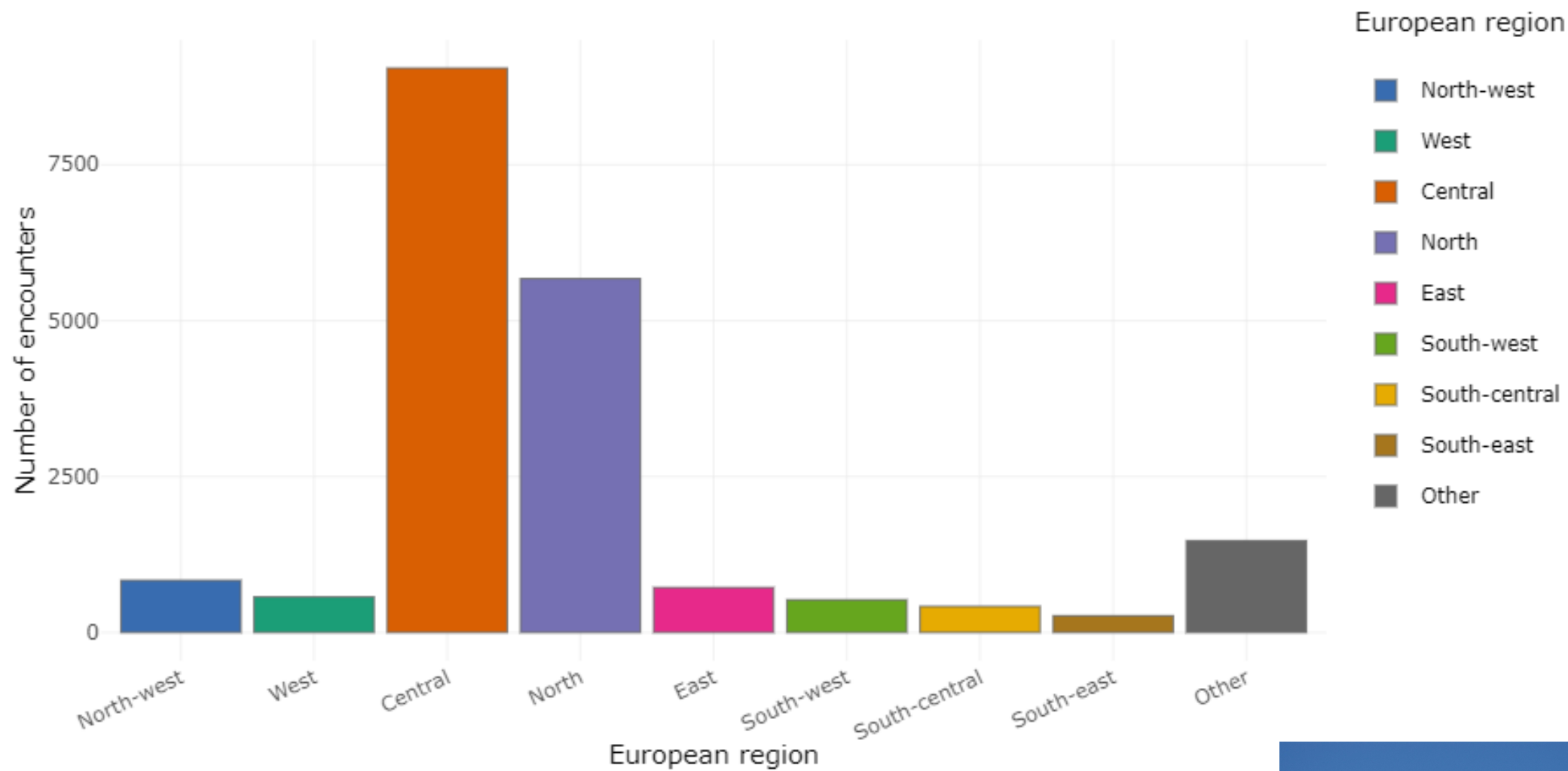


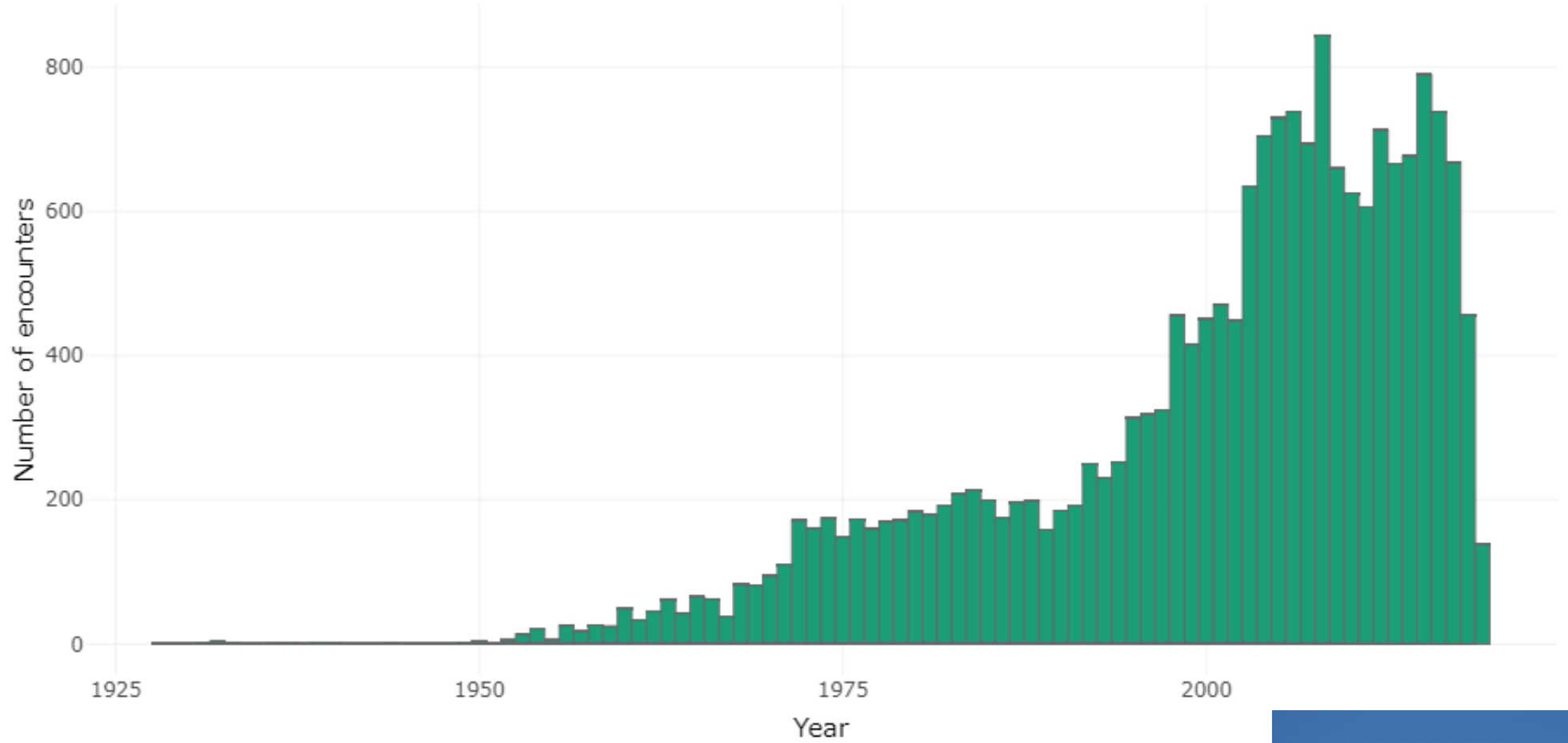
➤ **Mapping** – Sam Franks, Stephen Baillie (BTO)

