WINGSPAN 2026

# From Partnerships to Practice

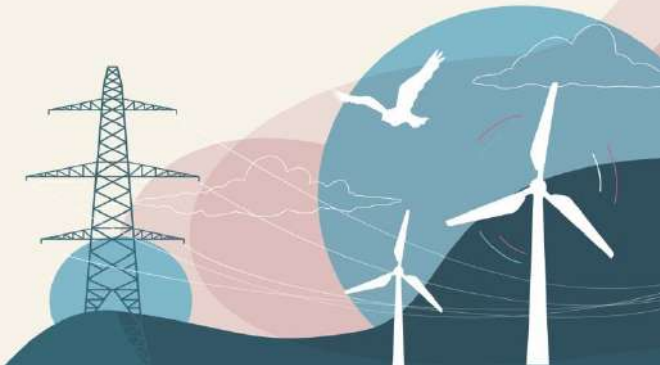
## Accelerating Nature-Positive Energy Infrastructure

3 – 5 November 2026
Berlin



Renewables Grid Initiative · TB Raab Technisches Büro für Biologie · SafeLines4Birds · EUROKITE · LIFE EURO BUSTARD · 50hertz | Elia Group · elia group · NATURA 2000 · Co-funded by the European Union

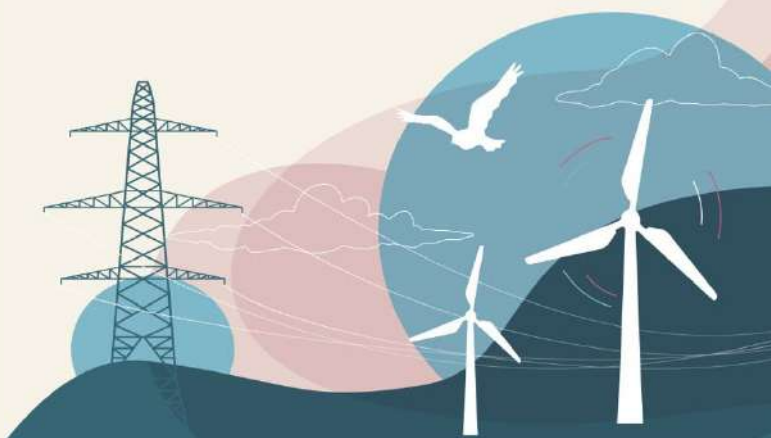
# Wingspan Programme and more!



# Vendor fair

**Ten exhibitors**

- TE Connectivity Energy GmbH
- S.A. de Preformados Metálicos (SAPREM)
- Skydrone Robotics SAS
- Hammarprodukter AB
- FulcrumAir
- Bioseco SA
- OrniLogic
- E-obs GmbH
- Deák Delta Kft.
- ProtectBird



WINGSPAN 2026

# From Partnerships to Practice

3 – 5 November 2026 | Berlin



## *Opening Words*

## Manon Thiel

Manager - Energy & Nature

Renewables Grid Initiative



WINGSPAN 2026

# Spotlight

## Innovations in monitoring: Enhancing conservation around energy infrastructure



**Dr. PJ Stephenson**

Conservation and Sustainability Expert



**Dr. Hendrik Reers**

Managing Director

OekoFor GmbH

# Advancing environmental monitoring strategies for energy infrastructure


## PJ Stephenson

**Conservation & Sustainability Consultant**
**University of Lausanne**
**IUCN SSC Species Monitoring Specialist Group**




© PJ Stephenson

# The argument for renewables gets stronger

The Guardian

## ‘Explosion of melt rates’: 20% of Swiss glaciers lost in five years

### Alpine regions in Europe experiencing extreme glacier collapse due to heat-trapping effects of fossil fuel pollution




SWI swissinfo.ch The Swiss voice in the world since 1935

GEOPOLITICS DEMOCRACY SCIENCE COMPANY BUSINESS SWISS ABROAD

## The Blatten rockfall caused damage amounting to 255 million Swiss francs.




© Noordoostpolder Wind Farm

# Motivations for data collection

**National legal obligations** for EIA

Six broad categories of frameworks and standards for biodiversity and nature in Europe influence reporting (and therefore monitoring):

- **Lender standards** - e.g., IFC Performance Standard 6
- **Compliance frameworks** - e.g. EU Birds and Habitats Directives
- **EU assessment and planning frameworks** - EU Directives on Environmental Impact Assessment and Strategic Environmental Assessment
- **Reporting frameworks** for nature and biodiversity disclosures - e.g. EU CSRD, TNFD, Global Reporting Initiative
- **Corporate decision-making tools** - e.g. Natural Capital Protocol
- **Target setting frameworks** - e.g. SBTN, IUCN Guidelines



Snapshot Report

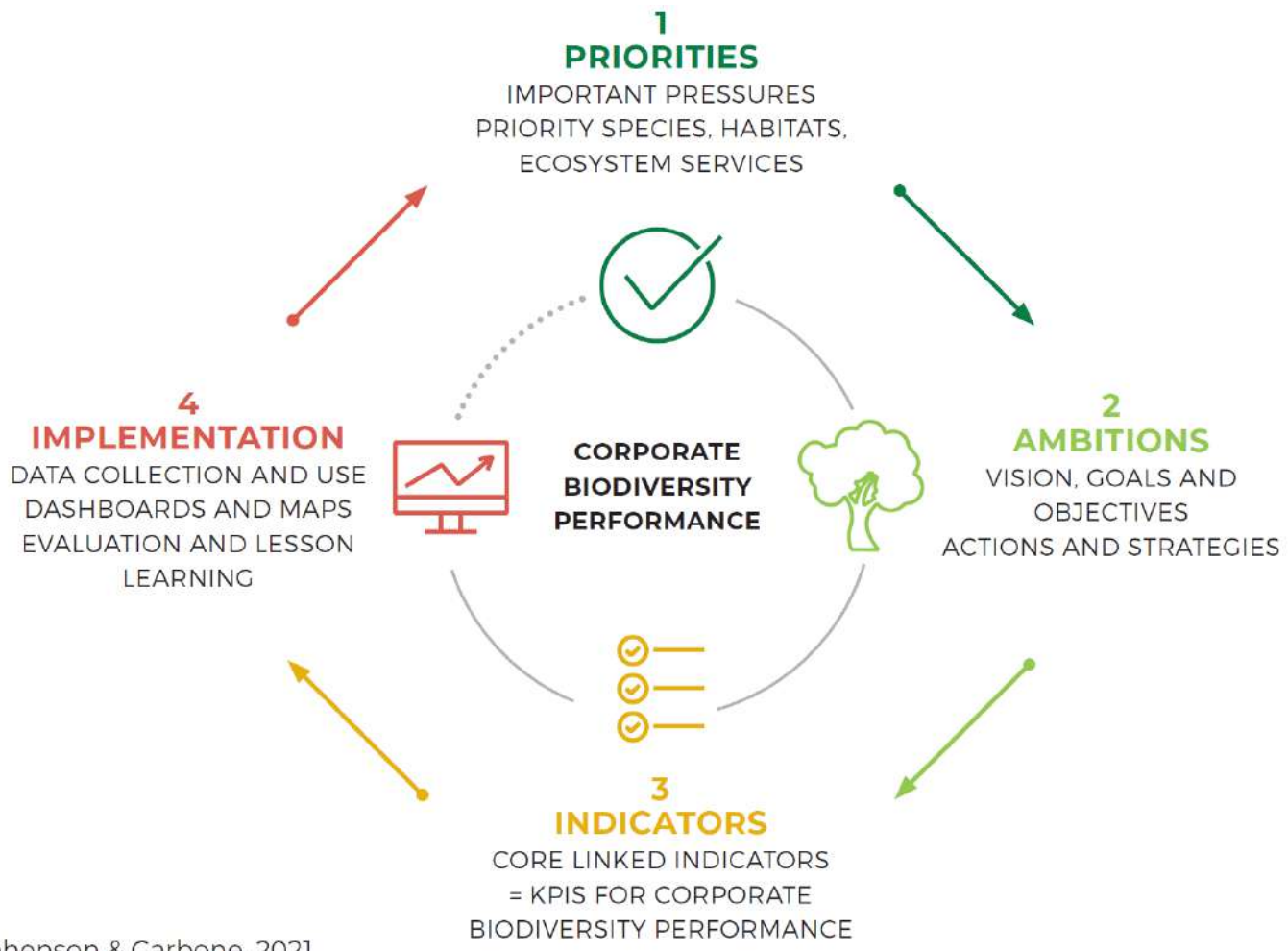
**Current state of Environmental Reporting for the Renewables and Grid Sector**

P. Stefanoudis, N. Sheikh, A. Cook & L. Weatherdon

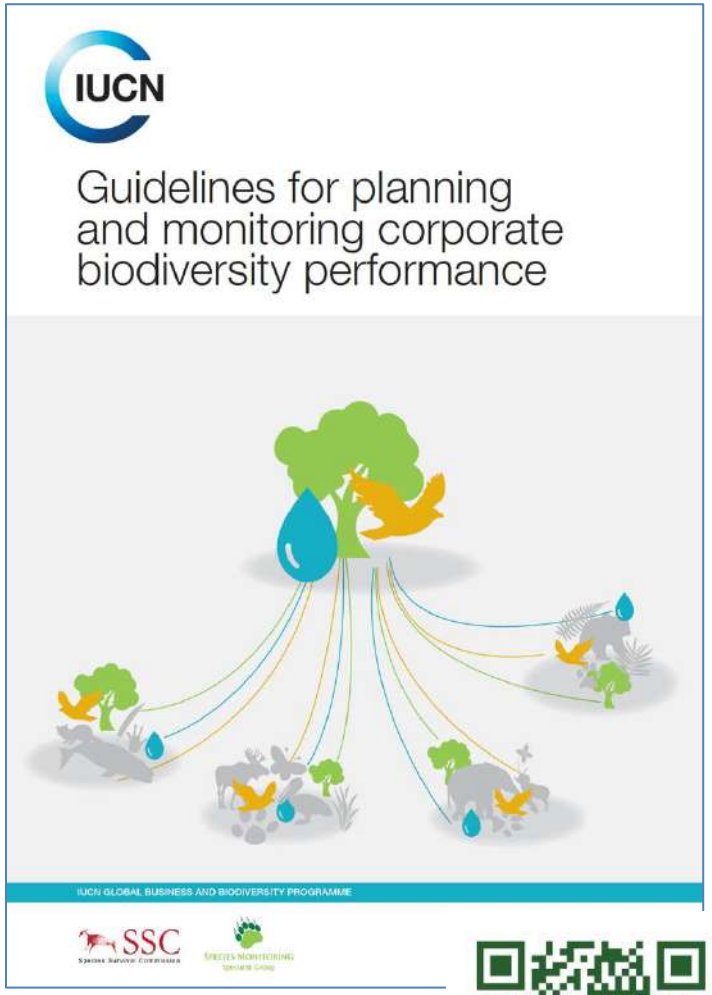
March 2026

GINGR
Global Initiative for Nature, Grids and Renewables

# Key planning and monitoring steps are common to all frameworks




Source: Stephenson & Carbone, 2021



# Best practices for monitoring – learn from conservation science and practice

- Step 1: Define the scope and the spatial and temporal scales for the monitoring strategy.
- Step 2: Identify target taxa and habitats for monitoring, to focus on those species most impacted by offshore wind development or associated Nature-Positive action.
- Step 3: Develop the key elements of a monitoring plan, which include:
  - Indicators.
  - Methods and data sources.
  - Defining timing and frequency.
  - Roles and responsibilities.
  - Survey design considerations.
  - Minimum monitoring requirements are also explained for marine birds, bats, marine mammals, fish and seabed communities.
- Step 4: Manage, share and analyse data.
- Step 5: Use data.



GINGR Navigator No. 2

**Monitoring Biodiversity at Sea**

*Discussion paper on advancing standardised biodiversity monitoring for Nature-Positive offshore wind development*

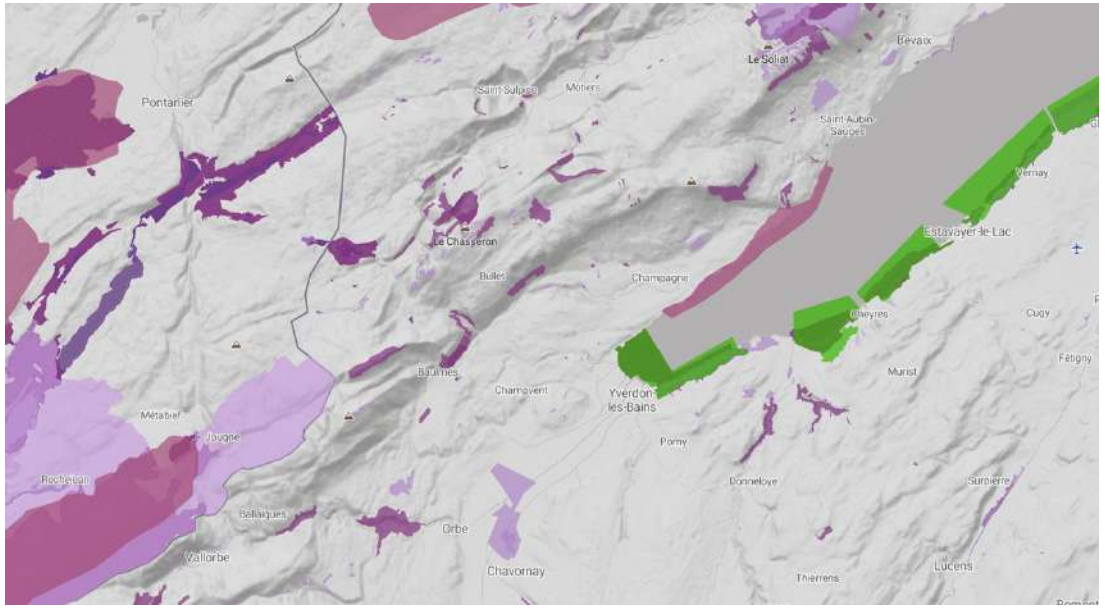
November 2024 · Dr. PJ Stephenson

GINGR
Global Initiative for Nature, Grids and Renewables

# Target taxa

Focus on species most impacted:

- birds and bats at risk of collision and electrocution
- animals, plants and fungi impacted by habitat loss (site specific)
- invasive alien species (site specific)
- protected areas and Key Biodiversity Areas (identified by initial biodiversity assessment or proximity analysis)




UN Biodiversity Lab



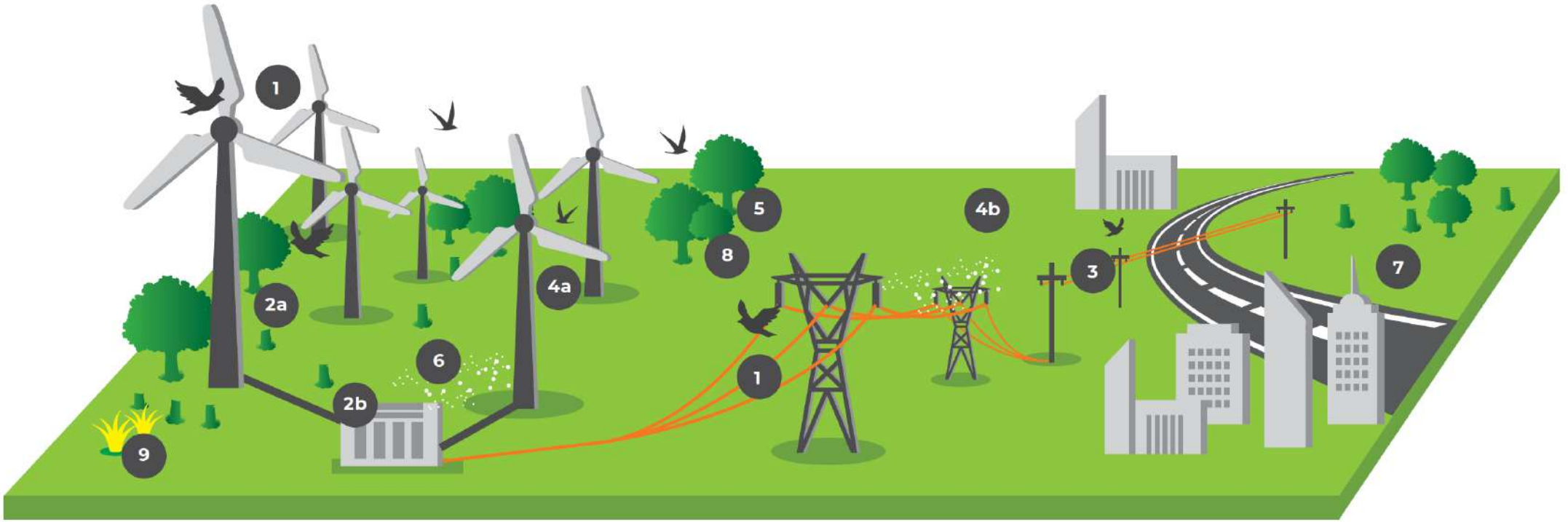
© PJ Stephenson



Bennun et al 2021

# Indicators: the pressure-state-response-benefit framework

# Indicators: pressures




© IUCN and TBC, 2021

Examples:

area of habitat lost or degraded

level of pollution

number of invasive alien species

number of bird or bat deaths

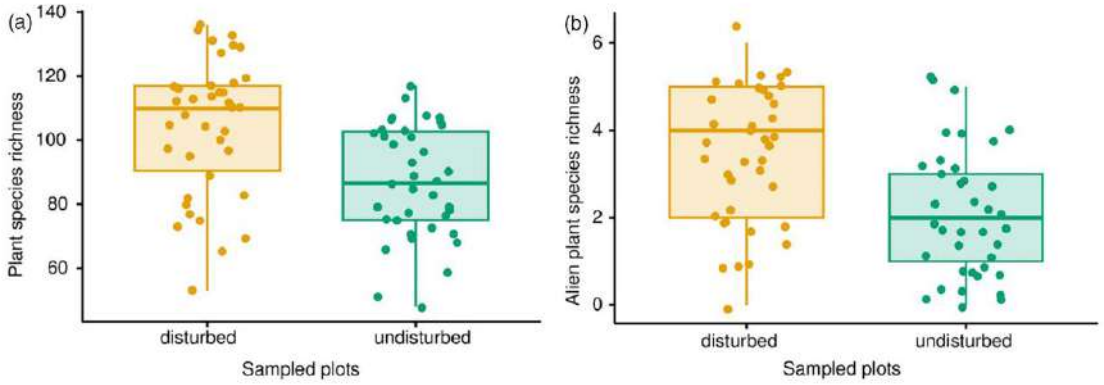
Bennun et al. 2021. *Mitigating biodiversity impacts associated with solar and wind energy development*. IUCN and The Biodiversity Consultancy.

© Nicholas Doherty

# Indicators: states

Most common and most important:

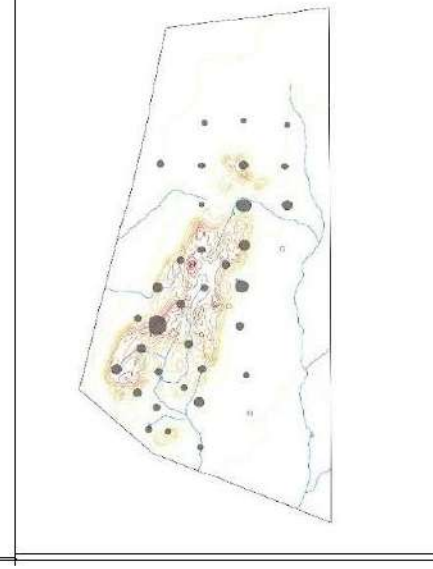
- Range (or extent) of species and habitats
- Diversity and abundance of species




Urziceanu et al. 2024. *Conservation Science & Practice* 6:e13109.

*Tragelaphus scriptus* (Bushbuck)









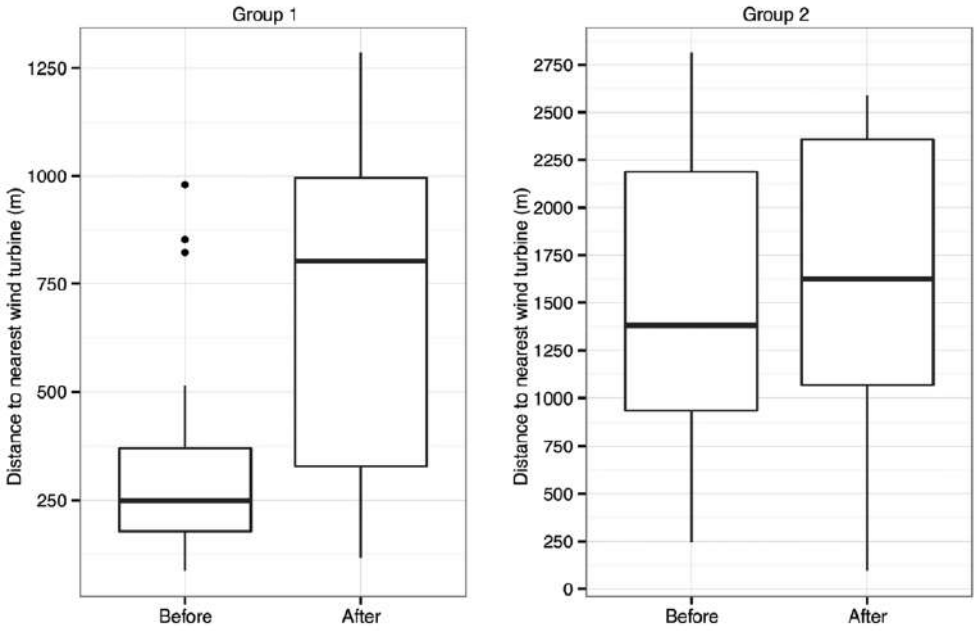
Photos © PJ Stephenson

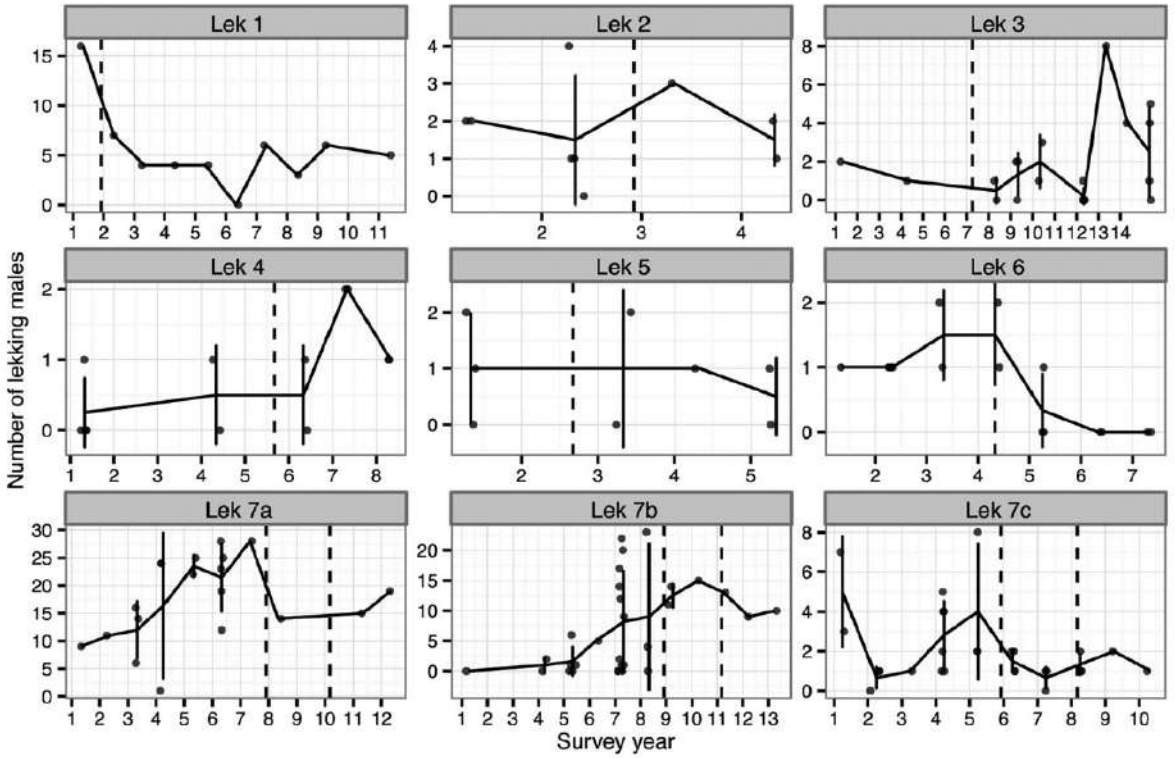
# Indicators: states

Data from EIAs and post-construction surveys for 7 sites in Scotland:

- black grouse leks within 500 m of the planned wind turbine moved after construction
- construction had no detectable effect on the abundance of lekking black grouse.






Zwart, M.C. et al. 2015. *Ecosphere*, 6: 1-11.

# Indicators: responses

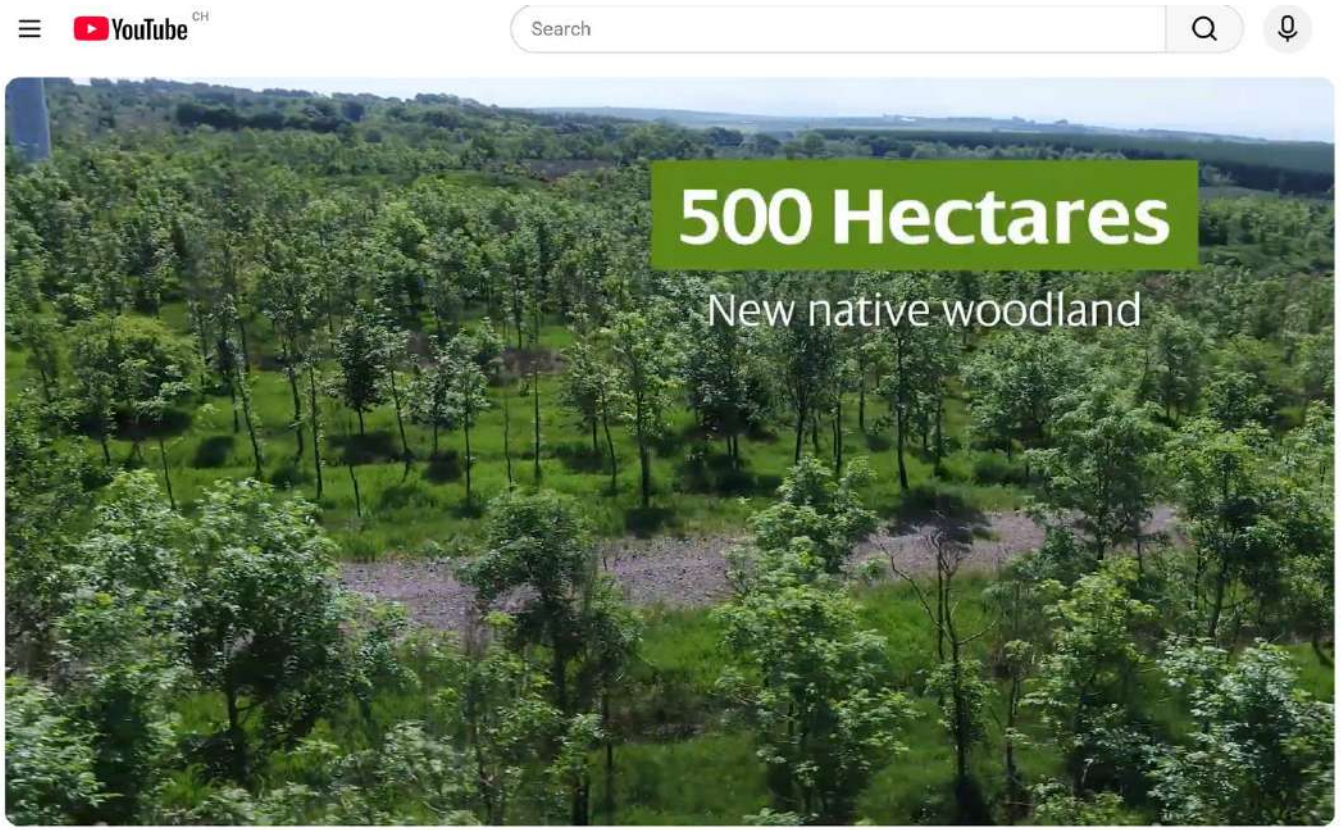
Changes in activities that cause or mitigate pressures, such as:

- Proportion of sites adapting construction based on species breeding seasons
- Number of bird diverters mounted on infrastructure
- Proportion of blades painted in black or red
- Number of incidents of shutdown-on-demand
- Number of native trees planted
- Area of native habitat restored…



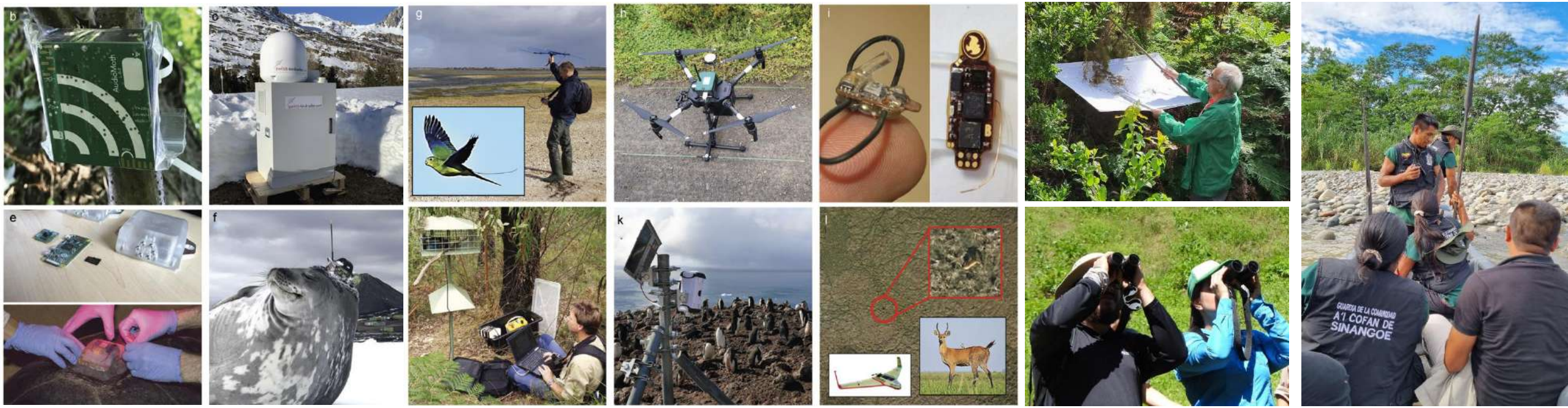
© BirdLife/Raptor Protection of Slovakia




Ecological Activity at ScottishPower Renewables' Onshore Windfarms

# Data collection: methods




Lahoz-Monfort & Magrath 2021. *BioScience*, 71: 1038-1062.

© Photos PJ Stephenson

Methods should be chosen due to:

- relevance to the indicators, species and habitats
- feasibility and reliability
- available budget and capacity
- national or regional standards, policies or legal requirements.

# Data collection: thermal and infrared cameras

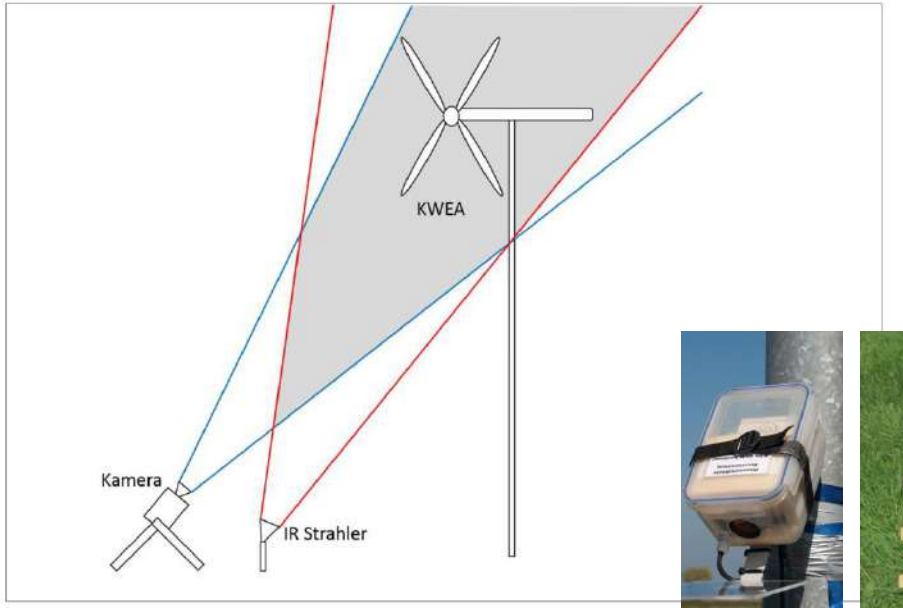




Vattenfall using thermal cameras to track birds, Hollandse Kust Zuid

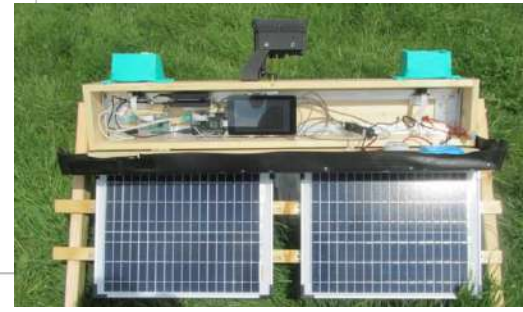


https://www.energy.gov/cmei/systems/windexchange/birds-and-bats

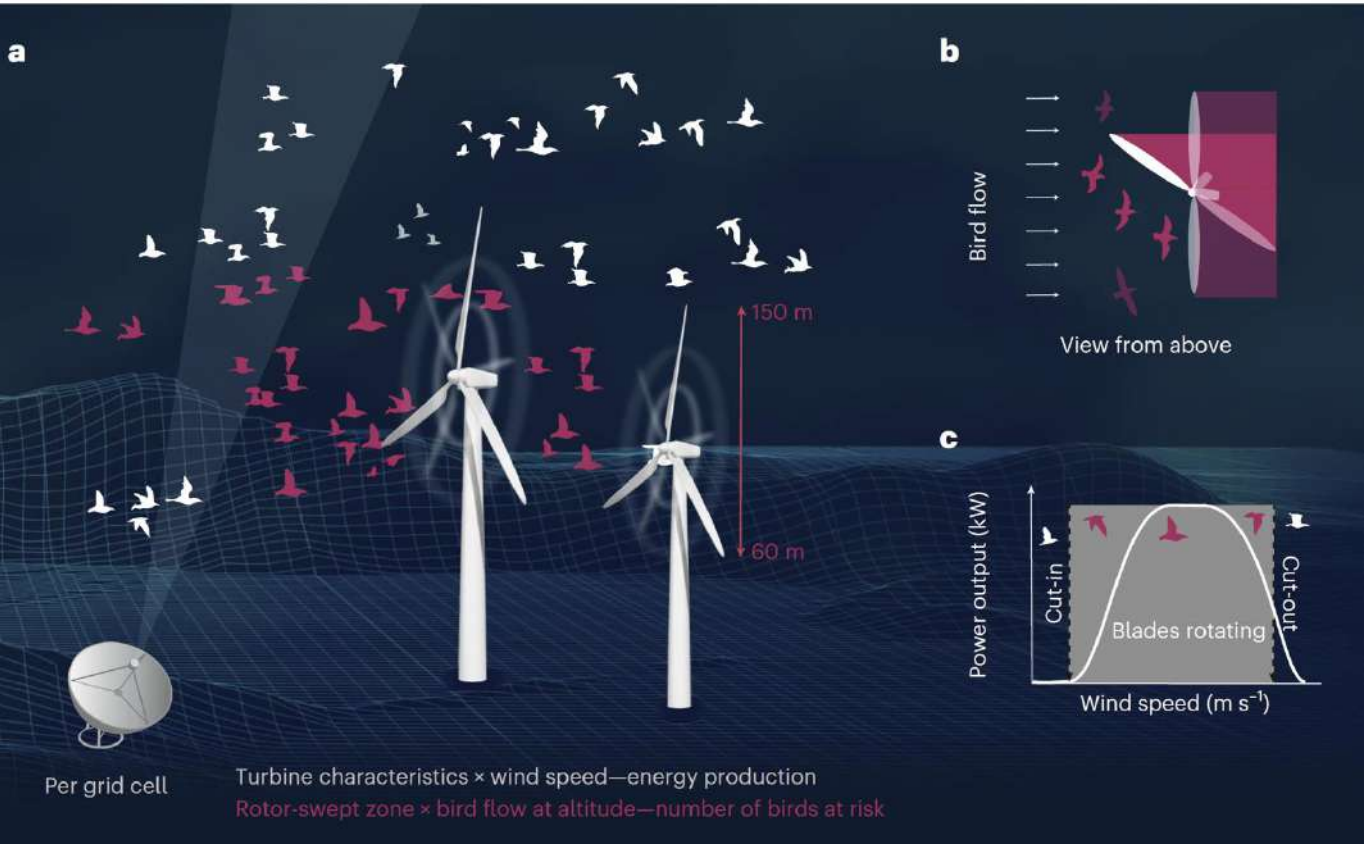



BfN-Skripten 550





# Data collection: radar

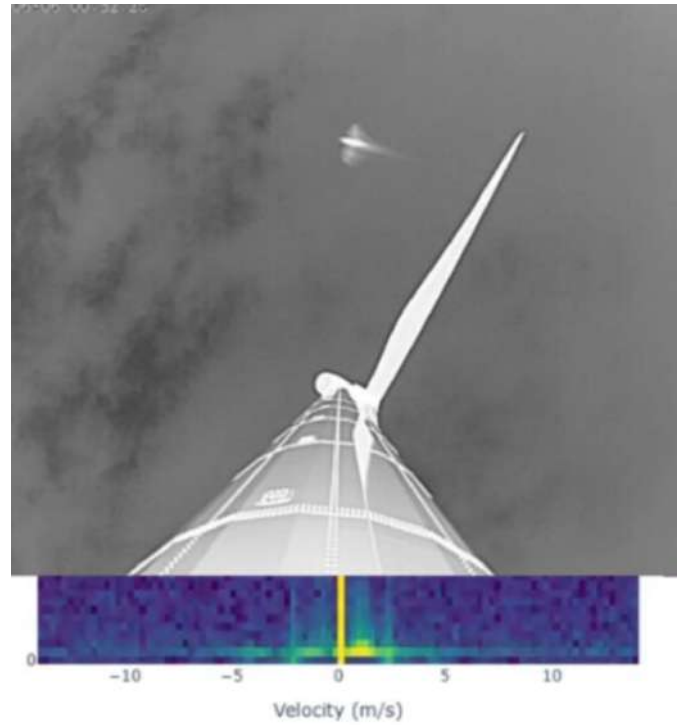



Weather surveillance radars monitor nightly and annual large-scale bird movements over Western Europe

Bauer, S. et al. 2026. *Nature Sustainability*

TNO, Dopplium & RWE testing radar tracking of bats, Eemshaven, Netherlands

https://www.tno.nl/






# Data collection: mixed methods

ZSW, Stöttener Berg, Baden-Württemberg, Germany, is conducting research into, e.g.,:

- Bird migration with radar
- Red kite movements with telemetry
- Bat detection with acoustic recording devices
- Insect detection with photo traps

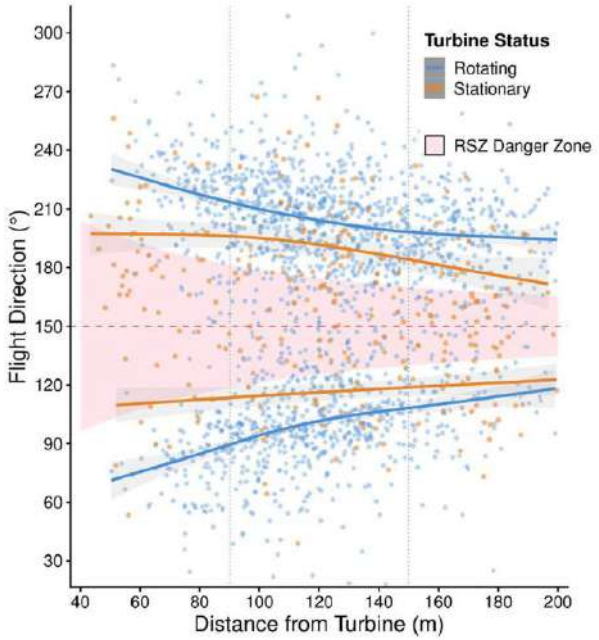


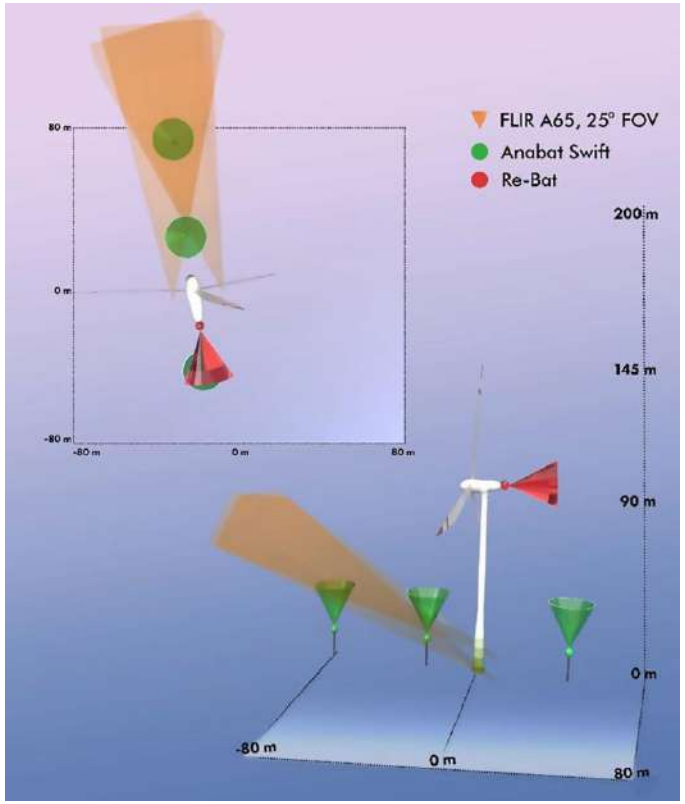


https://www.zsw-bw.de/
BfN-Schriften 765

# Data collection: mixed methods

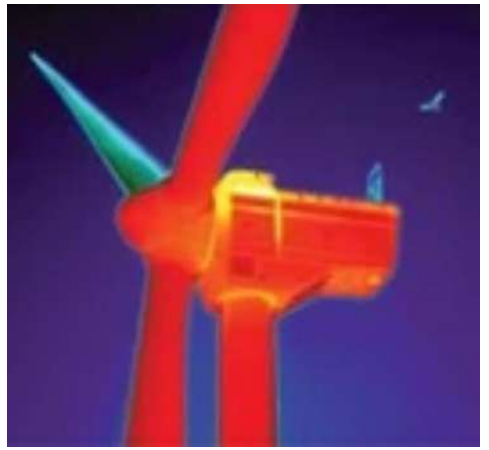
Many wind farms are using multiple sensors
(e.g., combinations of radar, cameras, and acoustics for birds and bats)




Shultz, A. et al. 2026. *PLoS One* 21:e0352329.





© M Schirmacher, BCI



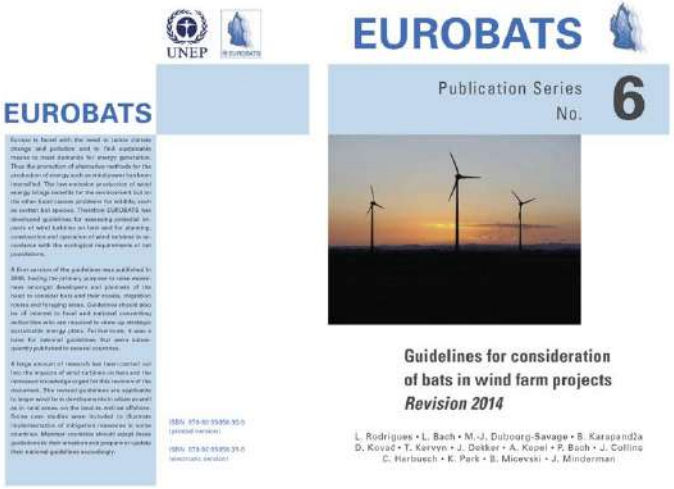
Krapivnitckaia, P. et al. 2024. *PloS One 19:*e0299153.

Reflects learning from conservation science where:
"*tools have been shown to complement each other when used together, by either increasing animal detection probabilities or increasing the number of indicators that can be measured at one site*"

Stephenson, P.J. 2020. *Current Opinion in Environmental Sustainability*, 45: 36-41

# Data collection: direct observations



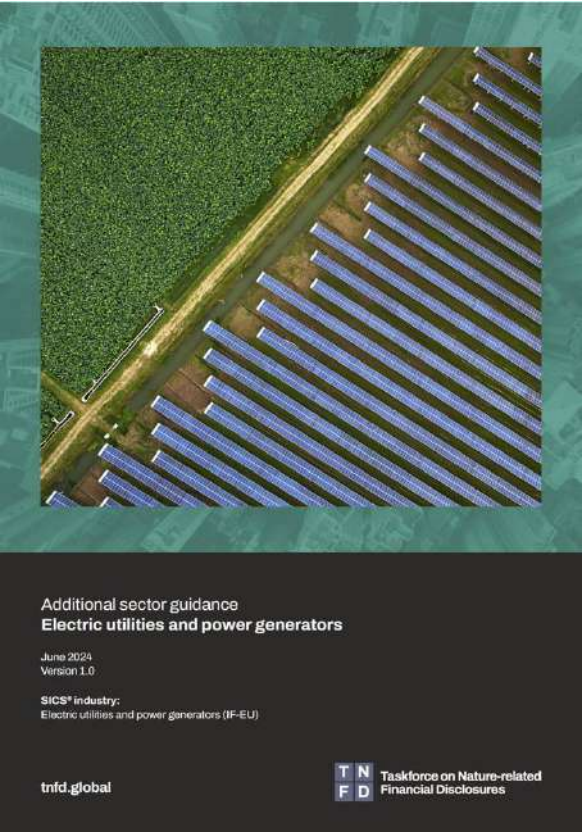


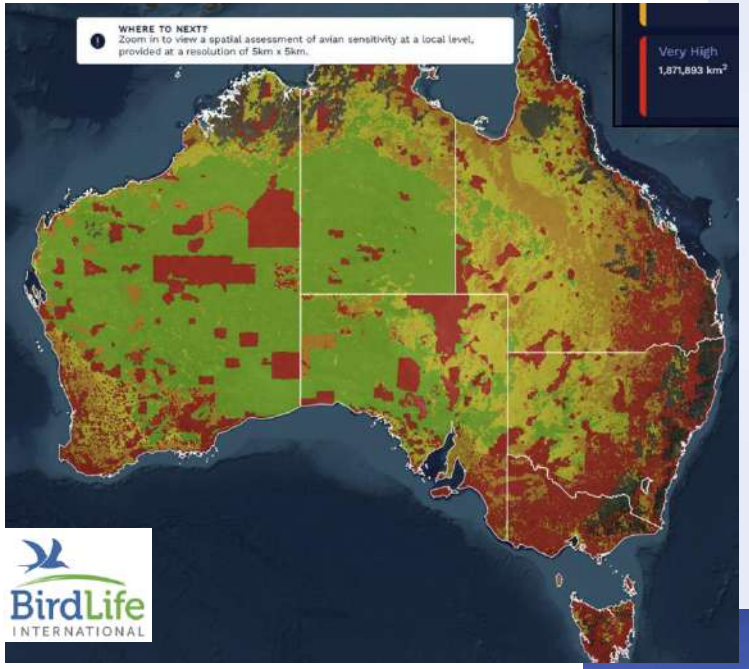

© PJ Stephenson

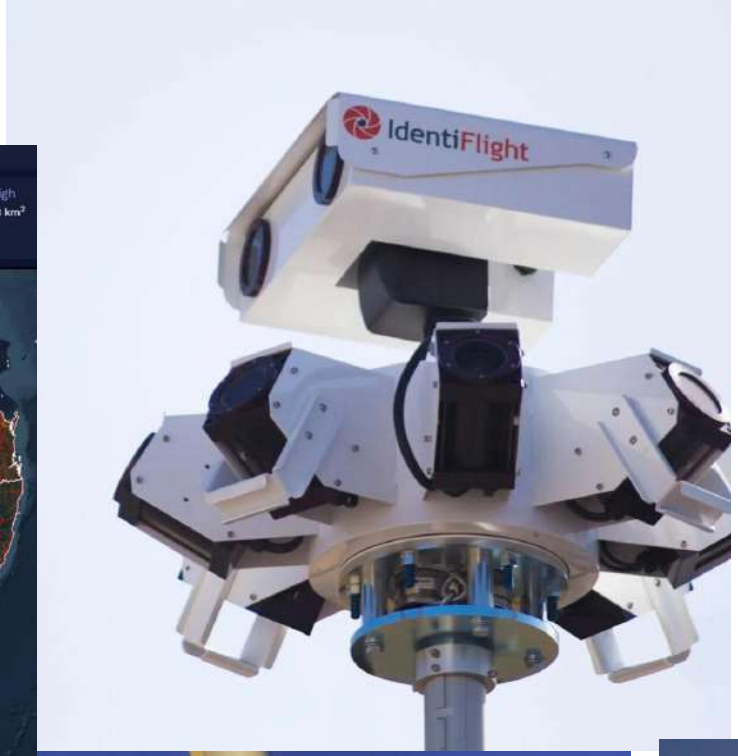


https://k9conservationists.org/wind-energy/#prev

# Data use



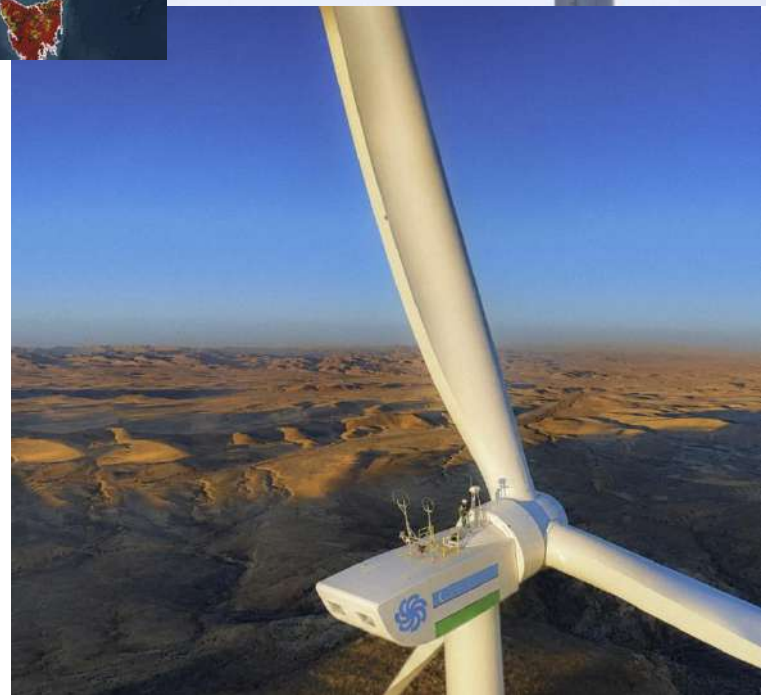







Cameras + neural networks used to detect birds and trigger shutdown on demand to avoid collisions
e.g. Identiflight Bird Protection System used by Masdar for the Zarafshan Wind Farm, Uzbekistan





# Data use







DTBird and DTBat similarly use cameras and acoustics with AI to allow shutdown

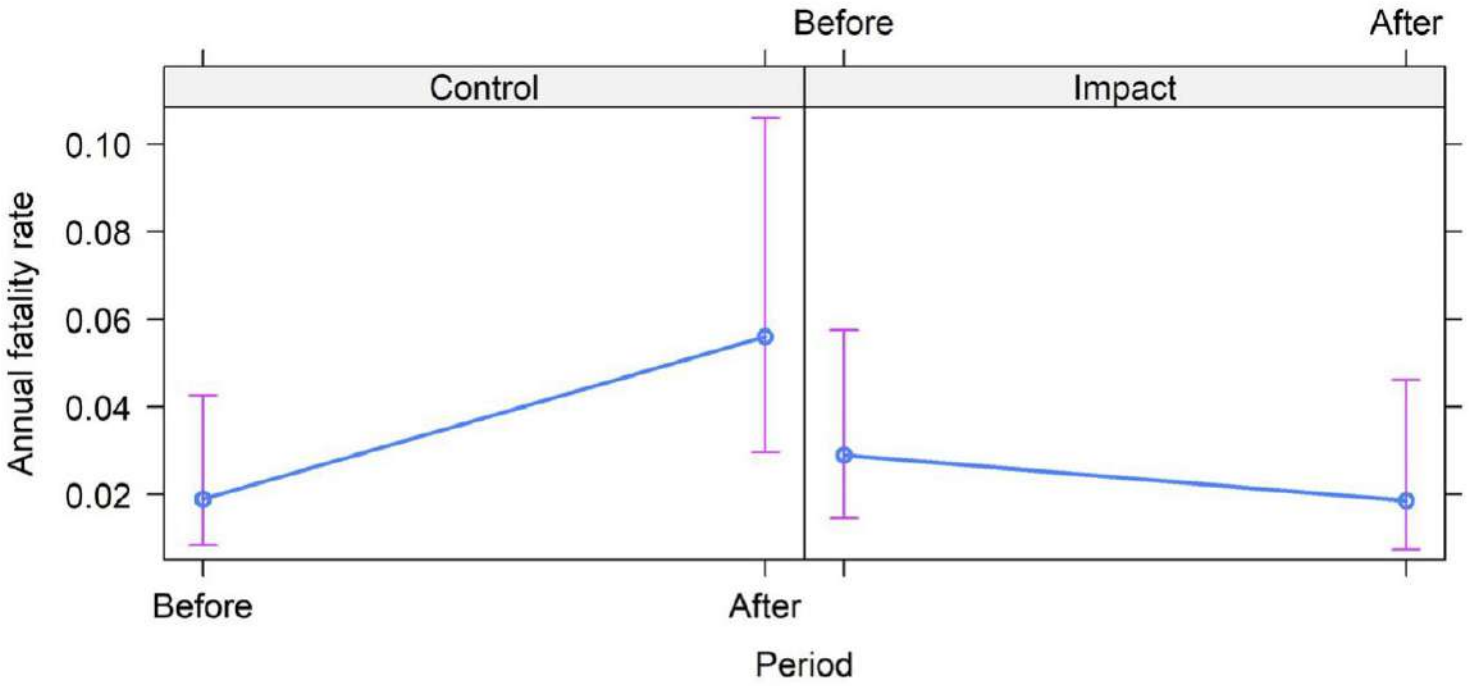
https://www.dtbird.com/en/

# Monitoring issues to address

Harmonization of indicators, data collection tools and protocols

Sharing of data and lessons so successful pilots and approaches can be rolled out

More use of counterfactuals to better understand causal relationships…




72% reduction in annual bird fatality rate compared with control in Norwegian wind farm



May, R. et al. 2020. *Ecology and Evolution*, *10*: 8927-8935



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© Alexander Belokurov http://imagenature.com

WINGSPAN 2026

# Spotlight

## Innovations in monitoring: Enhancing conservation around energy infrastructure



**Dr. PJ Stephenson**

Conservation and Sustainability Expert



**Dr. Hendrik Reers**

Managing Director

OekoFor GmbH

OekoFor
Ökologische Datenerfassung und Forschung GmbH

# How AI is rapidly changing the way we monitor and mitigate wildlife and renewable energy conflicts

Dr. Hendrik Reers | OekoFor GmbH

Wingspan 2026 | Berlin | 3–5 November 2026

# Before we start



**Data protection and legal questions are not part of this talk.**

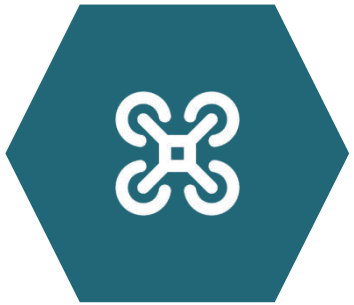
I am not a lawyer.

# Four steps of rising complexity



**1 Classify**

Apps & sensors



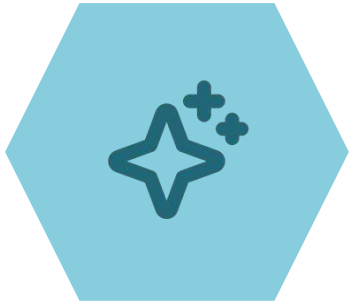
**2 Map**

Drones & aerial surveys



**3 Decide**

Real-time mitigation

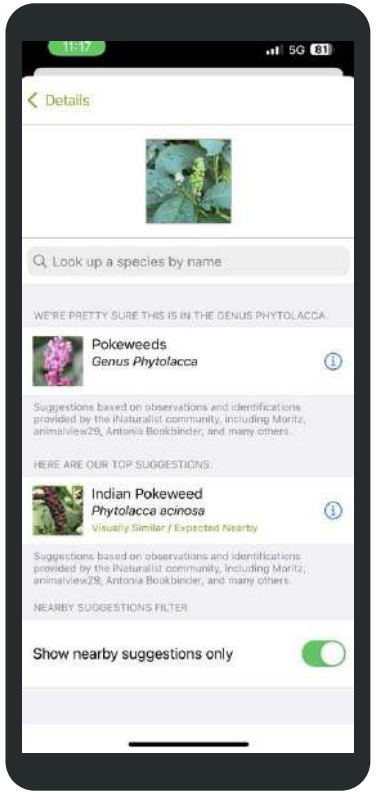


**4 Assist**

Language models as co-workers

# AI in everyone’s pocket

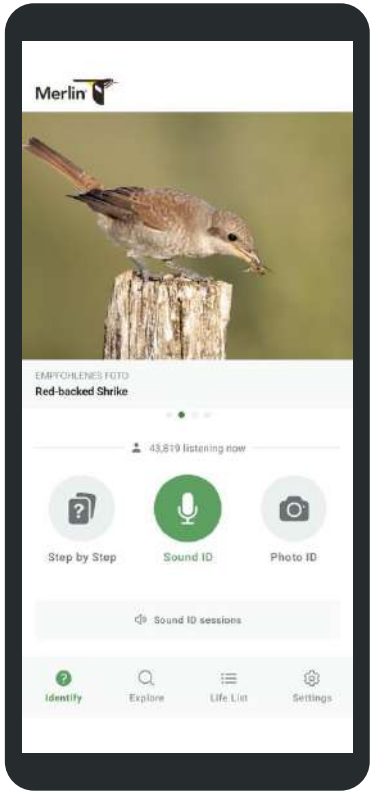





**iNaturalist**

**400 M**

observations




**Merlin**

**1.3 bn**

sound IDs

iNaturalist (live count 27 Oct 2026) · Cornell Lab of Ornithology (Merlin) · Photos: M. Kose (CC BY 4.0), S. Fauconnier (CC BY 4.0), H. Reers

# Professional ears in the field






## ecoPi

AI on the device · every detection verifiable

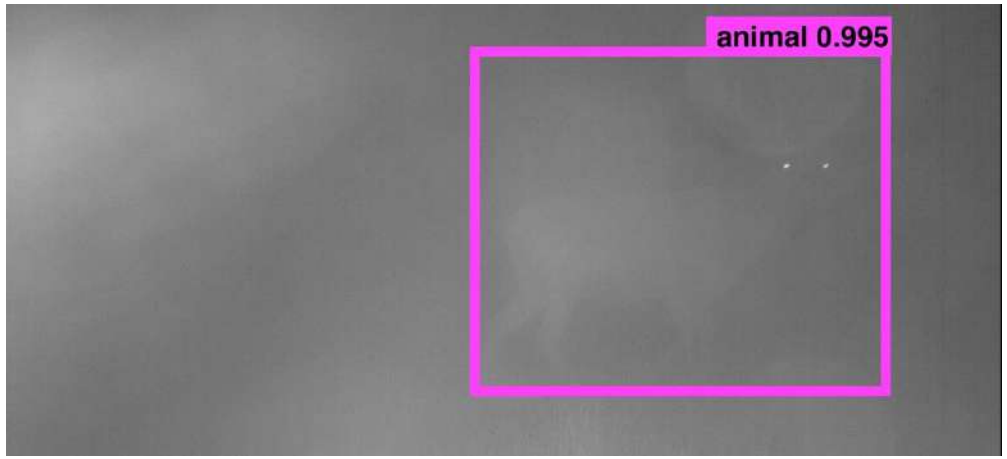
## trackIT audio:tracker

Bat calls identified live on the sensor

ecopi.de (OekoFor) · trackit.systems · Photos: OekoFor GmbH; trackIT Systems GmbH

# Camera traps that sort themselves




**2,000+**

species and groups recognised

SpeciesNet (Google), open source

MegaDetector (Beery et al. 2019) · SpeciesNet (Gadot et al. 2024, Google) · DeepFaune (Rigoudy et al. 2023) · Images: AddaxAI / P. van Lunteren

# Scaling up: drones and aerial surveys





## Vegetation

mapped under PV panels

## Seabirds

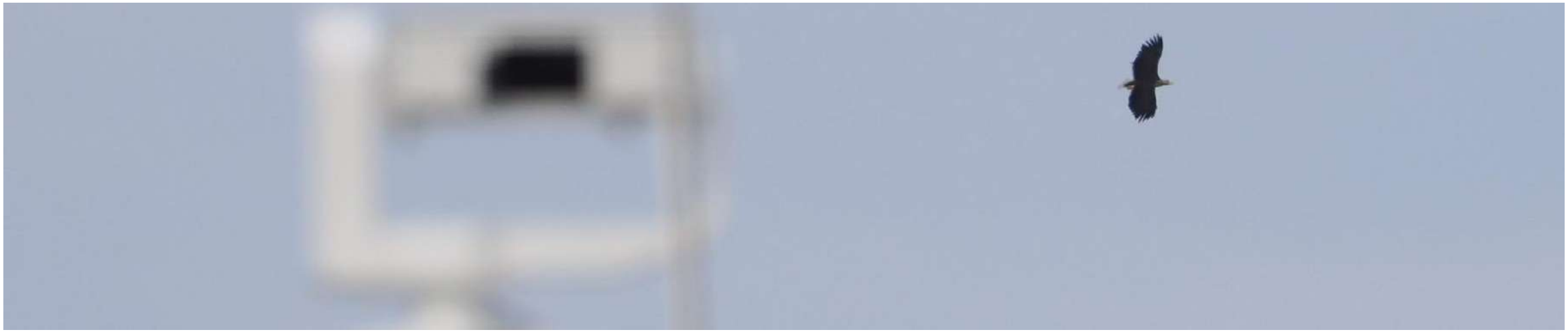
AI finds more than manual screening

## Pylons

nest boxes mapped from aerial images

Comm. Earth & Environment 2025 · Univ. of Limerick · Amprion 2025 · Photos: D. Kubbat / F&S solar (CC BY 3.0); Georgfotoart (CC BY-SA 4.0)

# Detect, track, classify, mitigate



**Detect**
camera, radar, microphone

**Track**
position, path and speed

**Classify**
target species or not?

**Mitigate**
curtail, deter or alert

# Mitigation with AI: three examples

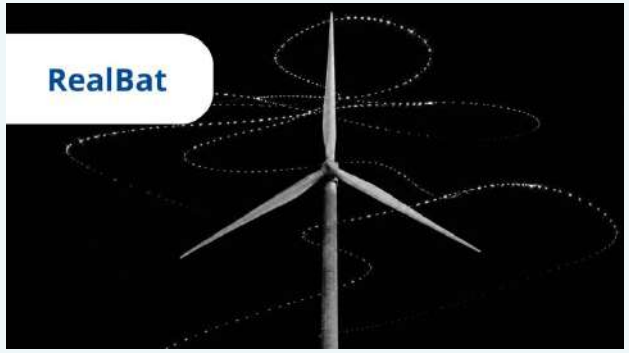
## Anti-collision systems



cameras track birds – the turbine stops in time

IdentiFlight: Reichenbach et al. 2021
Systems: IdentiFlight · Bioseco · Spoor

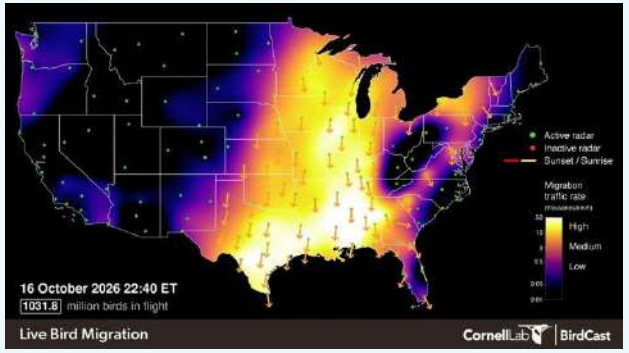
## Bat curtailment




nacelle data train smarter curtailment

France: Barré et al. 2026 (123 nacelles)
Next: RealBat, live AI (HAW Hamburg)

## Migration forecasts




48 h warning before mass migration

North Sea Start/Stop since 2023
BirdCast (US): machine learning

Images: IdentiFlight · HAW Hamburg / RealBat · Cornell Lab of Ornithology / BirdCast

# Where AI still falls short

**Lab ≠ field**

## Test → sea

porpoise clicks: more errors at sea

## 5 m → 95 m

bat calls: trained low, used at nacelle

Fog, rain and night

Small or distant birds

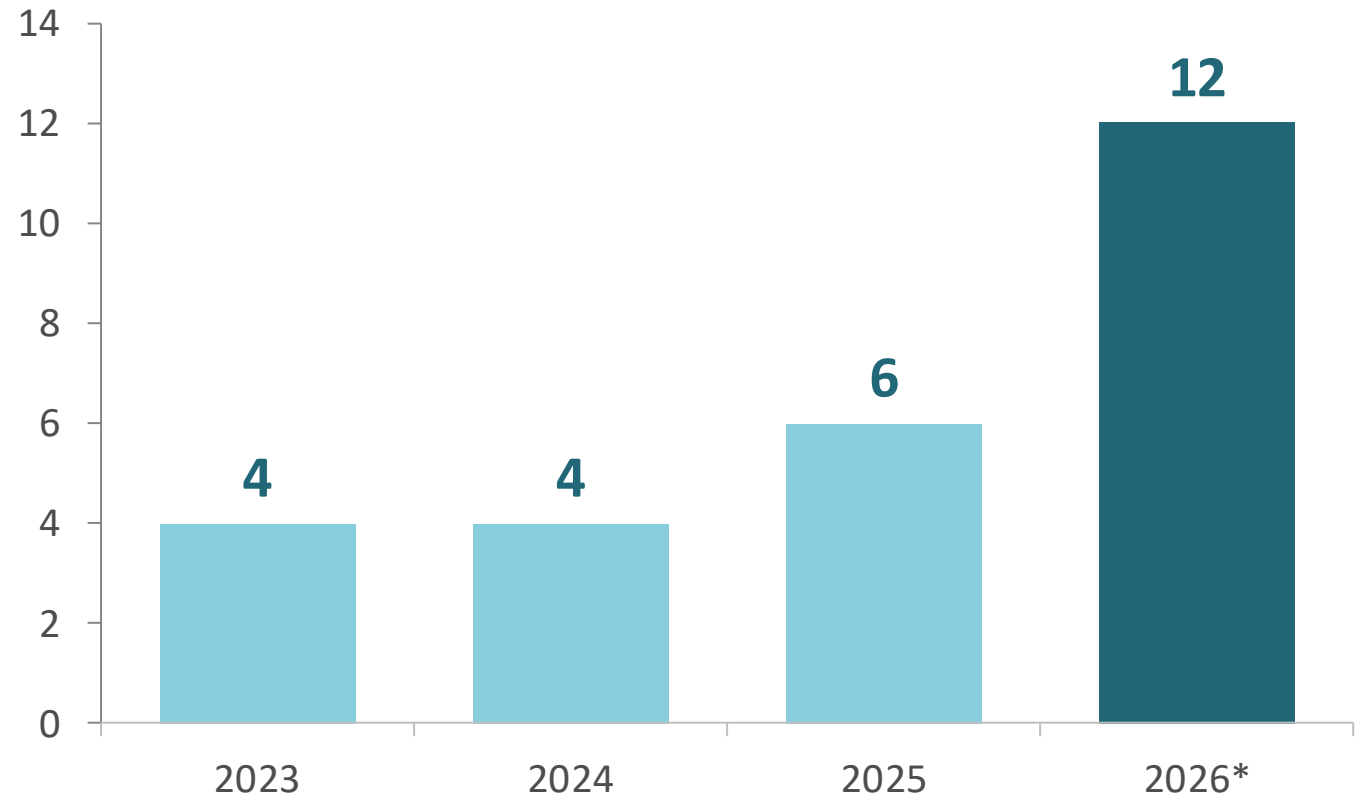
Look-alike species

False alarms cost yield

*Vendor claims are not independent validation.*

Gauger & Taupp 2026 (JASA) · Paumen et al. 2022 (Bioacoustics)

# The pace is accelerating




New model releases per year, one model family (Anthropic Claude). *2026: January–October

**Nov 2025**
Big jump in coding ability

**Jun – Jul 2026**
New model generation

**Sep – Oct 2026**
The next one, three months later

# What language models already do for us






## Screen laws and permits

Search earlier environmental reviews

**28,212 documents (PNNL)**



## Review reports

Check impact statements systematically

**550 uses classified (2026)**



## Build tools

Analysis software in days, not months

**Our example: next slide**

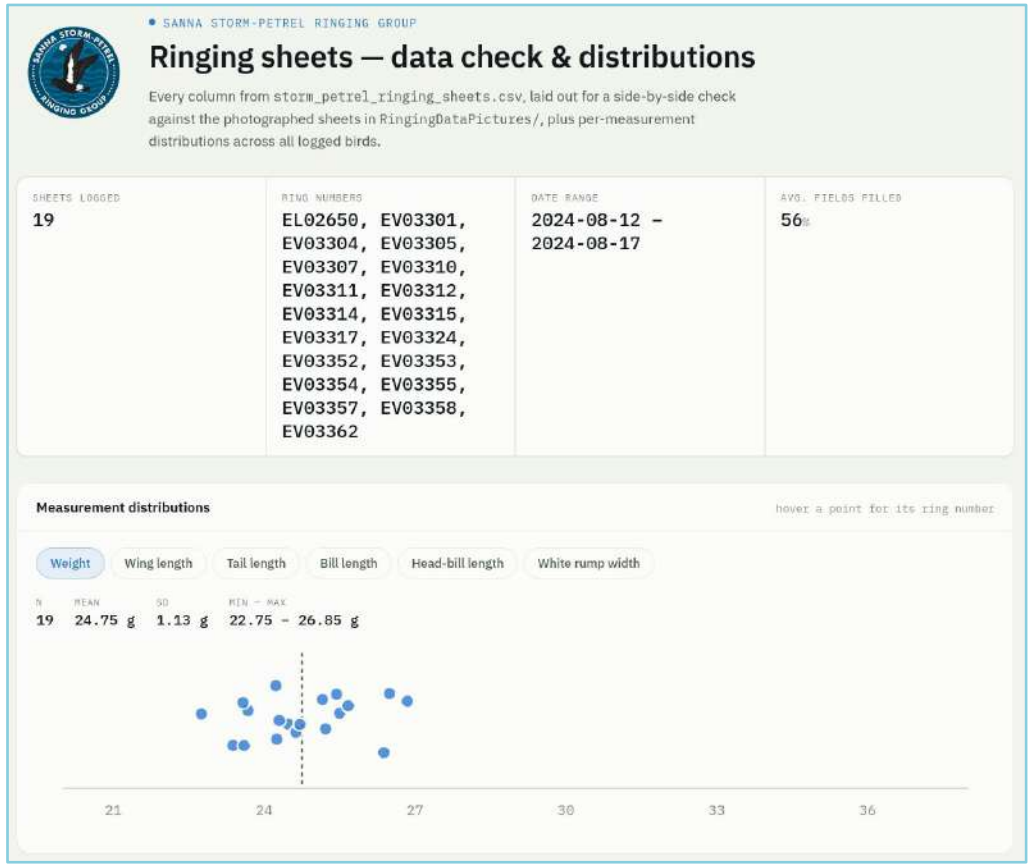
PNNL PermitAI / PolicyAI · LLM-facilitated review of US Environmental Impact Statements (Research Square 2026)

# From idea to working tool in one hour




Handwritten field sheet, photographed

AI




Read, checked and plotted automatically

# Take-home



**AI scales monitoring**

from smartphones to landscapes



**Validate independently**

lab accuracy is not field accuracy



**Experts stay in the loop**

AI assists, people decide

# Thank you!




Dr. Hendrik Reers · OekoFor GmbH, Freiburg

www.oekofor.de · www.ecopi.de

WINGSPAN 2026

# Spotlight

## Innovations in monitoring: Enhancing conservation around energy infrastructure



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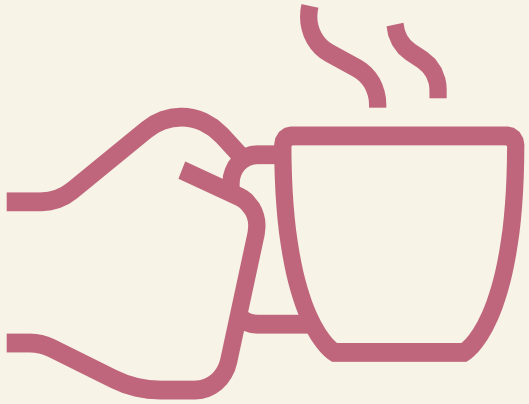
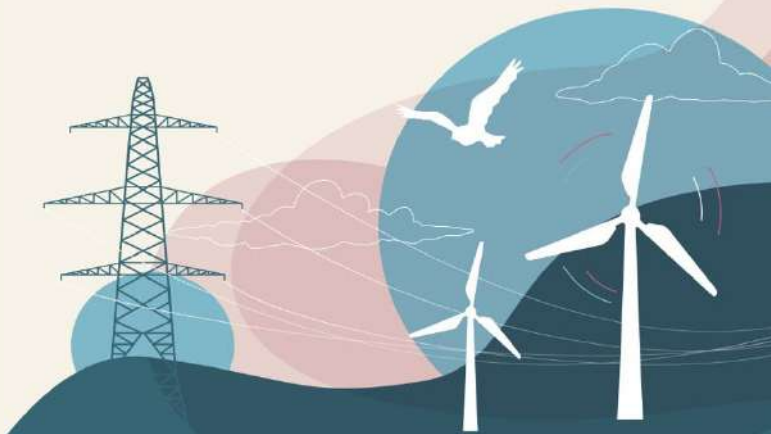
Managing Director

OekoFor GmbH



# COFFEE BREAK



WINGSPAN 2026

# From Partnerships to Practice

## Accelerating Nature-Positive Energy Infrastructure

3 – 5 November 2026
Berlin



Renewables Grid Initiative · TB Raab Technisches Büro für Biologie · SafeLines4Birds · EUROKITE · LIFE EURO BUSTARD · 50hertz | Elia Group · elia group · NATURA 2000 · Co-funded by the European Union

WINGSPAN 2026

# Presentations

## From Monitoring to Mitigation: Technical Innovations for Nature Protection



**Robin Dixon**
Head of Environmental Expertise
France Renouvelables



**Brian McGowan**
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Research Scientist
EDM International, Inc.

WINGSPAN 2026

# Lessons from France’s shutdown-on-demand and curtailment measures for onshore wind

**Robin Dixon**

Head of Environmental Expertise, France renouvelables



CONTEXT

# France combines fast wind growth with a demanding nature framework

ONSHORE WIND CAPACITY

**23.9** GW operating, 2025 ▶ **40–45** GW target for 2035

## A demanding framework

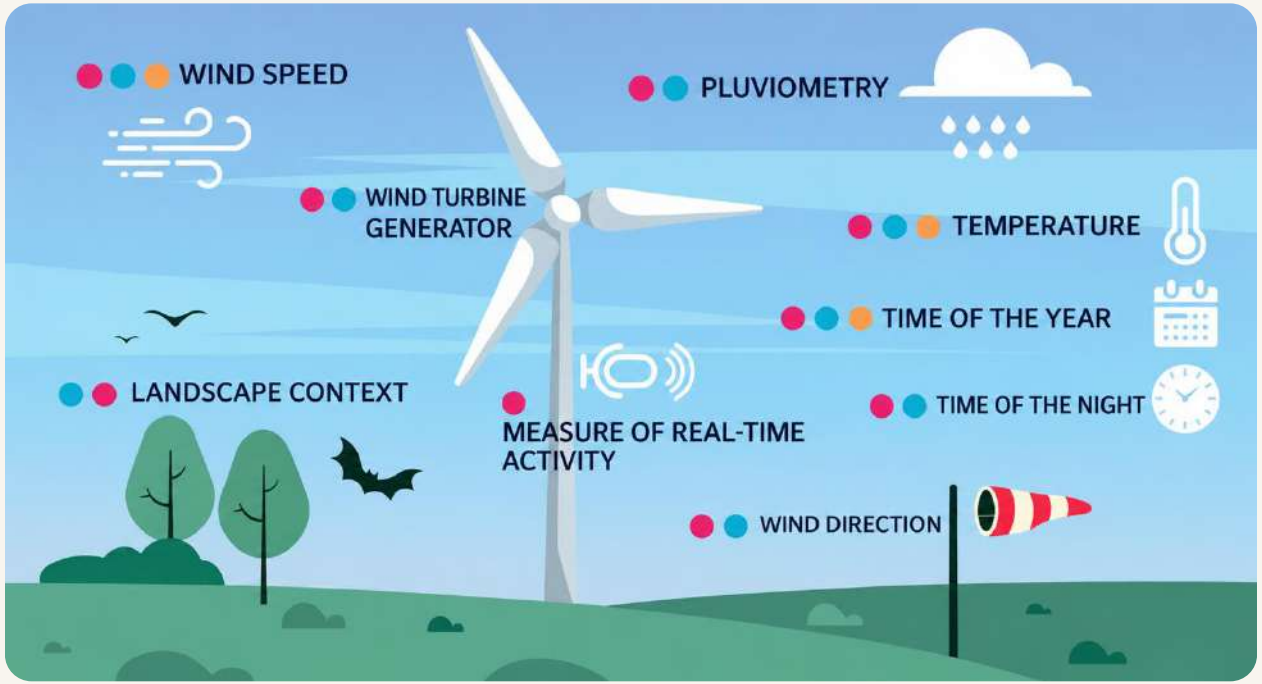
- Avoid–reduce–compensate sequence
- Standardised monitoring protocol
- Raw data sent to a national database

Flying wildlife faces habitat avoidance and collision risk. Curtailment, which slows or stops a turbine under certain conditions, reduces that impact during operation.

** Avoiding sensitive areas is the priority, but it is not the topic of this talk.*

BATS

# Bat curtailment is now standard practice, and it works




Conventional  Multi-criteria  Algorithmic (adds real-time activity)

NEW FARMS

**~100%**

include bat curtailment (¾ in 2023)

CONVENTIONAL

**–57%**

average mortality reduction (OPRECh)

LONG-RANGE BATS

**–83%**

estimated, site-specific thresholds

MID-RANGE BATS

**–84%**

estimated, site-specific thresholds

Sources: France renouvelables (2025b); OPRECh (2022); Ravache et al. (2026)

BATS

# Optimising bat curtailment means balancing protection and production

## Algorithmic curtailment

Algorithms predict bat presence: expected annual losses of 3.5–7.6%, to be tested on site.

## Protection target: the higher, the costlier

Protect 85%, 90% or 95% of bat activity? But must be viewed in relation to the the number of contacts.

## Making it work

Delayed starts and malfunctions are common but can be corrected with specialised software. Turbine operators must respond in short notice.

## Aviation lighting

Minimising lighting duration reduces bat attraction to turbines (Larnoy et al., 2025): a lead to explore.

Related work: Barré et al. (2026); Larnoy et al. (2025)

BIRDS · SHUTDOWN-ON-DEMAND

# SDOD is spreading fast in France, and almost all systems are camera-based

**WIND FARMS**

**186**

equipped with SDOD at the end of 2025

**WIND TURBINES**

**1 000+**

declared as equipped

**2D CAMERAS**

**75%+**

of the identified systems

**SUPPLIERS**

**~6**

active in France, out of 25+ worldwide

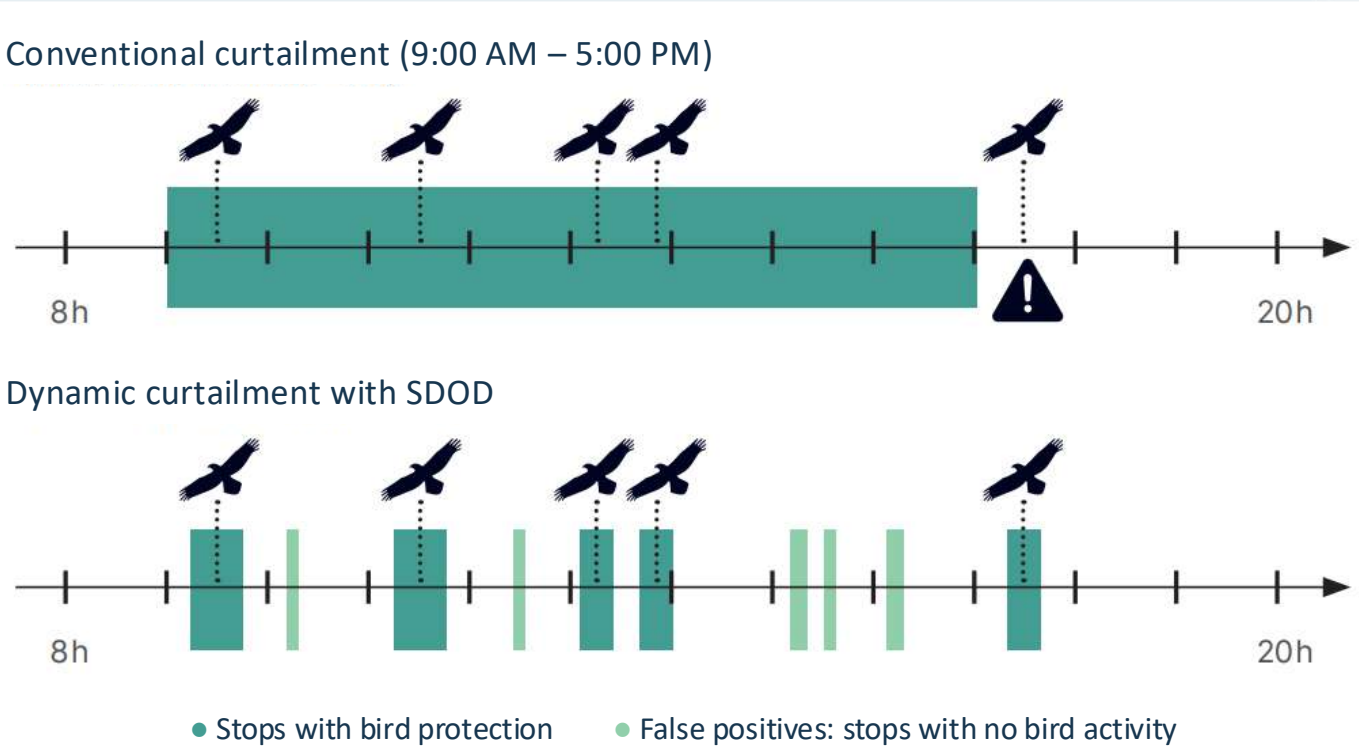
All identified systems are optical cameras, with a vast majority of 2D cameras.

## HOW AN SDOD WORKS

**1** Set a risk zone and target species → **2** Detect the bird → **3** Identify it → **4** React: slow, stop or deter

Source: OFB & ADEME (2026)

# SDOD stops turbines only when a bird is detected




**Double advantage:** continuous protection, with less lost production than conventional curtailment.

**Case by case.** Depends on target species, bird passages over the day and year, and installation and maintenance economics.

Source: France renouvelables (2025b)

# Evaluating an SDOD means separating performance from effectiveness

**1 — Functional**

Installed, online, accessible

**2 — Detection**

Does it spot the bird?

**3 — Classification**

Species, distance, trajectory

**4 — Order**

Is the stop order transmitted?

**5 — Response**

Do the blades slow in time?

**6 — Mortality avoided**

Fewer deaths than before, or than a control?

**Performance** | **Effectiveness**

Sources: ADEME & OFB (2026a, 2026b); Ballester & Bernard (2025)

# SDA+ sets two protocols to assess SDOD performance

ADEME and OFB launched the SDA+ programme in 2025 to standardise how performance is assessed: is the system operational, does it detect and classify birds, does it trigger a response?

| Aspect | Ex-factory certification | On-site protocol |
|---|---|---|
| Scope | Performance for SDOD comparison with fixed conditions and protocol | Performance for one SDOD on one site for a specific species or groupe of species |
| Distance | Distance classes, set by SDOD providers | One specific distance, set by state authorities |
| Performance components | Detection-classification | Temporal coverage X detection-classification X Percentage of correct stop commands before the risk distance X SCADA reaction |
| Conditions | Good conditions required | Representative of the site |
| Cost | SDA provider and ADEME | Wind farm operator |

Sources: ADEME & OFB (2026a, 2026b)

BIRDS · SDOD PERFORMANCE

# Operators and suppliers question the cost and design of the SDA+ protocols

### Cost

Significant cost, with no clear benefit for suppliers or operators.

### Overlap

Ex-factory and on-site protocols overlap.

### Calculation

Methods judged inadequate, particularly for false positives.

### Feasibility

The on-site protocol is not feasible in the short term.

**Next step: on-site tests in 2027, if suppliers and the sector invest with ADEME.**

# Effectiveness: does it reduce bird mortality?

Does the SDOD actually reduce bird mortality? The EFFICAS programme (CNRS) tried to measure it with a BACI method, but the results are mostly inconclusive and have been heavily criticised by the industry.

- **First large-scale test of SDA effectiveness:** 26 equipped wind farms, 20 analysed with a BACI design.
- The null hypothesis (no effect) is never rejected at 95%, so **a strong effect (≥30%) is ruled out for the tested systems** (mostly three 2D-camera models installed 2018–2024).
- BACI shows a 20–35% downward trend, but it is statistically indistinguishable from random variation.
- **It does not prove that SDAs are ineffective, and it says nothing about 3D, radar or newer algorithms.**
- **Limits** are data quality, control-site distance and regional bias (Occitanie over-represented, Grand-Est absent).
- **Recommendations** are certification, on-site monitoring and a better-designed new national evaluation.

Sources: Ballester & Besnard (2025); OFB & ADEME (2026)

# Feedback from the wind industry

- The approach (BACI, GenEst/EoA) is relevant, but the report is seen as missing its objective due to **data gaps** and **contestable methodological choices**.
- Very wide confidence intervals reflect statistical impotence, not proof of ineffectiveness.
- **The sample is unrepresentative** (26 of 123 farms, 73% in Occitanie, no Grand-Est, control sites up to 280 km away) and the data contain errors.
- Aggregating species by wingspan rather than target species (large protected raptors) dilutes the signal.
- **The study treats SDAs as a "black box":** it had no operating logs, ignored the post-installation run-in period, did not separate sound scaring from turbine curtailment, and pooled different camera resolutions and models.

Source: France renouvelables (2025a)

KEY MESSAGES

# Bat curtailment works; bird SDODs must now prove their case, site by site

## Bats

- Curtailment works for bats, and an imperfectly tuned curtailment is still better than none at all
- Optimising it should make it possible to target the periods when bats are genuinely active, limiting production losses without compromising protection. Algorithm-based curtailment is one solution, but it is not necessarily suited to every site.
- The sector's needs must be taken into account: activity rate versus number of contacts, and the economic impact of losses, which varies from site to site.

## Birds

- SDODs are now widely deployed in France, but they were rolled out without using the opportunity to measure performance and effectiveness at national scale from the outset.
- Wind operators already see these systems perform and deliver in the field. But with third-party attempts proving unsatisfactory, the industry must now organise itself to share the evidence and convince others of their relevance, case by case.

WE NEED A CHANGE OF METHOD

# Evaluate from the start.
# Share the data.
# Leave room to experiment.

Operators need room to test and adjust without adding to project costs.
Room to experiment is what allows progress.



# Robin Dixon


Head of Environmental Expertise, France renouvelables

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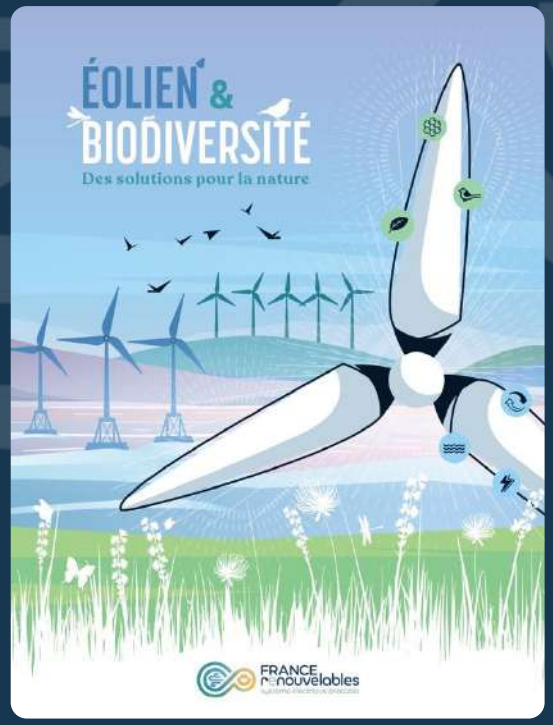


REFERENCES


ADEME, CEFE-CNRS, Exen, TotalEnergies (2022). Programme OPRECh. Synthesis report.

ADEME & OFB (2026a). SDA performance: ex-factory protocol and certification. SDA+ report.

ADEME & OFB (2026b). SDA performance: on-site evaluation protocol. SDA+ report.

Ballester M., Besnard A. (2025). EFFICAS final report. CEFE-CNRS.

Barré K. et al. (2026). Optimising bat-friendly curtailment algorithms for wind turbines. J. Environ. Manage. 416: 130829. doi:10.1016/j.jenvman.2026.130829

France renouvelables (2025a). Commentaires de France renouvelables sur le rapport final du programme EFFICAS 2025.

France renouvelables (2025b). Éolien & biodiversité : des solutions pour la nature. Kraaijenbrink M., Dixon R.

Larnoy et al. (2025). Minimizing aviation lighting duration reduces bat attraction to wind turbines. J. Appl. Ecol. 63: e70226. doi:10.1111/1365-2664.70226

OFB & ADEME (Chambert, Eglin, Franc) (2026). Efficacité des systèmes de détection-arrêt pour l'éolien terrestre : enseignements de l'étude EFFICAS et pistes d'actions. Observatoire des énergies renouvelables et de la biodiversité, October 2026.

Ravache et al. (2026). Site-specific curtailment thresholds substantially reduce bat mortality at wind energy facilities. J. Appl. Ecol. 63: e70591. doi:10.1111/1365-2664.70591

WINGSPAN 2026

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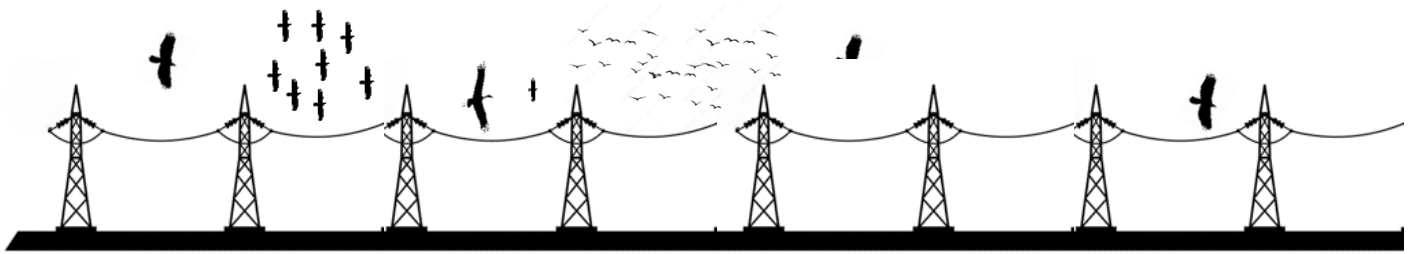
# Building Grid Operator Trust Through Long-Term Avian Mitigation Effectiveness

Brian McGowan
Scientias-Energy

Independent technical advice built on 30 years of global power-industry experience | CIGRE, IEEE working group participation & leadership

Wildlife mitigation | Wildfire ignition risk | Wood & composite asset performance | HV Materials | Biodiversity strategy implementation



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SCIENTIAS ENERGY



# Brian McGowan

## Founder – Scientias-Energy

- Independent engineering consultant with more than 30 years' experience in the international power industry.
- Helping conservation organisations and electricity utilities reduce wildlife mortality through effective, durable mitigation.
- Manufacturer-neutral advice on product selection, technical specifications and long-term performance.
- Convenor of CIGRE's working group on reducing bird electrocution on power lines, and participant in IEEE standards development.
- Projects completed in more than 20 countries.
- 15% of annual working time dedicated to pro bono conservation support.