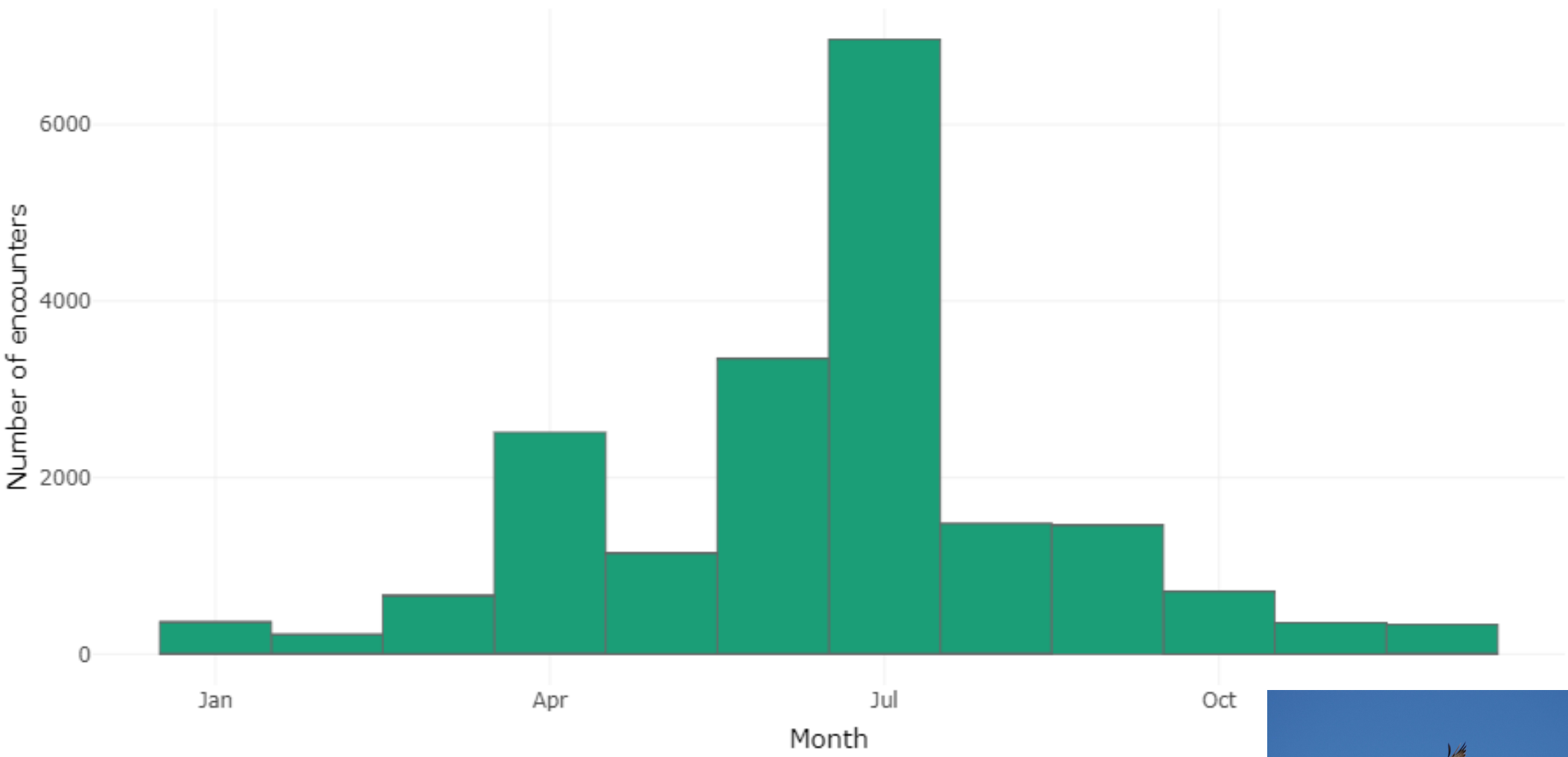
➤ **> 300 species!**

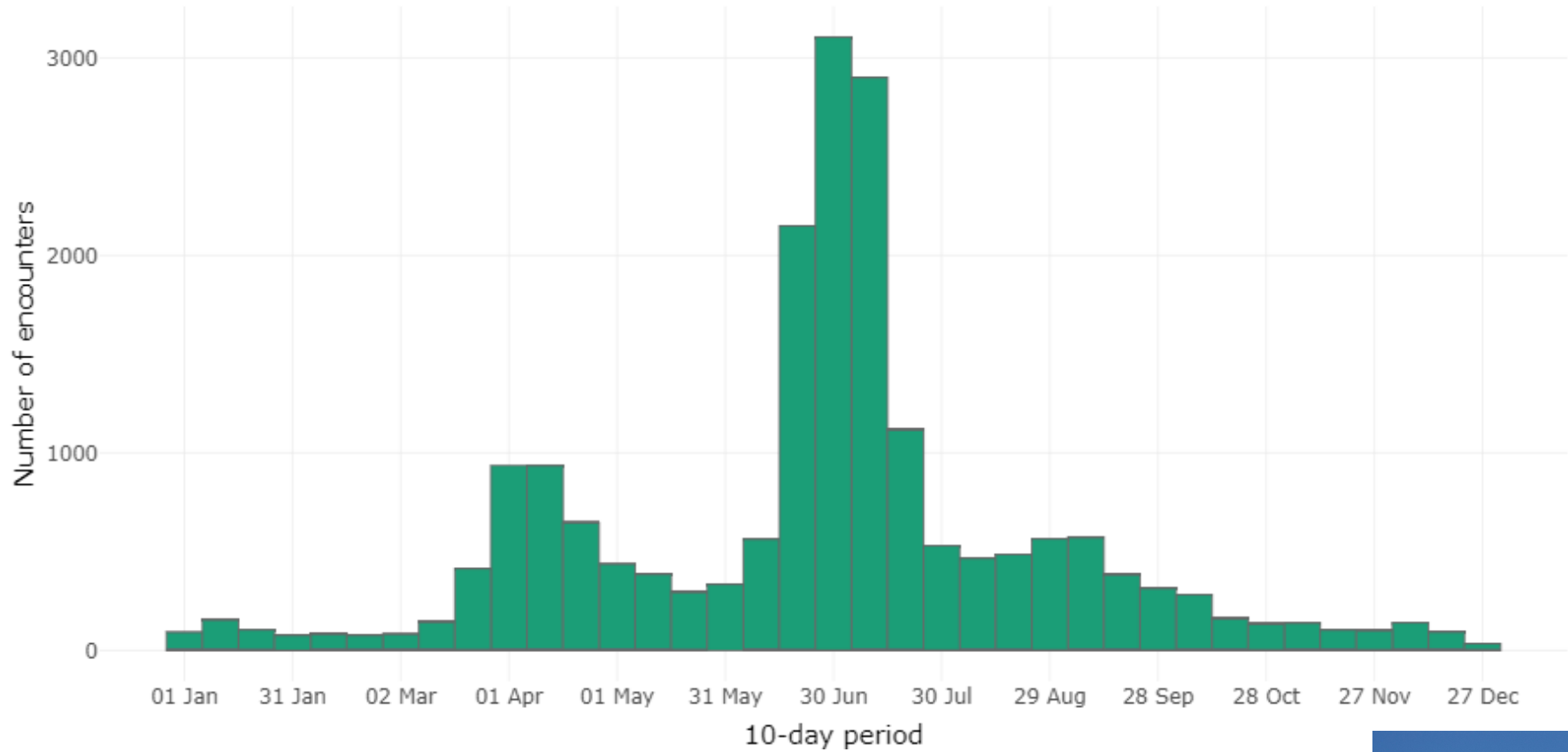


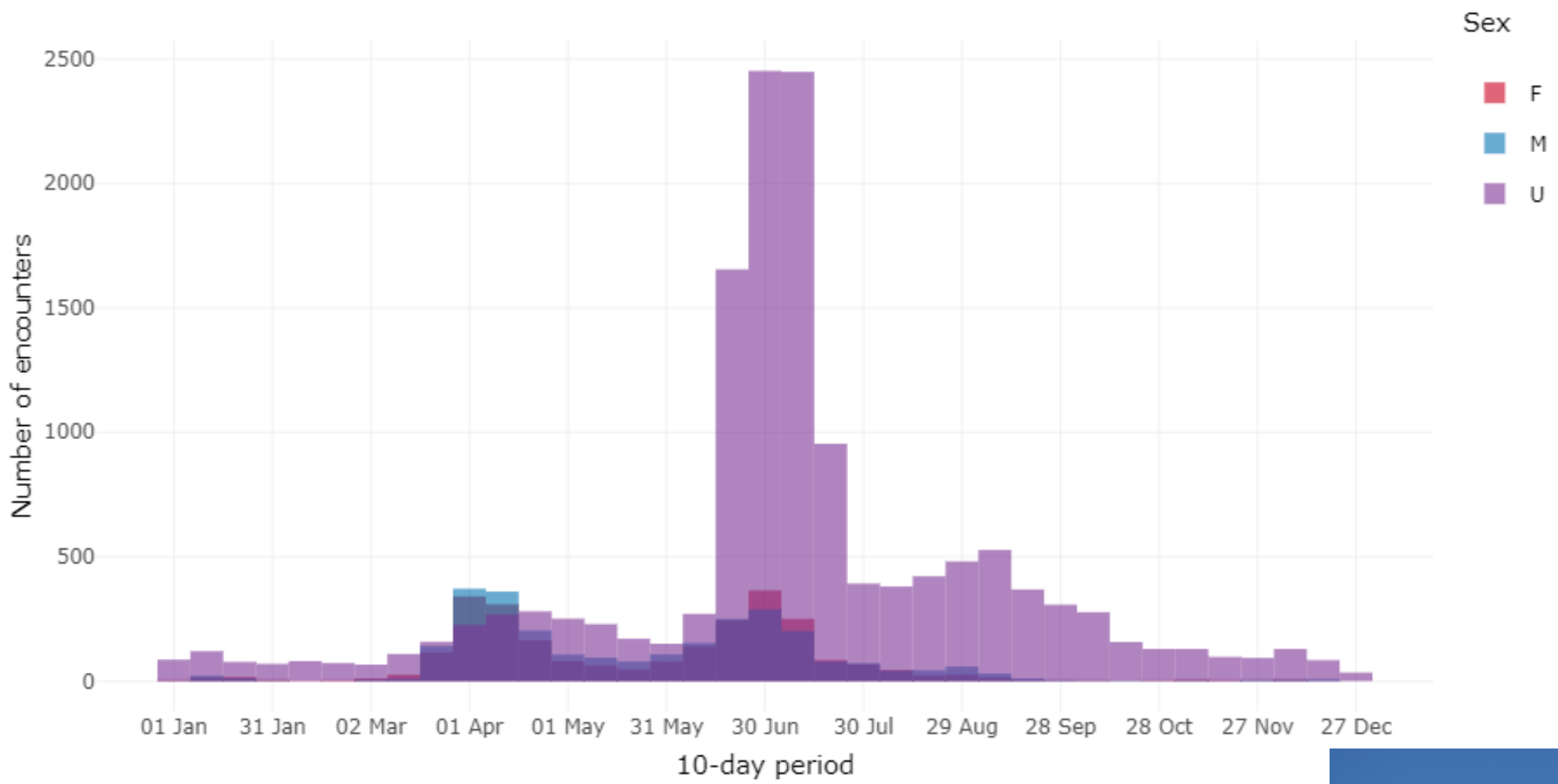




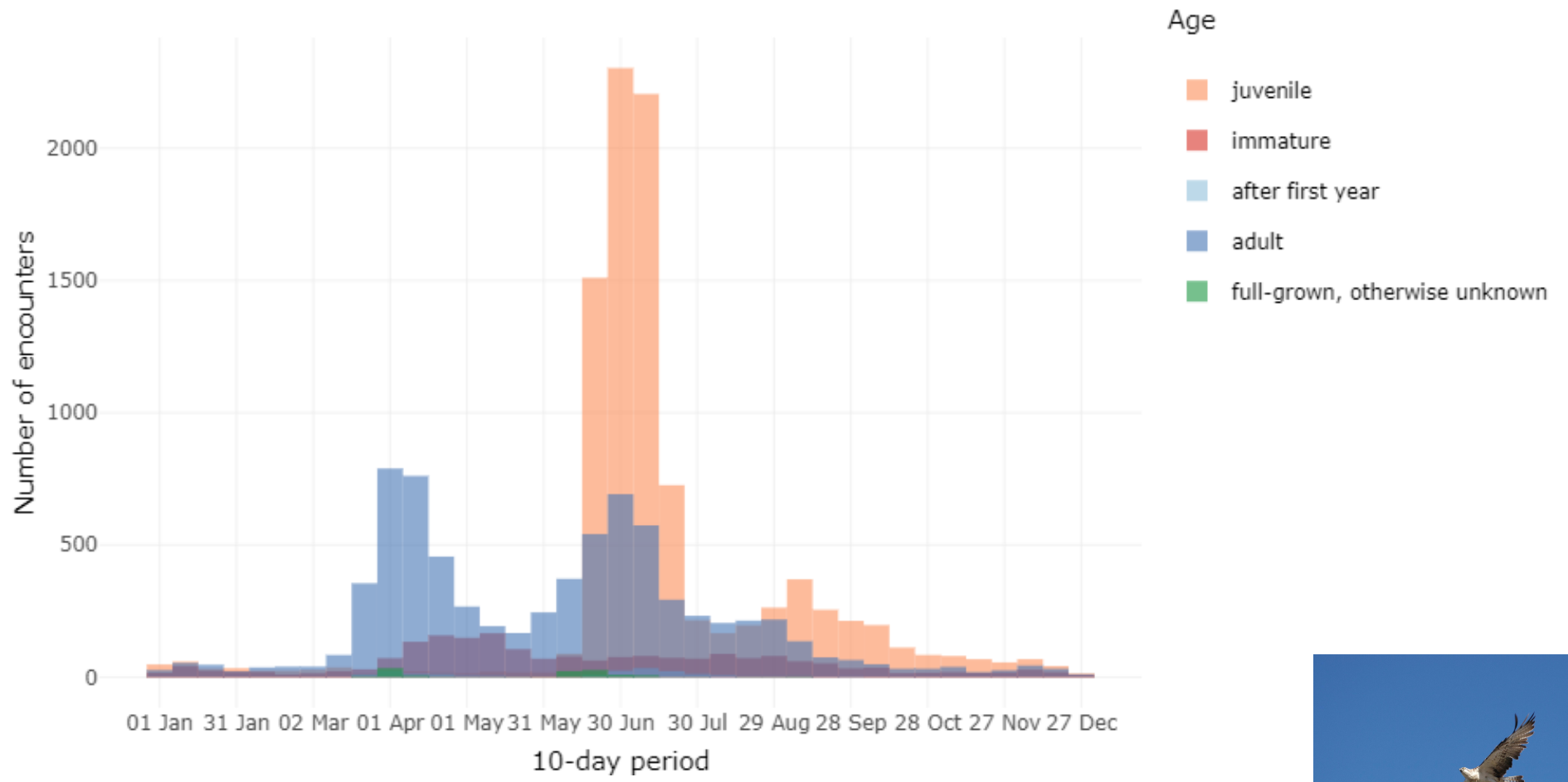






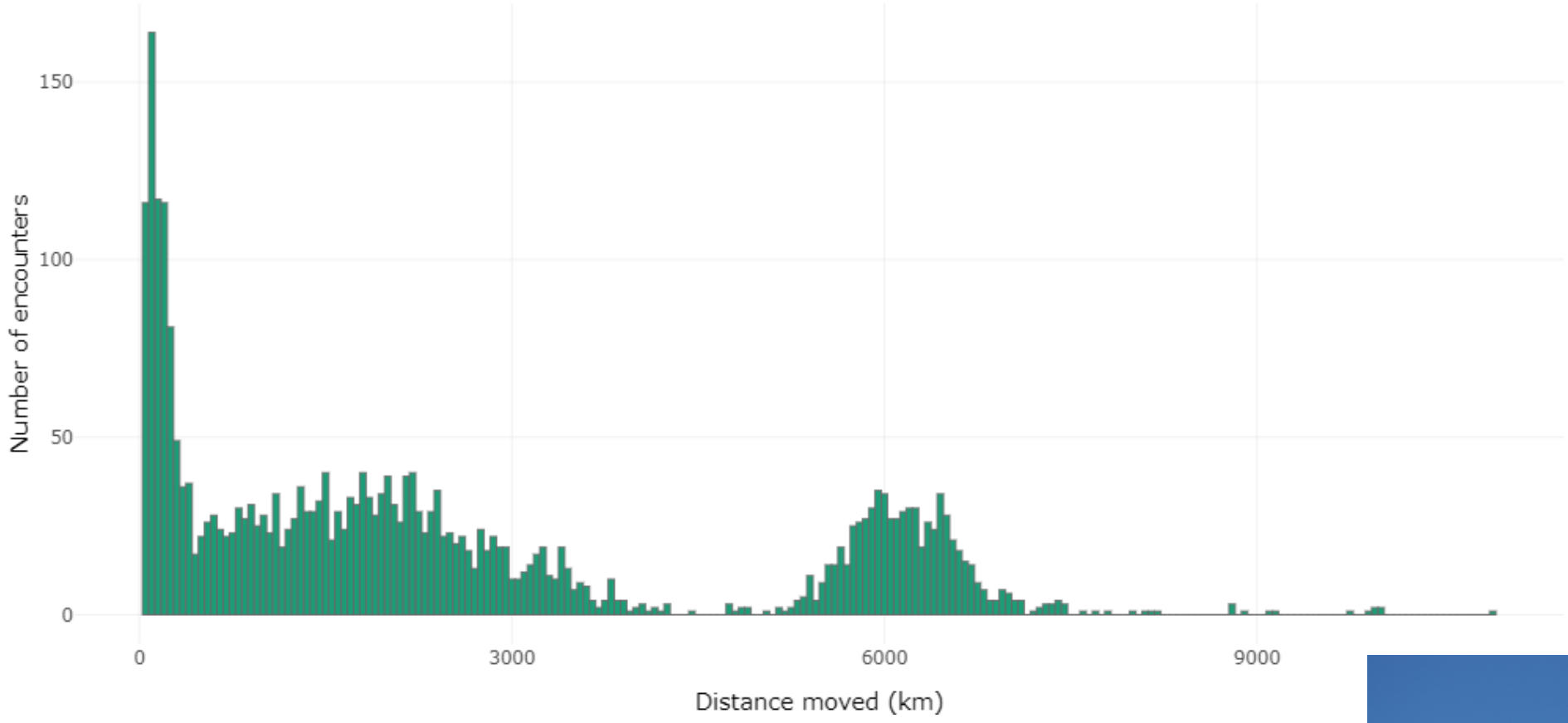


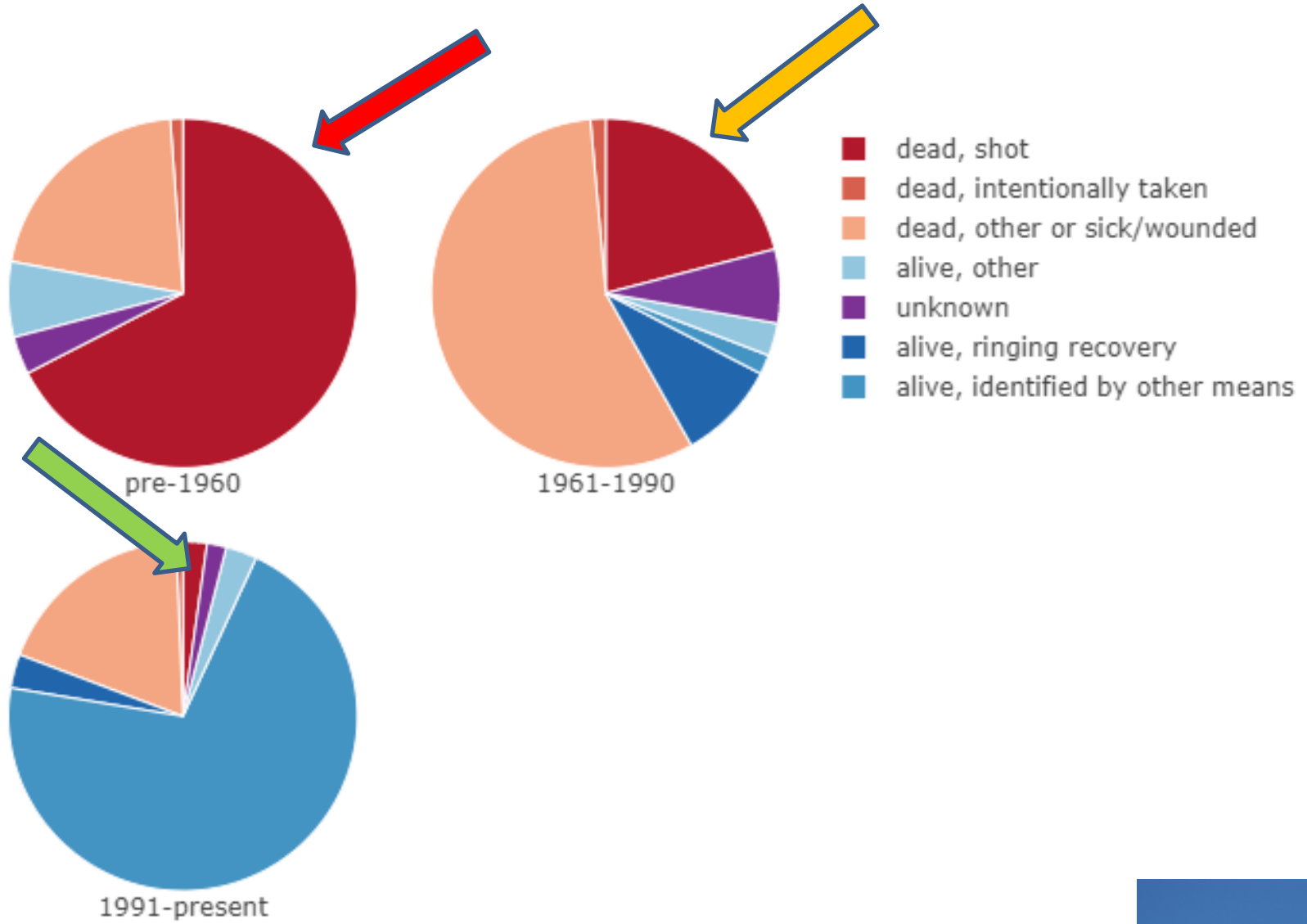






North







FILTER MAP

Ringling Region of Origin

- Central
- East
- North
- North-west
- South-central
- South-east
- South-west
- West
- NA

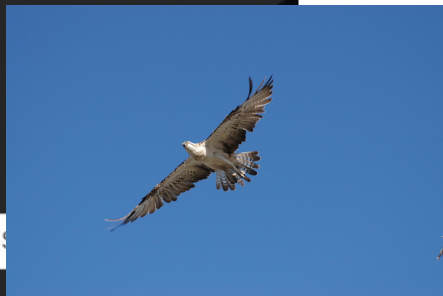
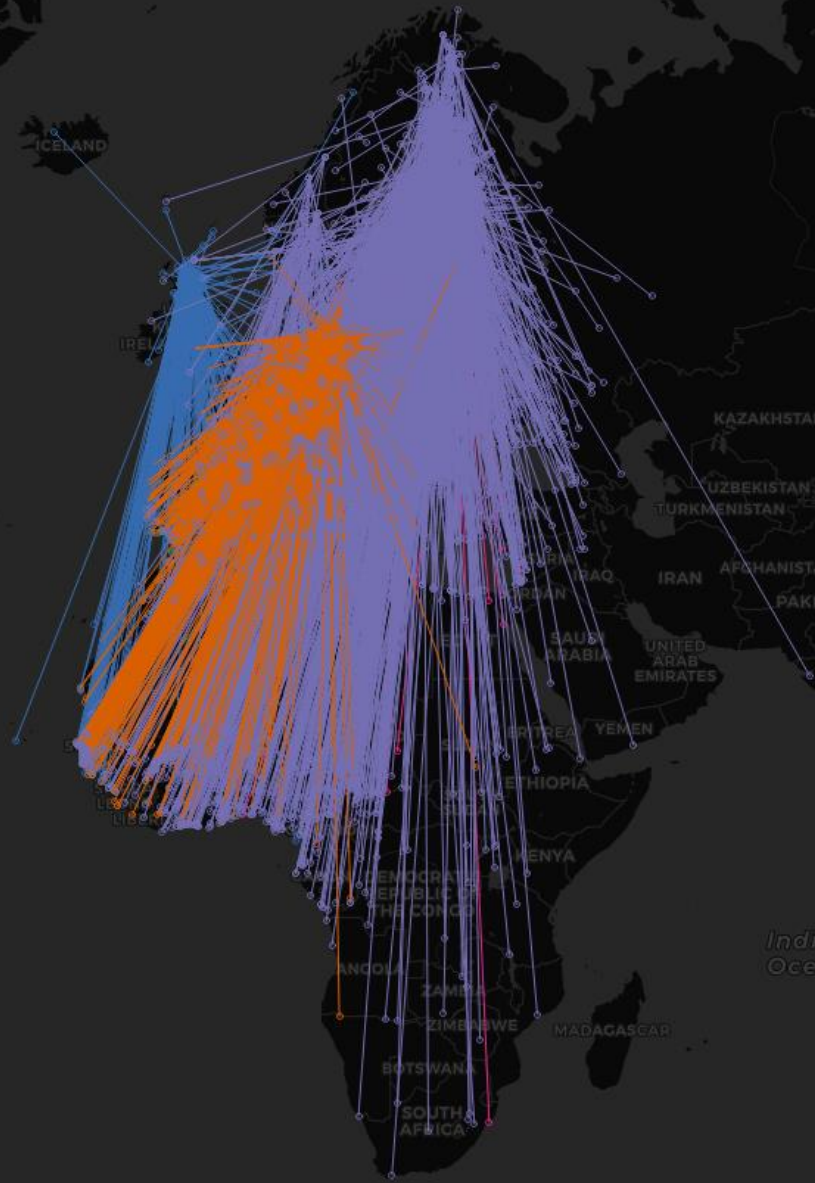