# The Challenge?

## UNAVOIDABLE INTERACTION



**50**
Billion
Birds



**120**
million
km
over-head-lines

## DEFINITION OF SUCCESS?



**CONSERVATION**
Mortality of threatened species



**GRID OPERATOR**
Faults/Outages
Fire Ignition
Conservation

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SCIENTIAS ENERGY

# Grid operator trust depends on RELIABLE performance. Long term DURABILTY matters.




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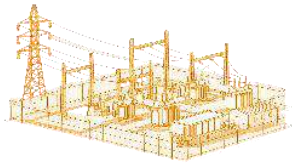
# Durability - definition

The ability of a solution to **remain functional** and within **specified performance** limits, **without damage or failure**, for the **defined service life** under stated **operating conditions.**

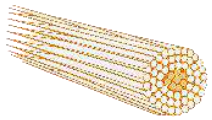
**Durability depends on design, material selection, correct installation and operating conditions.**



63 years



45 years



40 years

*According to CIGRE TB 176 (Aging of the system, impact on planning)*



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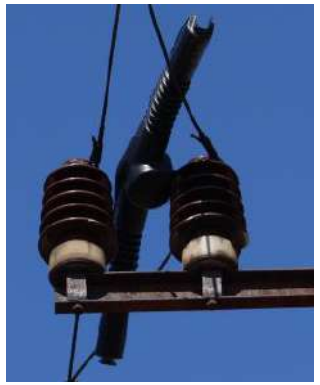
# If durability ≠ Service requirements

## FIELD FAILURES



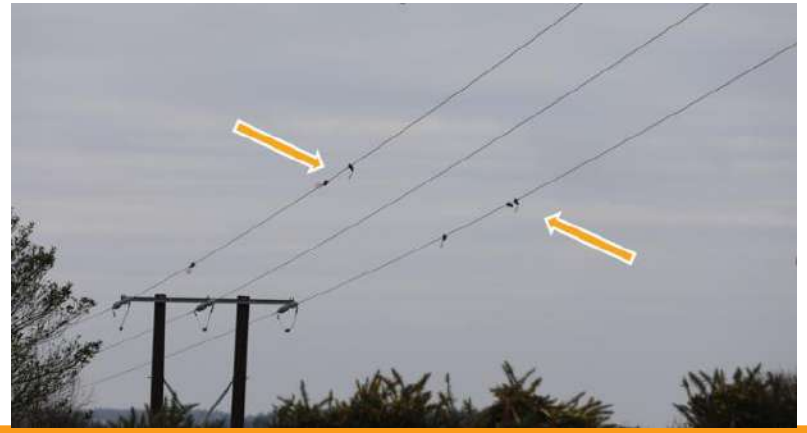








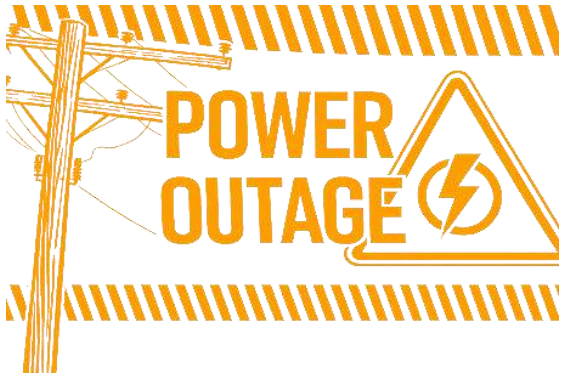


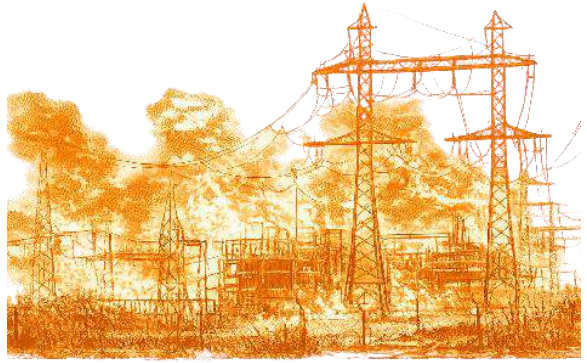
## LOSS OF TRUST




MORTALITY

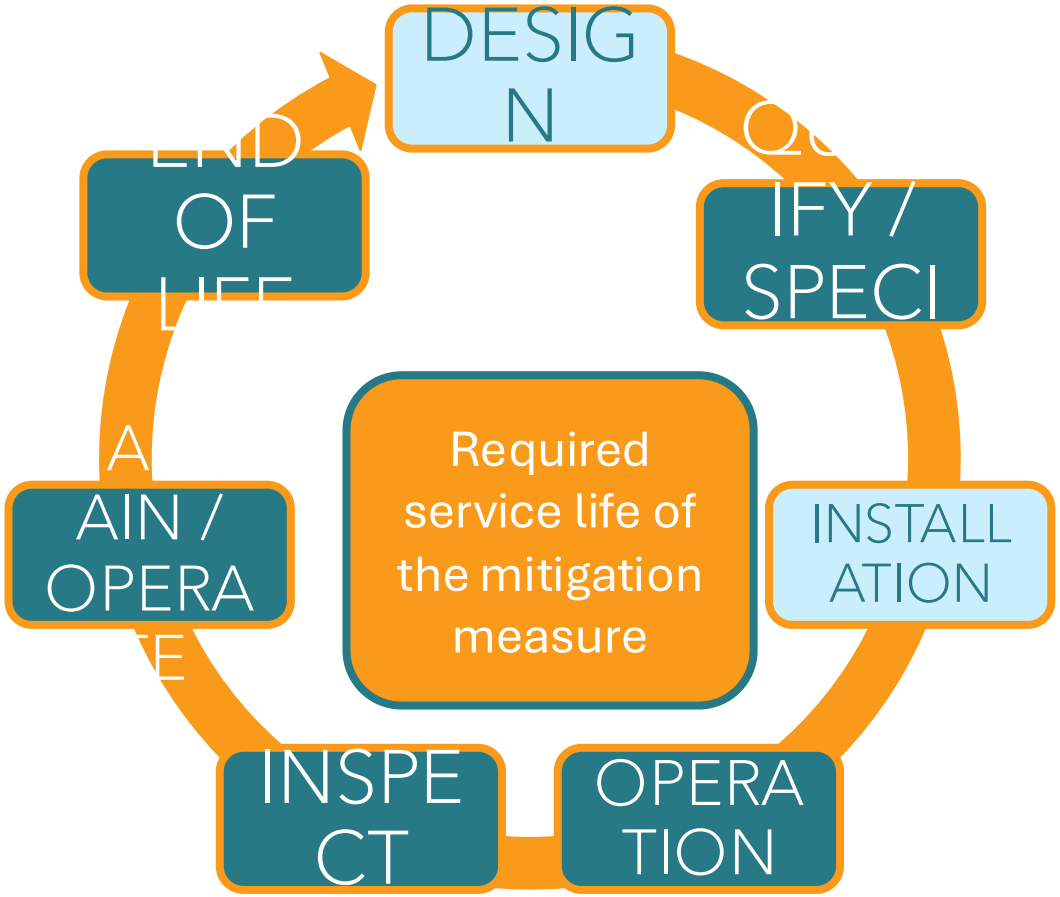



FAULTS / OUTAGES



FIRE IGNITIONS

# Asset management for sustained bird protection




The industry generally defines requirements, designs solutions and installs them

Long-term inspection, maintenance and replacement receive less consistent attention

Every mitigation installation needs a named owner, an inspection schedule and a funded maintenance and replacement plan.



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# Change needed: Bird Flight Diverter (BFD) case

| | |
|---|---|
|  **QUALIFY / SPECIFY** | **Conservation:** Prioritise requirements – location, type, spacing.<br>**Utility:** Define life expectancy, environmental conditions.<br>**Standards organisation:** Develop internationally agreed guidance for bird flight diverter qualification and lifecycle management |
|  **INSPECT** | **Conservation:** Post installation monitoring to track mortality and durability.<br>**Utility:** Integrate bird flight diverters into operation and maintenance processes. |
|  **MAINTAIN / OPERATE** | **Utility:** Defined response to damaged, missing or ineffective devices.<br>**Solution providers:** Develop service to inspect, remove from service and replace. |
|  **END OF LIFE** | **Utility:** Build EoL into asset management processes.<br>**Solution providers:** Define end-of-life / replacement criteria. |

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# Take aways….

- Conservation objectives should define the required performance of mitigation.
- Product selection should consider both collision reduction and durability.
- Monitoring should assess mortality outcomes as well as device condition.
- Every installation needs an identified owner and a funded maintenance and replacement plan.
- Evidence from the field should inform future specifications and product improvements.








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# Proposed new IEEE working group

**IEEE:** (Institute of Electrical and Electronics Engineers) is a global professional organisation advancing technology through technical standards, research publications, conferences and education.

**Proposal:** Guide for Mitigating Wildlife-Related Faults and Outages on Electric Power Transmission Lines






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# SUMMARY:

## Grid operator TRUST depends on reliable performance

- ✓ Will it function in our environment?
- ✓ Will it keep functioning, (without side-effects)?
- ✓ Can we inspect and maintain it?
- ✓ Can we remove and replace it, (if necessary)?



If we can establish clear
EFFECTIVENESS + DURABILITY + LIFECYCLE OWNERSHIP,
we can build trust.

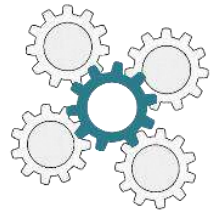
If not, we build RESISTANCE.

# Thank you for your attention

Scientias-Energy
website

Brian McGowan
Linkedin

Book a video call
with an expert



- ✓ Independent
- ✓ Integrity
- ✓ Innovation
- ✓ Impact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LIFE SAFELINES4BIRDS · WINGSPAN 2026

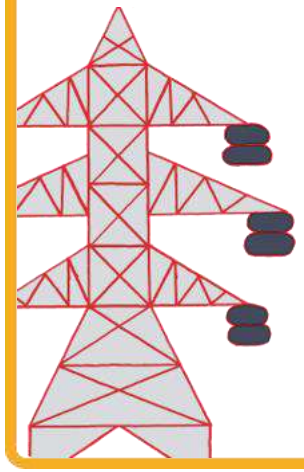
# Tracking juvenile Black Storks

## Identifying power-line exposure hotspots

LIFE SafeLines4Birds · Reducing bird mortality caused by power lines



Quaintenne G. · Chapalain F. · Gailly R. · Gendre N. · Paquet J.-Y. · Vangeluwe D. · Marchand I.
LPO · ACETAM · Natagora · RBINS



Co-funded by the European Union

04/11/2026

SafeLines4Birds

# CONTEXT

## SafeLines4Birds project

*Reducing bird mortality caused by power lines*

## LIFE project

▶ **France, Belgium & Portugal**

6 years project (2023-2028), around 14 millions euros




©Weyrichfoto




©Ingrid Marchand

# CONTEXT

## SafeLines4Birds project

*Reducing bird mortality caused by power lines*

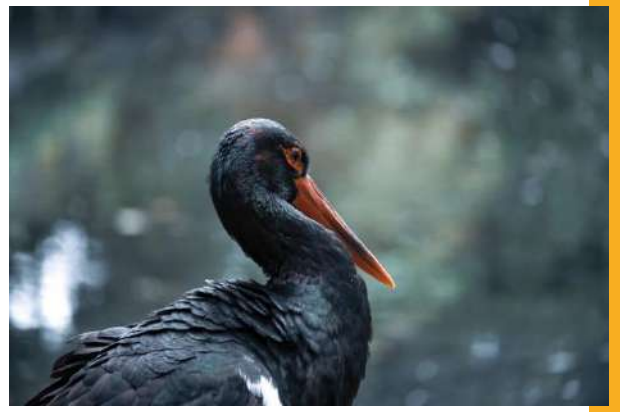
## LIFE project

▶ France, Belgium & Portugal

6 years project (2023-2028), around 14 millions euros

## 13 species

**Black Stork,** White Stork, Little Bustard, Bearded Vulture, Bonelli's Eagle, Cinereous Vulture, Egyptian Vulture, Lesser Kestrel, Common Crane, Osprey, Eurasian Woodcock, Eurasian Curlew, Northern Lapwing



























# CONTEXT

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*Reducing bird mortality caused by power lines*

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## 23 actions

Reduce bird collision, reduce bird electrocution and reduce bird disturbance



©Romain Beaubert



©Bruno Berthemy

# CONTEXT

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*Reducing bird mortality caused by power lines*

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## 23 actions

Reduce bird collision, reduce bird electrocution and reduce bird disturbance

## Tracking juvenile Black Storks

GPS leg-ring tracking to investigate mortality throughout the annual cycle



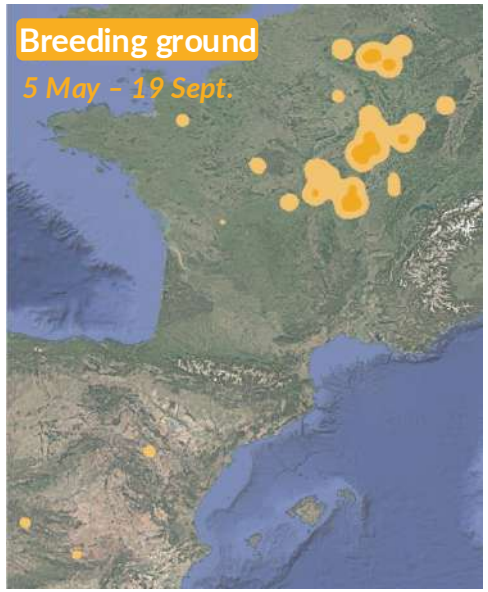



©Robin Gailly

# MATERIALS & METHODS

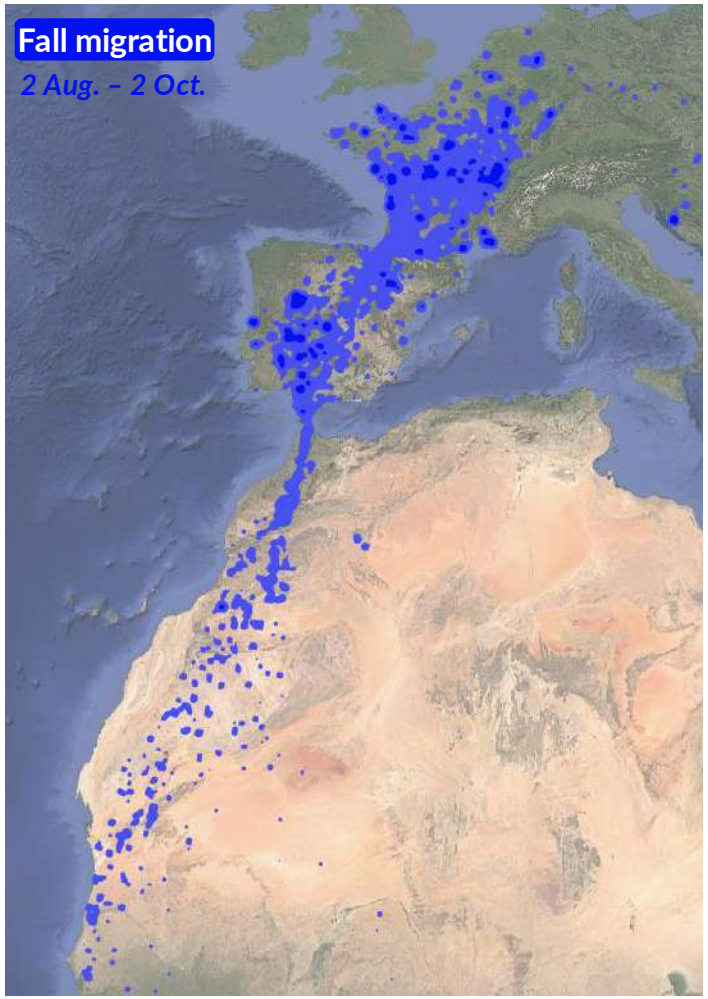
## Tracking juvenile Black Storks from Europe to Africa

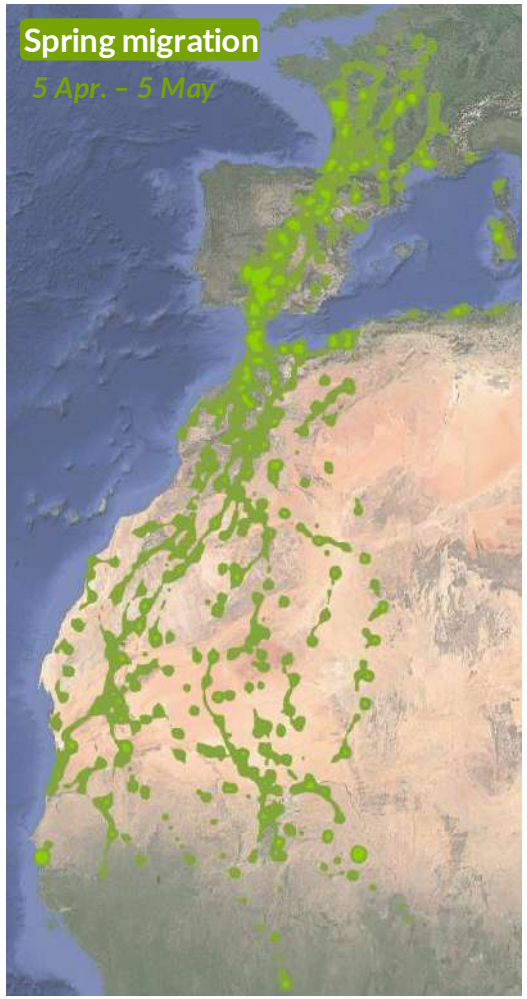
*GPS leg-ring tracking (~30-min intervals) to investigate mortality throughout the annual cycle.*

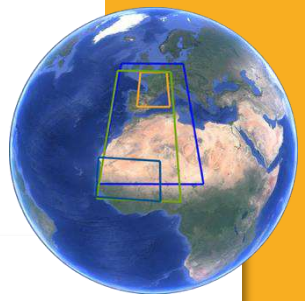








**105**
GPS-tagged juveniles,
104 with usable GPS data

**2023–2025**
Tracking period

France + Belgium

**≈486,000**
Validated GPS fixes

◀ GPS-based space use (50% & 95% utilisation distributions) • Median transition dates (1A-2A GPS tracking).

**GPS** → **Behaviour** → **Space use** → **Power-line exposure**

# WHY JUVENILES?

## High mortality during the first year

*Despite a relatively high survival rate, juvenile Black Storks face important risks, particularly during the first fall migration.*

1



**42 deaths**

▶ **39 in first-year birds (1A)**

52% apparent survival · 95% CI: 38.6–63.3% · First 365 days of GPS tracking

## First-year survival can be extremely low

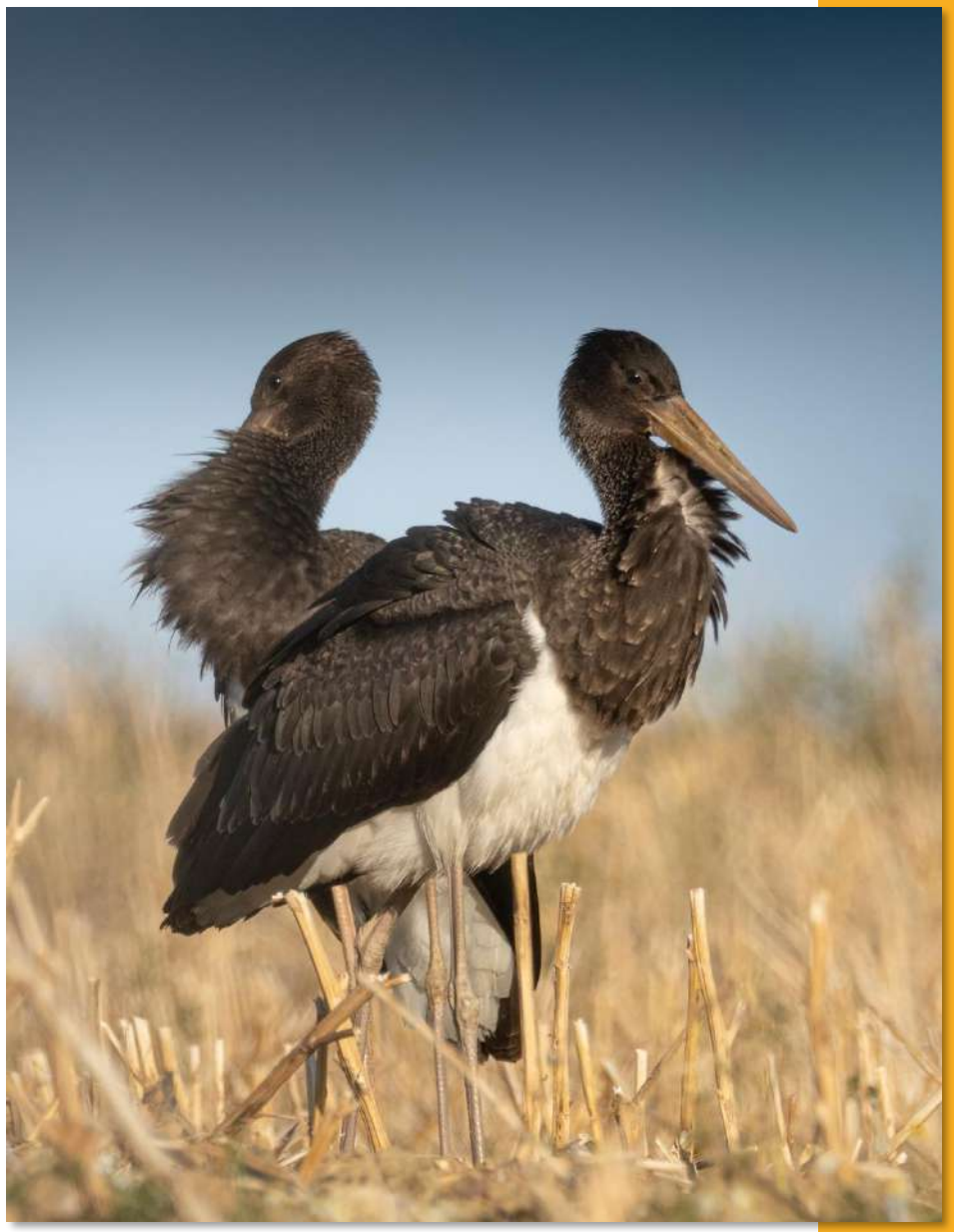
BALTIC POPULATION
VÄLI ET AL. (2024)

**4%**
Apparent survival
Colour-ringed birds

**11%**
GPS-based survival

HUNGARY
TAMÁS (2011)

**17%**
First-year apparent survival
Ring-recovery data



©A. Dusart

Väli et al. (2024). Bird Conserv. Int.34, e10
Tamás (2011), Biologia 66, 912-915

# WHY JUVENILES?

## High mortality during the first year

*Despite a relatively high survival rate, juvenile Black Storks face important risks, particularly during the first fall migration.*

1



**42 deaths**

▶ **39** in **first-year birds (1A)**

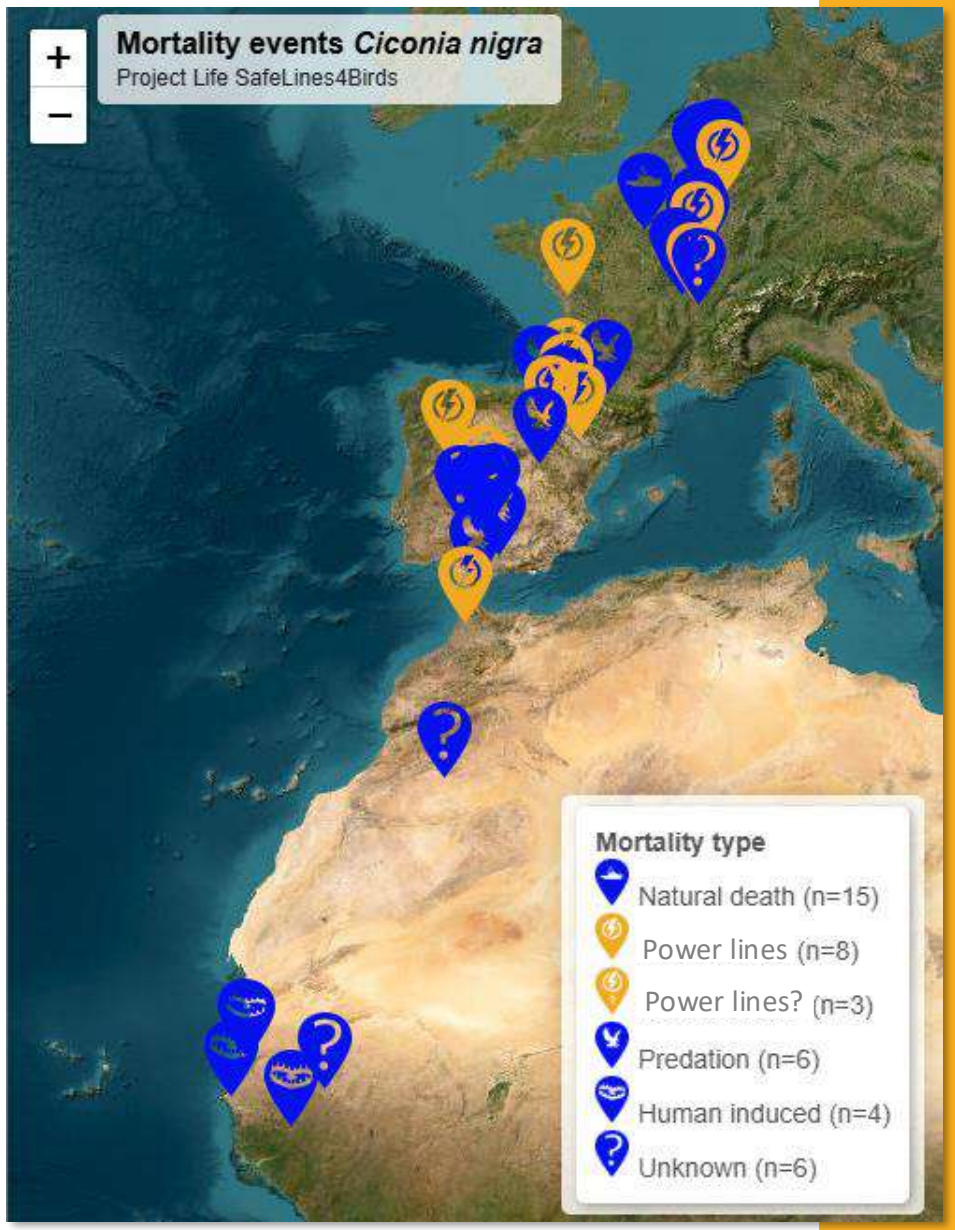
52% apparent survival · 95% CI: 38.6–63.3% · First 365 days of GPS tracking

2



**52%**

of documented deaths occurred during **fall migration**



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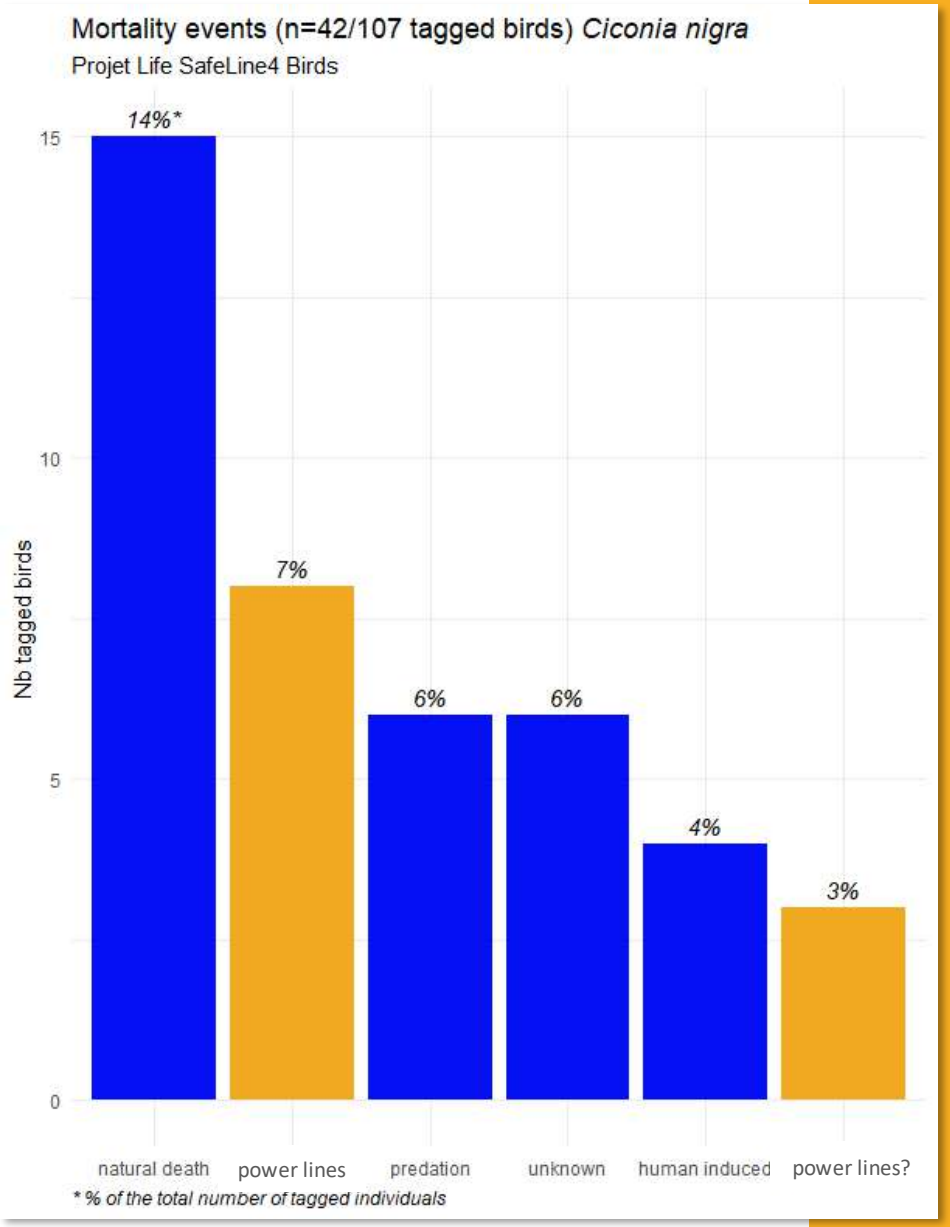
**26%**

**Power-line** related mortality confirmed or suspected among 1A deaths



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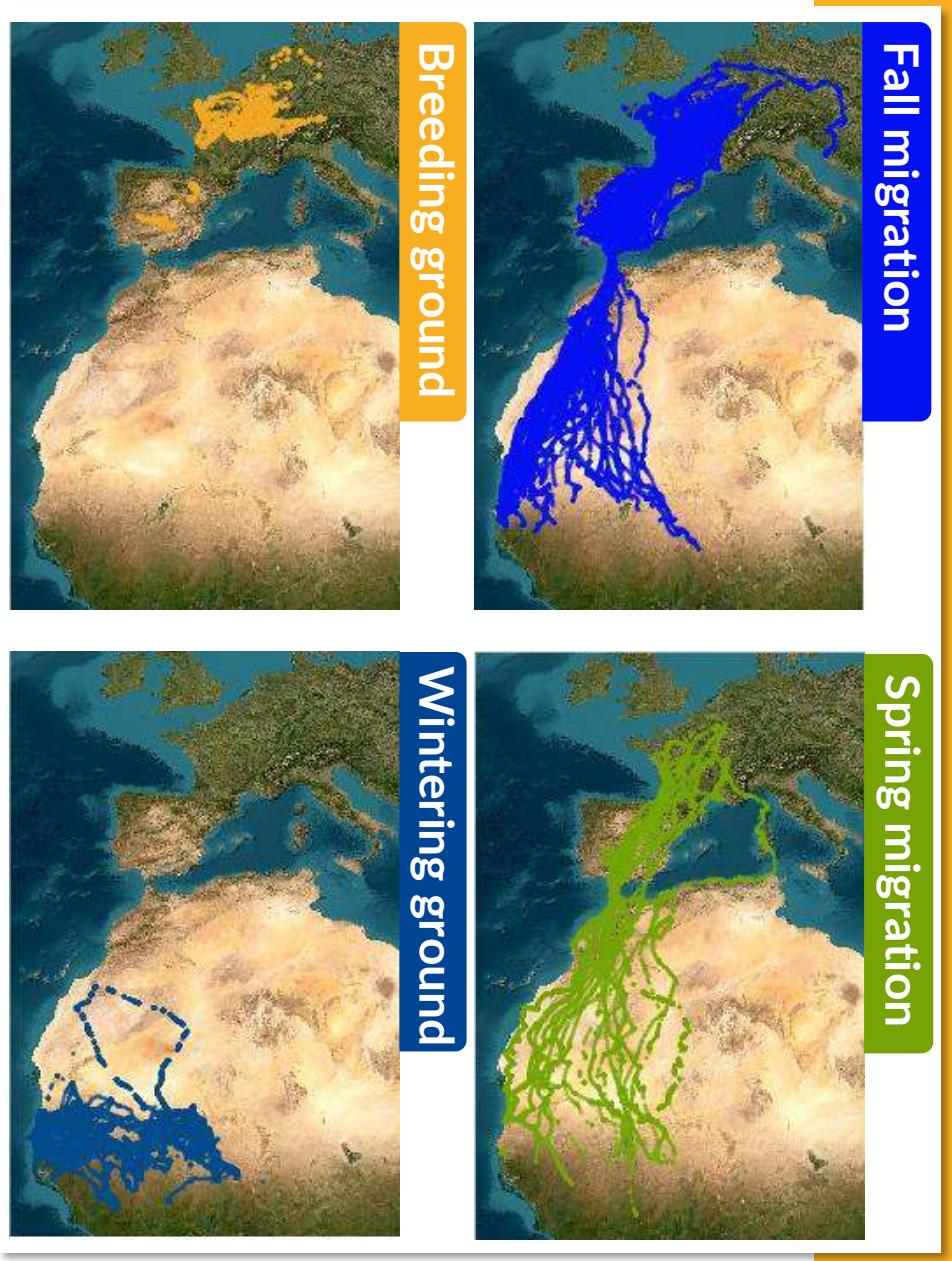

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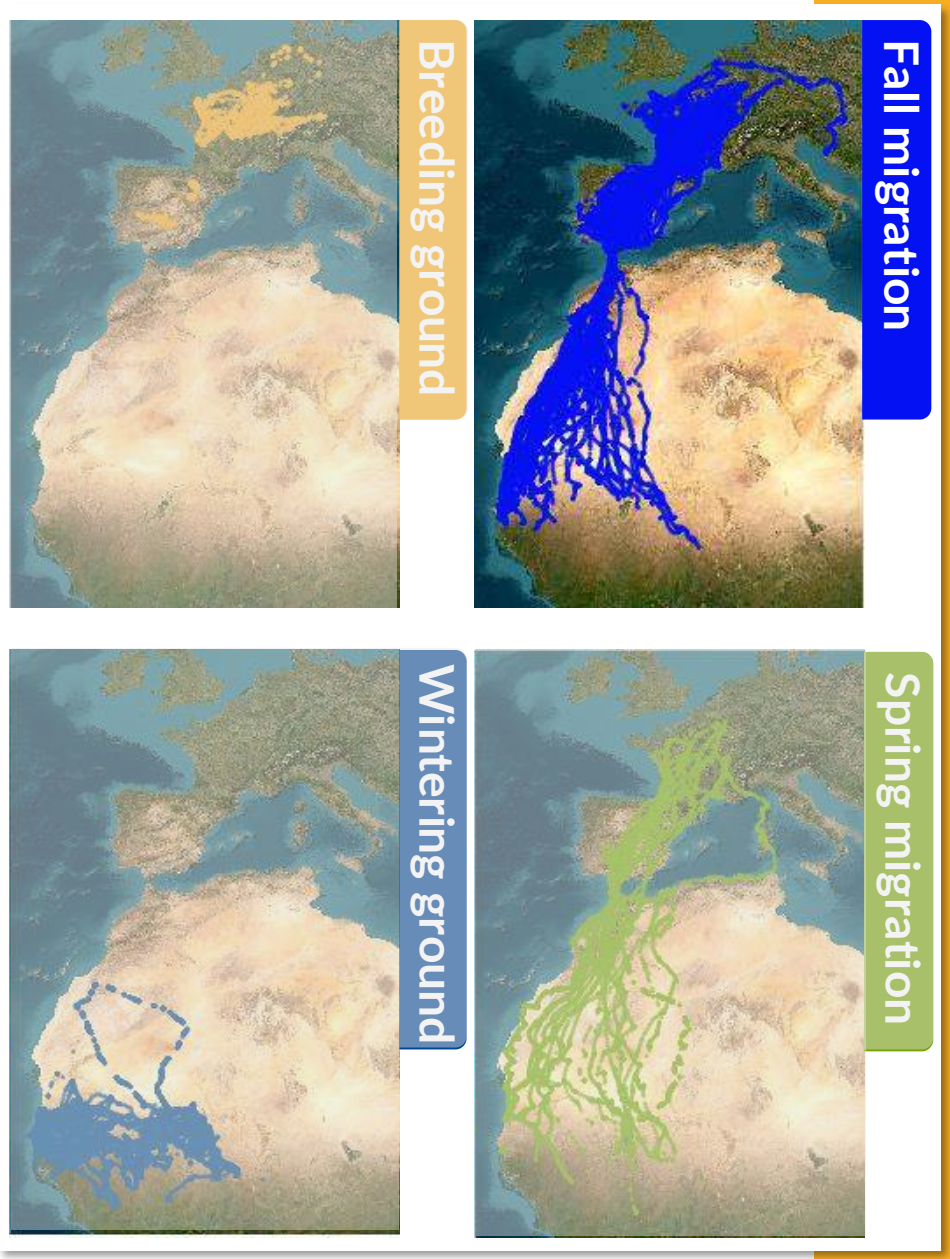
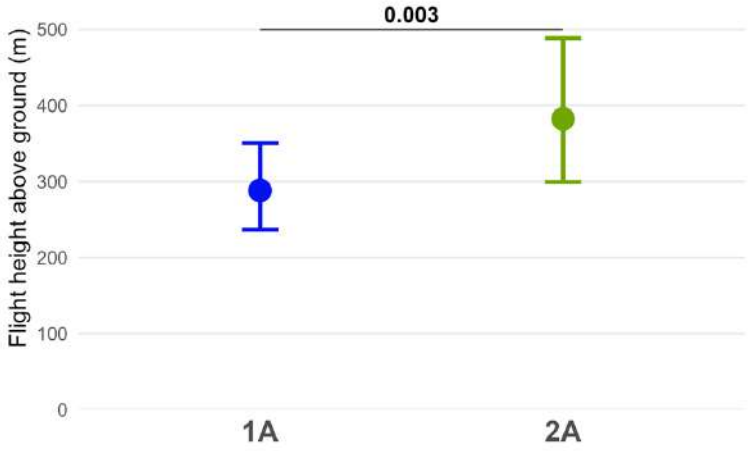


# THEY LEARN TO MIGRATE

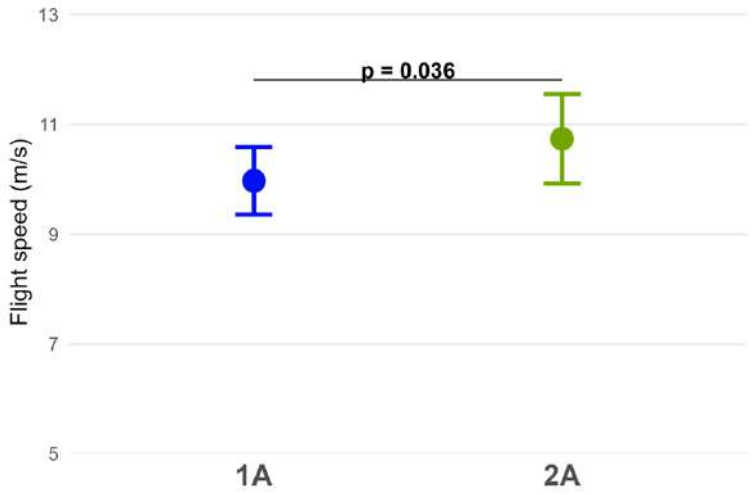
## The first journey is a major challenge

*During their first fall migration, juvenile Black Storks fly lower and more slowly, with more frequent prolonged stopovers - patterns that may reflect less efficient use of thermal updrafts.*

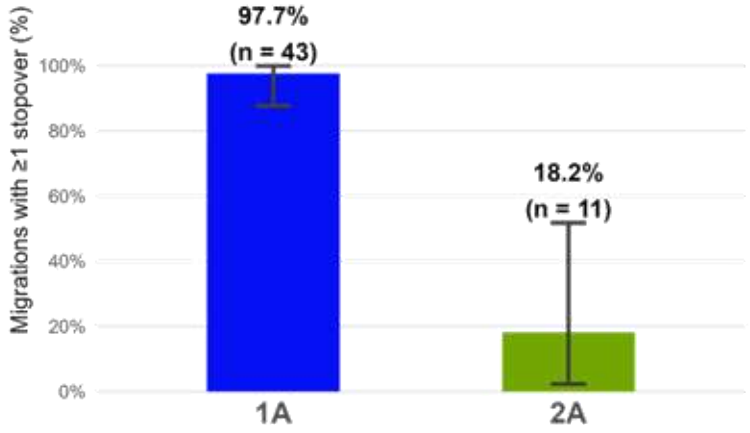
**Lower flight altitude**
1A vs 2A




**Slower flight**
1A vs 2A




**More stopovers**
1A vs 2A



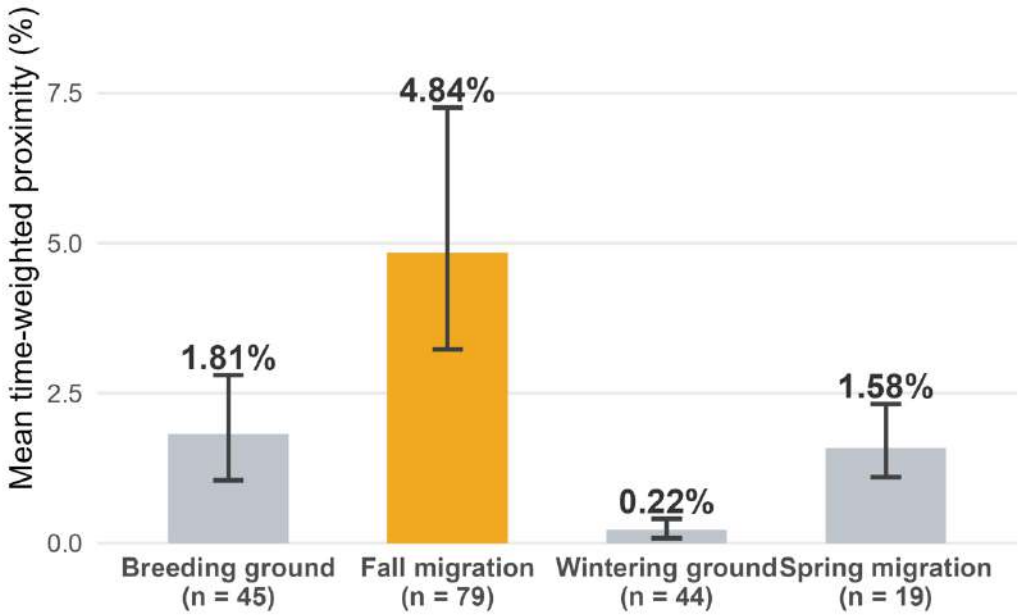

& **10/11** birds flew more often below 50 m altitude in 1A than 2A (p = 0.012)

➢ Migratory experience may be associated with higher flight altitudes and a reduced propensity for low-altitude flight, potentially affecting exposure to power-line hazards.

# AUTUMN MIGRATION: WHEN EXPOSURE PEAKS

## Power-line proximity (OSM) is highest during fall migration

WHEN ARE BIRDS CLOSE TO POWER LINES?




Within 100 m of power lines
GPS intervals ≤ 60 min
Coverage ≥ 72 h
Bootstrap 95% CI

HOW MANY BIRDS WERE RECORDED FLYING LOW NEAR POWER LINES?

**51.3%**

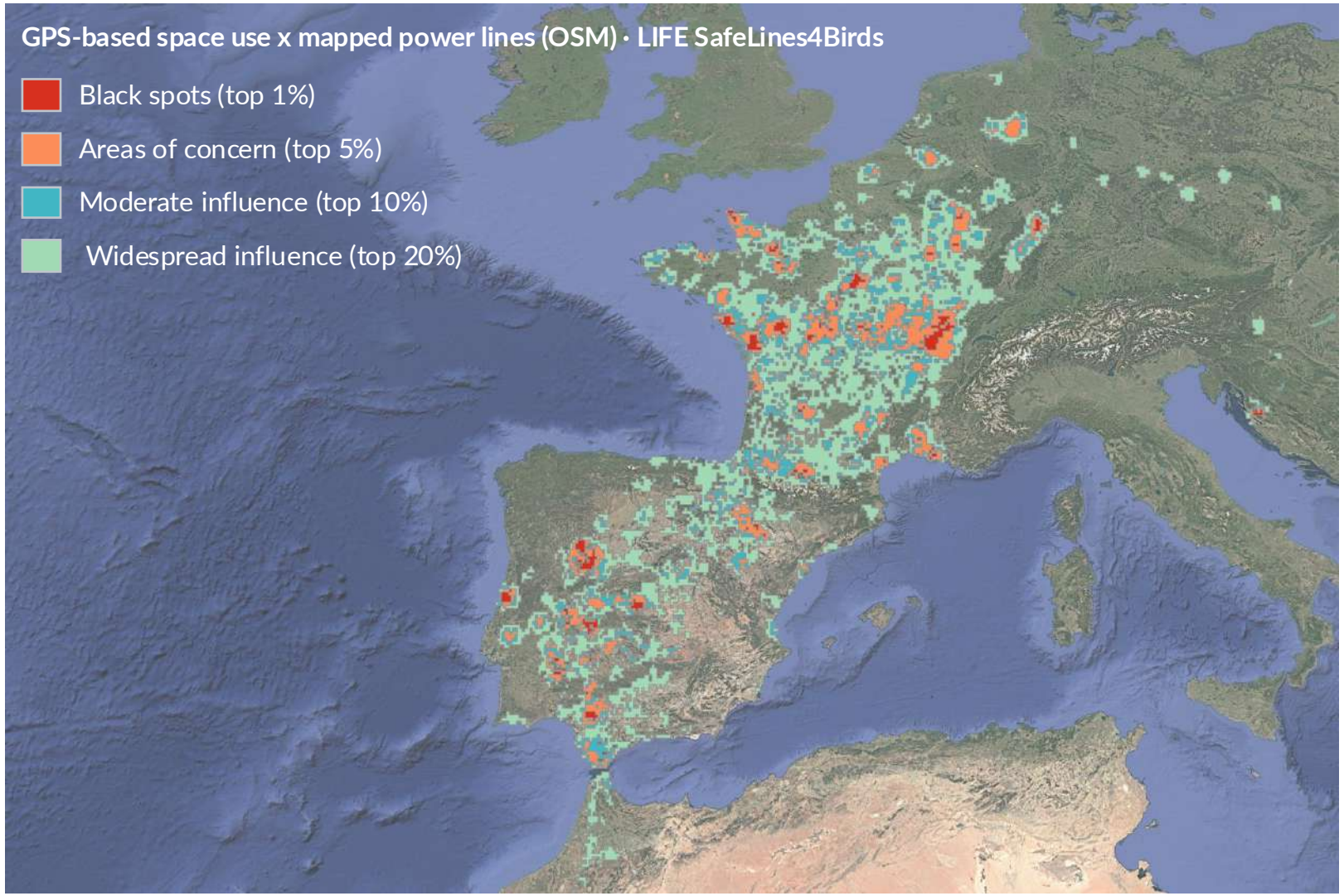
**40 out of 78 tracked birds**
had at least one recorded flight fix within 100 m of a mapped power line and at ≤ 50 m above ground.

Fall migration · GPS observations, not confirmed crossings

➢ **Fall migration** is a key period for identifying potential power-line exposure.

# WHERE DOES EXPOSURE CONCENTRATE?

## Potential exposure hotspots during fall migration are concentrated along the European migration corridor




Map focused on the European migration corridor; additional, smaller areas of potential exposure were also identified in Africa.

Black spots by country

| | |
|---|---|
| France | 65 % |
| | 6,087 km² |
| Spain | 21 % |
| | 1,965 km² |
| Portugal | 6 % |
| | 578 km² |
| Others | 8 % |

**86%**

of identified black-spot area lies in France and Spain.