Map Key

Ringling Region

- Central
- East
- North
- North-west
- South-central
- South-east
- South-west
- West
- Other

Close





FILTER MAP

Ringling Region of Origin

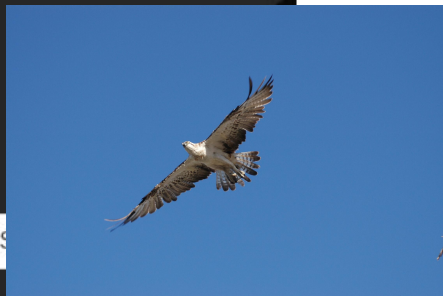
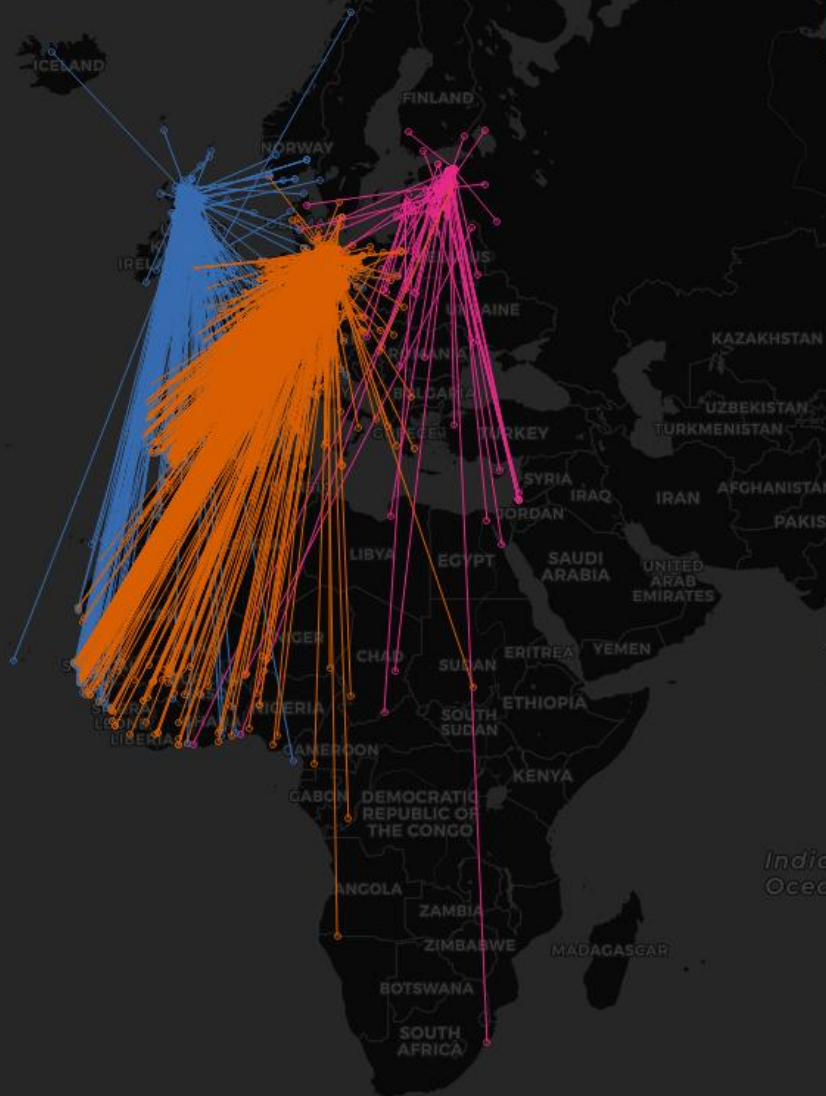
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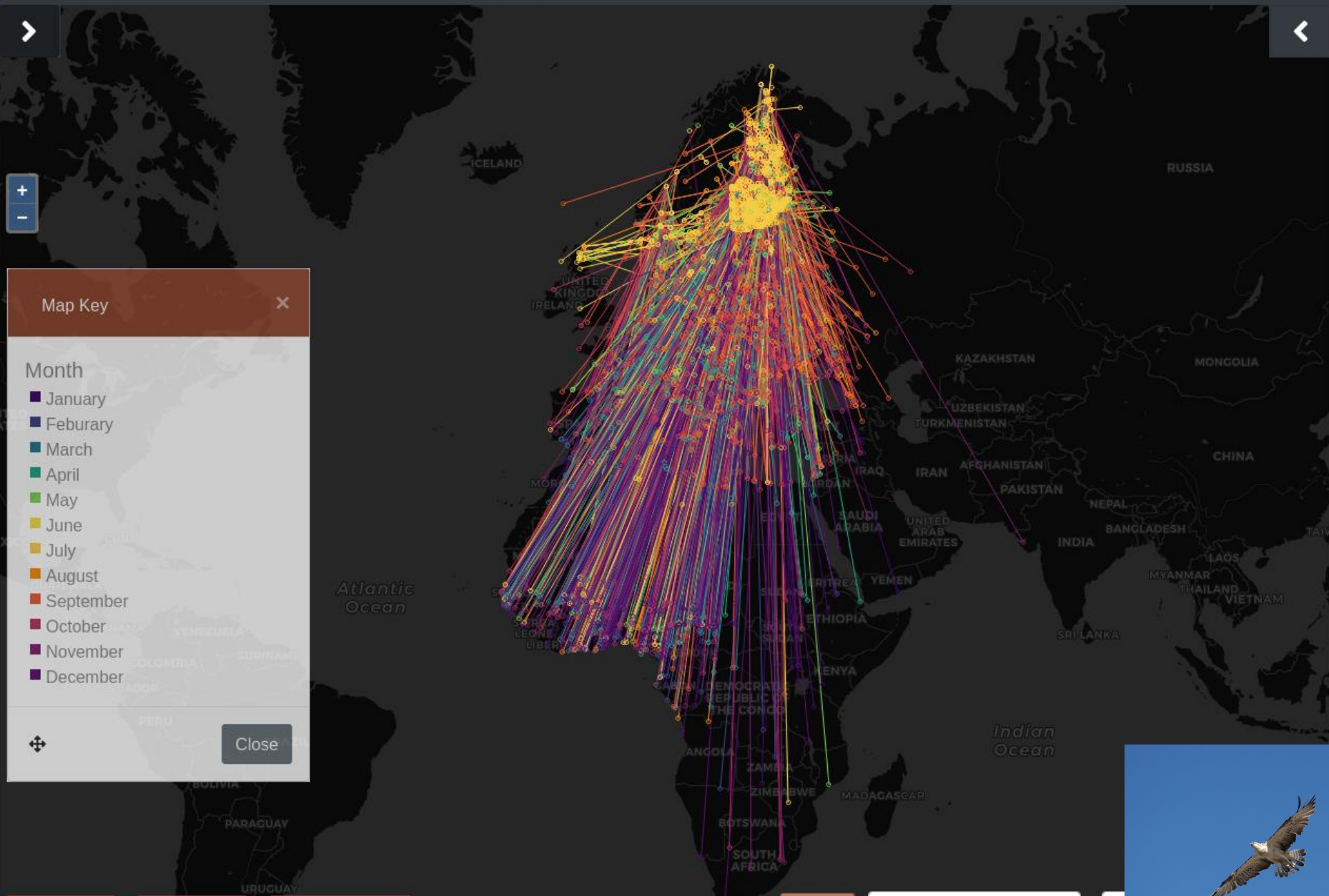
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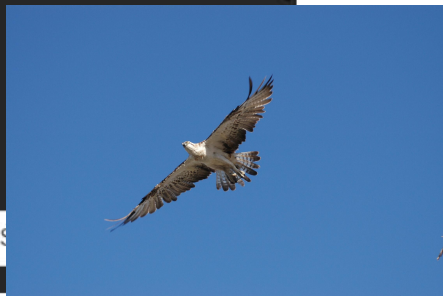