## SO? WHAT DO WE DO NOW?

Do we give every young Black Stork a map of the power grid before its first migration?

## NO. WE MAKE THE POWER GRID SAFER!

# FROM TRACKING TO CONSERVATION ACTION

## Equip the lines with anti-collision and anti-electrocution devices

*Concrete actions in France and Belgium*

### ▶ Underground cables

20km in France



© Enedis

### ▶ Anti-collision devices

40km in France and 20km in Belgium



© Romain Beaubert

### ▶ Anti-electrocution devices

950 poles and pylons equipped in France



©Romain Beaubert



©Cécile Rousse



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WINGSPAN 2026

# Presentations

## From Monitoring to Mitigation: Technical Innovations for Nature Protection



**Robin Dixon**
Head of Environmental Expertise
France Renouvelables



**Brian McGowan**
Founder
Scientas-Energy



**Ingrid Marchand**
Coordinator SafeLines4Birds
LPO France



**Robin Gailly**
Project Officer - Ornithology
Natagora



**Jan Volek**
Head of Grid Management
EG.D



**James Dwyer**
Research Scientist
EDM International, Inc.

# Wingspan konference 2026

**Jan Volek**
**EG.D, s.r.o. (member of E.ON Group)**
**DSO in Czechia**

EUROKITE

ČSO

eg·d
ČLEN SKUPINY E.ON

# EUROKITE – Basic information

## Eurokite

**Project name:** LIFE EUROKITE

**Duration:** 2019–2027

**Goal:** Protect raptors, especially the Red Kite (Milvus milvus), by reducing human-caused mortality.

**Partners:** 20 organizations across 12 European countries.

## Problem

- Thousands of birds die every year due to:
- Electrocution on electric poles, illegal poisoning and traps, collisions with infrastructure.
- In the Czech Republic, hundreds of thousands of birds are killed annually on unsecured poles.

## EG.D's Role

- Securing high-voltage poles to prevent electrocution (installation of 700 safe brackets Claw/Birdsafe).
- Collaboration with **Czech Society for Ornithology** (CSO) to identify critical locations.
- Technical measures: insulation of conductors, protective covers, and safe designs.

# Implemented methology

Cooperation with AOPK* and CSO

## Bird Protection against Electrocution

Annual bird mortality in the CZE is estimated at 117,800 – 343,300 individuals per year



## Bird Protection Against Collisions with Conductors

Particularly in areas with watercourses, water bodies, and agricultural land



## Protection of Nesting Storks on Utility Poles

Increasing number of stork nests located on utility poles





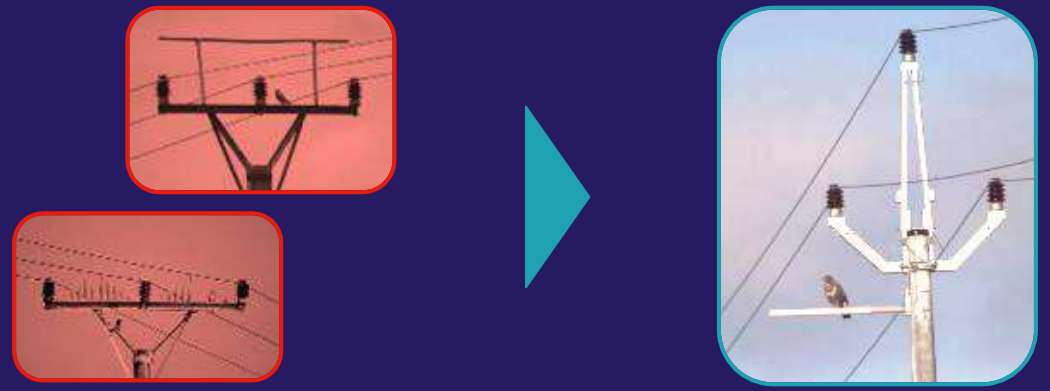
AOPK - Nature conservation agency of Czech Republic

# Implemented measures

## Bird Protection on MV Poles

### Instalation of safe designs

Continuous monitoring and reporting



### Prioritization of high-risk areas based on GPS tracking data

1040 installed brackets (the target was met)

+ new planned projects Life Dunka and Swiss fonds



# Implemented measures

## Prevention of Bird Collisions with Power Lines

- Most commonly on MV and HV overhead line sections
- Particularly above watercourses, water bodies, and agricultural land
- Details of priority sections for mitigation measures
















# Implemented measures

## Protection of White Storks on LV and MV Overhead Power Lines

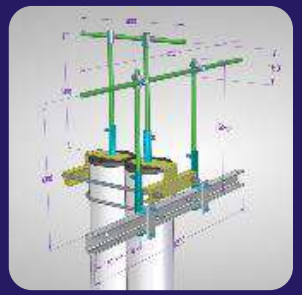
- Alternative nesting platform located within 50 m of the existing nest
- Nesting platform installed at the same height as or higher than the original nest
- Transfer of chicks at an appropriate age and developmental stage
- The pole is equipped with composite-material bird detergent devices to prevent further nesting.











# Innovative Bird Protection Measures

## Innovation (Drones and Other Advanced Technologies)

Use of drones for the installation and removal of bird flight diverters on overhead power lines





## Use of Utility Poles for Little Owl Conservation

Managed installation of nest boxes on EG.D concrete poles



# Innovative Bird Protection Measures

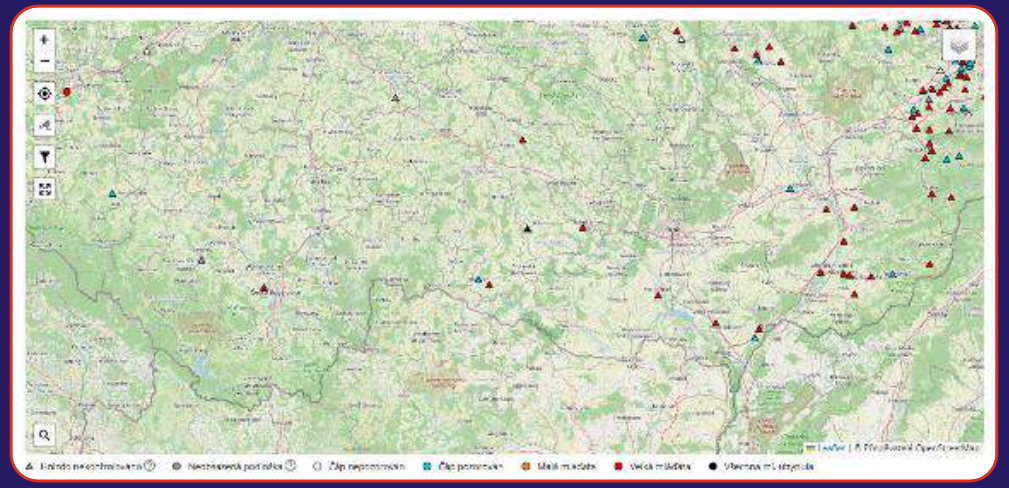
## Digital Mapping of Distribution Network Sections for Bird Flight Diverters

Integration of overhead line sections designated for bird flight diverter installation into the EG.D Geoportal



## Online Integration of Stork Nest Data from the CSO Database into the EG.D Geoportal

Transfer of current information on stork nests located on utility poles to the EG.D Geoportal



# Examples














Further information can be found at

**egd.cz**

# Thank you for your attention

Ing. Jan Volek
EG.D s.r.o.
jan.volek@egd.cz

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WINGSPAN 2026

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# Apple AirTags Reveal Post-Rehabilitation Outcomes for Great Horned Owls



**Michael C. Tincher,[1] Jacelynn T. Day,[1] Shayna Maddalena-Feinberg,[1] Carrie J. Laxson,[1] Jordan Hagel,[1] Angela M. Dwyer,[2] and James F. Dwyer[3]**

[1] Rocky Mountain Raptor Program, Fort Collins, CO 80524 USA

[2] Bird Conservancy of the Rockies, Fort Collins, CO 80521 USA

[3] Forestry, Wildlife, and Natural Resources, Front Range Community College, Fort Collins, CO 80526 USA

# Introduction

- Telemetry studies
  - Provide information on raptor behavior, habitat, movement, and survival
  - Inform conservation and management actions and programs
  - Telemetry studies can be prohibitively expensive
  - Telemetry can also be time-consuming and potentially dangerous, forcing tradeoffs between sample sizes and tracking intensity



# Introduction

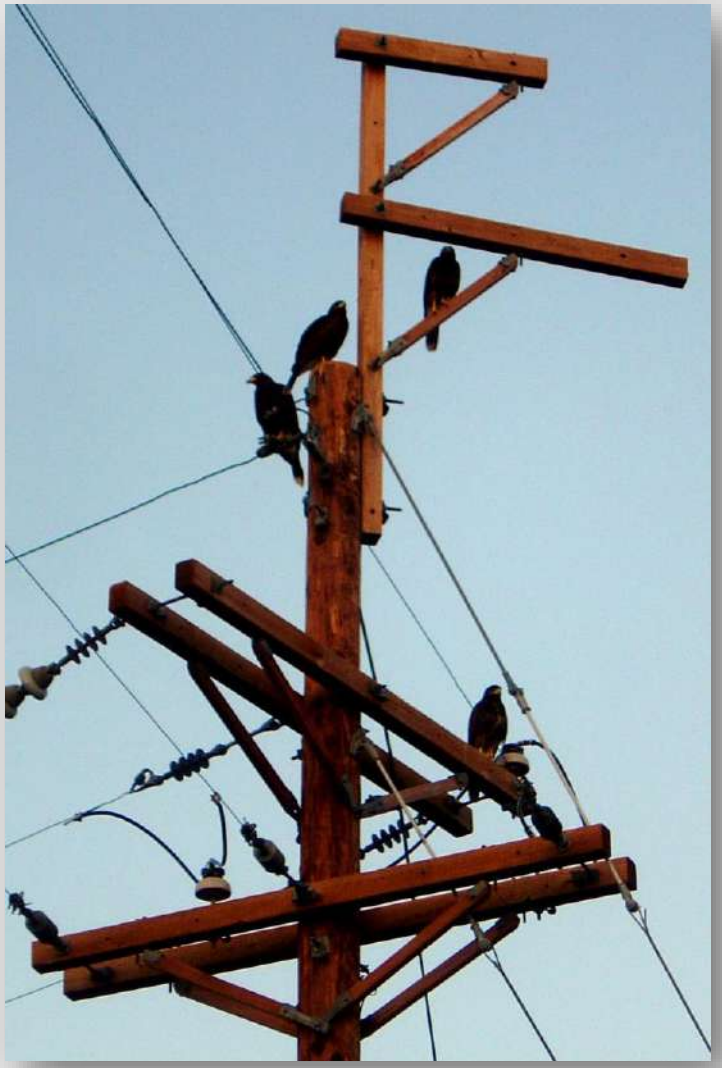
- To explore an alternative
  - Brooke Poplin, Jim Bednarz, and Andrew Gregory
  - Deployed AirTags on Harris's Hawks
- Poplin et al.
  - Reported their work at the 2023 RRF Conference in Albuquerque
  - Findings:
    - It worked!
    - Not perfect, but AirTags have potential



Photo credit: Brooke Poplin

# Introduction

- Why Harris's Hawks? High electrocution risk



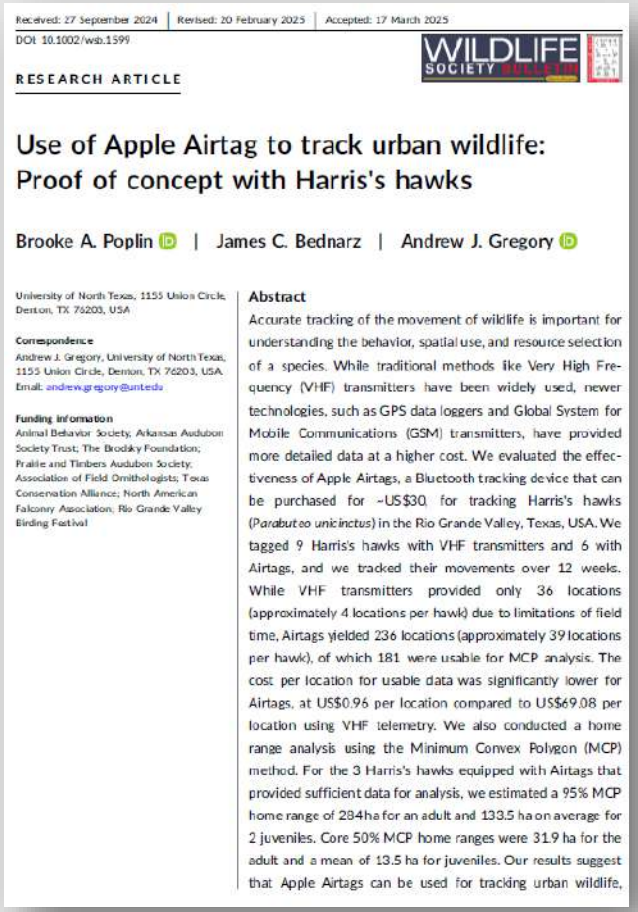






# Introduction

- Why AirTags?
  - Inexpensive
  - Crowdsourced data
    - is free to collect
    - reduces time commitment
    - In urban areas
  - Safe – no field crews in aircraft
- Could AirTags work with Great Horned Owls?



Received: 27 September 2024 | Revised: 20 February 2025 | Accepted: 17 March 2025
DOI: 10.1002/wsb.1599

WILDLIFE SOCIETY BULLETIN

RESEARCH ARTICLE

## Use of Apple Airtag to track urban wildlife: Proof of concept with Harris's hawks

Brooke A. Poplin | James C. Bednarz | Andrew J. Gregory

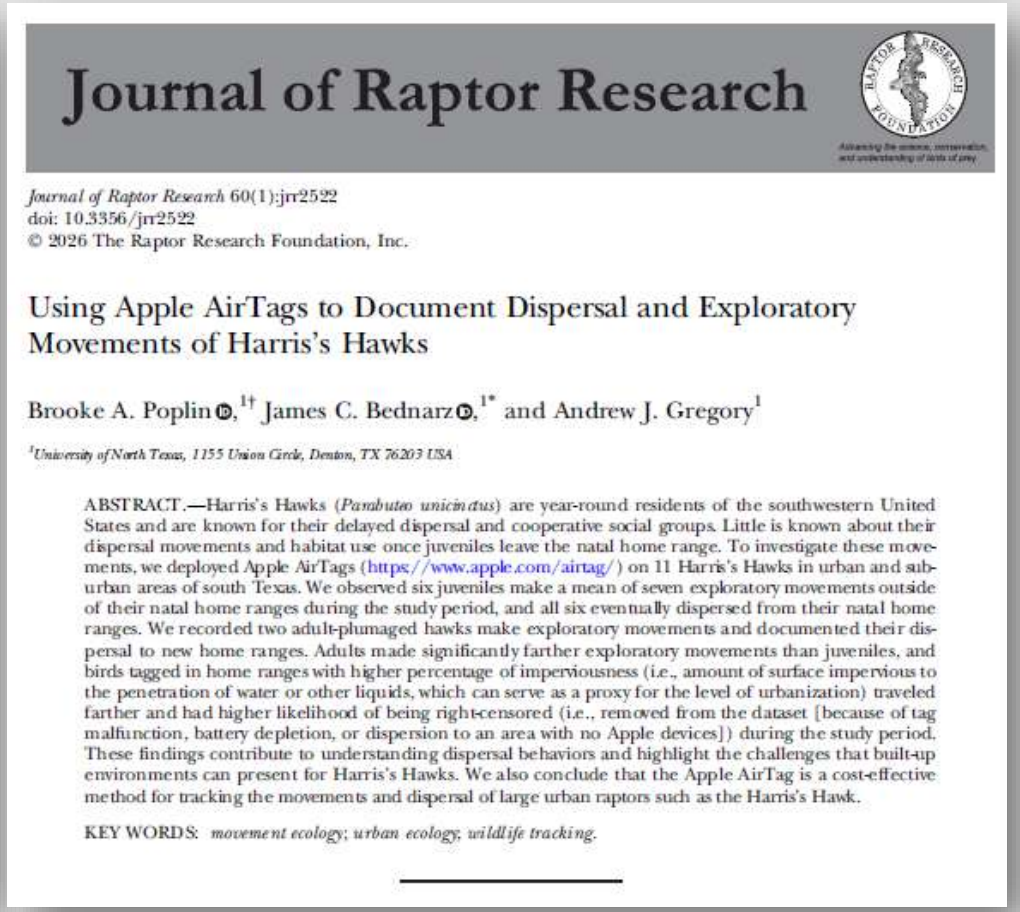
University of North Texas, 1155 Union Circle, Denton, TX 76203, USA

**Correspondence**
Andrew J. Gregory, University of North Texas, 1155 Union Circle, Denton, TX 76203, USA
Email: andrew.gregory@unt.edu

**Funding information**
Animal Behavior Society; Arkansas Audubon Society Trust; The Brodsky Foundation; Prairie and Timbers Audubon Society; Association of Field Ornithologists; Texas Conservation Alliance; North American Falconry Association; Rio Grande Valley Birding Festival

**Abstract**

Accurate tracking of the movement of wildlife is important for understanding the behavior, spatial use, and resource selection of a species. While traditional methods like Very High Frequency (VHF) transmitters have been widely used, newer technologies, such as GPS data loggers and Global System for Mobile Communications (GSM) transmitters, have provided more detailed data at a higher cost. We evaluated the effectiveness of Apple Airtags, a Bluetooth tracking device that can be purchased for ~US$30 for tracking Harris's hawks (*Parabuteo unicinctus*) in the Rio Grande Valley, Texas, USA. We tagged 9 Harris's hawks with VHF transmitters and 6 with Airtags, and we tracked their movements over 12 weeks. While VHF transmitters provided only 36 locations (approximately 4 locations per hawk) due to limitations of field time, Airtags yielded 236 locations (approximately 39 locations per hawk), of which 181 were usable for MCP analysis. The cost per location for usable data was significantly lower for Airtags, at US$0.96 per location compared to US$69.08 per location using VHF telemetry. We also conducted a home range analysis using the Minimum Convex Polygon (MCP) method. For the 3 Harris's hawks equipped with Airtags that provided sufficient data for analysis, we estimated a 95% MCP home range of 284 ha for an adult and 133.5 ha on average for 2 juveniles. Core 50% MCP home ranges were 31.9 ha for the adult and a mean of 13.5 ha for juveniles. Our results suggest that Apple Airtags can be used for tracking urban wildlife,



Journal of Raptor Research

*Journal of Raptor Research* 60(1):jrr2522
doi: 10.3356/jrr2522
© 2026 The Raptor Research Foundation, Inc.

## Using Apple AirTags to Document Dispersal and Exploratory Movements of Harris's Hawks

Brooke A. Poplin[1†] James C. Bednarz[1*] and Andrew J. Gregory[1]

[1]*University of North Texas, 1155 Union Circle, Denton, TX 76203 USA*

ABSTRACT.—Harris's Hawks (*Parabuteo unicinctus*) are year-round residents of the southwestern United States and are known for their delayed dispersal and cooperative social groups. Little is known about their dispersal movements and habitat use once juveniles leave the natal home range. To investigate these movements, we deployed Apple AirTags (https://www.apple.com/airtag/) on 11 Harris's Hawks in urban and suburban areas of south Texas. We observed six juveniles make a mean of seven exploratory movements outside of their natal home ranges during the study period, and all six eventually dispersed from their natal home ranges. We recorded two adult-plumaged hawks make exploratory movements and documented their dispersal to new home ranges. Adults made significantly farther exploratory movements than juveniles, and birds tagged in home ranges with higher percentage of imperviousness (i.e., amount of surface impervious to the penetration of water or other liquids, which can serve as a proxy for the level of urbanization) traveled farther and had higher likelihood of being right-censored (i.e., removed from the dataset [because of tag malfunction, battery depletion, or dispersion to an area with no Apple devices]) during the study period. These findings contribute to understanding dispersal behaviors and highlight the challenges that built-up environments can present for Harris's Hawks. We also conclude that the Apple AirTag is a cost-effective method for tracking the movements and dispersal of large urban raptors such as the Harris's Hawk.

KEY WORDS: *movement ecology; urban ecology; wildlife tracking.*

# Introduction

- Why Great Horned Owls?
  - Abundant
    - “Populations robust; not in need of management”
      - Artuso et al. (2022)
    - Frequently admitted to wildlife rehabilitation programs
  - Accessible
    - Urban
    - Non-migratory
  - Durable
    - “…no observed effect of radio-transmitters on reproductive performance”
      - Artuso et al. (2022)
  - Large enough to carry an AirTag
    - Male average mass = 1,304 g
    - Female average mass = 1,706 g



# Introduction

- Why Great Horned Owls?
  - High electrocution risk



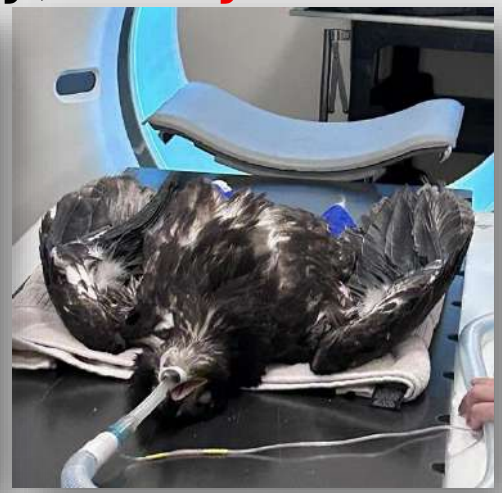


# Introduction

Rocky Mountain RAPTOR Program
a second chance at freedom

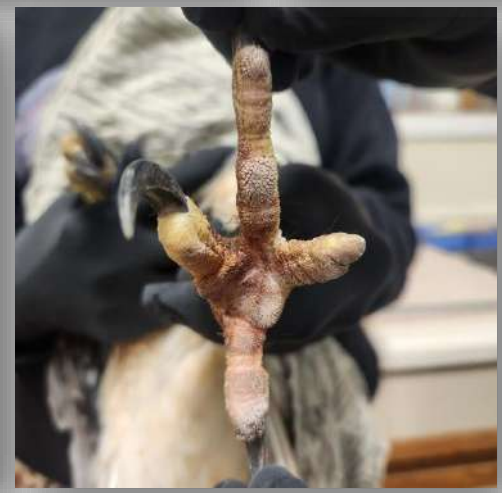
- Why RMRP?
- Admit ~ 300 raptors annually; many for electric trauma or wire collision











# Introduction

- Why RMRP?
- Many of those admissions are Great Horned Owls











# Introduction

Rocky Mountain RAPTOR Program
a second chance at freedom

- Why RMRP?
- ~ 60-70% of treatable cases are released, including owls











# Introduction

- Two research questions
  - **Could AirTags work with another species and landscape?**
    - Species = Great Horned Owls
    - Landscape = Fort Collins, CO
  - **What could AirTags teach us about post-rehabilitation outcomes?**
    - Do rehabilitated Great Horned Owls survive?
    - We AirTagged young owls.  Is rehabbing these individuals worth the cost?
  - Abandoned research question
    - Compare AirTags to other Bluetooth trackers
      - ~50% of U.S. cell phones are Apple products; the other 50% are a mix of various Androids
      - Apple products participate by default; the others are opt-in only
      - So, an AirTag pings ~50% of phones; other devices ping maybe 10%

# Methods

- Step 1
  - Testing on a non-releasable owl
  - Deployment inside RMRP to test fit and durability of a 3D-printed case (Android)
  - ~ 5 months (162 d)
  - It worked – moving outside





# Methods

- Step 2
  - AirTag deployment in RMRP's flight enclosures





# Methods

- Step 3
  - Soft release from a flight enclosure (more often)
  - Release near natal nest (used rarely to avoid wires)

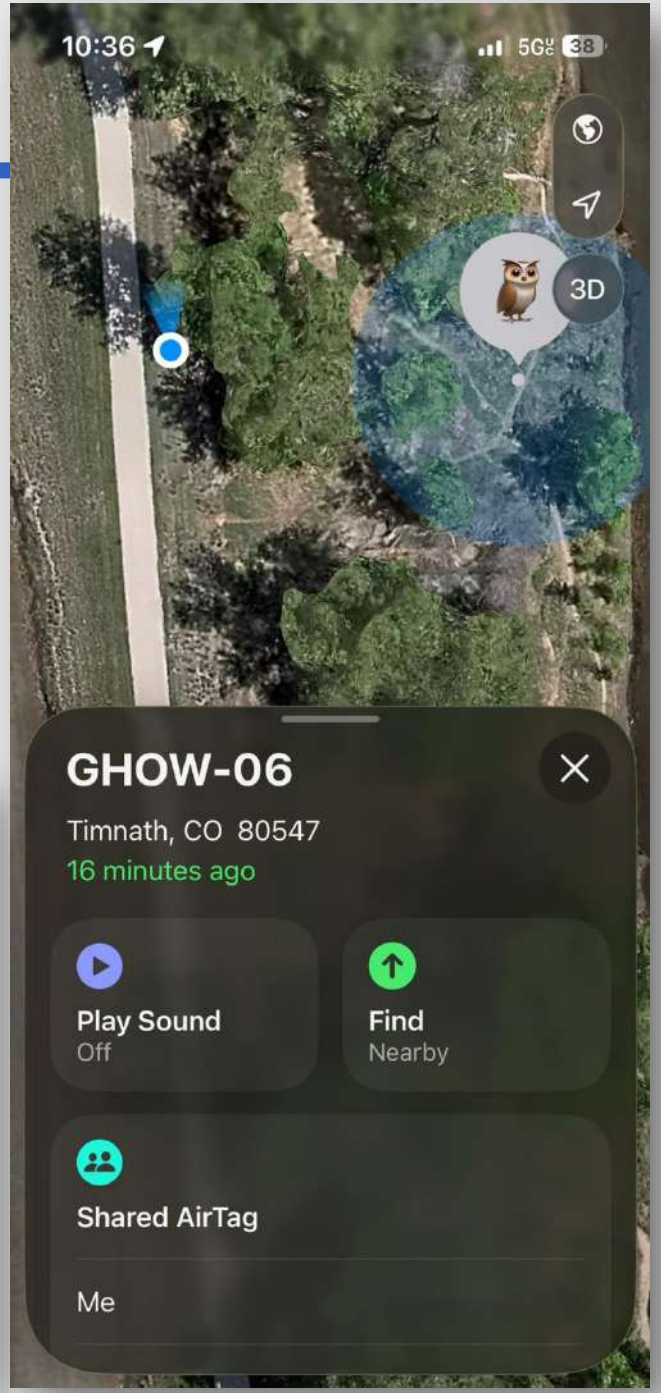




# Methods

- Step 4
  - Each team member assigned days to log in and record locations
    - Early am, mid-day, late pm
  - Occasionally track via Find My
  - Use Find My at static locations to identify mortalities








# Methods

- Analyses
  - Correlate causes of admission with post-release outcomes
  - Compare home ranges to published accounts
    - 50% and 95% Minimum Convex Polygons
    - 50% and 95% weighted, area-corrected autocorrelated kernel density estimation wAKDE
      - Program R, *ctmm* package
      - Bandwidth: autocorrelated Gaussian reference-function method
      - Separate bandwidth for each owl
      - wAKDE accounted for temporal dependence in locations unequal time intervals and repeated observations close together in time



# Results

- 8 GHOWs AirTagged to date; 4 have died, 4 remain alive

| ID | Reason for Admission | Release Date | Status at 10/1/26 | Tracking Duration (mo) | Tag Final Status |
|---|---|---|---|---|---|
| 01 | Fell from nest; internal trauma | 9/2/2025 | Dead | 0.8 | Landfill |
| 02 | Fell from nest; fractured right ulna | 9/2/2025 | Dead | 4.0 | Recovered |
| 03 | West Nile Virus | 10/24/2025 | Alive | 12.0 | Active |
| 04 | Fell from nest; spinal trauma | 10/30/2025 | Dead | 0.5 | Recovered |
| 05 | Fell from nest; spinal trauma | 1/9/26 | Dead | 2.8 | Recovered |
| 06 | Entangled in soccer net; abrasions | 9/2/2026 | Alive | 2.0 | Active |
| 07 | Fell from nest; leg injury | 9/2/2026 | Alive | 2.0 | Active |
| 08 | Fledgling; no injury | 9/2/2026 | Alive | 2.0 | Active |

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- Injury correlation: core injuries; low survival rates
- WNV owl should be dead, but isn’t

# Results

- WNV infection still alive > a year later?!
- On admission ↓ At release→



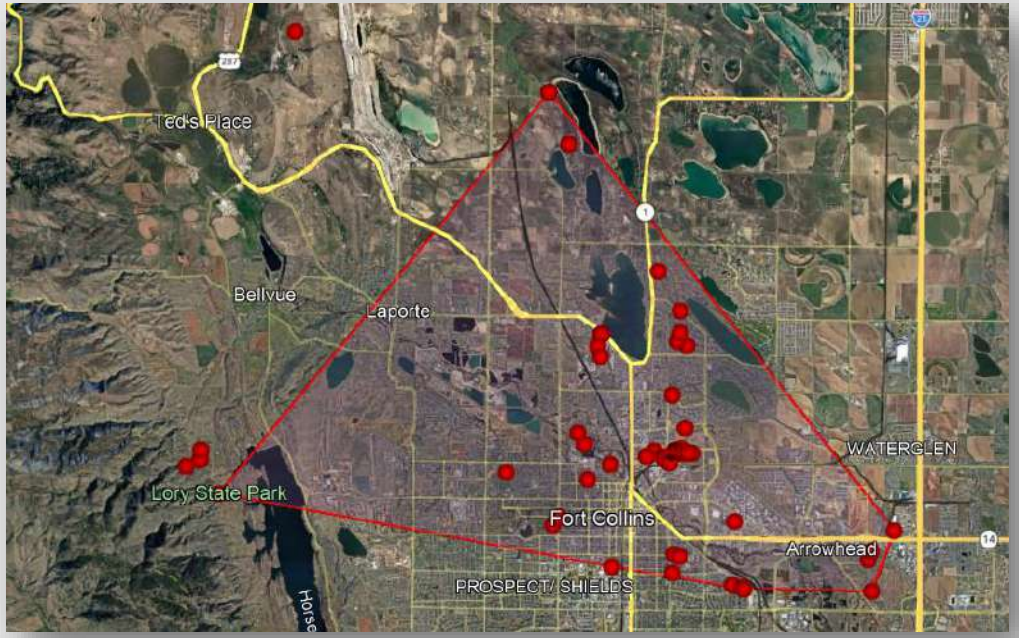


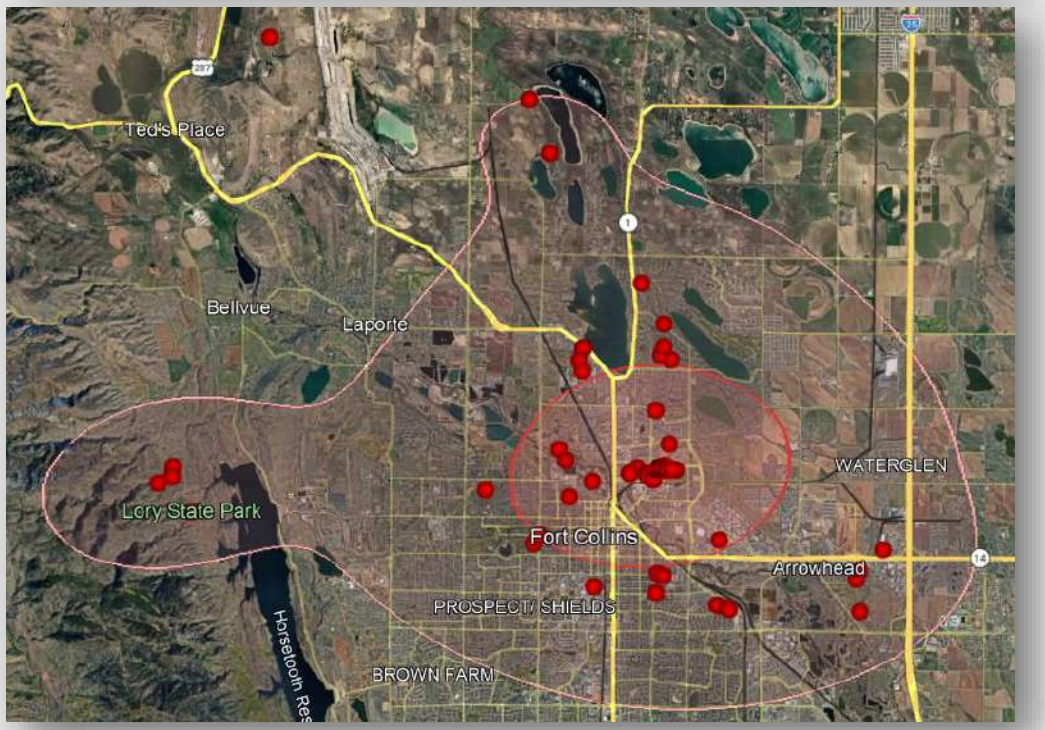
# Results

- 5 GHOWs AirTagged in round one
  - Wide variation in range sizes

| ID | Color | Locations | MCP (km²) | | aKDE (km²) | |
|---|---|---|---|---|---|---|
| | | | 50% | 95% | 50% | 95% |
| 01 | Red | 119 | 0.1 | 81.9 | 20.5 | 144.6 |
| 02 | Yellow | 335 | 1.5 | 13.1 | 3.2 | 25.2 |
| 03 | Green | 1063* | 4.3 | 24.8 | 6.3 | 38.0 |
| 04 | Blue | 39 | 0.1 | 22.0 | 5.2 | 37.2 |
| 05 | Orange | 44 | 0.2 | 3.2 | 0.8 | 5.6 |

* tracking is ongoing



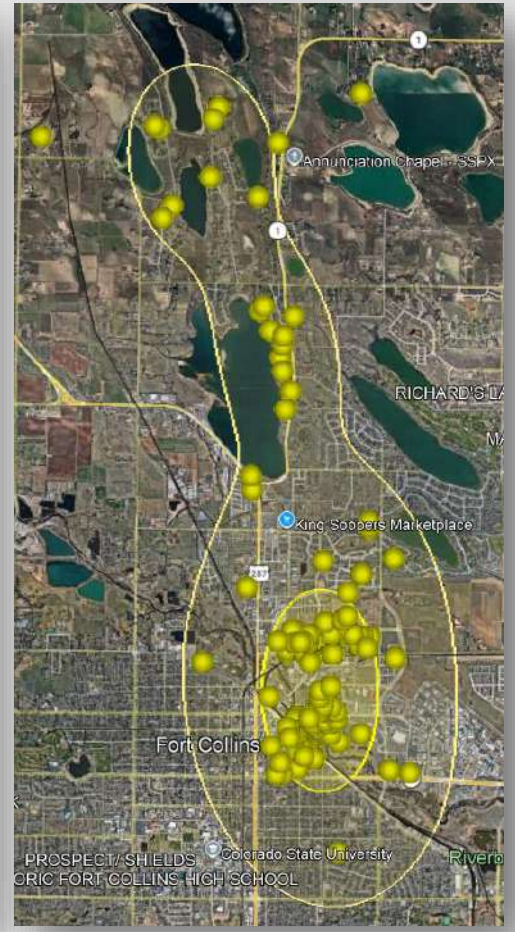
# Results

- 5 GHOWs AirTagged in round one
  - Wide variation in range sizes

| ID | Color | Locations | MCP (km²) | | aKDE (km²) | |
|---|---|---|---|---|---|---|
| | | | 50% | 95% | 50% | 95% |
| 01 | Red | 119 | 0.1 | 81.9 | 20.5 | 144.6 |
| 02 | Yellow | 335 | 1.5 | 13.1 | 3.2 | 25.2 |
| 03 | Green | 1063* | 4.3 | 24.8 | 6.3 | 38.0 |
| 04 | Blue | 39 | 0.1 | 22.0 | 5.2 | 37.2 |
| 05 | Orange | 44 | 0.2 | 3.2 | 0.8 | 5.6 |

* tracking is ongoing



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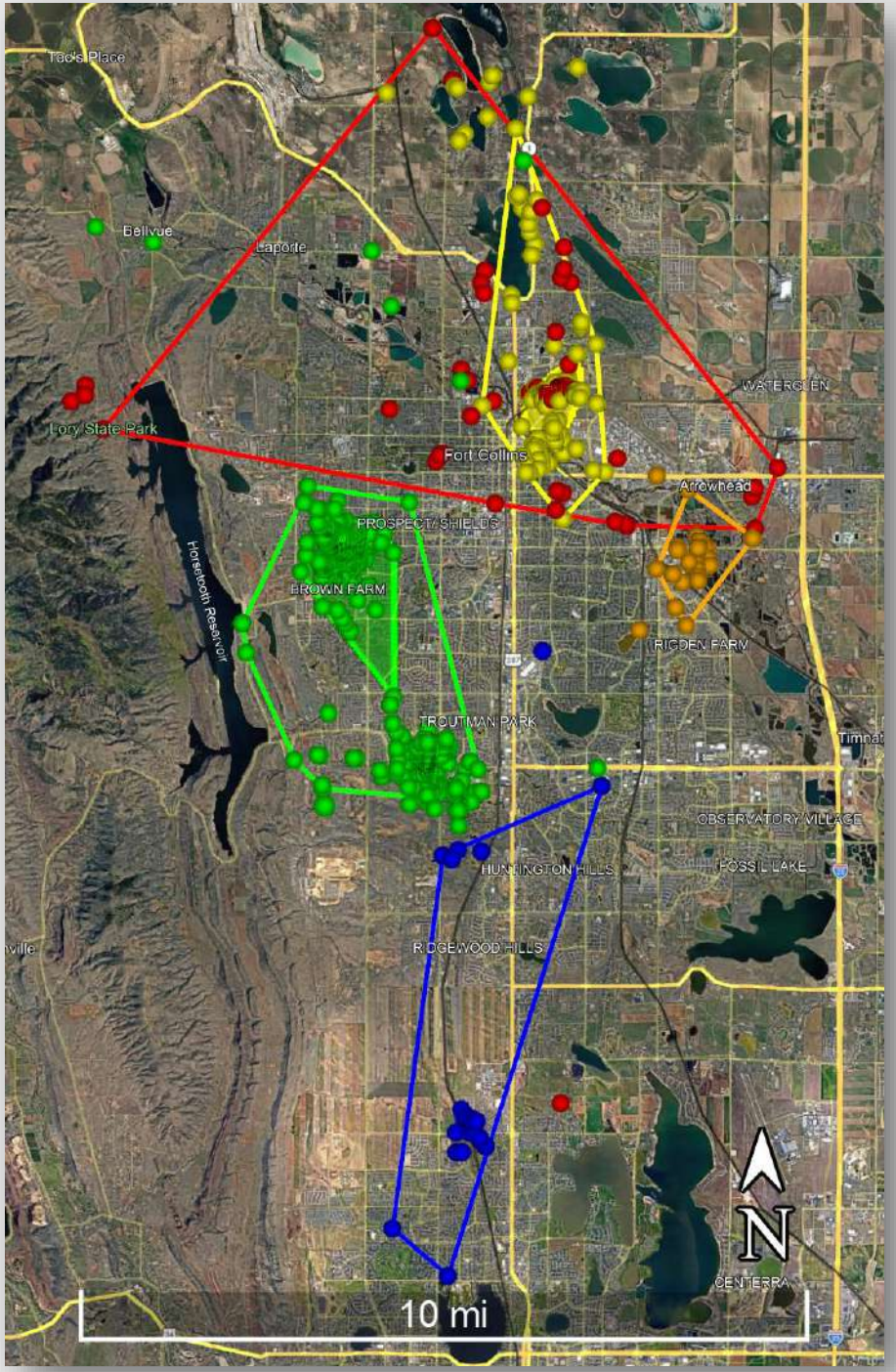
| 04 | Blue | 39 | 0.1 | 22.0 | 5.2 | 37.2 |
| 05 | Orange | 44 | 0.2 | 3.2 | 0.8 | 5.6 |

* tracking is ongoing



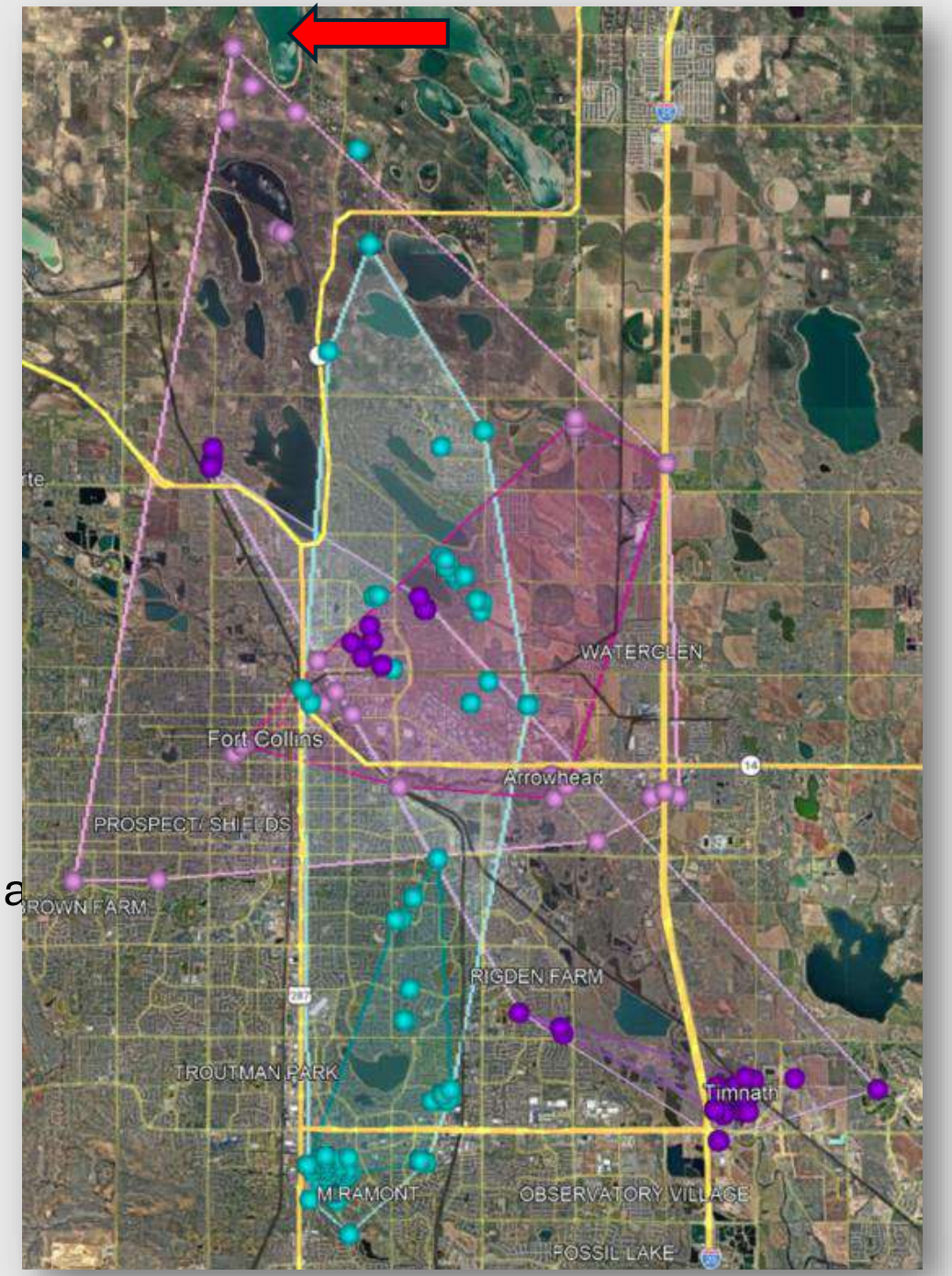
# Results

- 3 GHOWs AirTagged in round two
  - Wide variation in urban habitats used

| ID | Color | Locations | MCP ($km^2$) | | aKDE ($km^2$) | |
|---|---|---|---|---|---|---|
| | | | 50% | 95% | 50% | 95% |
| 06 | Purple | 90* | 1.5 | 38.1 | 55.7 | 221.7 |
| 07 | Teal | 121* | 7.6 | 48.1 | 60.7 | 255.6 |
| 08 | Pink | 40*, ** | 25.7 | 101.1 | 93.5 | 374.4 |