Map Key ✕

Month

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

⊕ Close



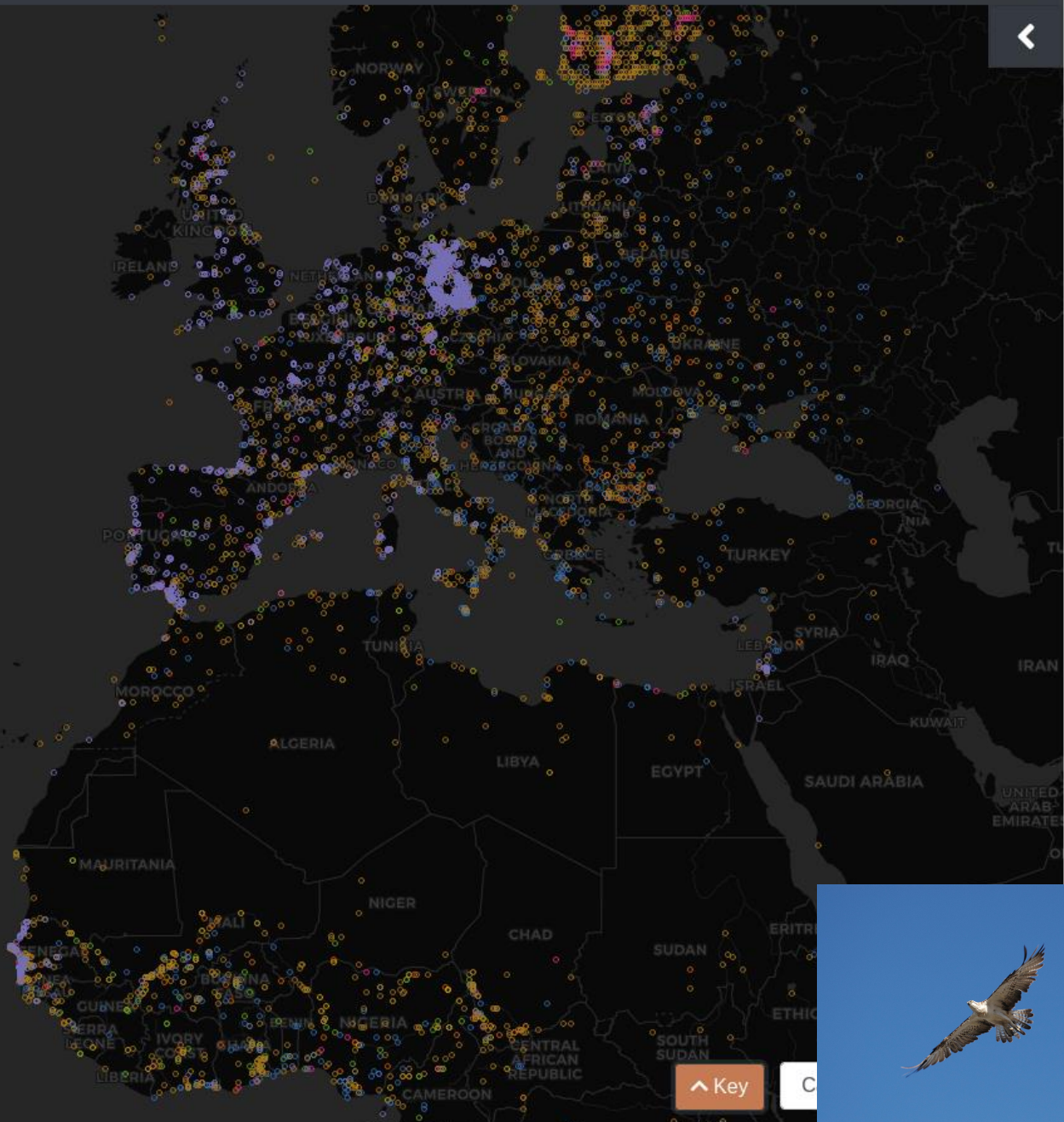


**Map Key** [Close]

**Condition**

- Unknown
- Alive, ringing recovery
- Alive, identified by other means
- Dead, shot
- Dead, intentionally taken
- Dead, other or sick/injured
- Alive, other

[Close]

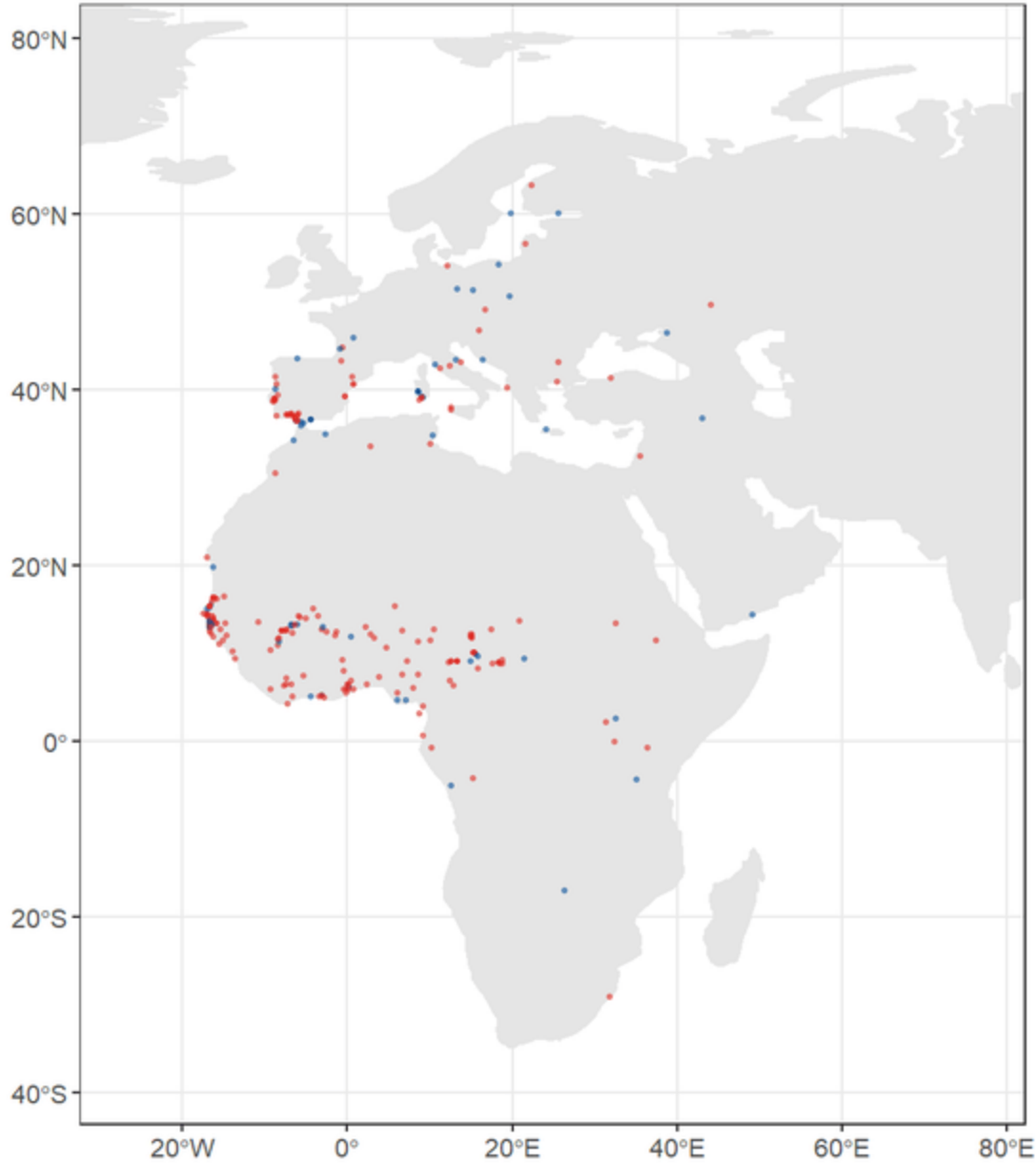




# 03010 *Pandion haliaetus* | Encounters by month & age



Jan



### Age

- juvenile/immature
- after first year/adult
- unknown







**Map overlay ring recoveries & tracks  
>150 studies offered tracking data for the atlas**

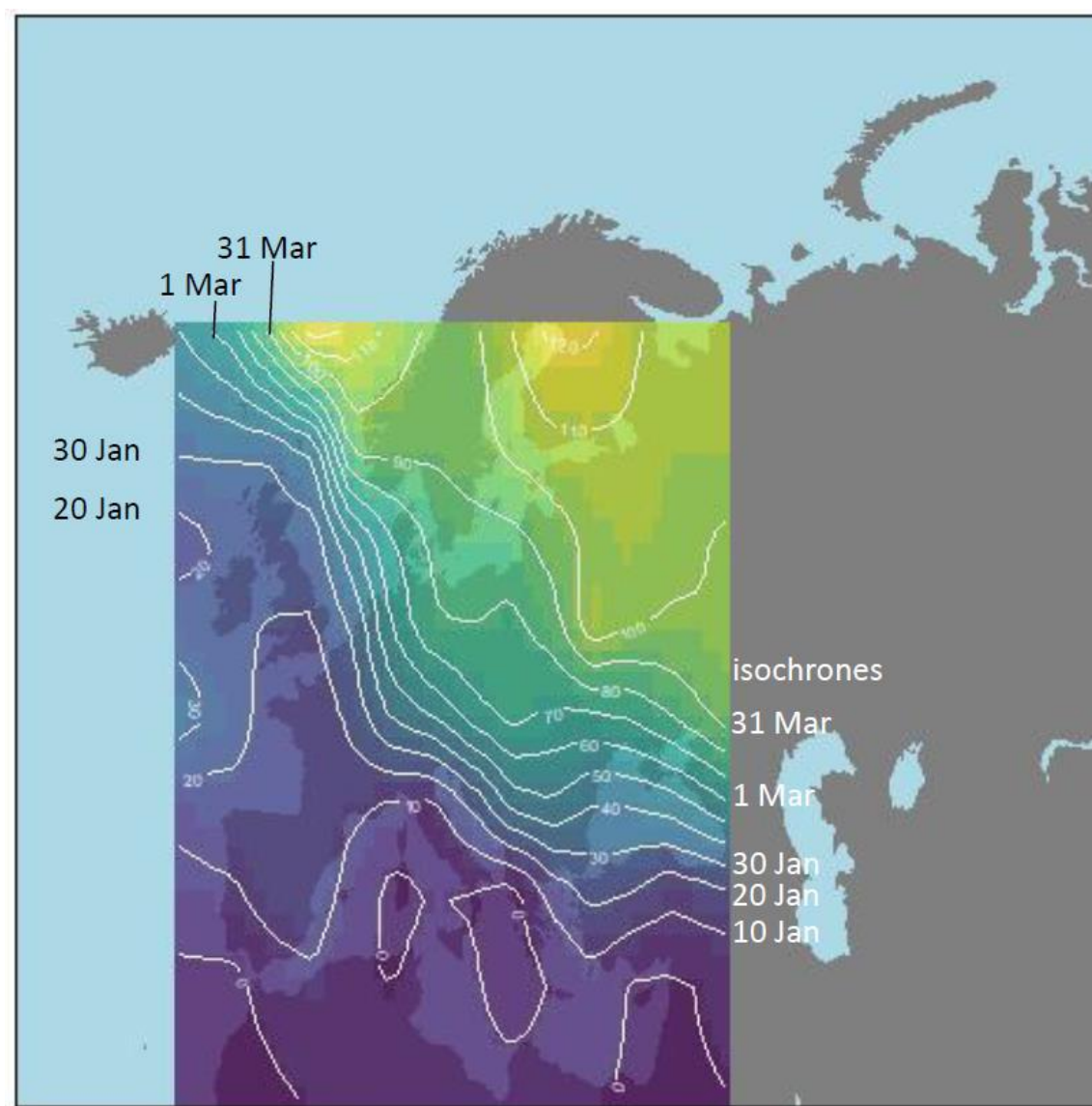
Locations of publicly visible studies at movebank.org (April 2018)



# CMS/EURING Migration Atlas - main components

## CMS/EURING Migration Atlas – analysis modules

- **Migration seasons of hunted species** – Franz Bairlein (IAR), Roberto Ambrosini (Milano University)