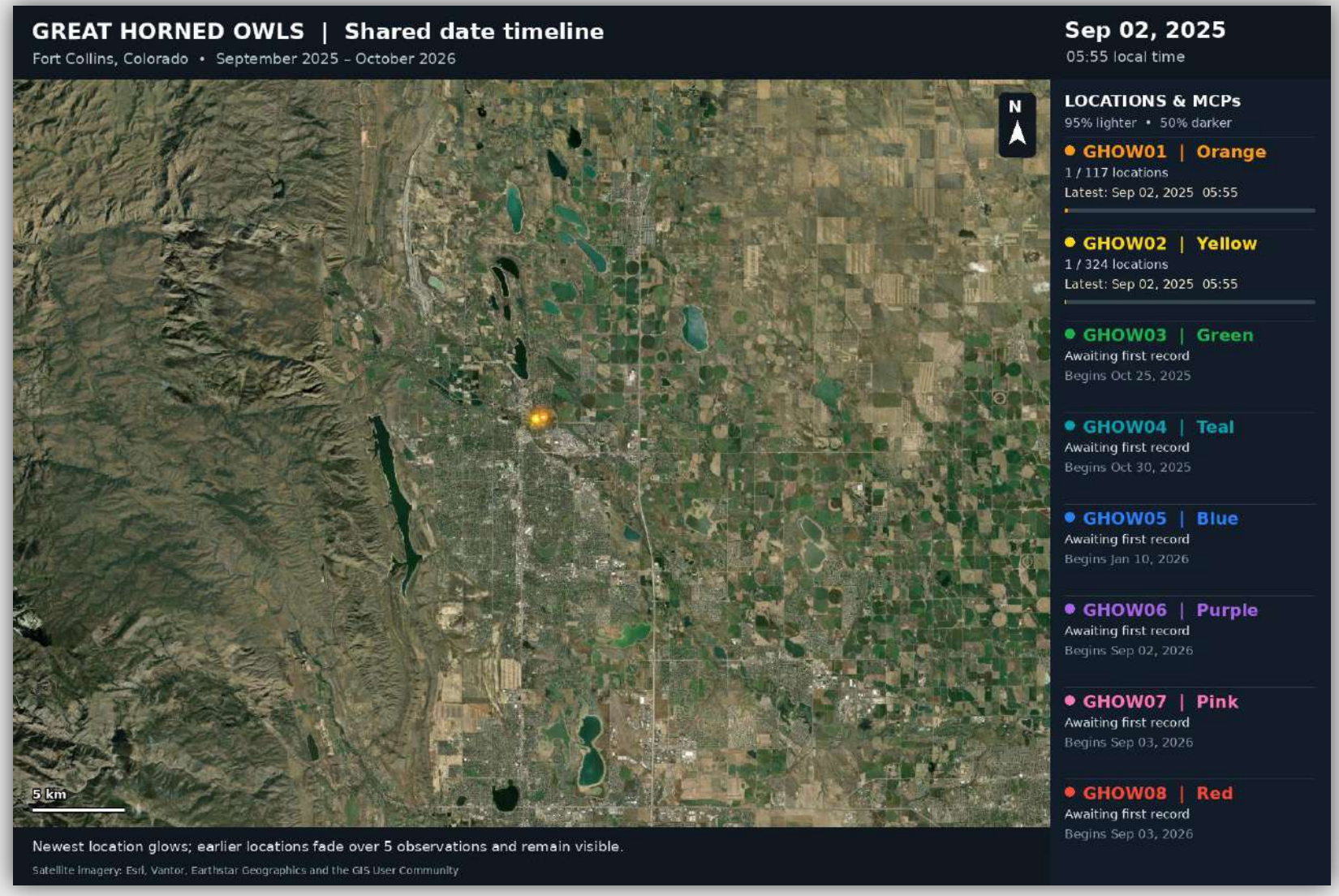
* tracking is ongoing

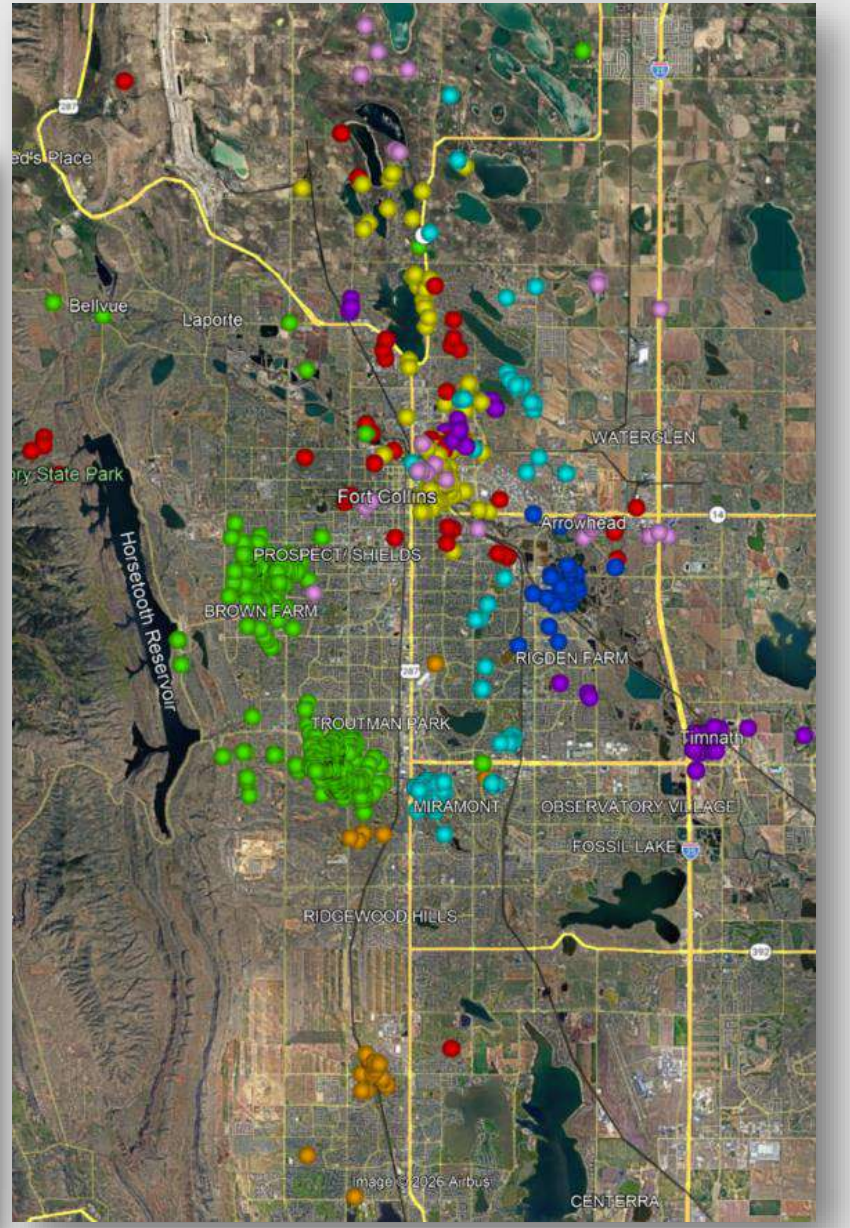
** appears to have settled along the edge of a private lake with a home at only one end



# Results

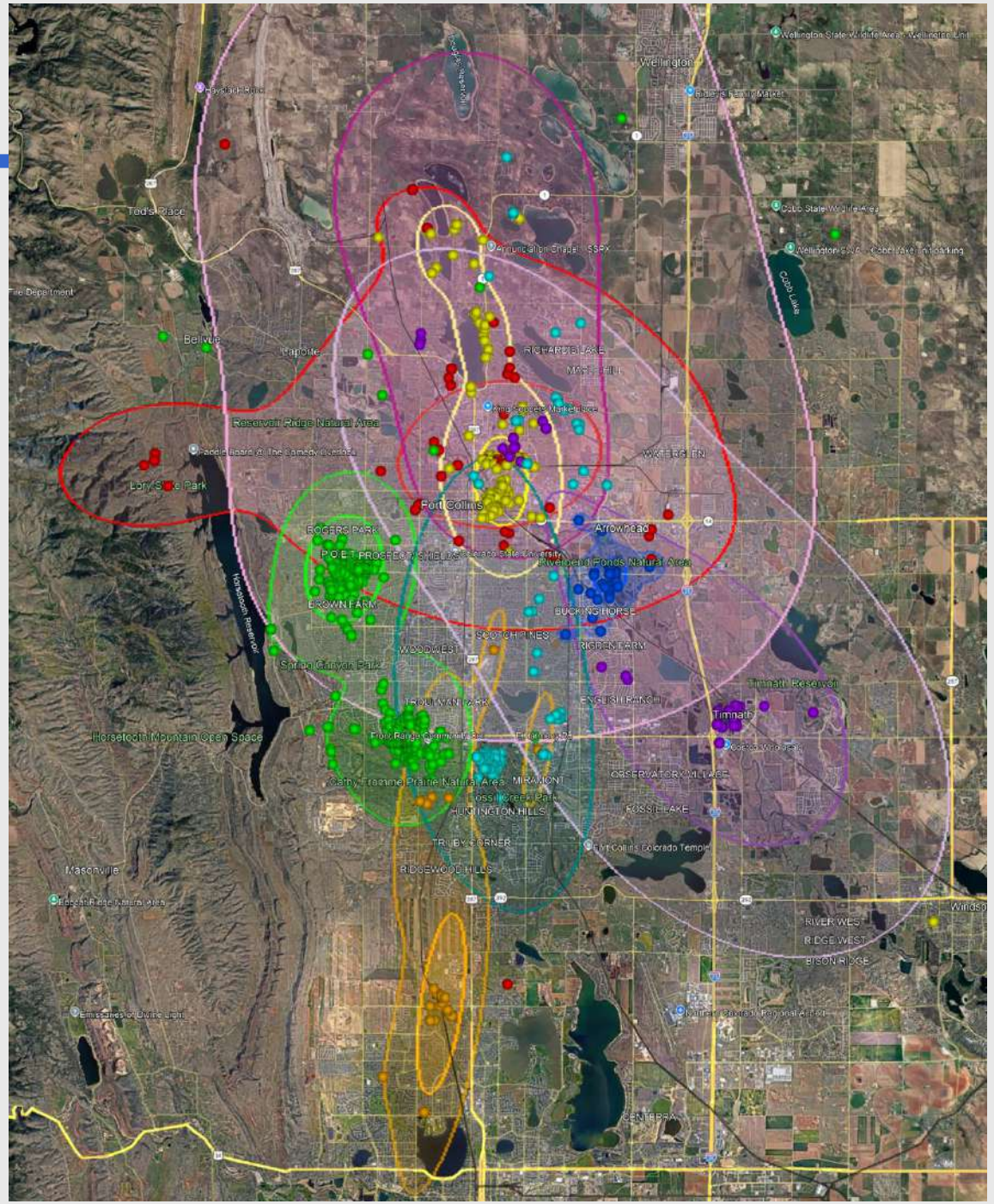
- All data:



# Results

- Comparison to previous home range estimates:
- GHOW home ranges are essentially unstudied; presumably highly variable
  - Bennet and Bloom (1994) in California
    - Territorial ♀ 0.9 – 2.3 $km^2$
    - Territorial ♂ 1.5 – 11.2 $km^2$
  - Rohner (1997) in Yukon Territory
    - Territorial adults 2.5 – 5.0 $km^2$
    - **Floaters 4.8 – 69.4 $km^2$**
    - **Generally similar to the ranges we're finding**



# Discussion

- Q1: Could AirTags work with other species and landscapes?
  - Yes, at least for some urban GHOWs
  - Inexpensive and safe
  - Rapid identification and precise locations for mortalities
  - Downsides
    - Manual log-ins, 6 users maximum per AirTag
    - Occasional likely erroneous locations during data collection and processing
    - Occasional interruptions to AirTag service
    - Inconsistent for owls who wander beyond urban areas
    - Other Bluetooth trackers are not (yet) competitive
    - iPhones outperform iPads for field tracking



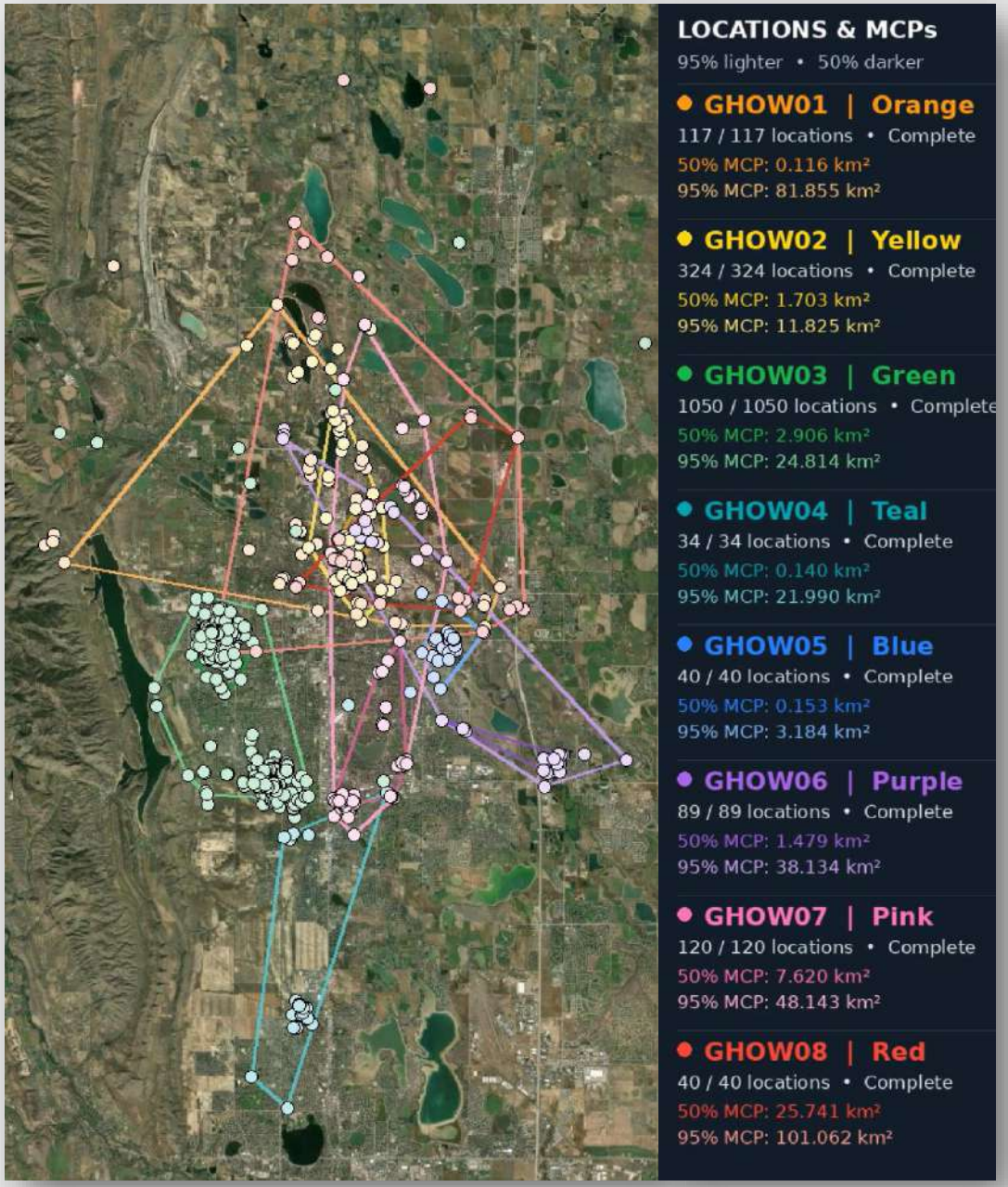
# Discussion

- Q2: Do rehabilitated Great Horned Owls survive?
  - Some do, some don’t
    - We expect a 50-75% mortality rate for first year owls in the wild (Artuso et al. 2022)
  - Should we focus limited funding on rehabilitating less common species?
  - Or perhaps focus limited funding on specific types of injuries
    - Young Great Horned Owls with spinal trauma do not appear to recover well given our small sample size



# Discussion

- New Technologies Explored
  - ☑ AirTags
  - ☑ Commercially available AirTag cases
  - ☑ 3D printed Android cases
  - ☑ AI data animations →
  - ✗ Other Bluetooth trackers
  - ✗ Automated data downloads
- Future Research
  - Will AirTags work on GHOWs elsewhere?
    - **We would love to collaborate with other wildlife rehabilitation facilities**
    - **Especially interested in areas with overhead power lines**
  - Can we automate data collection?



# Conclusions

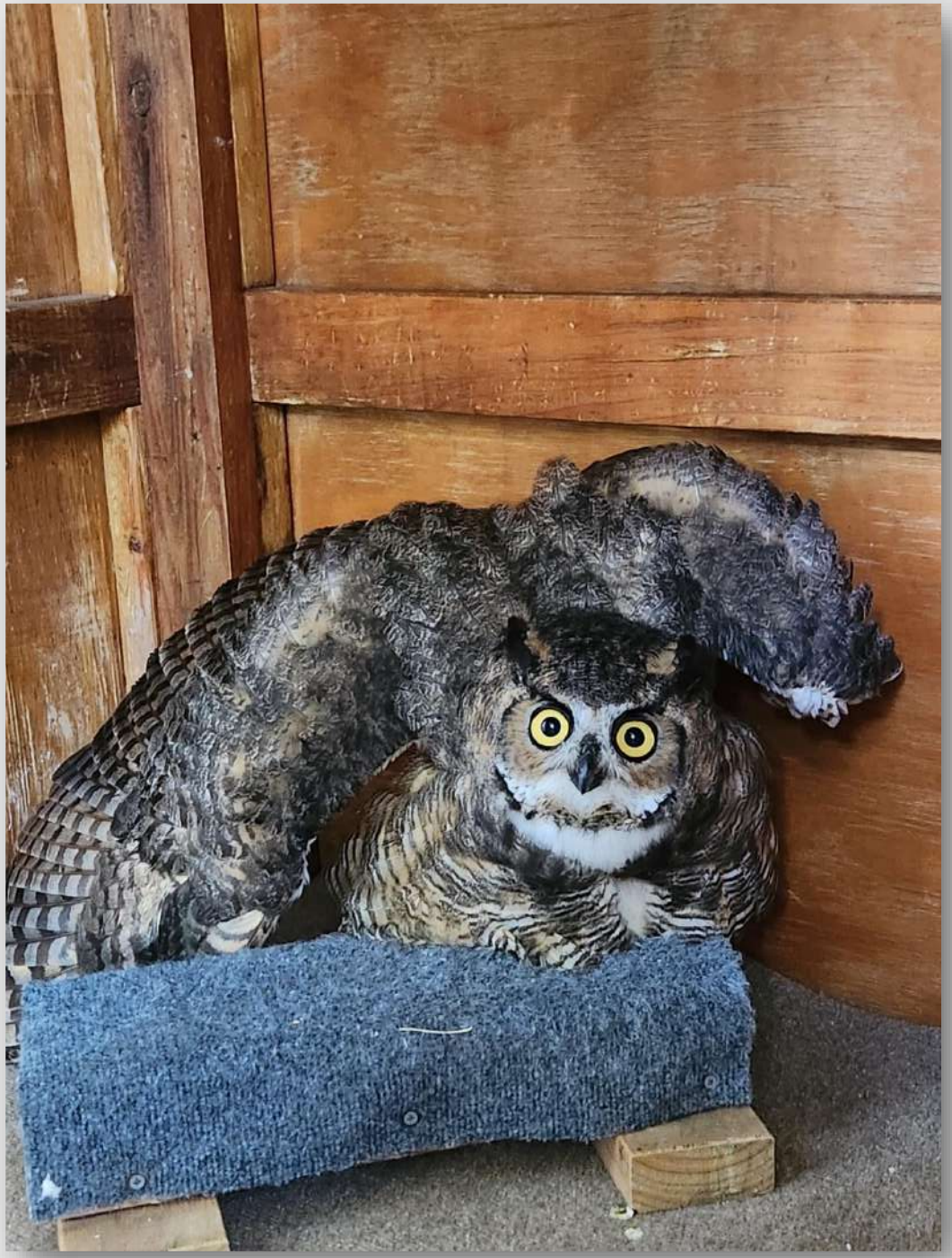
- It is working, data collection is ongoing
- **Anyone interested in collaborating?**
- **European equivalent owl?**
  - **With powerlines nearby?**

- Contact:
  - James (JD) Dwyer, James.Dwyer@frontrange.edu

FRONT RANGE COMMUNITY COLLEGE

  - Mike Tincher
  - mike@rmrp.org

Rocky Mountain RAPTOR Program
a second chance at freedom



WINGSPAN 2026

# Presentations

## From Monitoring to Mitigation: Technical Innovations for Nature Protection



**Robin Dixon**
Head of Environmental Expertise
France Renouvelables



**Brian McGowan**
Founder
Scientas-Energy



**Ingrid Marchand**
Coordinator SafeLines4Birds
LPO France



**Robin Gailly**
Project Officer - Ornithology
Natagora



**Jan Volek**
Head of Grid Management
EG.D



**James Dwyer**
Research Scientist
EDM International, Inc.

WINGSPAN 2026

From Partnerships to Practice

3 – 5 November 2026 | Berlin

*Interactive game*

# Nature-Positive Energy: Play, Debate, and Discover!



# Interactive game

## Objective

- Engage in a light-hearted, interactive session to reflect on the various presentations and discussions of the conference.
- We encourage your participation, follow-up conversations to reinforce the **conference key takeaways** in a relaxed setting.

## Structure

- Slides with questions
- Live polls



# Instructions

Go to

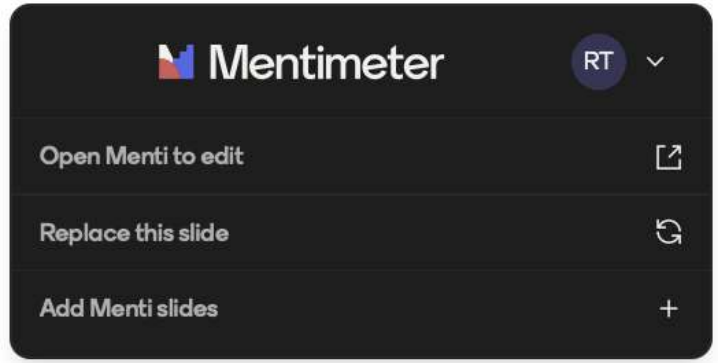
**www.menti.com**

Enter the code

**8192 5399**



Or use QR code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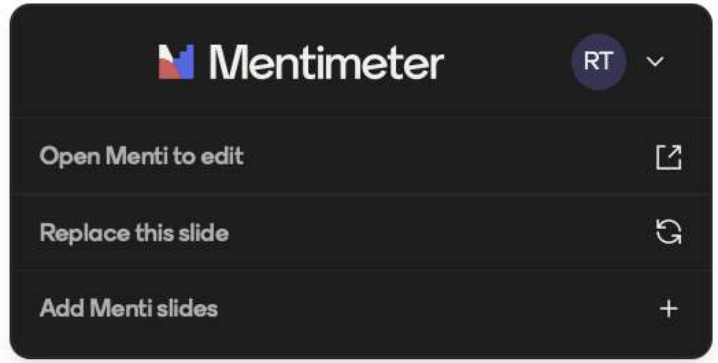
Replace this slide
Add Menti slides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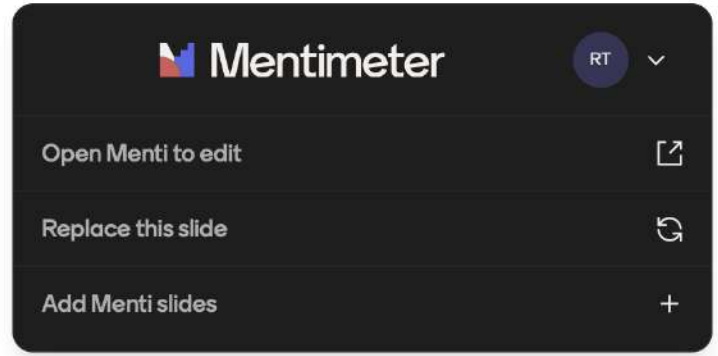
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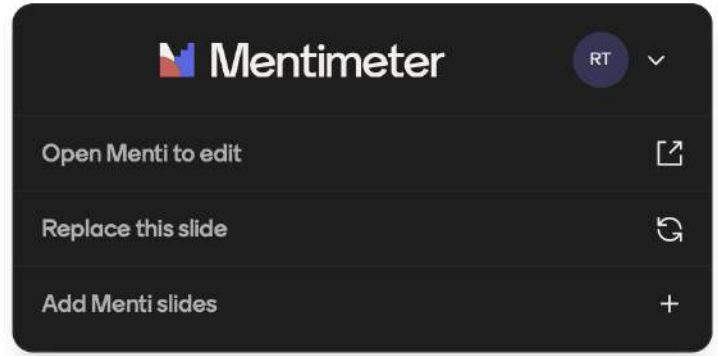
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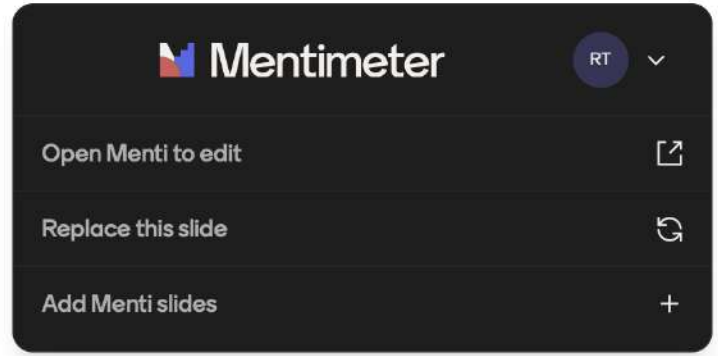
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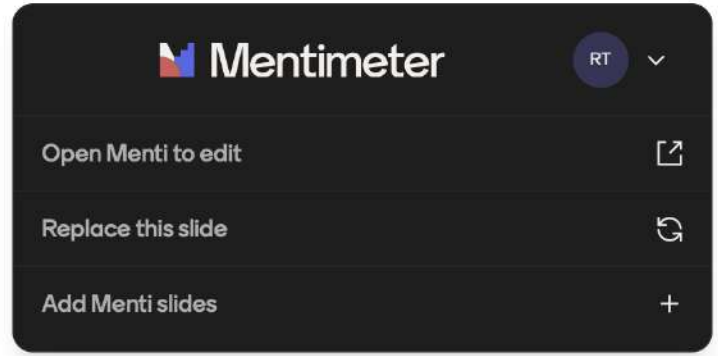
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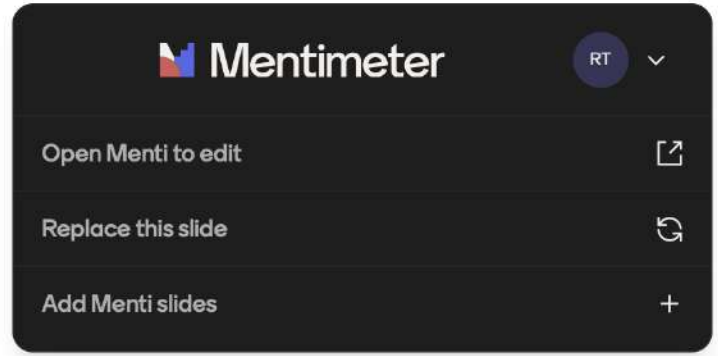
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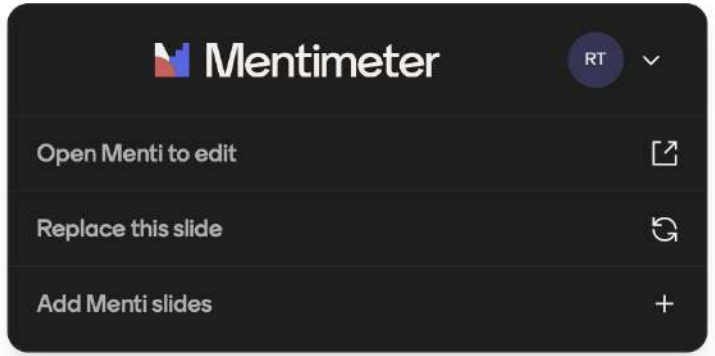
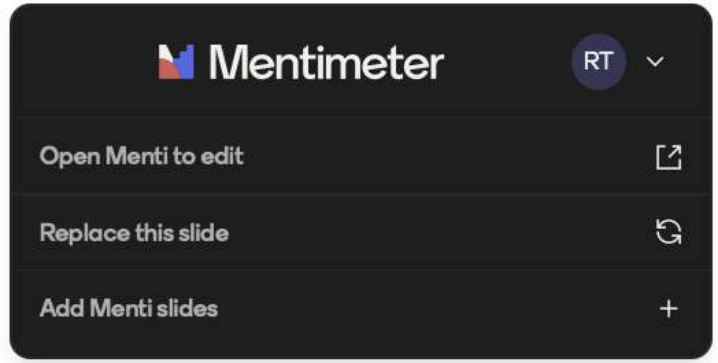



https://www.mentimeter.com/app/home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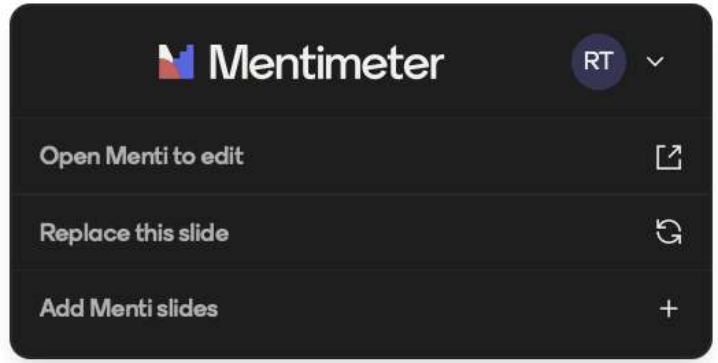
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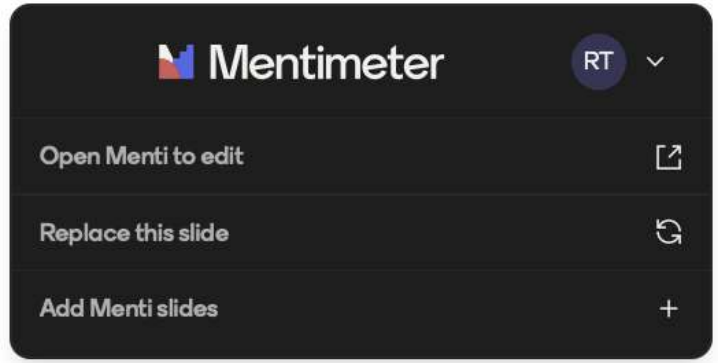
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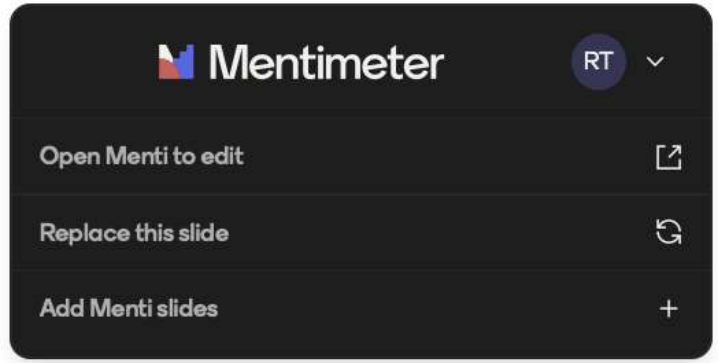
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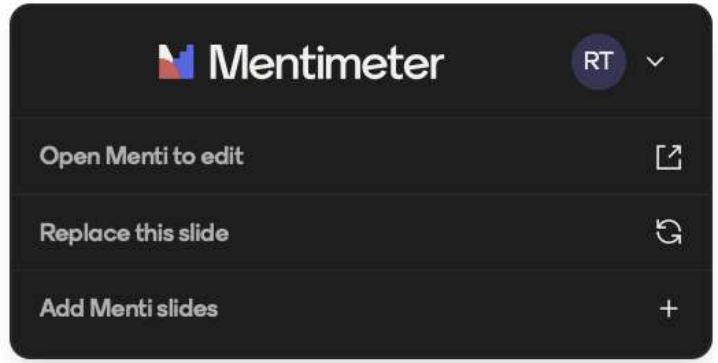
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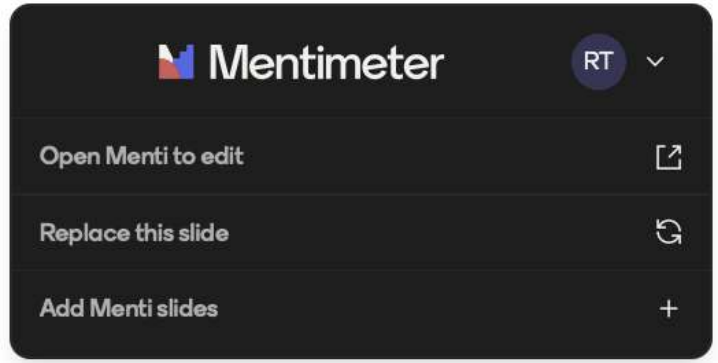
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WINGSPAN 2026

From Partnerships to Practice

3 – 5 November 2026 | Berlin

# Poster session

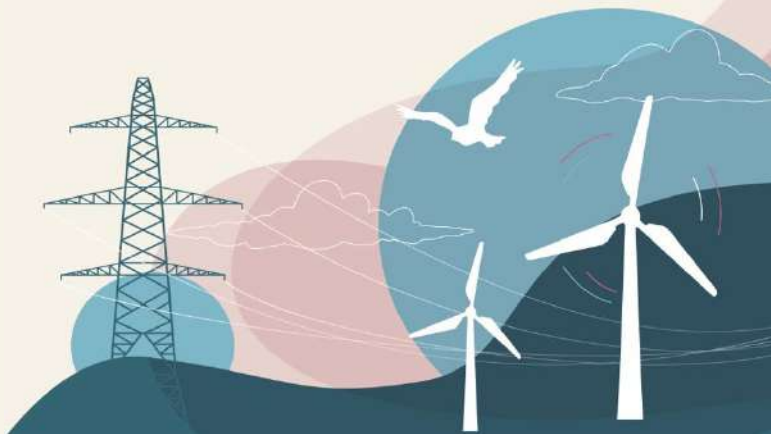
12:45 - 15:00
At the Pink house



# Poster Presentations

1 Incorporating biodiversity into LCA: quantifying the impacts of power lines on bird and mamma diversity with Norway as a case study

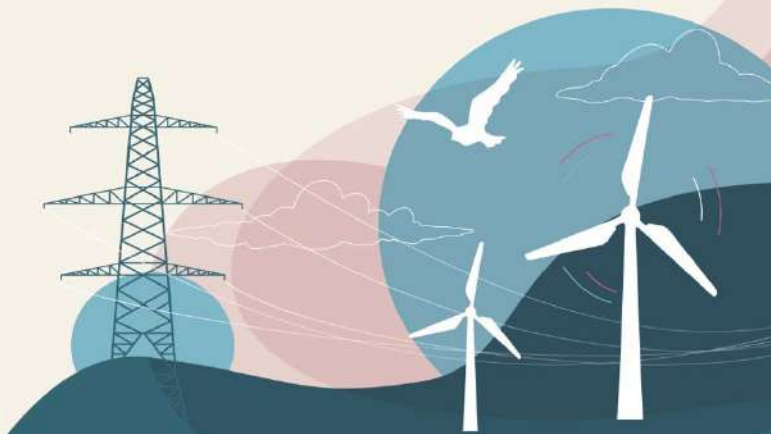
Dr. Dafna Gilad



# Poster Presentations

2 Black Stork Tag (BST) Project: Investigating Black Stork (Ciconia nigra) ecology and wind farm interactions using high-resolution GPS tele

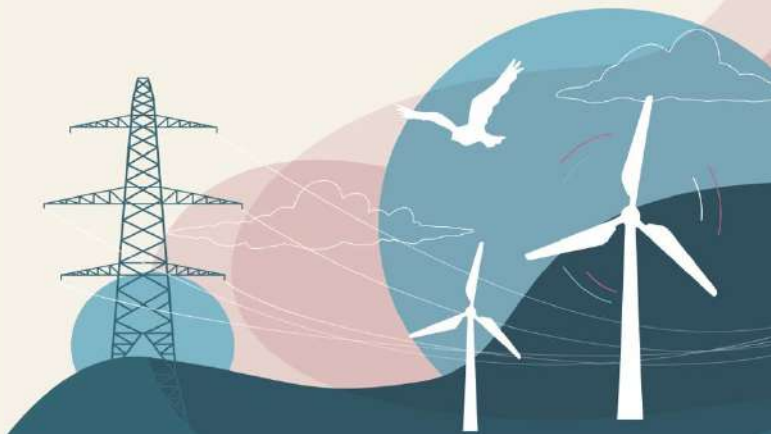
Louise De Neyer



# Poster Presentations

3 Practical Insights from RWE’s Onshore Biodiversity Positive Pilots

Peter Jones



# Poster Presentations

4 Red Kite (*Milvus milvus*) protection in the EUROKITE LIFE project in Hungary

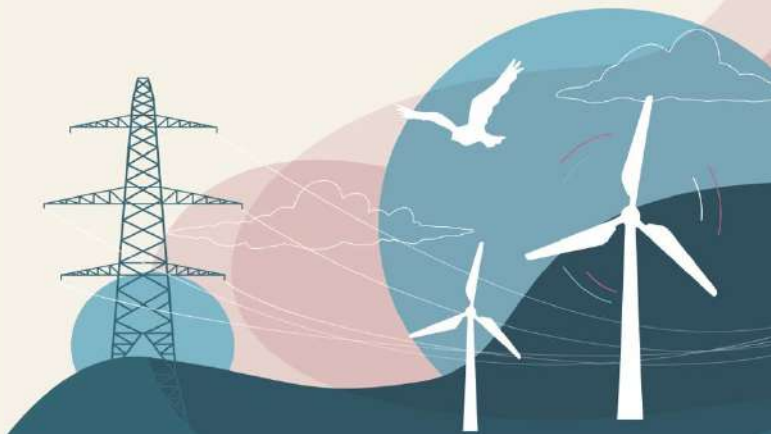
Előd Győrig



# Poster Presentations

5 Electrocution on Medium-Voltage Power Poles as a Major Threat to the Reintroduced Northern Population

Bernhard Gönner



# Poster Presentations

6 Wind energy development and the conservation of the greater mouse-eared bat (*Myotis myoti* integrating movement ecology, habitat moc and population dynamics for evidence-bas planning

Jean-François Godeau



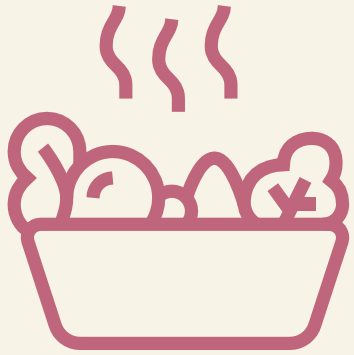
# Poster Presentations

7

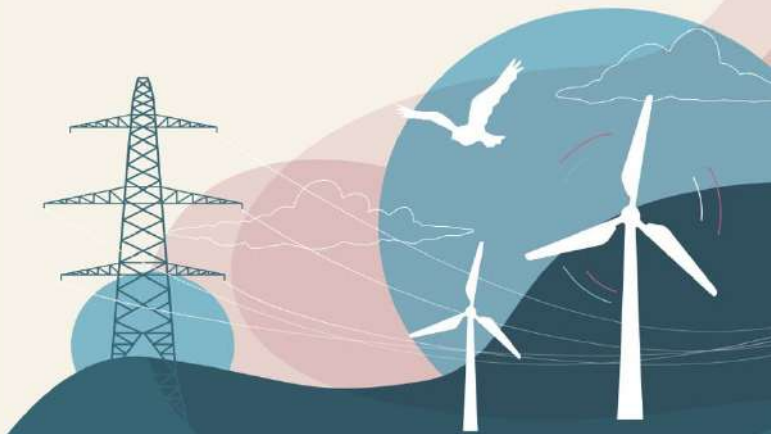
Mapping artificial land surfaces to accelerate nature-positive renewable energy deploym spatial decision support framework from th REALS project

Stela Hristova





# LUNCH BREAK



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12:45 - 15:00
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WINGSPAN 2026

# Presentations

## LIFE EUROKITE



**Andreas Gärtner**
Administrator LIFE EUROKITE
TB Raab GmbH



**Moderator**
**Hannah Böing**
Team Leader
TB Raab GmbH



**Dr. Maximilian Raab**
Chief Strategy Officer
TB Raab GmbH



**Alfonso Godino**
LIFE EUROKITE Coordinator
AMUS - Acción Por El Mundo Salvaje



WINGSPAN CONFERENCE
NOVEMBER 04, 2026
BERLIN

Co-funded by the European Union

## Final Conference

# LIFE EUROKITE Main Results

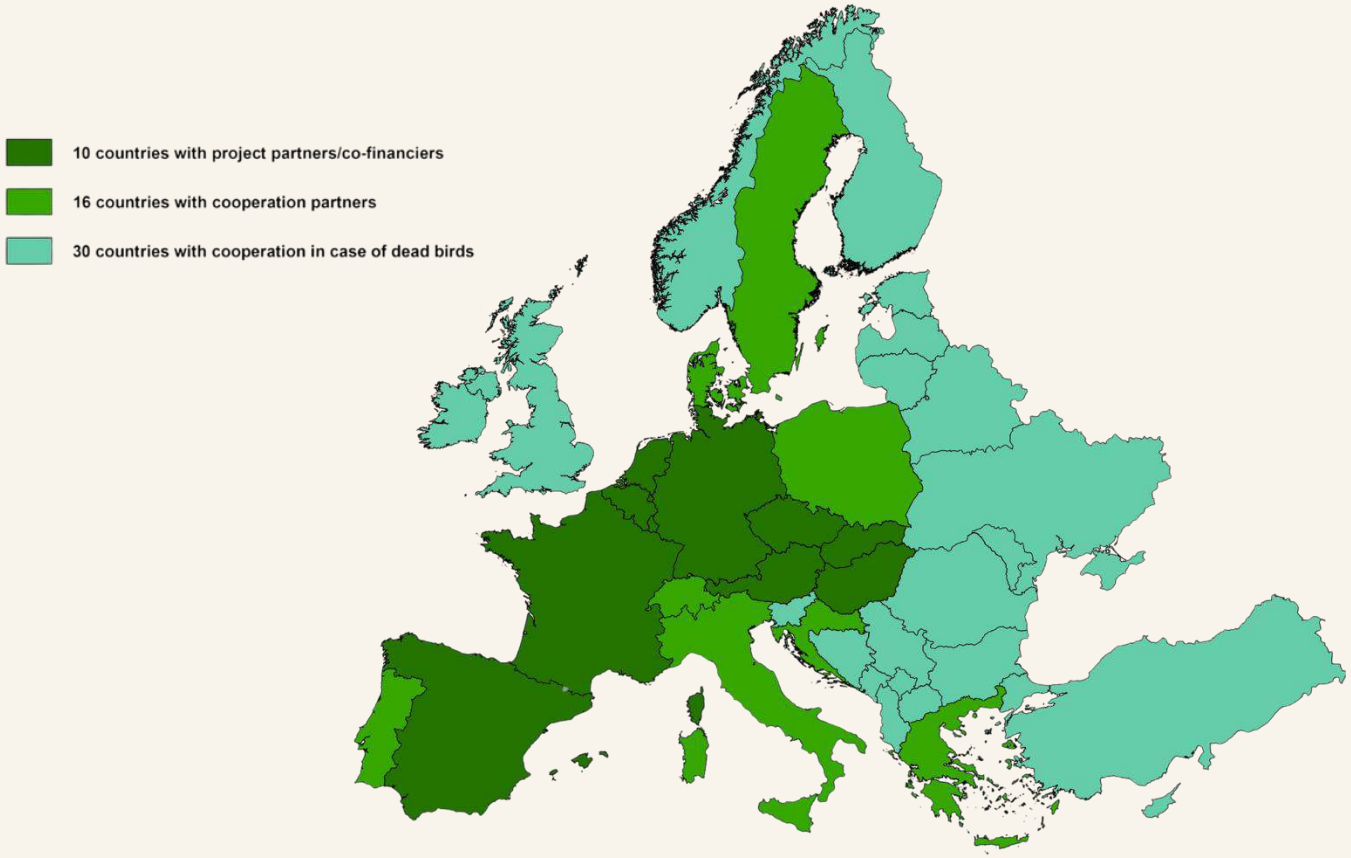
**Cross-border Protection of the Red Kite in Europe by Reducing Human - Caused Mortality 2019-2027**

DI Andreas Gärtner
Project Administrator LIFE EUROKITE



Red Kite
© Hansruedi Weyrich

# Project Overview




## Project duration:

07.12.2019 - 31.01.2027

## Coordinating beneficiary:

MEGEG

TB Raab was commissioned to implement the LIFE EUROKITE project after a pan-European public tender.

## Scale of Collaboration

Coordinated by with 18 project partners, 10 co-financiers, and 73 cooperation partners across Europe.

## Total budget:

€ 9,537,423

## EU contribution (60%):

€ 5,722,454

**Project Partners:**

**Co-financiers:**

**Coordinating beneficiary:** MEGEG, TB Raab

# Core Objective

Significant **reduction of impact of poisoning** (reduction of the rate of poisoning cases by 5% on EU level).

Identification and **solving of** problematic cases concerning **electrocution / collision**. Reduction of other anthropogenic reasons of mortality.

**Population reinforcement in Spain** halters range loss and identifies the factors causing a decline of the populations.