**All huntable species under EU Birds Directive  
a significant contribution to a most debated question**

# CMS/EURING Migration Atlas - main components

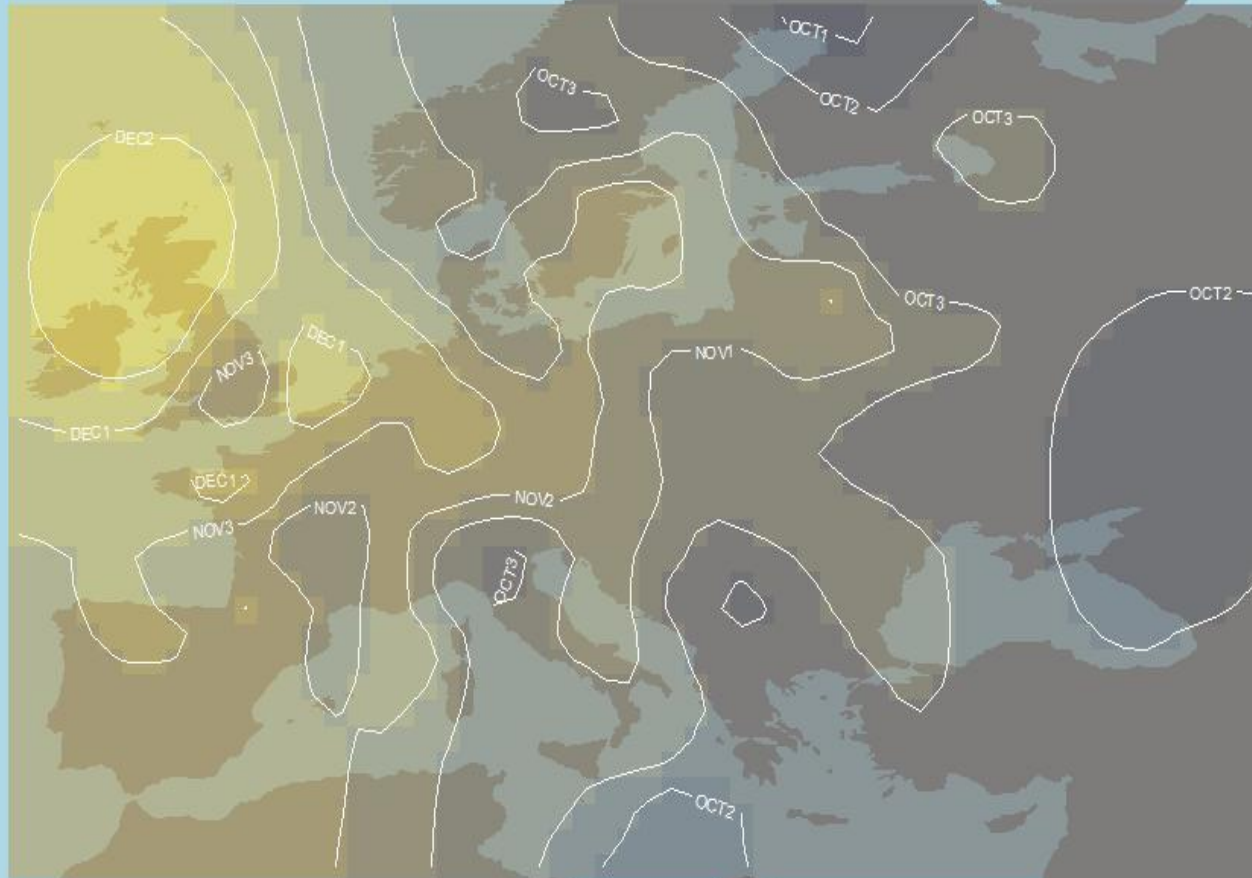


## CMS/EURING Migration Atlas – analysis modules

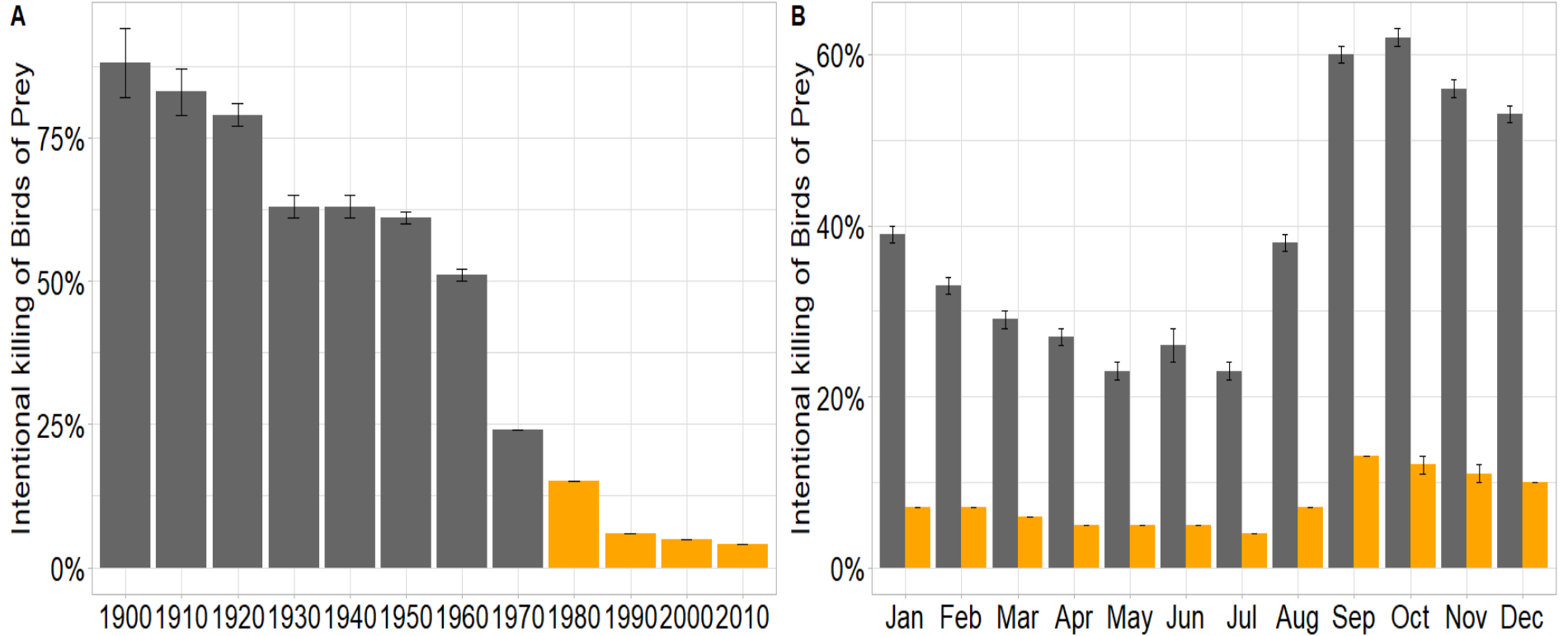
- **Analysis of killing of birds by man** – Caterina Funghi, Fernando Spina (ISPRA)
- **A geographical, historical and cultural analysis**



AUG1 AUG2 AUG3 SEP1 SEP2 SEP3 OCT1 OCT2 OCT3 NOV1 NOV2 NOV3 DEC1 DEC2



Birds of prey, after 1981, 50%

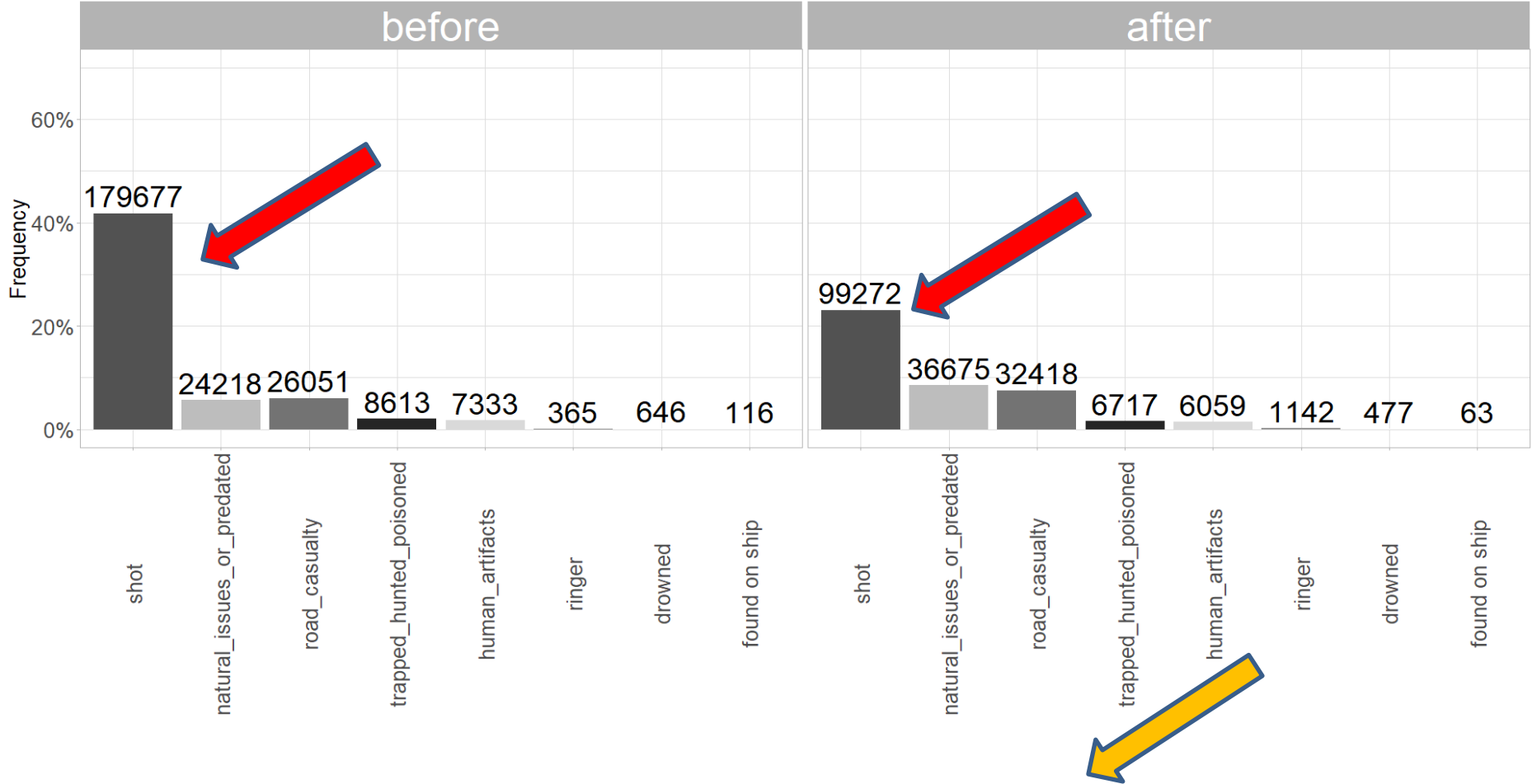


**Figure 1:** Proportion ( $\pm$  SE) of the intentional killing of Birds of Prey per decade (A) and per month of the year (B). Periods before and after the EU Directive are in grey and yellow respectively

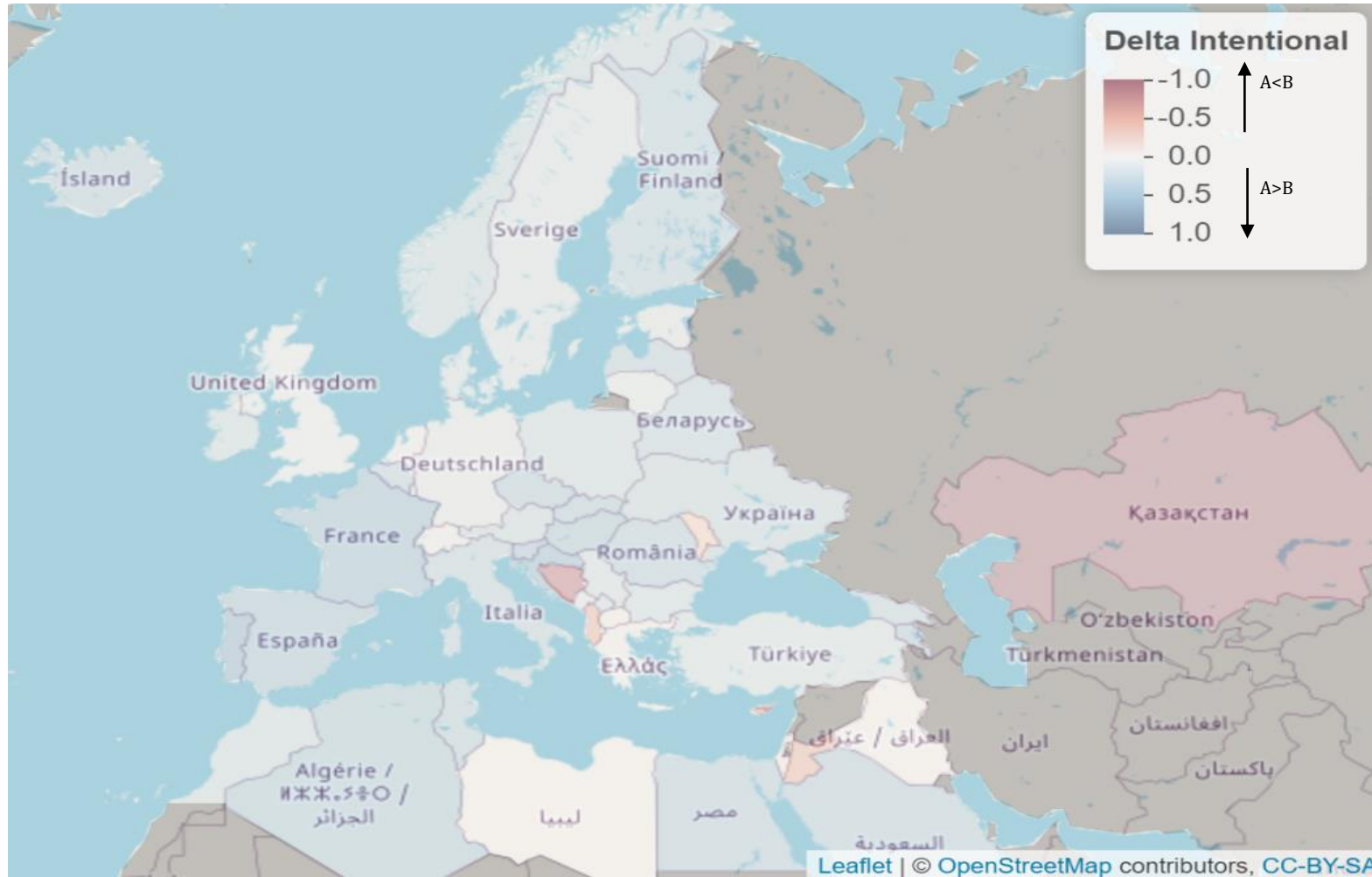


**CONSIDERING SPECIES LISTED IN ANNEX I: “shot” cause drastically decreased; circumstances of not intentional death by man (e.g., road casualty) dramatically increased in years after the Directive.**





**Figure 20\_AnnexII:** Percentage of death causes of species reported in Annex II, before and after the Birds Directive. Numbers over each bar are real values.



Density map of the difference before – after 1981 of mean proportion of intentional killing of Birds of prey. Values > 0 (redder) reflect an increase of intentional killing after the Birds Directive. Values <0 (bluer) reflect a decrease of intentional killing after the Birds Directive

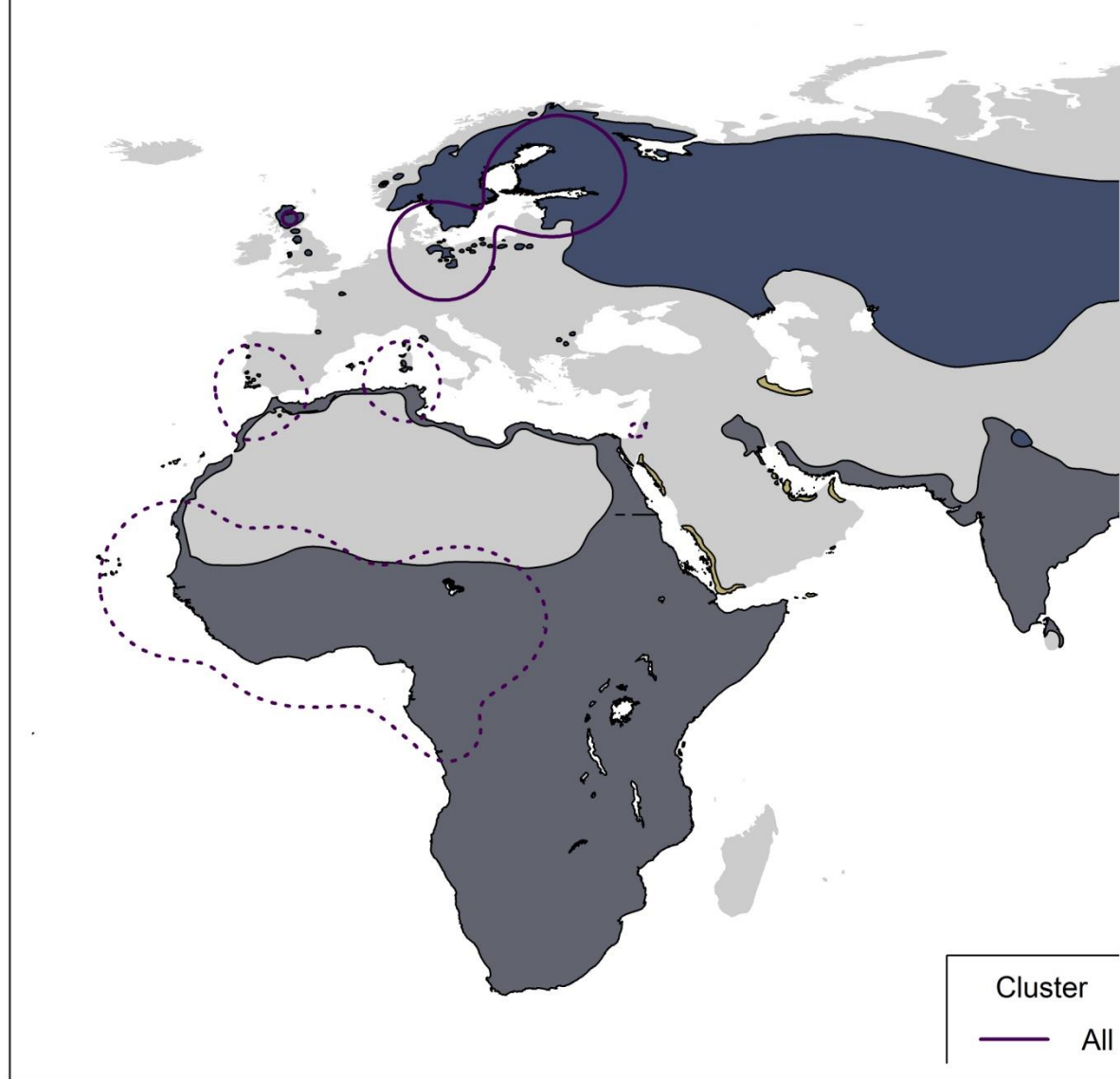


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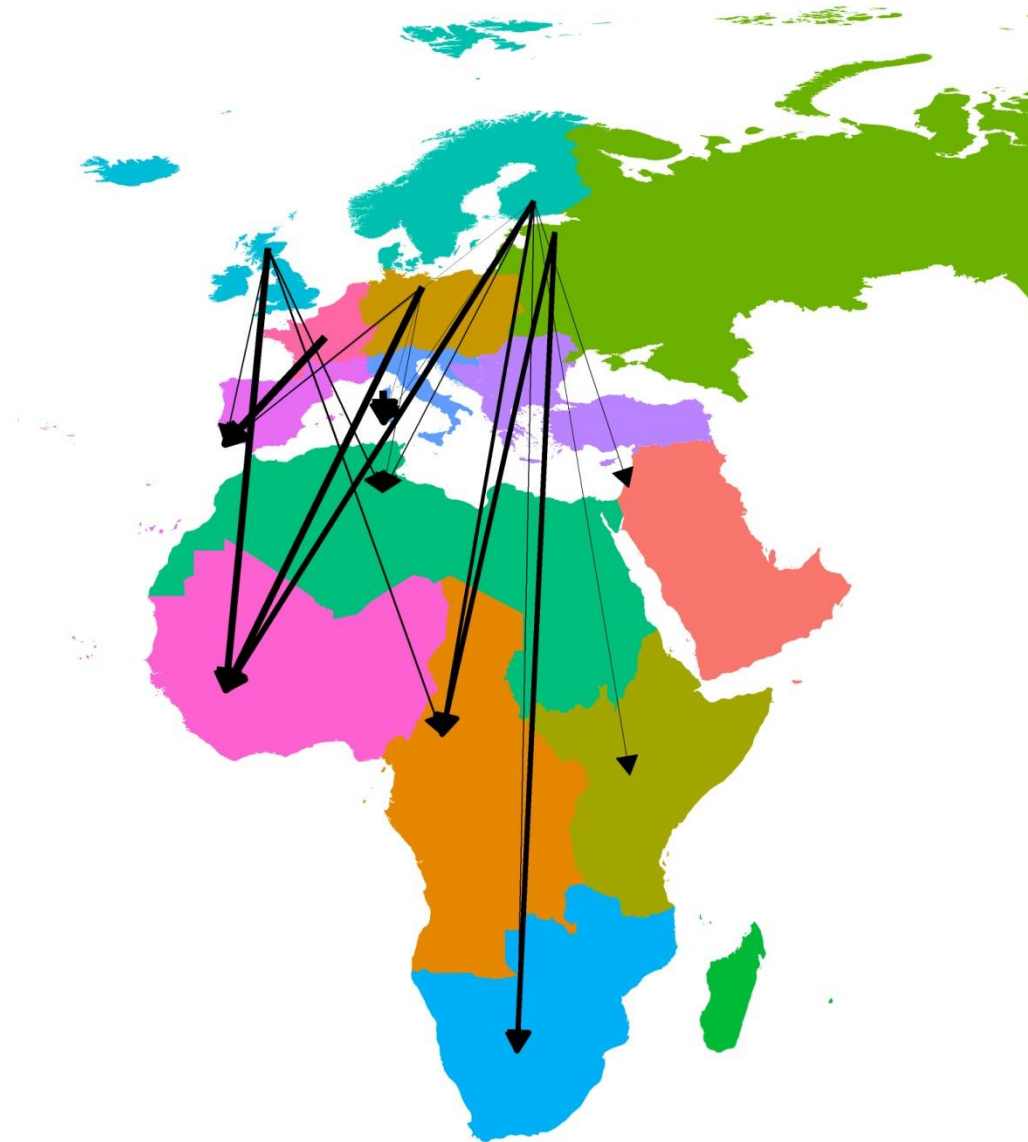