Poisoned Red Kite
© AMUS



Dead Red Kite under a power line
© LIFE EUROKITE



Partners of the reinforcement project in Spain
© AMUS

# Telemetry

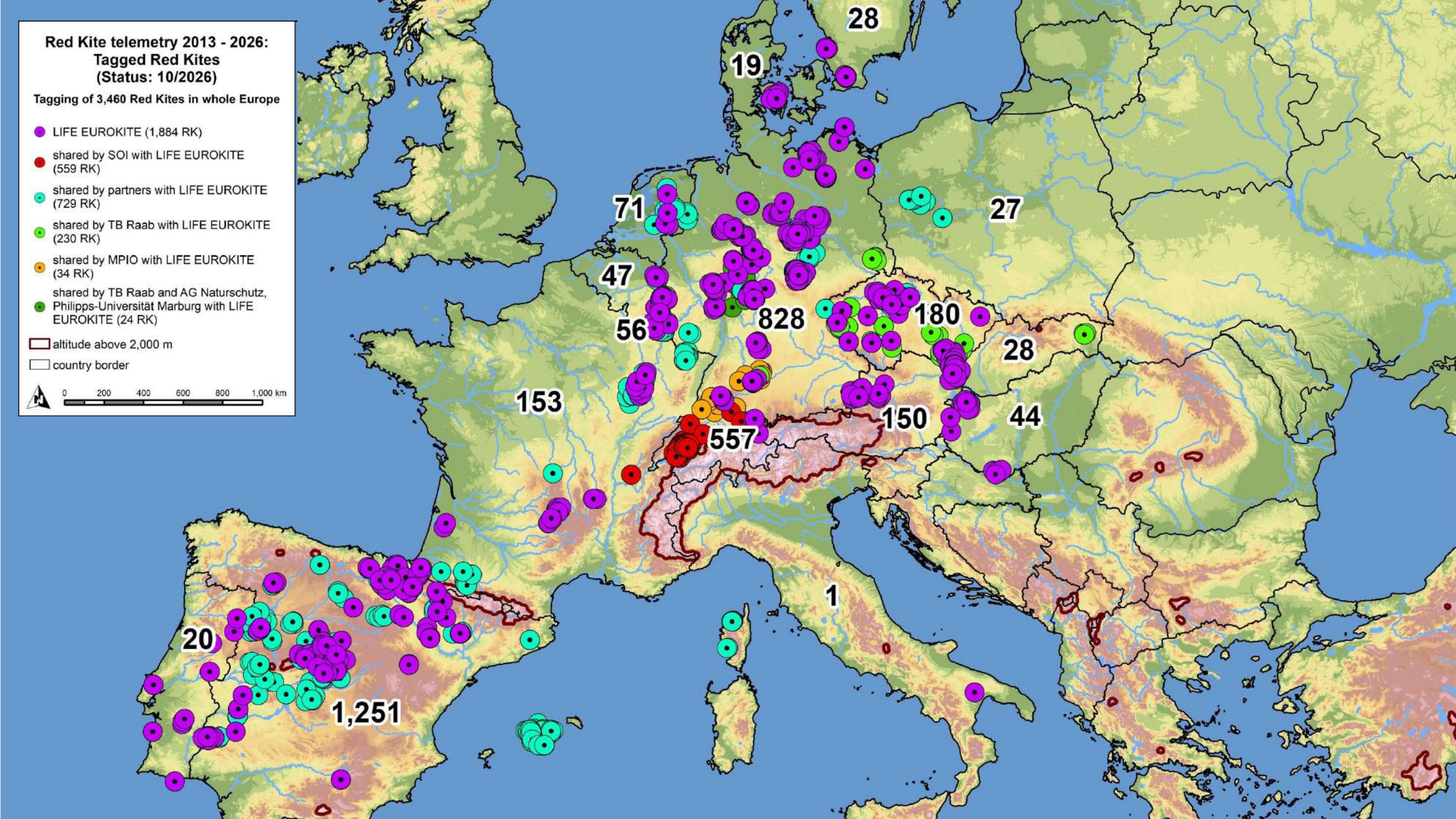
The core idea of the LIFE EUROKITE project was to use telemetry technology to identify the spatial habitat use of the target species and quantify ***the causes of mortality.***

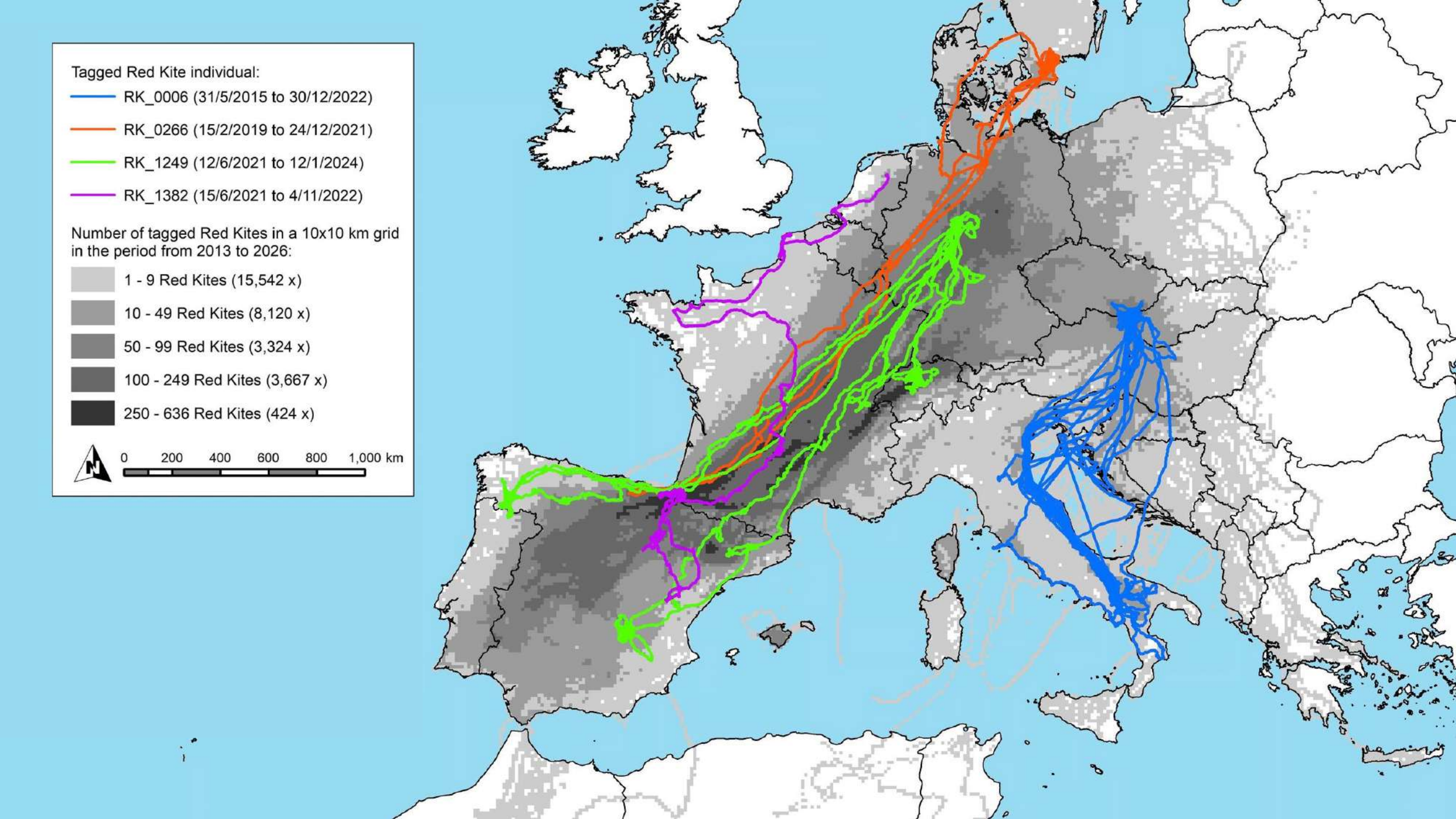
Telemetry Database: Centralized tracking network compiling data from ***over 3,460 tagged Red Kites.***

Additional, ***other species*** (White-tailed Eagle, Black Kite, Imperial Eagle & Honey buzzard were tagged too, but with a much smaller sample size)



Tagged red kites in the nest
© Boris Maderič


Red Kite telemetry 2013 - 2026:
Tagged Red Kites
(Status: 10/2026)
Tagging of 3,460 Red Kites in whole Europe
LIFE EUROKITE (1,884 RK)
shared by SOI with LIFE EUROKITE (559 RK)
shared by partners with LIFE EUROKITE (729 RK)
shared by TB Raab with LIFE EUROKITE (230 RK)
shared by MPIO with LIFE EUROKITE (34 RK)
shared by TB Raab and AG Naturschutz, Philipps-Universität Marburg with LIFE EUROKITE (24 RK)
altitude above 2,000 m
country border
0 200 400 600 800 1,000 km
28
19
71
27
47
828
180
56
28
153
150
44
557
1
20
1,251


Tagged Red Kite individual:
RK_0006 (31/5/2015 to 30/12/2022)
RK_0266 (15/2/2019 to 24/12/2021)
RK_1249 (12/6/2021 to 12/1/2024)
RK_1382 (15/6/2021 to 4/11/2022)
Number of tagged Red Kites in a 10x10 km grid in the period from 2013 to 2026:
1 - 9 Red Kites (15,542 x)
10 - 49 Red Kites (8,120 x)
50 - 99 Red Kites (3,324 x)
100 - 249 Red Kites (3,667 x)
250 - 636 Red Kites (424 x)
N
0 200 400 600 800 1,000 km

# Breeding Monitoring

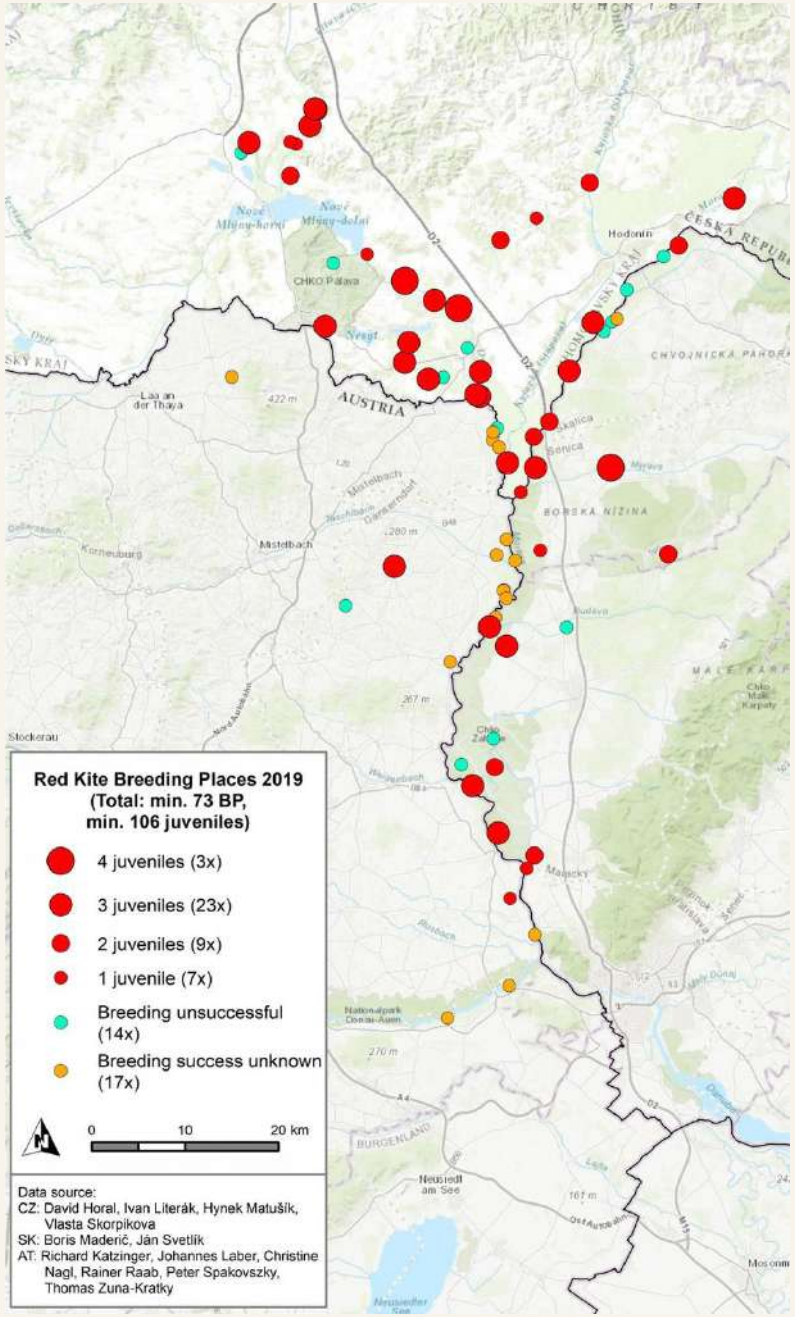


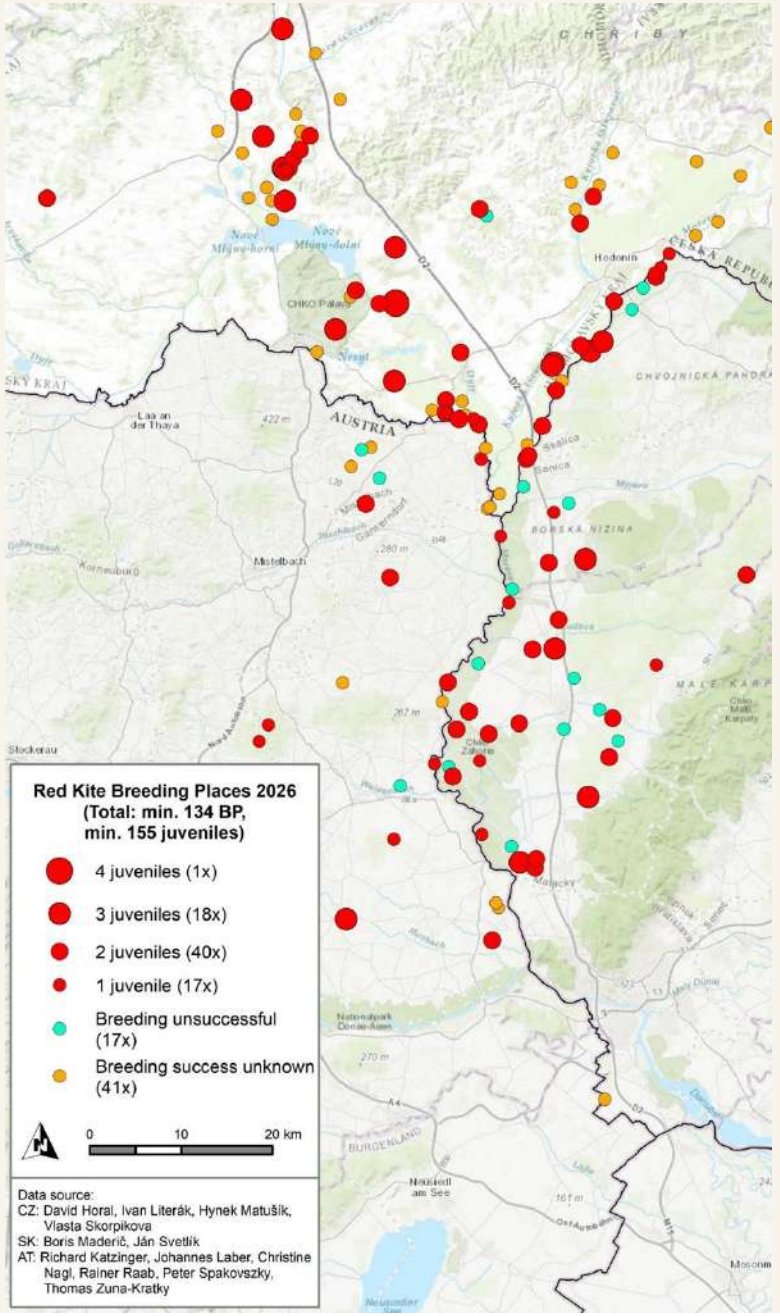
Red kite chicks
© Boris Maderič

***Non-Invasive Monitoring Technologies:*** Implementation of drones and GoPro nest cameras allowed field teams to ***safely monitor*** nest productivity and fledging success without causing disturbance to the breeding birds.

***Extremadura (Spain):*** Documented red kite breeding population expanded from 20 pairs in 2020 to 51 pairs in 2025— ***a 155% population increase*** during the project.

***Three-Border Region (Austria, Czech Republic, Slovakia):*** Breeding pairs grew from 73 pairs (min. 106 juveniles) in 2019 ***to 104 breeding pairs (min. 125 juveniles) in 2025.***


Red Kite Breeding Places 2019
(Total: min. 73 BP,
min. 106 juveniles)
4 juveniles (3x)
3 juveniles (23x)
2 juveniles (9x)
1 juvenile (7x)
Breeding unsuccessful (14x)
Breeding success unknown (17x)
0
10
20 km
Data source:
CZ: David Horal, Ivan Literák, Hynek Matušík, Vlasta Skorpikova
SK: Boris Maderič, Ján Svetlík
AT: Richard Katzinger, Johannes Laber, Christine Nagl, Rainer Raab, Peter Spakovszky, Thomas Zuna-Kratky


Red Kite Breeding Places 2026
(Total: min. 134 BP,
min. 155 juveniles)
4 juveniles (1x)
3 juveniles (18x)
2 juveniles (40x)
1 juvenile (17x)
Breeding unsuccessful (17x)
Breeding success unknown (41x)
0
10
20 km
Data source:
CZ: David Horal, Ivan Literák, Hynek Matušík, Vlasta Skorpikova
SK: Boris Maderič, Ján Svetlík
AT: Richard Katzinger, Johannes Laber, Christine Nagl, Rainer Raab, Peter Spakovszky, Thomas Zuna-Kratky



Roosting Site
© Jan Svetlík

***Standardized Monitoring:*** Coordinated January winter counts covering 267 selected roosting sites across 18 countries, with 179 sites consistently monitored in 16 countries.

# LIFE EUROKITE Winter Count

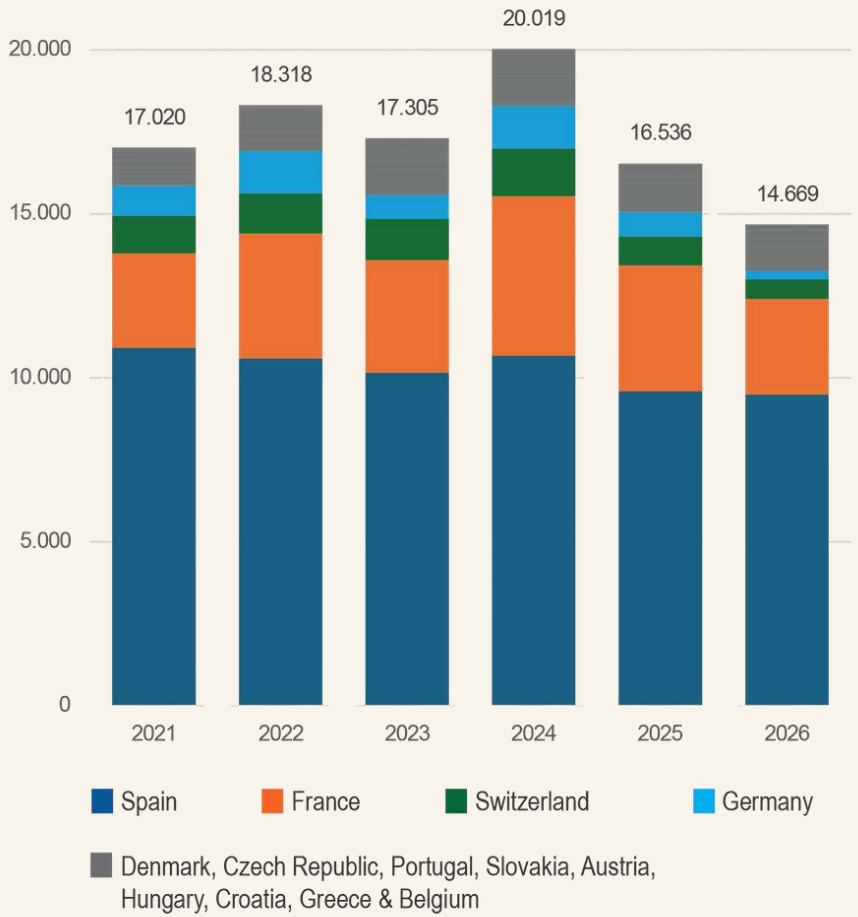
## *Regional Growth vs. Broad Trends:*

### *Extremadura (Spain):*

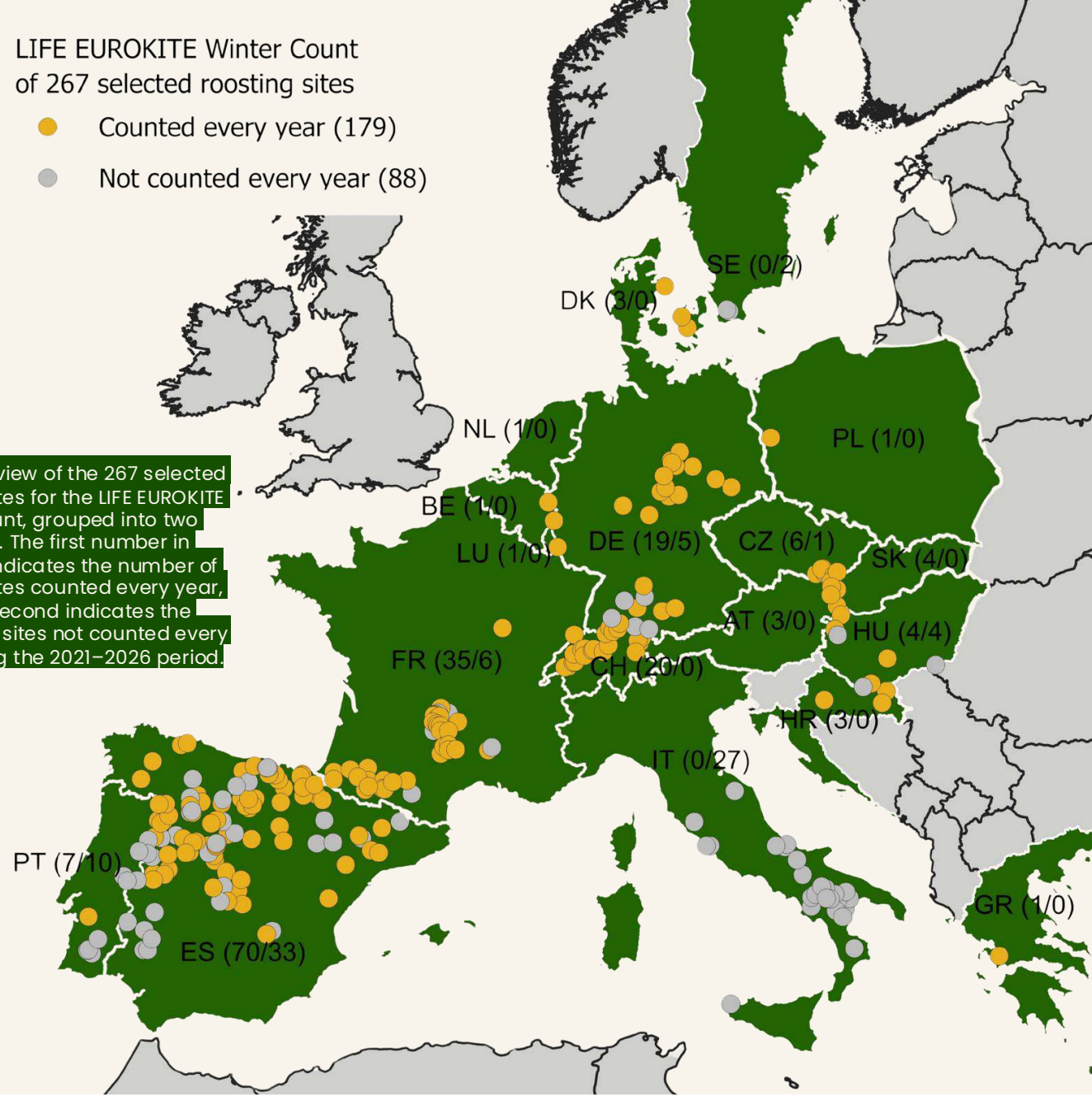
Wintering population ***expanded by 35%*** during the project (from 5,404 individuals in 2020 to 7,311 in 2025).

### *Central Europe:*

Overall wintering counts in countries like Germany and Switzerland experienced ***declines in 2025–2026,*** influenced by winter weather conditions, natural population cycles, and shifting roosting behaviors.




Graph: Total number of red kites counted at roosting sites (179) surveyed annually during the LIFE EUROKITE Winter Count 2021–2026. Italy and Sweden are excluded because no roosting sites in these countries were surveyed every year. Luxembourg, the Netherlands and Poland are excluded because no red kites were recorded at the selected roosting sites in these countries.

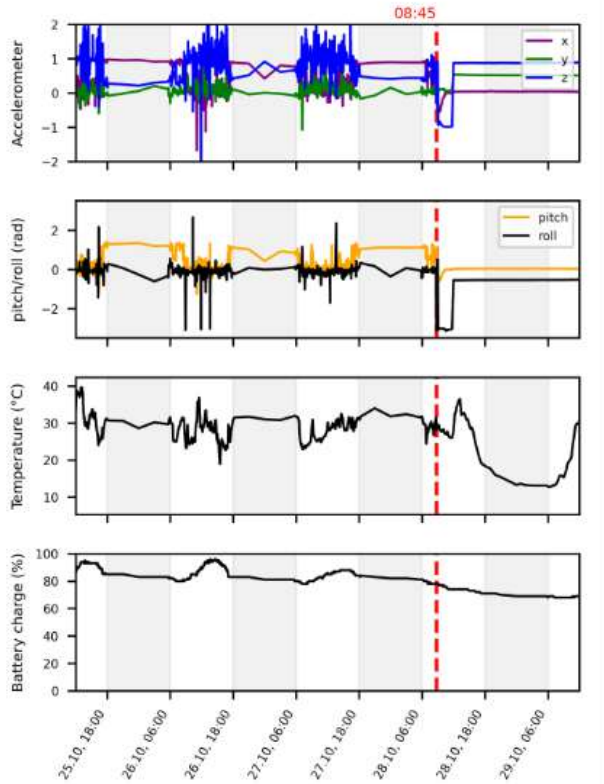



Map: Overview of the 267 selected roosting sites for the LIFE EUROKITE Winter Count, grouped into two categories. The first number in brackets indicates the number of roosting sites counted every year, while the second indicates the number of sites not counted every year during the 2021–2026 period.

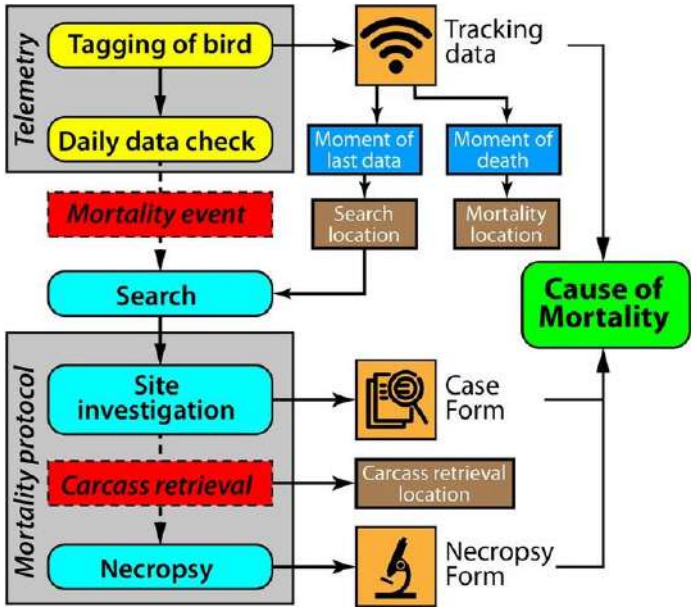
# The LEAP Framework

***The LIFE EUROKITE Assessment Protocol (LEAP)*** is a standardized framework designed to accurately identify the timing, location, and cause of death for GPS-tagged birds.

***LEAP Protocol:*** Combines real-time GPS tracking, standardized site investigations, and expert necropsies to achieve high-quality mortality determination in ***64% of cases.***




Tracking metadata from Red Kite RK_2159 (road collision victim): The four plots show the recorded tracking metadata between October 25 at 12:00 and October 29 at 12:00, transmitted once every 5 h. Gray shaded areas represent nighttime, white shaded areas daytime. The moment of mortality is marked with a red, dashed vertical line on the morning of October 28 at 8:45




Schematic representation of the process to determine the cause of mortality of GPS-tagged Red Kites as part of the LIFE EUROKITE assessment protocol (LEAP)
© Panter et al. (2025)

# LIFE EUROKITE Crime Report



Bait full of Carbofuran
© RPS

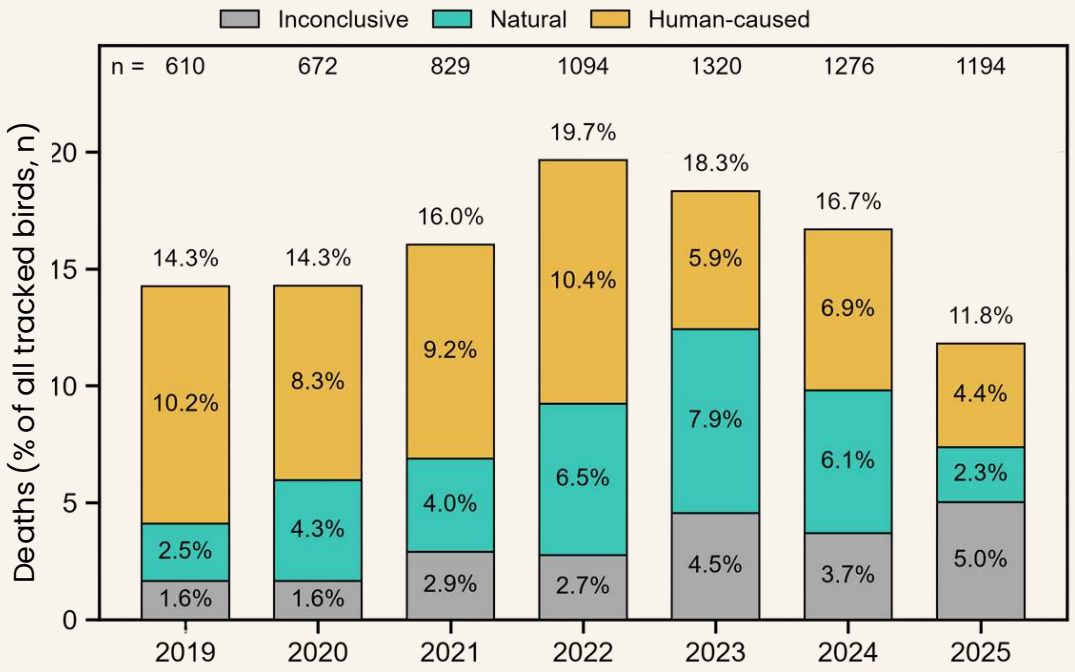
***Illegal human caused mortality*** is one of the biggest threats to red kites in Europe.

***Unprecedented Scale:*** Evaluated 3,554 tagged raptors across 19 countries, documenting 320 illegally killed birds in 24 countries.

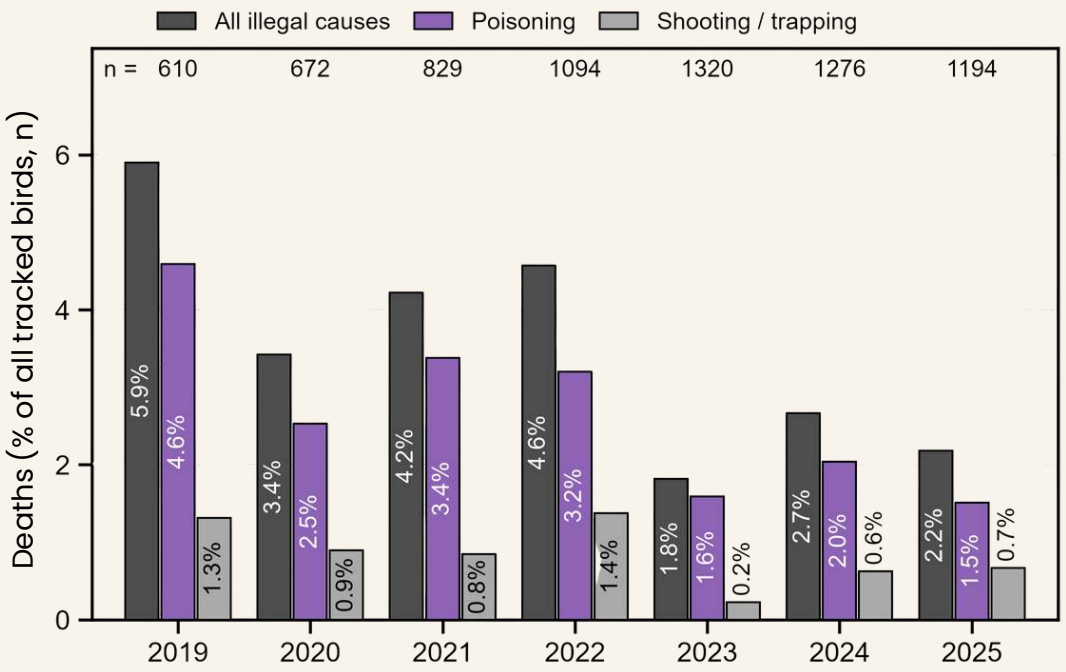
***Staggering Europe-Wide Estimates:*** An estimated ***~46,000 Red Kites*** were illegally killed in Europe between 2020 and 2024.

***Illegal Poisoning Dominance:*** Represents ***74%*** of recorded wildlife crime cases, primarily using banned toxic substances like Carbofuran. Illegal shooting accounts for ***20%.***

***Forensic GPS Success:*** High-resolution GPS tracking delivered direct evidence leading to ***the first landmark conviction*** in Germany for illegally shooting a protected White-tailed Eagle.



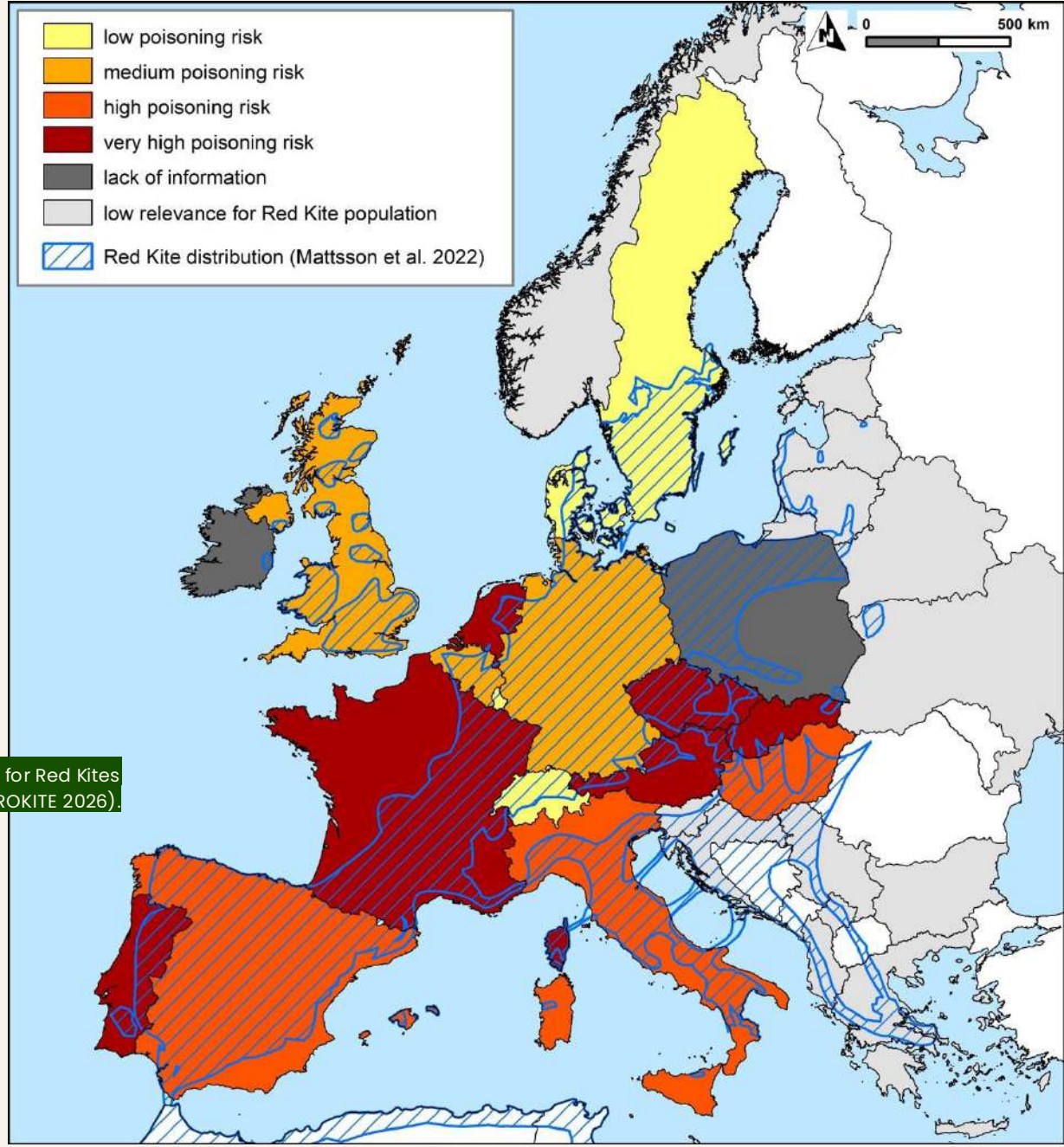

Deaths by mortality cause group. The graph shows the percentage of deaths by mortality cause group from 2019 to 2025.




Illegal causes of death: total and components.



Tagged red kite poisoned while feeding on a poisoned corvid carcass.
© Karel Makoň




Map: Potential Risk of Poisoning for Red Kites in Europe (LIFE EUROKITE 2026).

# Stakeholder Involvement & Milestones in Wildlife Crime

## Stakeholder Outreach & Education:

***Conducted 106 information events*** in Hungary targeting technical forestry/hunting schools, universities, and professional hunters' associations.



Forestry University of Sopron
© Előd Győrig

# Stakeholder Involvement & Milestones in Wildlife Crime

## Specialized Investigation & Public Resources:

***Wildlife Crime Guideline:*** Published as a comprehensive operational manual to assist authorities and law enforcement in evidence collection.

Scan to read PDF

# Stakeholder Involvement & Milestones in Wildlife Crime

## Specialized Investigation & Public Resources:

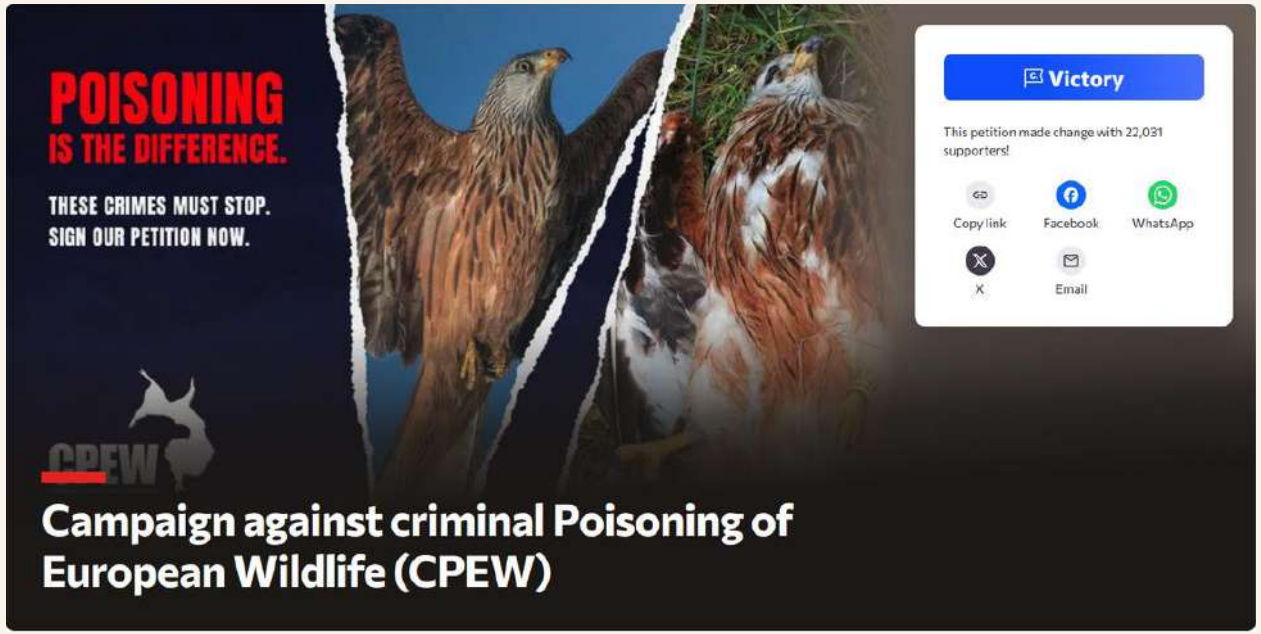
***Bird Crime Brochure:*** Distributed in ***7 languages*** to enable citizens to identify signs of illegal poisoning and report incidents safely.

Scan to read PDF

# Stakeholder Involvement & Milestones in Wildlife Crime

## Specialized Investigation & Public Resources:

***CPEW Campaign:*** The Campaign against criminal Poisoning of European Wildlife unified ***79 organizations*** and gathered ***22,033 signatures*** to end wildlife poisoning.



# Stakeholder Involvement & Milestones in Wildlife Crime

## Forensic GPS Telemetry:

High-precision GPS tracking provided undeniable courtroom evidence, securing the ***first landmark conviction in Germany*** for the illegal shooting of a protected White-tailed Eagle (resulting in a fine and loss of hunting license).



X-ray showing evidence of illegal shooting.
© LIFE EUROKITE



The bird's GPS transmitter was tied to a piece of wood
© LIFE EUROKITE

# Stakeholder Involvement & Milestones in Wildlife Crime

## GPS data help secure conviction in a red kite poisoning case

**Extremadura, Spain | February 2025**

- A GPS-tagged German red kite was poisoned. Following EUROKITE's alert to AMUS, wildlife police launched an investigation.
- Another red kite, a common buzzard, a marsh harrier and a feral cat were also found dead. Toxicological analyses confirmed poisoning.
- GPS data established the time and location of death, recorded positions inside a country house and showed the bird's subsequent movement to a roadside location.
- GPS evidence and the police investigation led to one person's arrest and conviction.

### Court sentence:

**2 years in prison · 4-year hunting ban · Payment of court costs · Financial compensation to LIFE EUROKITE**

The Regional Government of Extremadura will also impose a fine for killing protected wildlife.

# Dissemination Actions

- Monograph Publication
- Inaugural Wingspan Conference
- Educational Films
- Pan-European Network
- International Information Boards

## Monograph Publication:

Published the book ***"The Red Kite in Europe - Successful Protection at International Level"*** (May 2022) in collaboration with APG (Austrian Power Grid) to promote cross-border conservation.



# Dissemination Actions

- Monograph Publication
- Inaugural Wingspan Conference
- Educational Films
- Pan-European Network
- International Information Boards

## Educational Films:

Pro Vértes produced 4 short films covering major raptor threats: ***Raptor Conservation Threats on Land and in the Air, Satellite Transmitters, Poisoning, and Electrocution*** as well as ***a publication about red kite conservation.***



# Dissemination Actions

- Monograph Publication
- Inaugural Wingspan Conference
- Educational Films
- Pan-European Network
- International Information Boards

## International Information Boards:

Installed ***5 public information boards*** across key project sites in Austria (TB Raab/MEGEG), Spain (AMUS, SEO/BirdLife – 2 boards), Germany (Rotmilanzentrum), and France (LPO).



# Dissemination Actions

- Monograph Publication
- Inaugural Wingspan Conference
- Educational Films
- Pan-European Network
- International Information Boards

## Inaugural Wingspan Conference (Brussels 2024)

Launched the biennial flagship conference engaging ***320 stakeholders*** (155 in-person from 32 countries, 165 online). Established a long-term roadmap: ***Berlin 2026, Paris 2028, Vienna 2030, Madrid 2032.***




Group photo at Wingspan 2024
© Hansruedi Weyrich

# Dissemination Actions

- Monograph Publication
- Inaugural Wingspan Conference
- Educational Films
- Pan-European Network
- International Information Boards

## Pan-European Network

Built a collaborative protection network uniting partners ***across 10 core countries***, cooperation partners in ***16 countries,*** and carcass-recovery cooperation in ***30 countries***.



Cooperation with hunters in Austria
© LIFE EUROKITE

# Sustaining Conservation Beyond LIFE EUROKITE



Red kites
© Hansruedi Weyrich

***Czech Bird of the Year 2027***
Designation of the Red Kite as Czech Bird of the Year 2027 to drive public education, media campaigns, and local stakeholder involvement.

***Sustained Grid Safety Standards***
Grid operators committed to incorporating bird-friendly technical standards into ongoing grid maintenance and future infrastructure planning.

***Long-Term Monitoring & Threat Response***
Continued tracking of tagged birds, maintenance of feeding stations, active investigation of mortality events, and anti-poisoning collaboration with farmers and hunters.

***Institutionalized Wingspan Platform***
Continuation of the biennial Wingspan Conference to maintain cross-sector collaboration between energy developers, grid operators, and conservationists.

# Conclusion – Key Findings



Poisoned red kite in Slovakia
© RPS

**Dominance of Anthropogenic Impact:**

- Represents 74% of recorded wildlife crime cases, primarily using banned toxic substances like Carbofuran. Illegal shooting accounts for 20%..

***Staggering Europe-Wide Estimates*: :**

- *An estimated ~46,000 Red Kites were illegally killed in Europe between 2020 and 2024.*

**Decreasing Trend in Human-Caused Deaths:**

- Over the course of the project, human-caused mortality rates—particularly ***illegal poisoning***—showed ***a decrease.***

# Conclusion – Key Findings



Tagged red kite poisoned while feeding on a poisoned corvid carcass.
© Karel Makoň

**Combating Europe-Wide Bird Crime:**

- Wildlife crime remains a European-wide issue with widespread hotspots, and ***conviction rates remain low.***
- ***Telemetry as a Forensic Tool:*** High-resolution GPS tracking has proven to be one of the most critical tools for detecting, investigating, and prosecuting wildlife crimes through collaboration between authorities and conservationists.

**Climate Change Shifts:**

- Climate change is ***influencing the distribution*** of birds of prey in Europe, with some populations expanding their breeding ranges northwards.

## Coordinating beneficiary

EUROKITE

The TB Raab GmbH was commmissioned to implement the LIFE EUROKITE project after a pan-European public tender.

TB Raab Technisches Büro für Biologie

MEGEG

## Cooperation partner

AMUS Acción por el Mundo Salvaje

Austrian Power Grid APG

amprion

Pollinarium Zentrum am Museum Heineanum

ČSO

JUNTA DE EXTREMADURA Consejería para la Transición Ecológica y Sostenibilidad

deltamilieu PROJECTEN

eg·d ČLEN SKUPINY E.ON

LPO BIRDLIFE FRANCE Agir pour la biodiversité

natagora

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netz BURGENLAND

NÖ Netz EVN Gruppe

PRO VÉRTES NONPROFIT ZRT.

Castilla-La Mancha Consejería de Agricultura, Medio Ambiente y Desarrollo Rural

DOMOVA DRAVCOV NA SLOVENSKU

SEO BirdLife

ZÁPADOSLOVENSKÁ DISTRIBUČNÁ

## Co-financiers

Bundesministerium Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie

Baden-Württemberg MINISTERIUM FÜR UMWELT, KLIMA UND ENERGIEWIRTSCHAFT

inatura Natur, Mensch und Technik erleben

LAND OBERÖSTERREICH

Das Land Steiermark

LAND SALZBURG

LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG

MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE Liberté Égalité Fraternité

SACHSEN-ANHALT Ministerium für Umwelt, Landwirtschaft und Energie

niederösterreich naturschutz

This project is co-financed by the LIFE Nature Programme of the European Union

NATURA 2000

## Cooperation partner

## Additional cooperation partners for specific research questions in the field of renewable energy

This project is co-financed by the LIFE Nature Programme of the European Union

# Thank you for your attention!

Together, we can give red kites a safer future.

**Andreas Gärtner**
**Administrator, LIFE EUROKITE**

andreas.gaertner@tbraab.at · www.life-eurokite.eu



Red Kite
© Hansruedi Weyrich

WINGSPAN 2026

# Presentations

## LIFE EUROKITE



**Andreas Gärtner**
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TB Raab GmbH



**Moderator**
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AMUS - Acción Por El Mundo Salvaje



WINGSPAN CONFERENCE
NOVEMBER 04, 2026
BERLIN

**Final Conference – LIFE EUROKITE (LIFE18 NAT/AT/000048)**

# RED KITE MORTALITY ON INFRASTRUCTURE



© APG, LIFE EUROKITE

DR. MAXIMILIAN RAAB
CSO, TB RAAB GMBH

# Europe-Wide Red Kite Mortality

## (Peer review, Panter et al.)

***Unprecedented Dataset***
Analyzed 2,346 GPS-tracked Red Kites tagged across 14 European countries (2013–2022), documenting 979 mortality events and 624 conclusive adult/subadult cause-of-death cases.

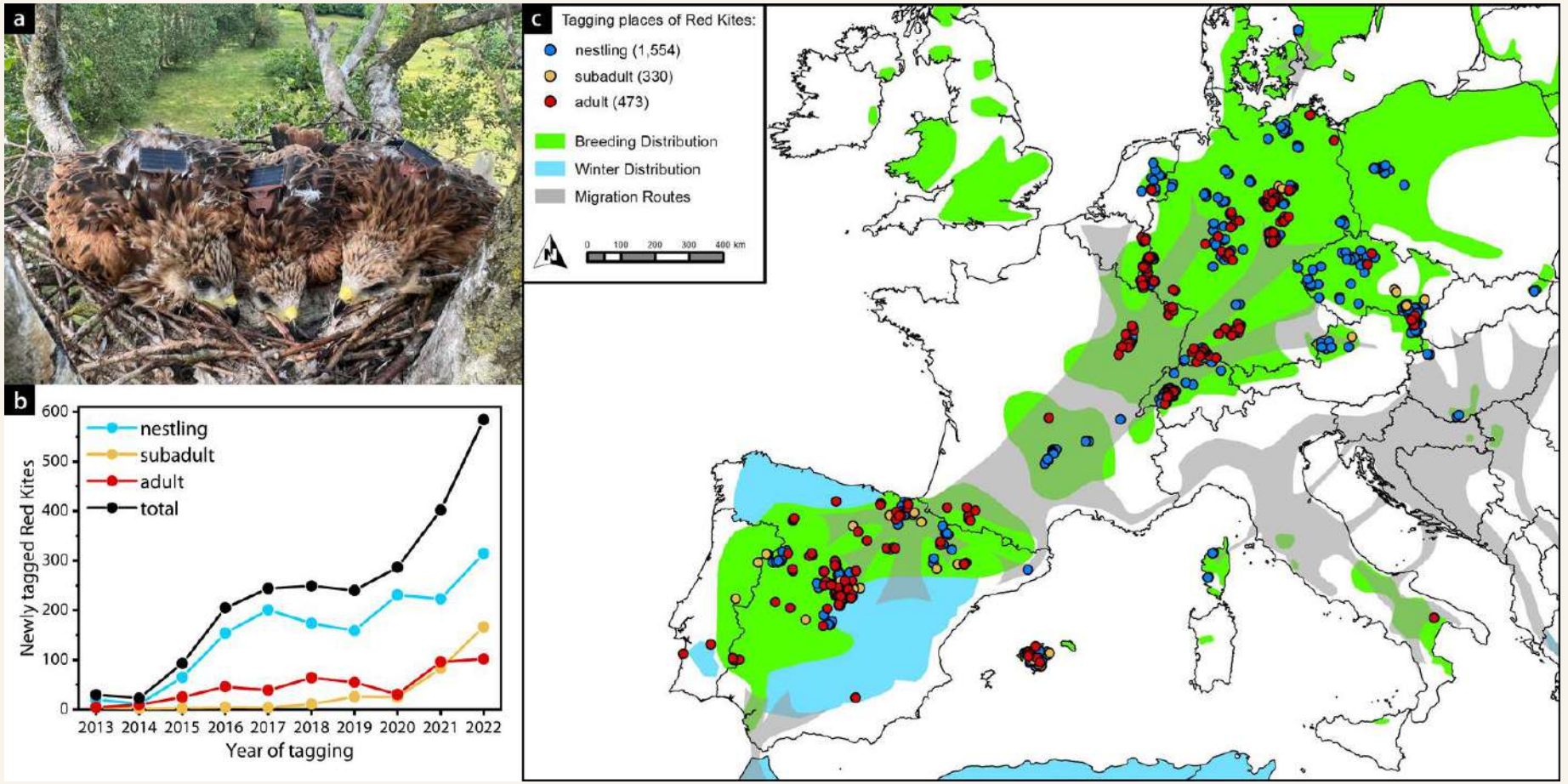
***Dominance of Anthropogenic Drivers***
Human-caused mortality accounts for 69.1% of all Red Kite deaths—more than double the proportion of natural causes (30.9%).