## CMS/EURING Migration Atlas – analysis modules

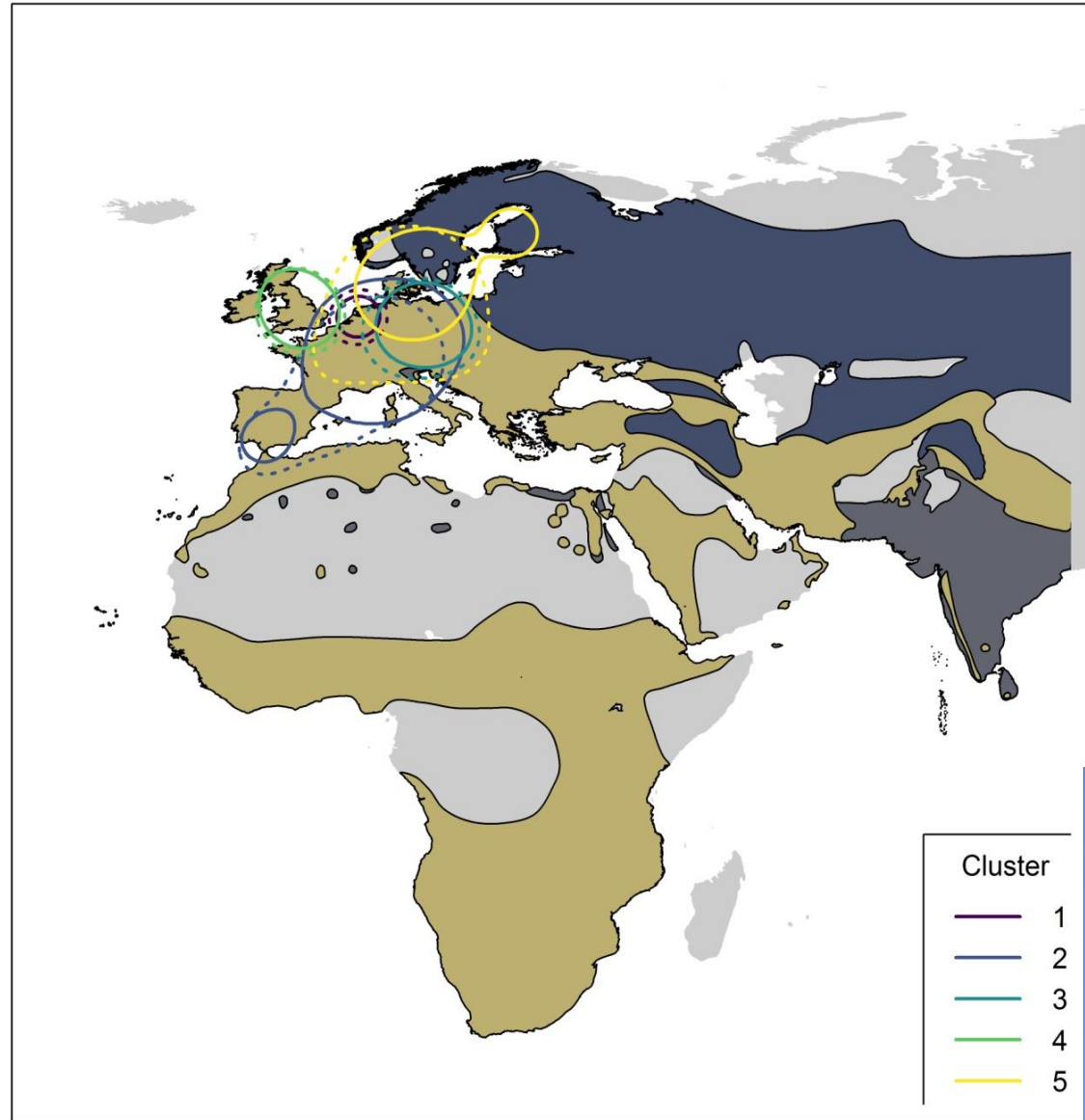
- **Connectivity analysis** – Niccolò Fattorini, Roberto Ambrosini (Milano University)
- **The “spirit” of CMS – biological/political sharing of responsibility for conservation**



**Figure 03010-1.** Map showing 95% kernel contours of of first-level clusters identified by the migratory connectivity analysis, if any, or 95% kernel contours of all encounters, in case of no clustering structure. Solid lines indicate the clusters in the breeding range, dotted lines those in the non-breeding range.



**Figure 03010-6.** Map showing pre-defined regions in different colours, with black arrows linking centroids of individual encounters in different regions. Arrow width is proportional to transition probability.





# CMS/EURING Migration Atlas - main components



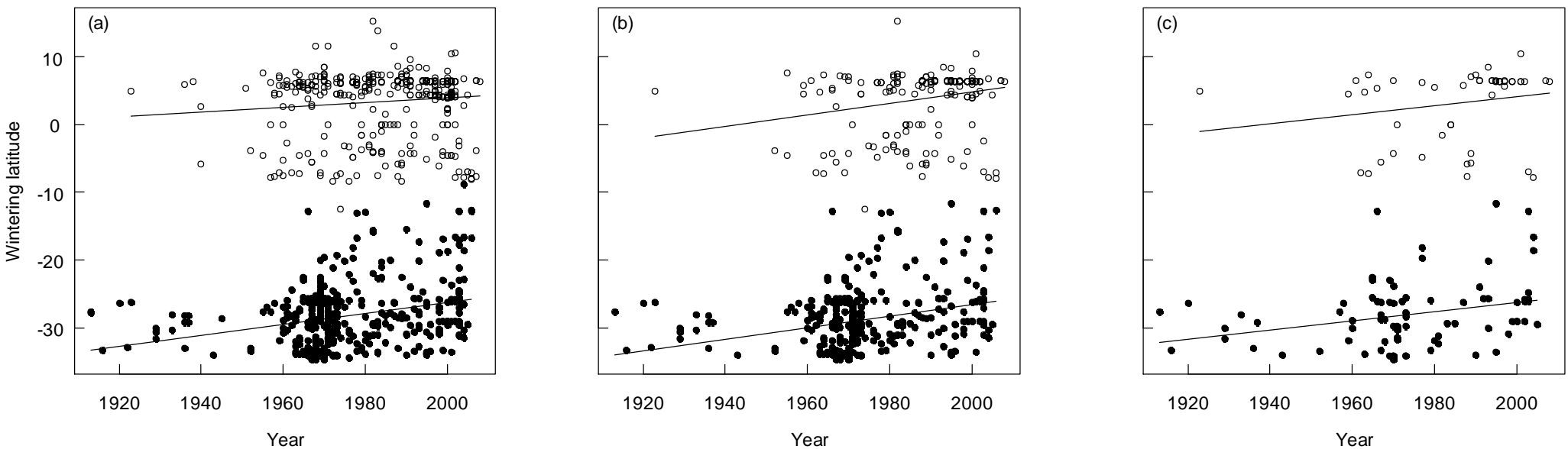
## CMS/EURING Migration Atlas – analysis modules

- **Changes in migration patterns** – Tom Romdal, Kasper Thorup (Denmark)
- **Migrants as efficient indicators of consequences of climate change**

# Reaction to climate change: tendency to decrease the overall migration distance by different populations

- period 1912-2008; best sample of African recoveries in a LDM
- northwards shift of wintering areas 3-9 Km year<sup>-1</sup>
- more birds winter in more northern and drier areas
- tendency for an earlier arrival on the breeding grounds
- problems with seasonality of complete winter moult in Africa?

-Ambrosini et al, 2011, Clim Res.





# CMS Global Animal Migration Atlas Project

The driving force behind creating a Global Atlas on Migratory Animals is to provide policy and

## African-Eurasian Bird Migration Atlas outreach to other taxa

The project of the Global Animal Migration Atlas is expected to be developed in modules. The CMS Secretariat currently supervises two projects which mark the first modules of the Global Atlas Project:

- Atlas of Central Asian Mammals
- Eurasian-African Bird Migration Atlas





## Eurasian-African Migration Atlas

Biological aspects – applied use through conservation instruments

✓ spatial and temporal patterns of bird movements (routes, migration hotspots, wintering sites);

### ➤ CMS

➤ AEWA

➤ RAPTORS MOU

➤ LANDBIRDS AP

➤ ACAP SEABIRDS

➤ WILDLIFE DISEASES



## Eurasian-African Migration Atlas

**Biological aspects – applied use through conservation instruments**

✓ **spatial and temporal patterns of bird movements (routes, migration hotspots, wintering sites);**

- **EU WILD BIRDS DIRECTIVE**
- **Hunting seasons in EU**



## Eurasian-African Migration Atlas

**Biological aspects – applied use through conservation instruments**

- ✓ **connectivity between breeding, stopover, and wintering sites**
  - **Ecological networks**
  - **Habitat use and functionality along flyway**
  - **Harvesting models incl. cumulative, flyway-scale perspective for more effective, coordinated and scientifically-based management of hunting in Europe**
  - **CBD post-2020 global agenda – connectivity indicator**



A long series of attempts during many years

It took definitely long.....

**... BUT FINALLY WE'RE THERE!!!**

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***TEMPUS  
FUGIT...***

***Thanks!!***