***Consistent Multi-Year Pressure***
Relative anthropogenic mortality rates remained consistently high across all 10 study years (2013–2022).

***Europe-Wide Cause-of-Death Hierarchy***

- Illegal Poisoning: 25.2% (leading human-caused threat).
- Natural Predation: 25.3% (primarily top predators like Eagle Owls and Goshawks).
- Traffic Collisions: 16.3% combined (10.9% road, 5.4% rail).
- Power Line Hazards: 9.9% (7.5% electrocution, 2.4% collisions).
- Illegal Shooting / Trapping: 8.7%.
- Wind Turbine Collisions: 3.8%.

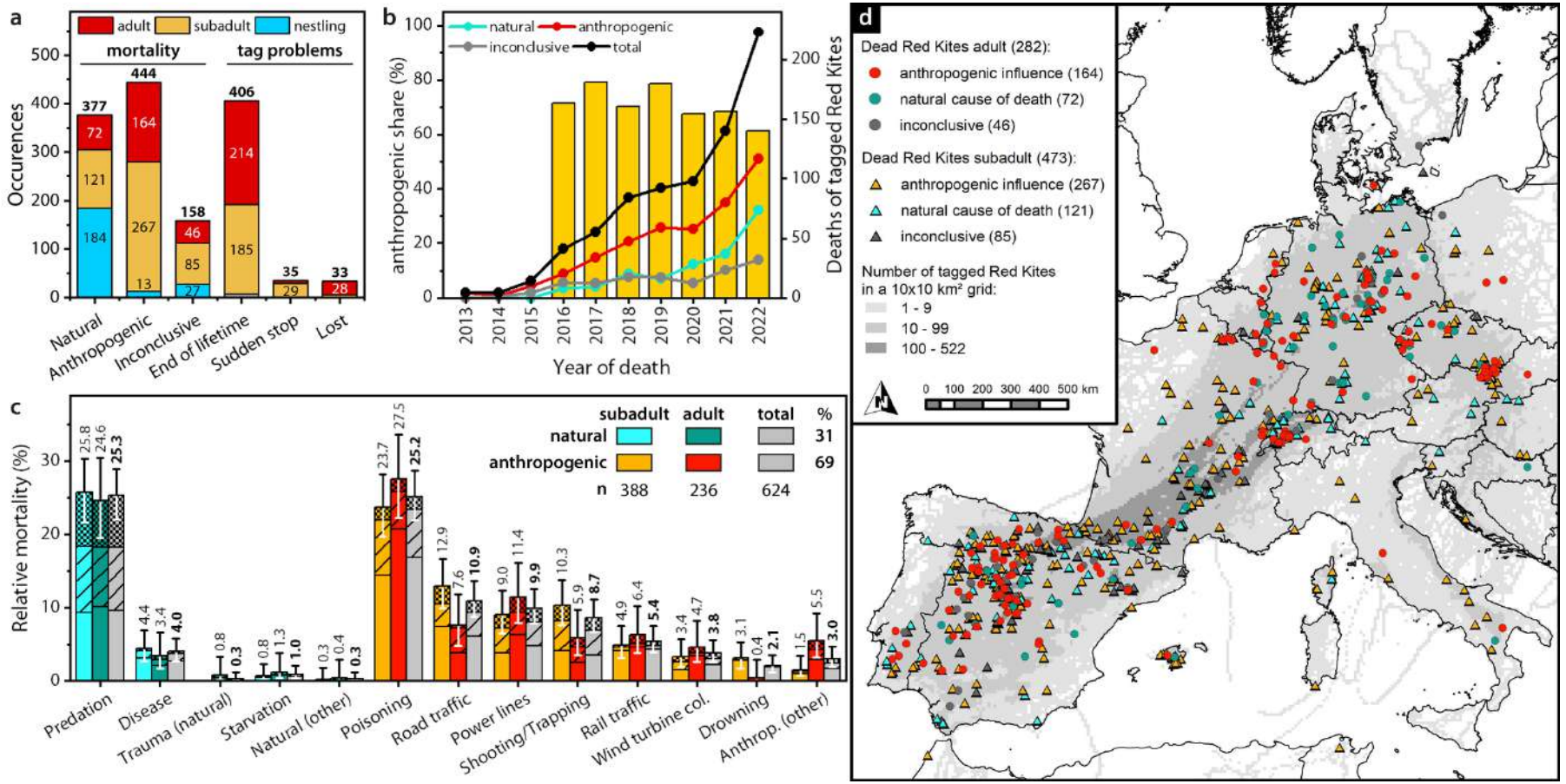
***Age-Class Dynamics***
Subadult floaters experience a 26% higher annual mortality risk than adults due to wide-ranging dispersal behavior.




(a) Red kite nestlings fitted with solar-powered GPS tags.

(b) Number of kites tagged 2013 – 2022, totalling 2,346 individuals. Different colours according to age classes at tagging. The 'nestlings' category includes all nestlings and fledglings.

(c) Tagging locations (points). The breeding (green) and wintering distribution outside of the breeding distribution (blue) and migration routes (grey) based on Mattsson et al. Black lines represent country borders and coastlines (OpenStreetMap).




(a) data summary ('mortality': and 'tag problems'). The 'nestlings' category includes all nestlings and young fledglings that have not yet gained their full flight capability.

(b) Number of mortality events (lines) for subadults and adults, and the proportion of anthropogenic causes between 2013 – 2022 (barplots).

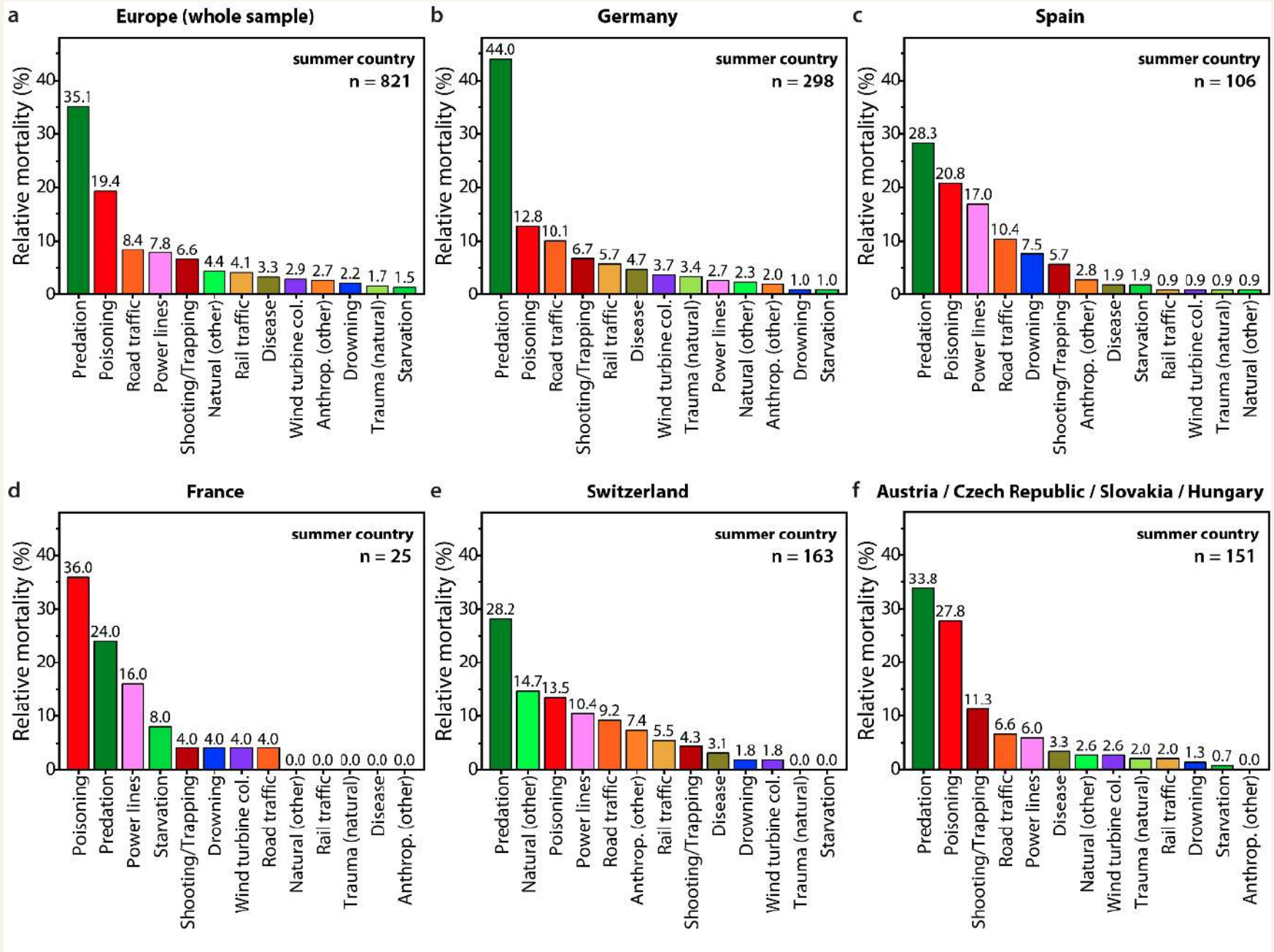
(c) Proportion of different mortality categories for different age classes. Within bar pattern shows certainty (solid: 'certain', hashed: 'probable', grated: 'possible'). Numbers indicate the total proportion, error bars are 95% confidence intervals.

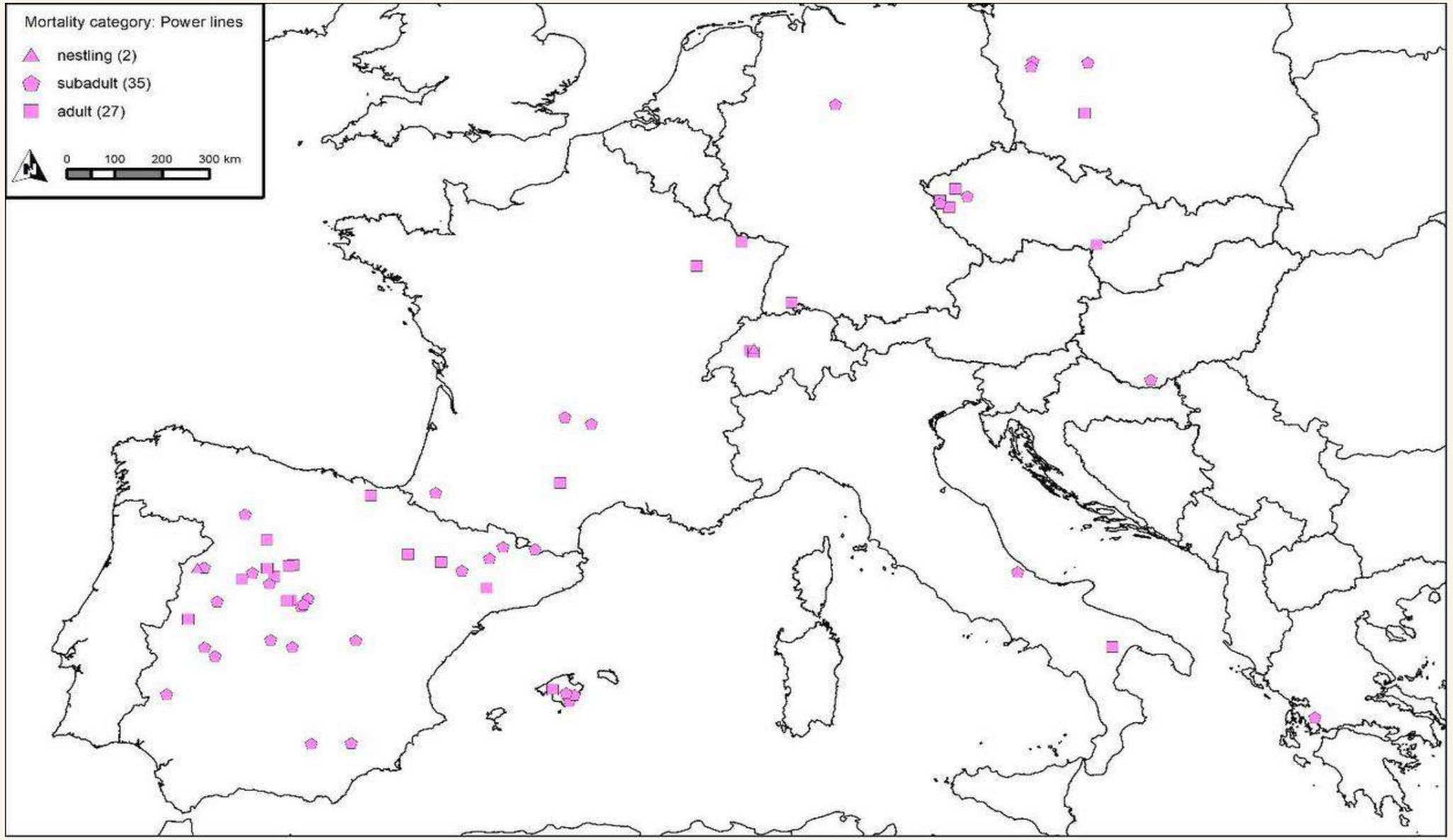
(d) Locations of mortality events for subadults and adults. Grey areas show the density of tracked individuals in this study at a 10 km² resolution.

Mortality causes in red kites (Milvus milvus) across Europe, where all age classes (nestling, subadult, adult) and certainty classes (certain, probable, possible) are pooled. The causes are ordered by occurrence for each summer country of the deceased individuals:

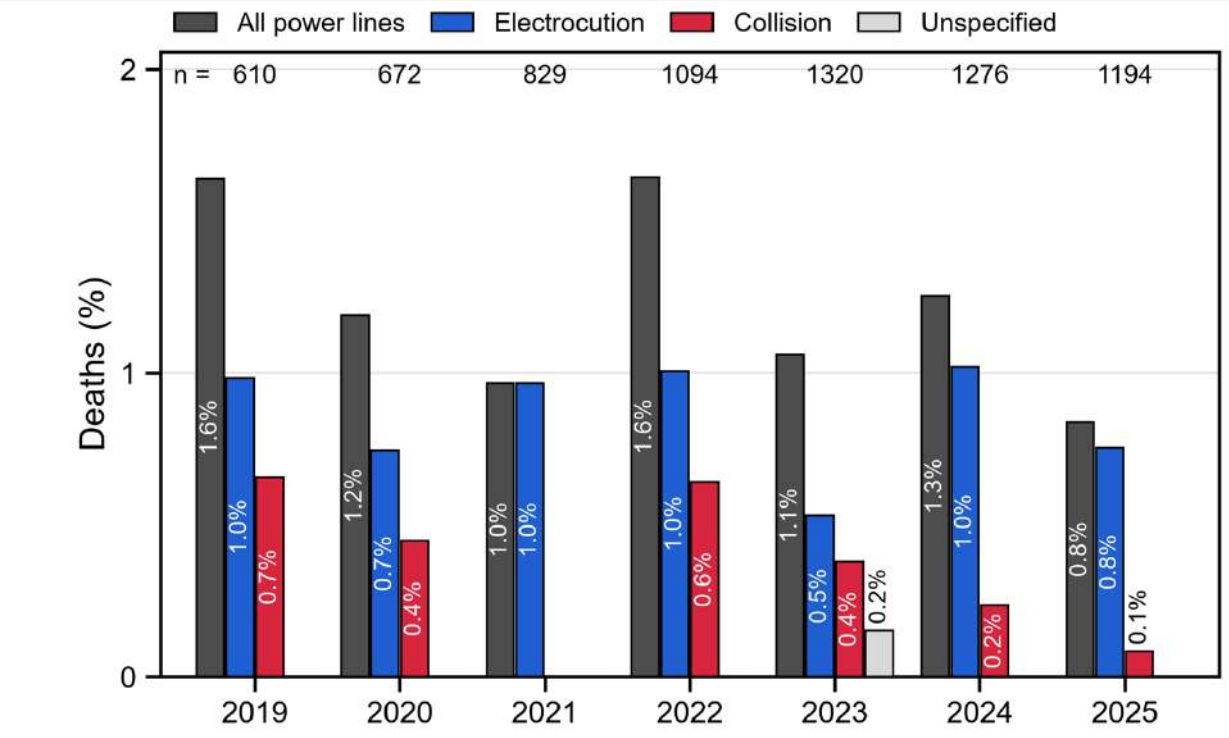
(a) the whole sample (Europe),
(b) Germany,
(c) Spain,
(d) France,
(e) Switzerland, and
(f) Austria, the Czech Republic, Slovakia and Hungary (AT/CZ/SK/HU).

Colours highlight differences in rank orders of mortality categories among summer countries.

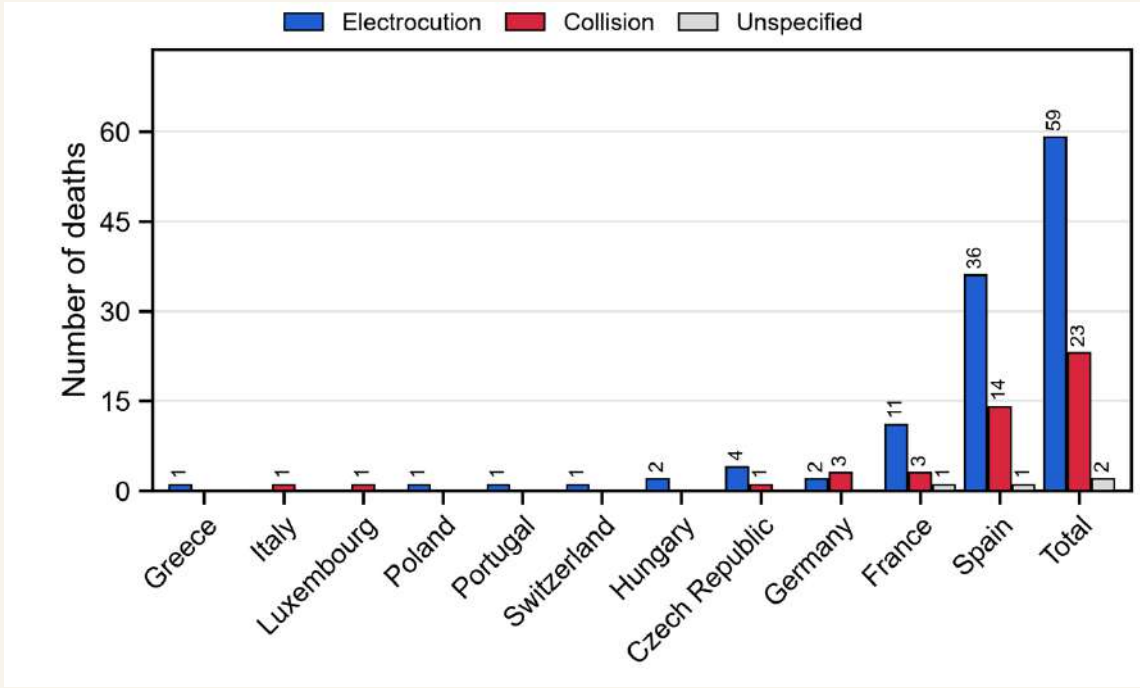





Mortality cases from power lines for nestlings, subadults and adults (2013-2022).




Red kite mortality caused by power lines, categorised as electrocution and collision, from 2019 to 2025.




Red kite mortality caused by power lines, categorised as electrocution and collision, per country from 2019 to 2025.

# Infrastructure Hazards: Electrocution, Collisions & Spatial Risks



Roadkill
© LIFE EUROKITE

## Power Lines (9.9% of Total Mortality):

- ***Electrocution:*** Represents ***75.8% of power line deaths*** (7.5% of overall mortality) when birds perch on uninsulated medium-voltage pylons.
- ***Collisions:*** Mid-flight impacts with conductor cables account for ***24.2% of power line deaths*** (2.4% of overall mortality).

## Transportation Infrastructure (16.3% of Total Mortality):

- ***Roads (10.9%)*** and ***railways (5.4%)*** attract scavenging Red Kites to roadkill, making young floaters especially vulnerable.

## Renewable Wind Energy (3.8% of Total Mortality):

- ***Wind turbine collisions represent 3.8%*** of European mortality. Mitigating collision risks through proper site selection and predictive/automated curtailment is vital as wind capacity expands under the EU Green Deal.

## Geographic Variations in Grid Risk:

- Annual power line mortality risk is significantly lower in Germany ***(0.4%)*** compared to Central Europe (***2.8%*** in AT/CZ/SK/HU) and Spain ***(4.2%)***, reflecting the success of statutory retrofitting laws.

# Safer Networks: Central European Power Line Retrofitting

## Large-Scale European Targets:

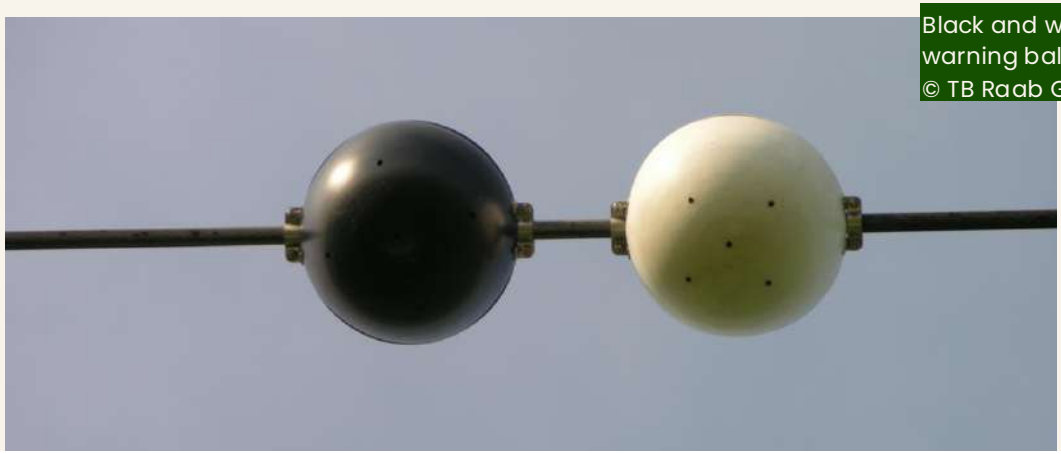
- Installed over 3,000 technical pylon modifications (bird-safe brackets, protective caps, and insulation sleeves).
- Upgraded over 117 km of overhead power lines along critical migratory flyways and core breeding zones.

## Key Partner Grid Highlights:

- **Czech Republic (EG.D / E.ON):** Installed **1,040 certified "Claw/Birdsafe" brackets** and renewed **94.5 km** of overhead distribution lines.
- **Slovakia (ZSD):** Retrofitted **942 distribution poles** with protective insulation, converting dangerous perches into safe vantage points.
- **Austria (APG):** Mounted high-visibility bird flight diverters along transmission corridors to mitigate mid-flight collision risks.
- **Spain (AMUS):** Modified **over 1,000 hazardous electric pylons** and corrected **>23 km of high-risk lines** in southwestern Spain



Replacing unprotected components with bird-safe devices
© EG.D



Black and white bird warning balls
© TB Raab GmbH





Underground cabling in Austria
© TB Raab GmbH; Peter Ujfalusi

# Underground Cabling: Permanent Infrastructure Risk Elimination

**The Ultimate Conservation Measure:**

Replacing medium-voltage overhead lines with underground cabling ***completely eliminates*** both electrocution and collision hazards.

**Targeted Deployment in Hotspots:**

***Grid operators*** (including Netz Burgenland and Netz Niederösterreich) focused undergrounding projects in high-density breeding and roosting corridors in eastern Austria.

**Permanent Landscape Restoration:**

***Completely removes*** physical flight obstacles from core habitats, creating safe flyways for Red Kites and other soaring raptors.

## Coordinating beneficiary

The TB Raab GmbH was commmissioned to implement the LIFE EUROKITE project after a pan-European public tender.

## Cooperation partner

## Co-financiers

This project is co-financed by the LIFE Nature Programme of the European Union

## Cooperation partner

## Additional cooperation partners for specific research questions in the field of renewable energy

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# Thank you for your attention!

Safer infrastructure. Safer skies for red kites.

**Dr. Maximilian Raab**
**CSO, TB Raab GmbH**

maximilian.raab@tbraab.at · www.life-eurokite.eu · www.tbraab.at



Red Kite
© Hansruedi Weyrich

WINGSPAN 2026

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AMUS - Acción Por El Mundo Salvaje



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# REINTRODUCTION OF RED KITES & MODIFICATION OF POWER LINES IN SW IBERIAN PENINSULA

Godino, A., Marrero, S. & Machado, C.
AMUS - Acción por el Mundo Salvaje



Tagged Red Kites © AMUS

# AMUS´ ACTIONS IN LIFE EUROKITE PROJECT

1. PREPARATORY ACTIONS
- Authorizations and birds´tagging
- **Feasibility study for the red kite´s reinforcement in Southern Spain**
- Birds monitoring

2. CONSERVATION ACTIONS
- Birds control
- Mortality detection
- Investigation and prevention of mortality
- Assessment of electrocution and collision risk associated with power lines
- **Reinforcement of population in southern Spain**

3. MONITORING THE IMPACT OF PROJECT ACTIONS

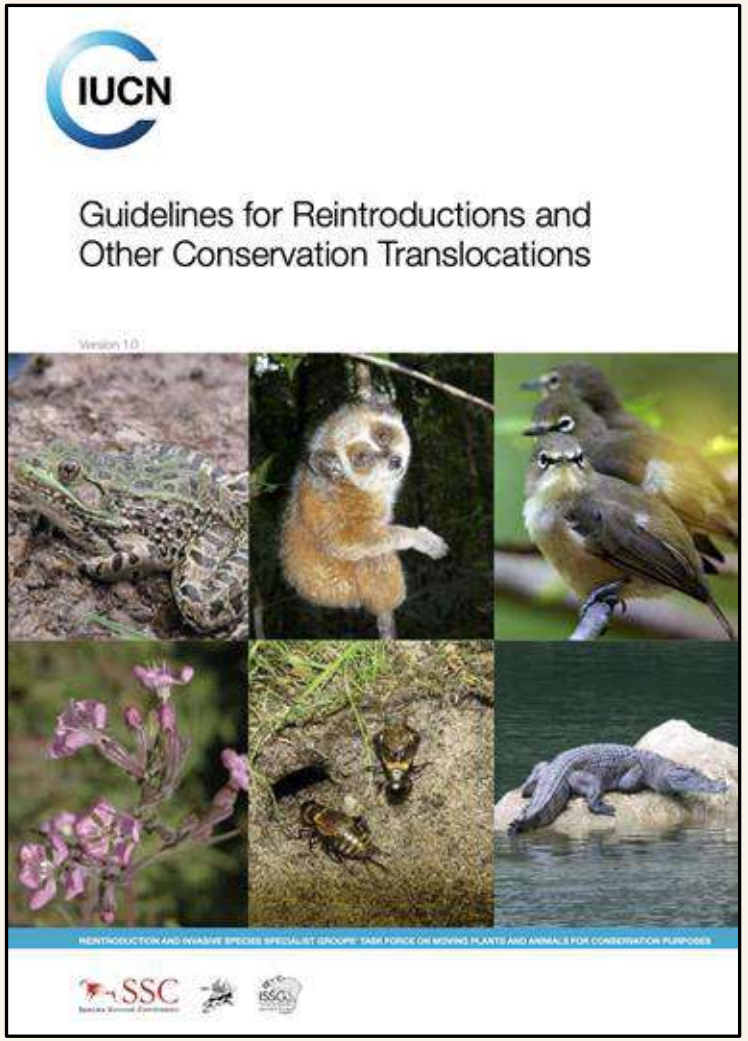
4. AWARENESS/RAISING AND DISSEMINATION OF THE PROJECT

5. PROJECT MANAGEMENT



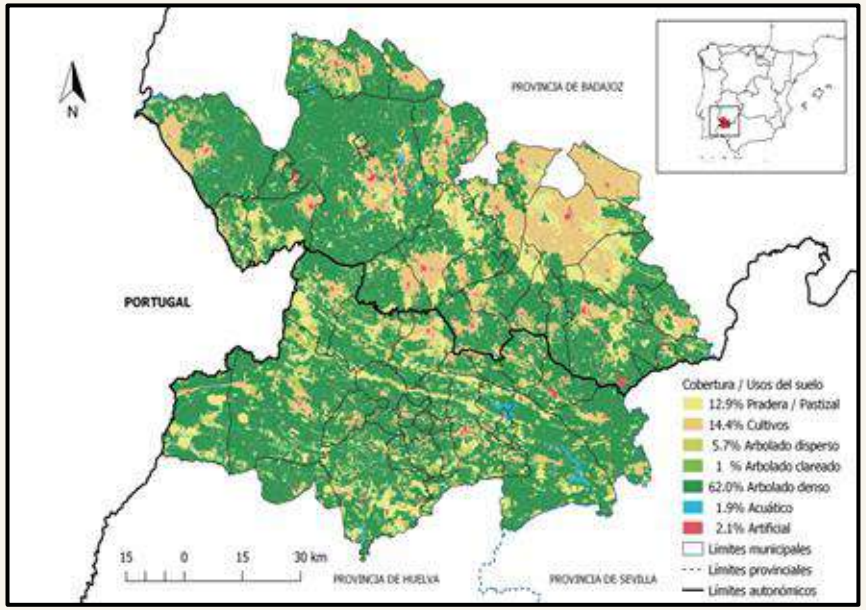
Red Kite © Hansruedi Weyrich

# AMUS´ ACTIONS IN LIFE EUROKITE PROJECT




ACTION A-9. Feasibility study for the population reinforcement in southern Spain

- Habitat suitability
- Food availability
- **Evaluation of threats: Poisoning, shooting, power lines electrocution/collision, etc**.




| BADAJOZ | HUELVA |
|---|---|
| 376.134 ha. | 301.322 ha. |

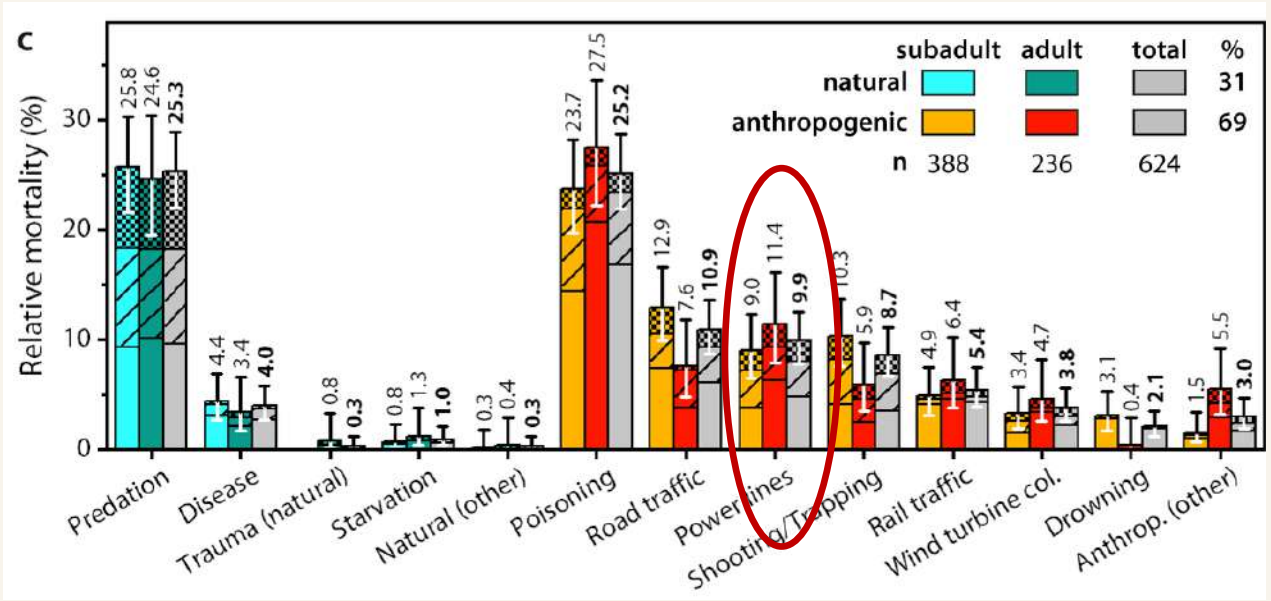
# High human-caused mortality in GPS-Tracked red kites across Europe.

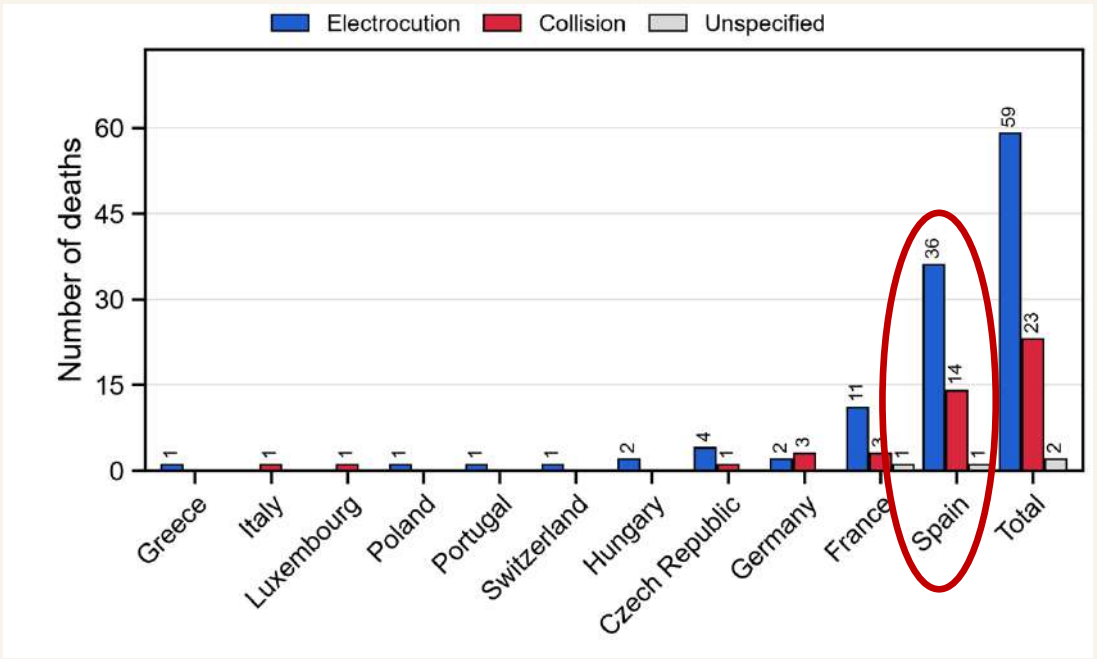
Panter et al. (under review)

- 1.248 red kites mortality records were detected in Europa. 69% of these records had a human-induce mortality.
- Poisoning and shooting represents more than 30% of red kite mortality in Europe.
- Energy infrastructures represents 14% of red kite mortality.
  - Power lines 9.9%
  - Wind Farms 3.8%

## Red kite mortality caused by power lines between 2019 -2025

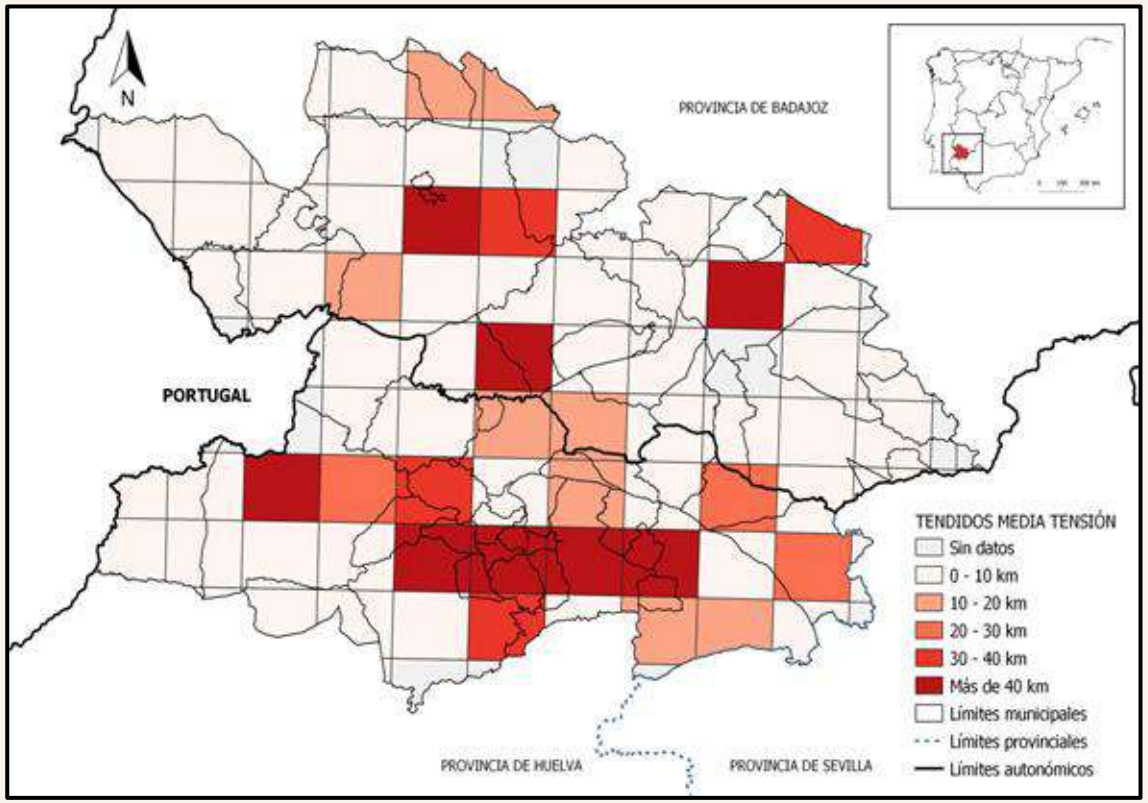
- 36 cases of electrocution
- 14 cases of collision



# AMUS´ ACTIONS IN LIFE EUROKITE PROJECT

Electrocution/collision with power lines detected in the feasibility study




- ✓ 4.3 electrocutions+collisions/year (2010-2020)
- ✓ 40% Eurasian griffon vulture, 20% Eurasian Eagle-owl, 40 % others especies (n=10).

**NO RED KITE RECORDS**

# COLLABORATION OF THE ELECTRIC COMPANIES WITHIN THE PROJECT



Red Kites © AMUS

- PROACTIVE RESPONSE
- ACTIVE RESPONSE
- PASSIVE RESPONSE

# PROACTIVE RESPONSE: Co-funding

endesa

saetayield
A MASDAR COMPANY



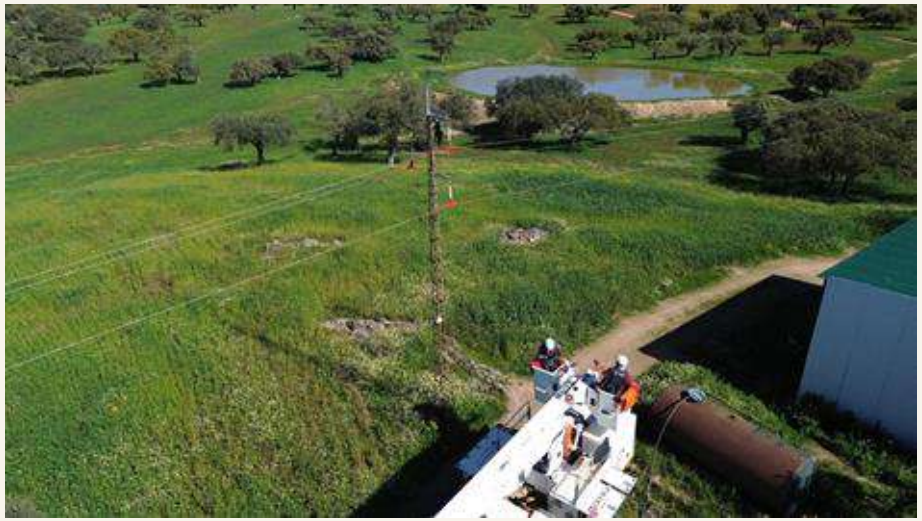


# PROACTIVE RESPONSE: Minimization of mortality

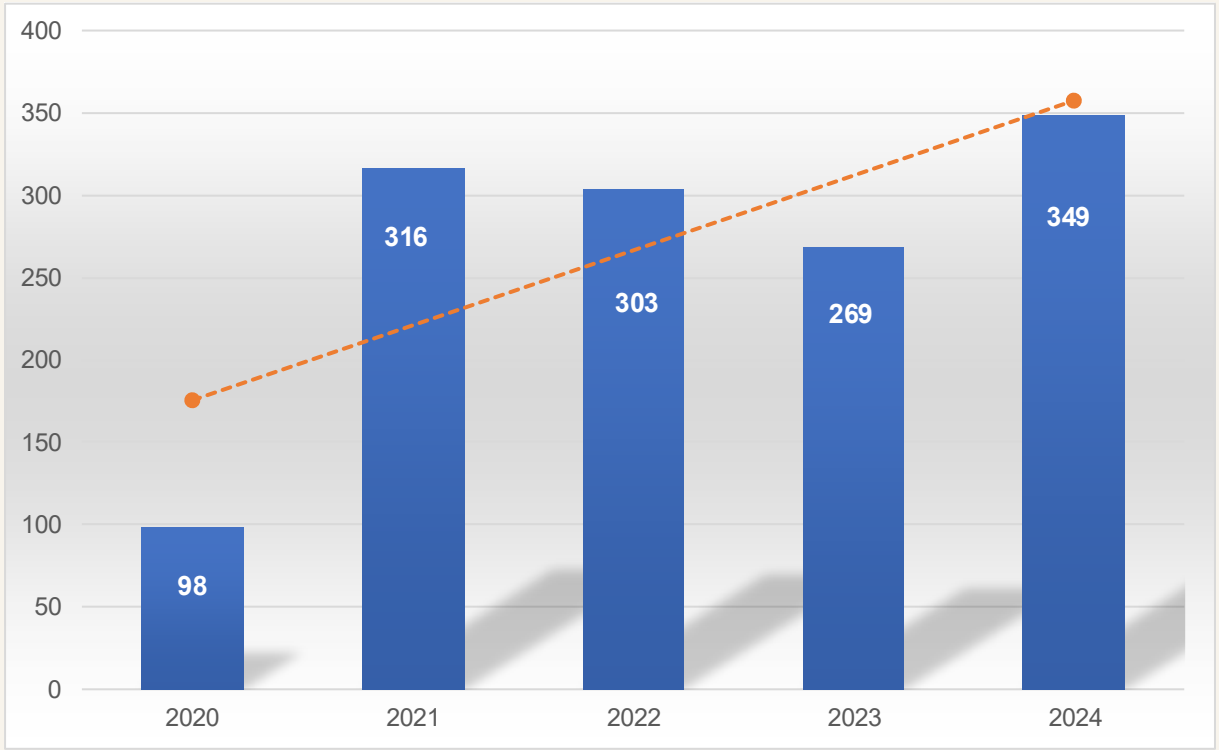
endesa







# PROACTIVE RESPONSE: Minimization of mortality




- Electrical pylons identification
- Potential risk assessment
- Priority areas for corrections
- Corrections (n= 1.335; 2020-2024)

**NO RED KITES ELECTROCUTED**

# PROACTIVE RESPONSE: Minimization of mortality

endesa







# ACTIVE RESPONSE: Minimization of mortality



Red Kite P24

Died after the collision with a high voltage power line

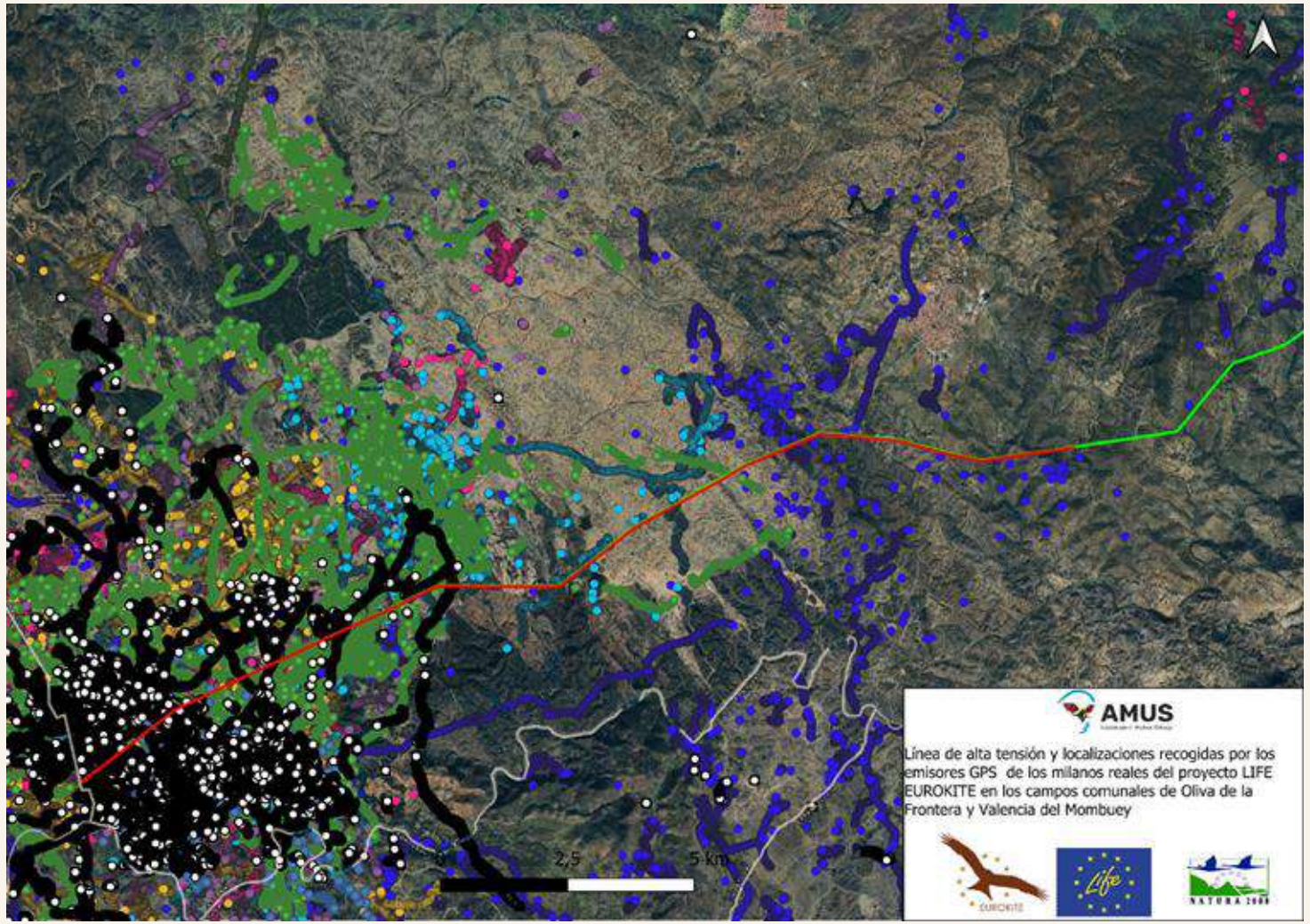


# ACTIVE RESPONSE: Minimization of mortality

RED ELÉCTRICA DE ESPAÑA

13 km of high voltage power line are marked with visual devices only 2 weeks after the red kite collision

**NO RED KITES´ COLLISIONS AFTER THE CORRECTION**



# ACTIVE RESPONSE: Minimization of mortality

Red kite released from the breeding program of the Regional Government of Aragon is electrocuted with the power line of the railway Madrid-Barcelona (Aragón region NE Spain)



This birds was breeding (incubating) but the fast detection allowed the rescue of the eggs, hatch the nestlings and release them




**Correction of 17 electric pylons**

# PASIVE RESPONSE: No correction / No reply





Red Kite C23: Died after the collision with a power line from the windfarm Merengue 1 (Cáceres province, Extremadura región)

The company never replied our mails

# PASIVE RESPONSE: No correction / Delayed correction



First red kite nestling hatched in southern Portugal (from released red kites) in the last 2 decades was electrocuted just after leave the nest

The electric company suggests:

- The payment of correction with the Eurokite LIFE funds.
- To wait to new projects to get funds.

Finally, the electric pylon will be corrected in 2027, with some others pylons in the area and after the collaboration of portugueses NGO QUERCUS, with the LIFE PowerLines4Birds project funds.



# LESSONS LEARNED

- It is strongly recommended to establish contacts in advance with the electric companies.
- To collaborate in the planification of the corrections (ONGs, authorities, power lines´ owners, etc).
- Report the mortality to wildlife authorities and power line´s owner.
- If power lines owner don't´ implement the correction after a bird electrocution/collision, report/claim wildlife authorities/courts.
- Improve the legislation



Red kites © Hansruedi Weyrich

# Thank you for your attention!

www.life-eurokite.eu



Tagged Red Kites
© AMUS

## Coordinating beneficiary

The TB Raab GmbH was commmissioned to implement the LIFE EUROKITE project after a pan-European public tender.

## Cooperation partner

## Co-financiers

This project is co-financed by the LIFE Nature Programme of the European Union

## Cooperation partner

## Additional cooperation partners for specific research questions in the field of renewable energy

This project is co-financed by the LIFE Nature Programme of the European Union

WINGSPAN 2026

# Presentations

## LIFE EUROKITE



**Andreas Gärtner**
Administrator LIFE EUROKITE
TB Raab GmbH



**Moderator**
**Hannah Böing**
Team Leader
TB Raab GmbH



**Dr. Maximilian Raab**
Chief Strategy Officer
TB Raab GmbH



**Alfonso Godino**
LIFE EUROKITE Coordinator
AMUS - Acción Por El Mundo Salvaje



WINGSPAN 2026

# Presentation

## LIFE EUROBUSTARD




**Dr. Rainer Raab**

CEO

TB Raab GmbH






# First overview of the LIFE EUROBUSTARD Project

WINGSPAN CONFERENCE
NOVEMBER 04, 2026
BERLIN

Mag. Dr. Rainer Raab

LIFE EUROBUSTARD
101215547 - LIFE24-NAT-AT-LIFE EUROBUSTARD
www.life-eurobustard.eu

# Project Facts

**Project countries:**
Austria, France, Germany, Hungary, Portugal, Romania, Slovakia, Spain, (Ukraine) (8)

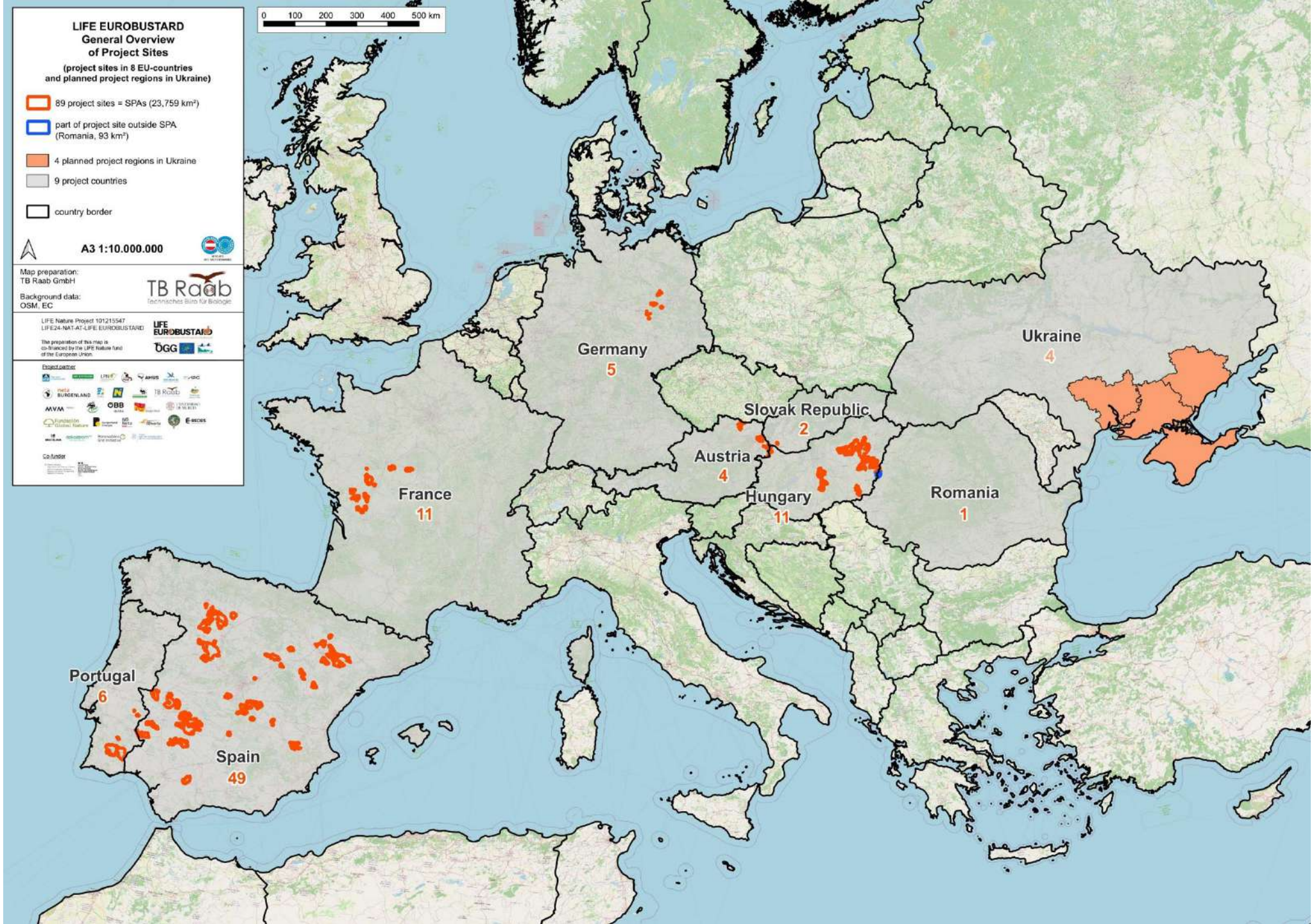
**Coordinating beneficiary:**
Österreichische Gesellschaft Großtrappenschutz (ÖGG), TB Raab oversees the project management

**Project duration:**
88 months
09/2025 – 12/2032

**Number of beneficiaries:** 30

**Project budget:**
22,957,555.88 €

**EU Co-funding:** 75%


LIFE EUROBUSTARD
General Overview
of Project Sites
(project sites in 8 EU-countries
and planned project regions in Ukraine)
89 project sites = SPAs (23,759 km²)
part of project site outside SPA
(Romania, 93 km²)
4 planned project regions in Ukraine
9 project countries
country border
A3 1:10.000.000
Map preparation:
TB Raab GmbH
Background data:
OSM, EC
TB Raab
Technisches Büro für Biologie
LIFE Nature Project 101215547
LIFE24-NAT-AT-LIFE EUROBUSTARD
The preparation of this map is
co-financed by the LIFE Nature fund
of the European Union.
LIFE EUROBUSTARD
ÖGG
Project partner
Co-funder
0 100 200 300 400 500 km
Germany
5
Ukraine
4
Slovak Republic
2
Austria
4
Hungary
11
Romania
1
France
11
Portugal
6
Spain
49

# Species – Great Bustard (*Otis tarda*)

One of heaviest birds able to fly

Habitat: open, dry grasslands and extensive arable lands,
low vegetation

Population Trend: Decreasing

Threats:

- Loss of undisturbed open habitats with suitable vegetation structure
- Collision with powerlines
- Destruction of eggs or chicks during agricultural works
- Predation of eggs, chicks or juveniles
- Disturbance
- Insufficient invertebrate food supply




© Mike Watson/BirdQuest

# Species – Little Bustard

One of the smallest bustards in the family of bustards

Habitat: Dry grasslands and extensive arable lands containing of pasture, long/rotation fallow land and legume crop

- Variety of microhabitats needed for successful reproduction
- Conservation status in Europe: Vulnerable (Partially endangered e.g., France)

Population Trend: Decreasing

# Project Objectives – Habitat management



- 91 ha Land purchase
- Innovative financing models for scaling the obtained results (CAP)
- Habitat management and restore 287 hectares for high-quality habitats

# Project Objectives – Reducing mortality factors

- Reducing collision risk within project areas by putting 28.6 km power lines under the ground and marking 110.8 km of power lines
- Clutch rescue of around 1.000 clutches

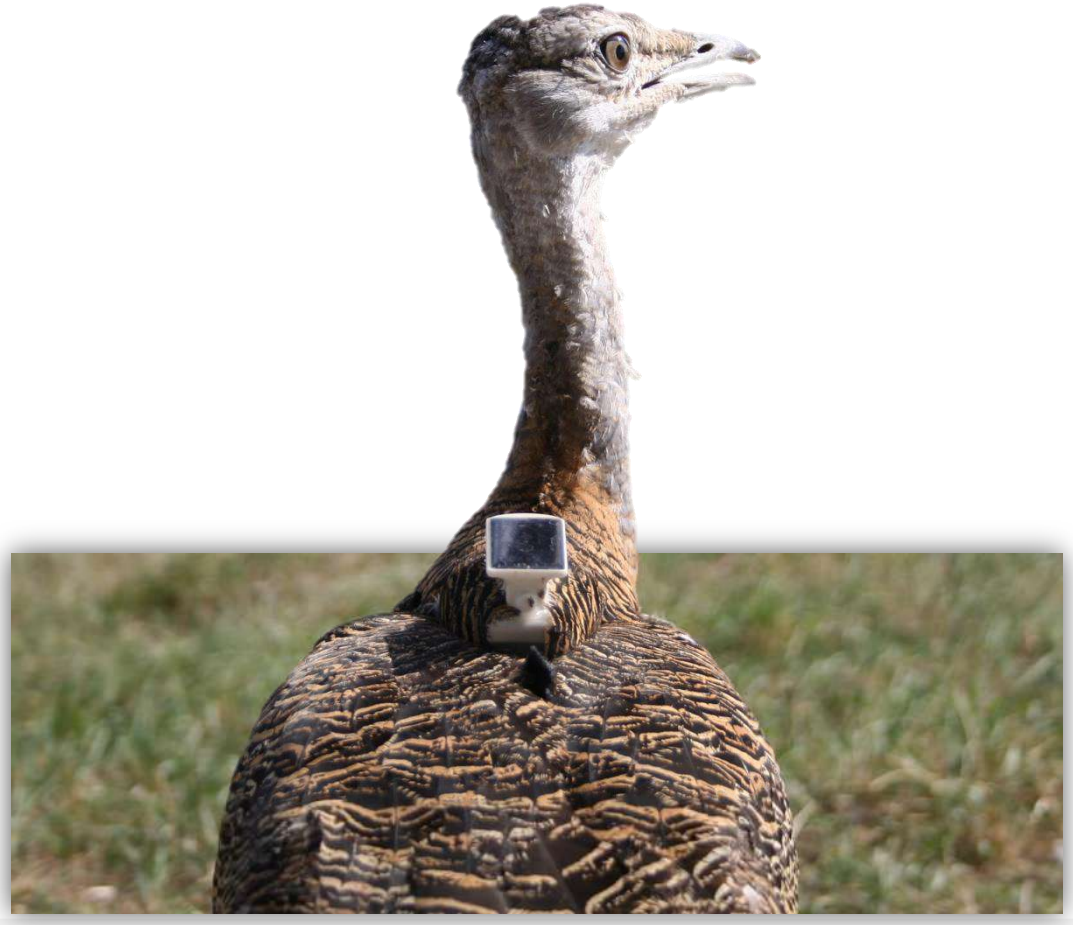


# Project Objectives – Public awareness



- 19 Information boards
- Construction of information centre and visitor tower in Austria and Slovakia

# Project Objectives – Replication of results



- Tagging 375 bustards (160 LB, 215 GB)
- 7 Scientific publications
- 6 Europe-wide conferences



# Based on 20 years experiences

**Over the last 20 years, 7 LIFE projects have been/are being carried out in Austria, Slovakia and Hungary for the Great Bustard (*Otis tarda*):**

1. LIFE04 NAT/HU/000109, OTISHU-Conservation of *Otis tarda* in Hungary (2004-2008)

2. LIFE05 NAT/SK/000115, Conservation of *Otis tarda* in Slovakia (2005-2009)

**3. LIFE05 NAT/A/000077, Cross-border Protection of the Great Bustard in Austria (2005-2010)**

**4. LIFE09 NAT/AT/000255, Cross-border Protection of the Great Bustard in Austria - continuation (2010-2015)**

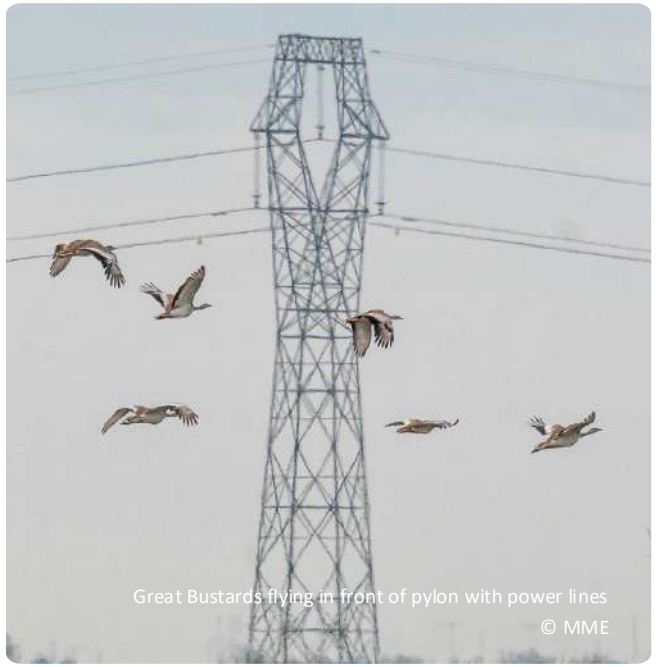
**5. LIFE15 NAT/AT/000834, LIFE Great Bustard - Cross-border protection of the Great Bustard in Central Europe (2016-2024)**

6. LIFE20 NAT/SK/001077, LIFE STEPPE on border (2022-2027)

**7. 101215547 — LIFE24-NAT-AT-LIFE EUROBUSTARD, Cross-border protection of the Great Bustard and the Little Bustard in Europe (2025-2032)**

# One of the most important threats in Europe

- Collisions with Overhead power lines



Great Bustards flying in front of pylon with power lines
© MME



Collision of Great Bustard with power line
© MME



# Power line related objectives

New bird diverter will be designed and tested and 110.8 km of high-voltage lines will be marked

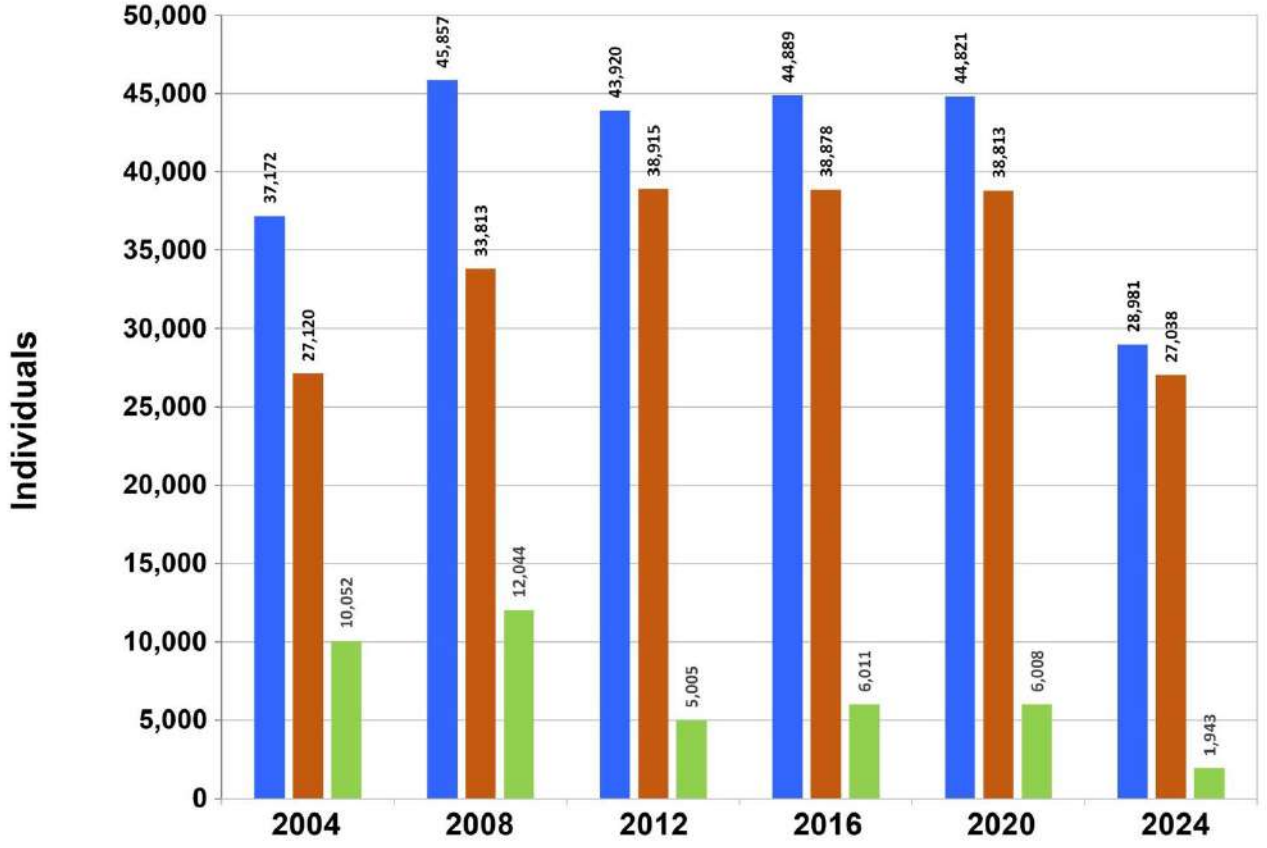


28.6 km of medium-voltage lines will be placed underground



No new overhead power lines will be built in the most important great bustard habitats in Austria






## Numbers of the European population of Great Bustard

in the period 2004 till 2024

- Numbers Great Bustard population in Europe
- Numbers Great Bustard population in 8 LIFE EUROBUSTARD project countries and Ukraine
- Numbers Great Bustard population in 6 other European countries

(Population estimates for the Great Bustard in Europe from 2004 to 2024)

Graphic preparation:
TB Raab GmbH

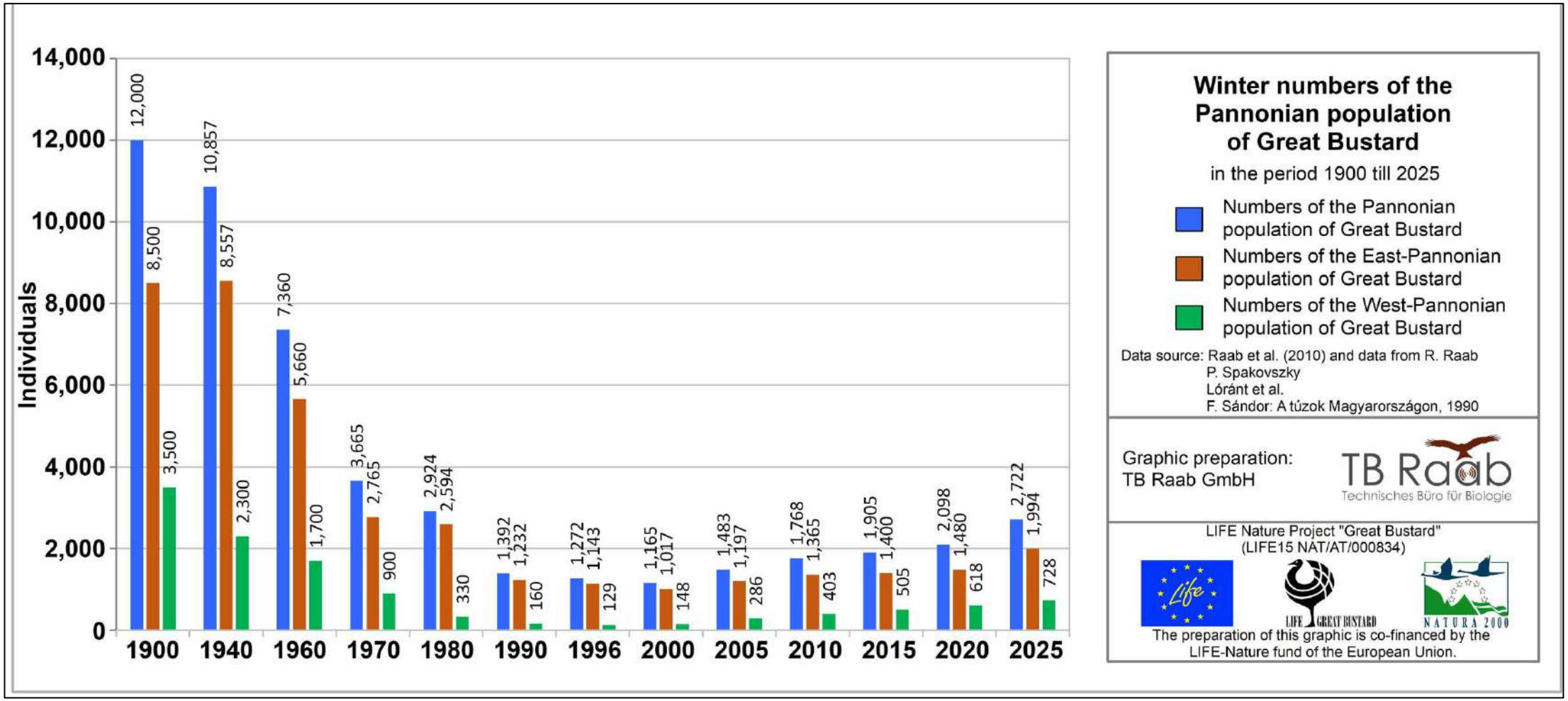
TB Raab
Technisches Büro für Biologie

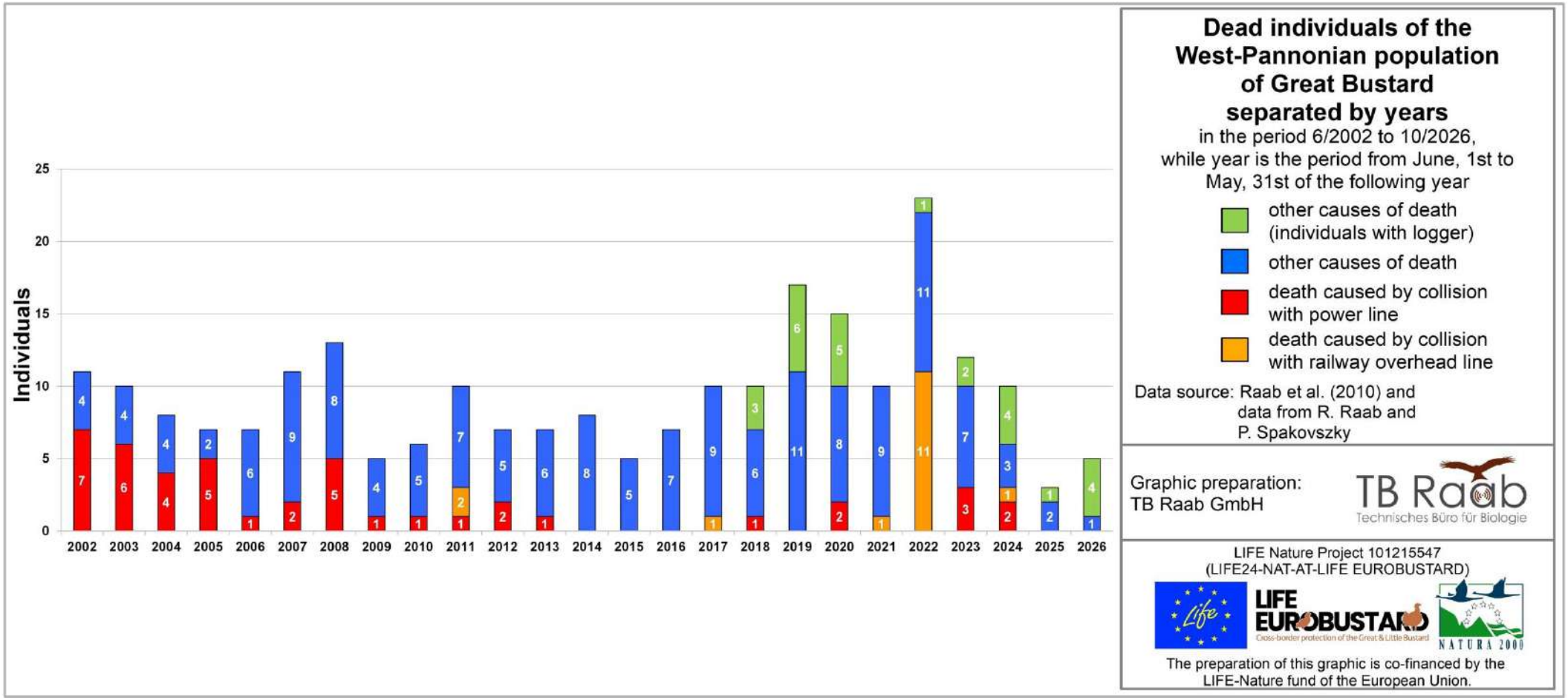
LIFE Nature Project 101215547
(LIFE24-NAT-AT-LIFE EUROBUSTARD)

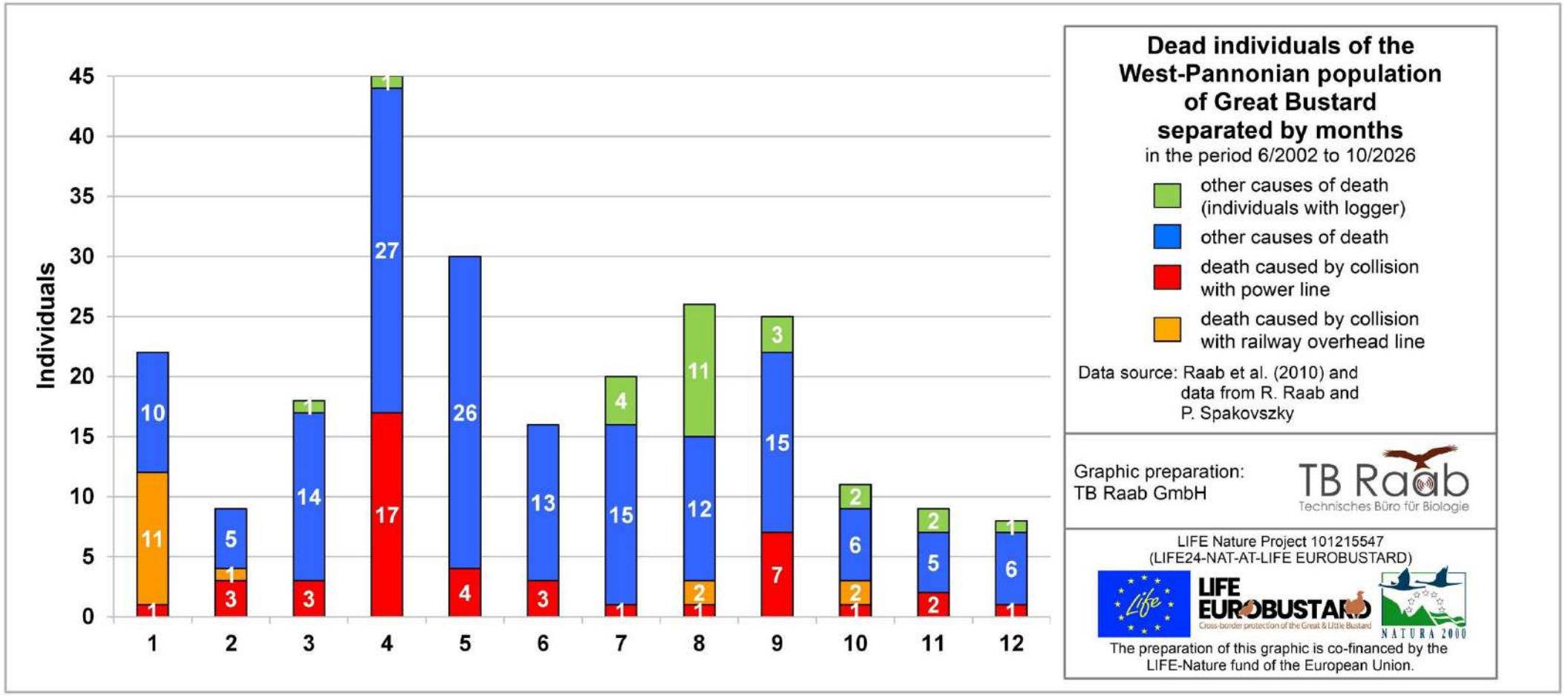
LIFE EUROBUSTARD
Cross-border protection of the Great & Little Bustard

NATURA 2000

The preparation of this graphic is co-financed by the LIFE-Nature fund of the European Union.


Individuals
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1900: 12,000 / 8,500 / 3,500
1940: 10,857 / 8,557 / 2,300
1960: 7,360 / 5,660 / 1,700
1970: 3,665 / 2,765 / 900
1980: 2,924 / 2,594 / 330
1990: 1,392 / 1,232 / 160
1996: 1,272 / 1,143 / 129
2000: 1,165 / 1,017 / 148
2005: 1,483 / 1,197 / 286
2010: 1,768 / 1,365 / 403
2015: 1,905 / 1,400 / 505
2020: 2,098 / 1,480 / 618
2025: 2,722 / 1,994 / 728
Winter numbers of the Pannonian population of Great Bustard
in the period 1900 till 2025
Numbers of the Pannonian population of Great Bustard
Numbers of the East-Pannonian population of Great Bustard
Numbers of the West-Pannonian population of Great Bustard
Data source: Raab et al. (2010) and data from R. Raab
P. Spakovszky
Lóránt et al.
F. Sándor: A túzok Magyarországon, 1990
Graphic preparation:
TB Raab GmbH
TB Raab
Technisches Büro für Biologie
LIFE Nature Project "Great Bustard"
(LIFE15 NAT/AT/000834)
LIFE GREAT BUSTARD
NATURA 2000
The preparation of this graphic is co-financed by the
LIFE-Nature fund of the European Union.


Individuals
25
20
15
10
5
0
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026
Dead individuals of the West-Pannonian population of Great Bustard separated by years
in the period 6/2002 to 10/2026, while year is the period from June, 1st to May, 31st of the following year
other causes of death (individuals with logger)
other causes of death
death caused by collision with power line
death caused by collision with railway overhead line
Data source: Raab et al. (2010) and data from R. Raab and P. Spakovszky
Graphic preparation: TB Raab GmbH
TB Raab Technisches Büro für Biologie
LIFE Nature Project 101215547 (LIFE24-NAT-AT-LIFE EUROBUSTARD)
LIFE EUROBUSTARD Cross-border protection of the Great & Little Bustard
NATURA 2000
The preparation of this graphic is co-financed by the LIFE-Nature fund of the European Union.


Individuals
45
40
35
30
25
20
15
10
5
0
1
2
3
4
5
6
7
8
9
10
11
12
10
11
1
5
1
3
14
1
3
1
27
17
26
4
13
3
4
15
1
11
12
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3
15
7
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1
6
1
Dead individuals of the West-Pannonian population of Great Bustard separated by months
in the period 6/2002 to 10/2026
other causes of death (individuals with logger)
other causes of death
death caused by collision with power line
death caused by collision with railway overhead line
Data source: Raab et al. (2010) and data from R. Raab and P. Spakovszky
Graphic preparation:
TB Raab GmbH
TB Raab
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LIFE EUROBUSTARD
Cross-border protection of the Great & Little Bustard
NATURA 2000
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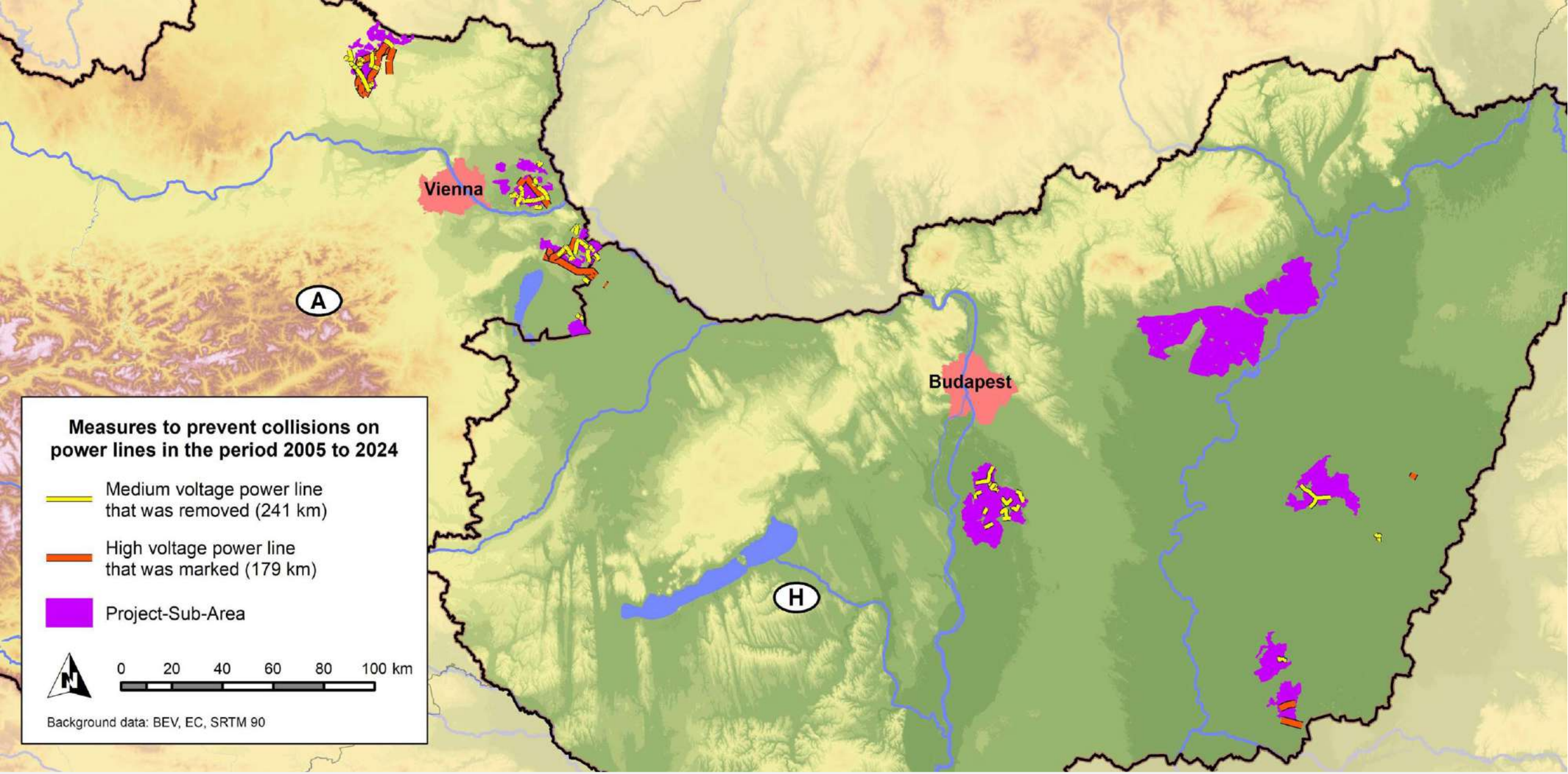
Over the past 20 years, approximately 241 km of medium voltage power lines were first placed into the ground and then the overhead power lines and pylons were removed, 154 km in Austria and 87 km in Hungary.



Thanks to a ground-breaking agreement with regional energy providers, it was decided that no new overhead power lines would be built in Austria's most important Great Bustard habitats. A newly built 12-kilometer section of a 110 kV power line in Burgenland was placed underground between 2013 and 2017, ensuring that these critical habitats have remained overhead line-free for over two decades.




LIFE EUROBUSTARD
Cross-border protection of the Great & Little Bustard

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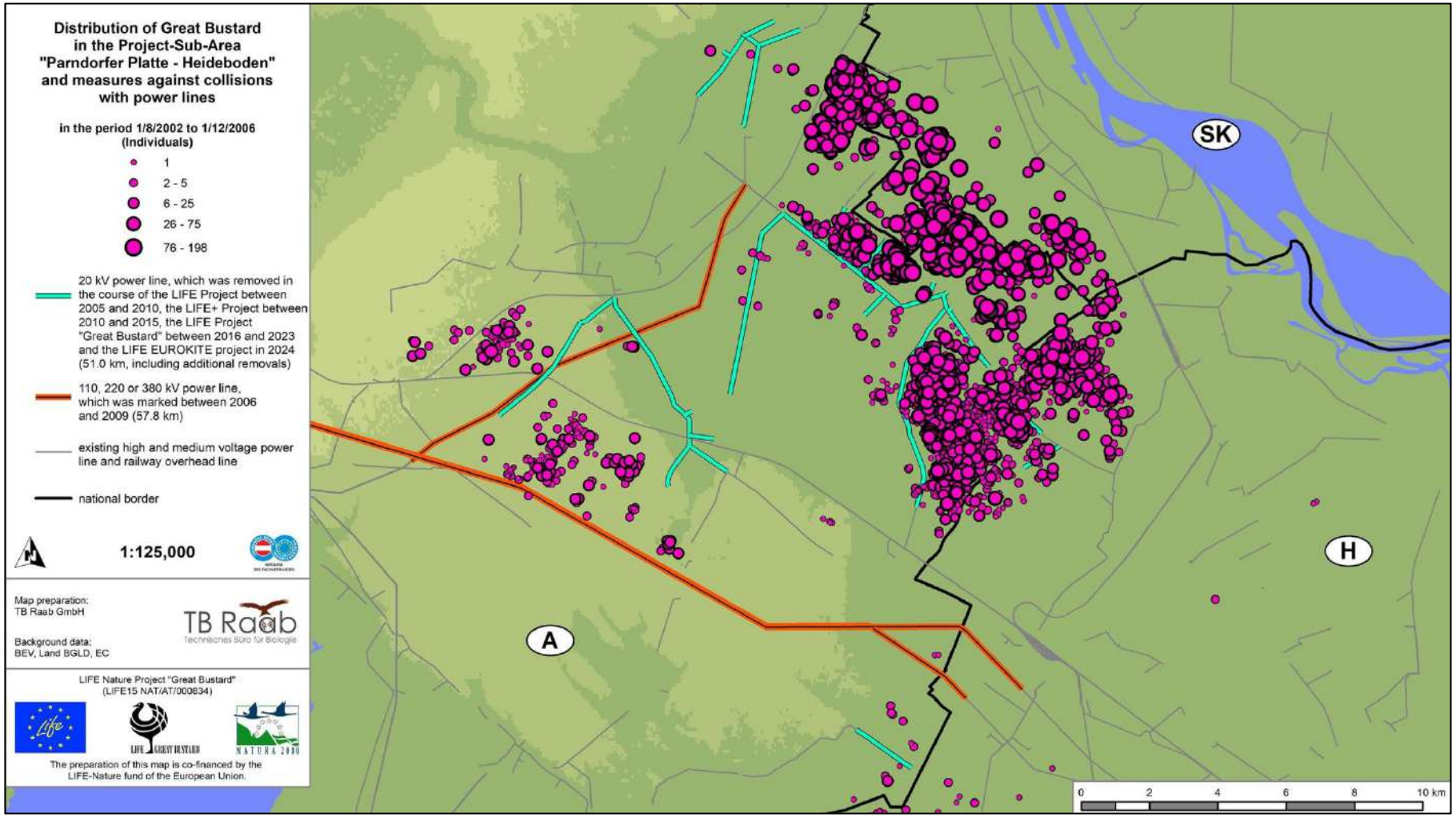
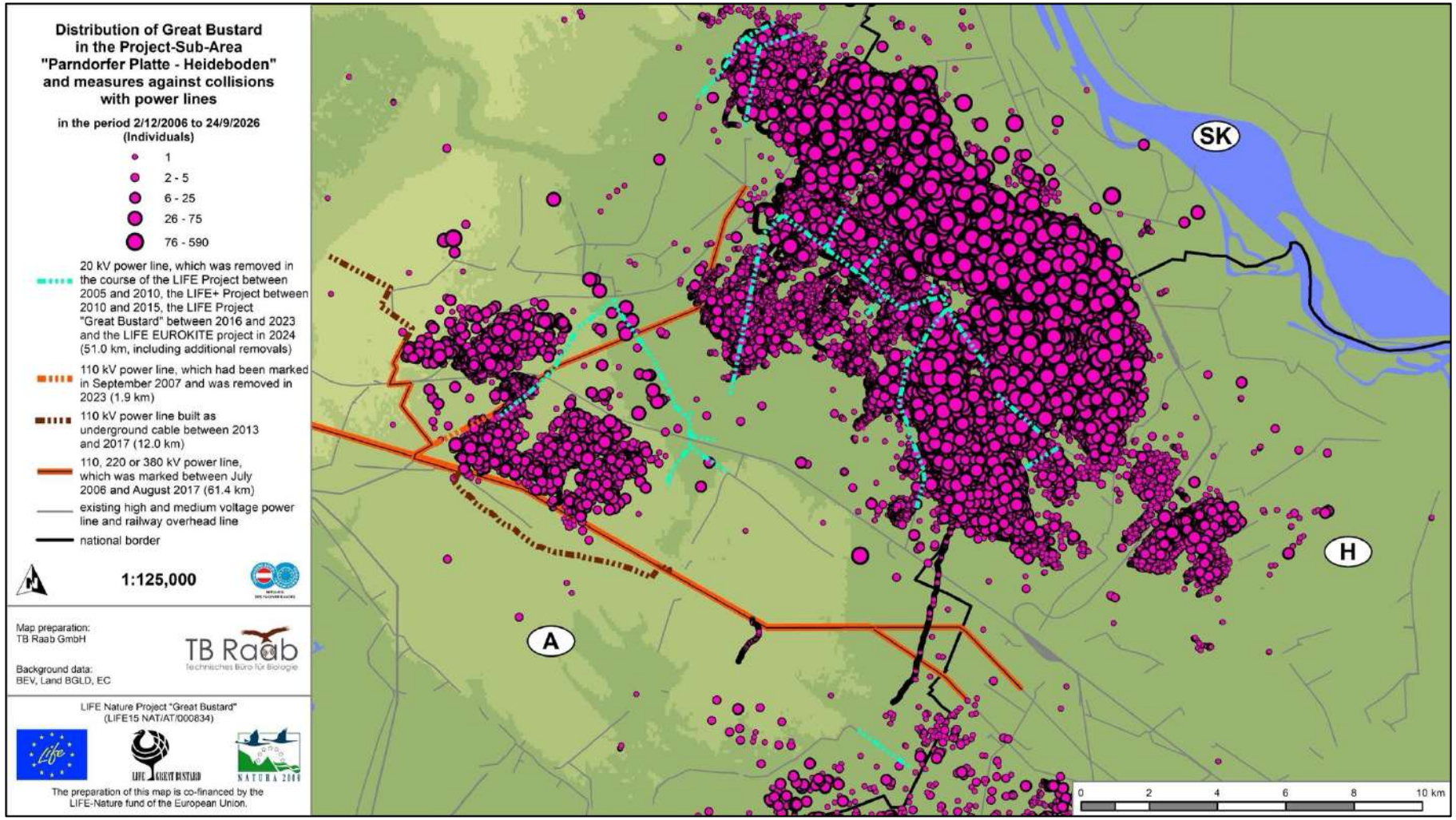
NATURA 2000

ÖGG
Österreichische Gesellschaft Großtrappenschutz

# Measures against collision with power lines - before



# Measures against collision with power lines - after



In contrast, both the global and European Great Bustard populations have declined by over 30% in just 11 years.*

**Thanks to conservation efforts such as habitat management, reduction of the risk of collision with power lines and cooperation with farmers and hunters, the Great Bustard populations in Austria and Hungary and the entire Pannonian region increased.**

*from 39,136 – 44,940 individuals in 2012 to 27,987 - 30,436 in 2023 in Europe.



# LIFE EUROBUSTARD

Cross-border protection of the Great & Little Bustard

The coordinating beneficiary is the Austrian Society for Great Bustard Conservation (ÖGG). TB Raab Ltd. oversees the project management and coordinates its implementation together with 29 partners, 2 co-financiers, and several cooperation partners.

## Project Partners

## Co-Funders

Federal Ministry
Agriculture and Forestry, Climate and Environmental Protection, Regions and Water Management
Republic of Austria

MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET DE LA COHÉSION DES TERRITOIRES
Liberté
Égalité
Fraternité

This project is co-financed by the LIFE Nature Programme of the European Union



# Thank you for your attention!

Mag. Dr. Rainer Raab
Technical Manager LIFE EUROBUSTARD
CEO TB Raab GmbH

E-mail: rainer.raab@tbraab.at



LIFE EUROBUSTARD
Cross-border protection of the Great & Little Bustard

LIFE EUROBUSTARD
101215547 - LIFE24-NAT-AT-LIFE EUROBUSTARD
www.life-eurobustard.eu

WINGSPAN 2026

# Presentation

## LIFE EUROBUSTARD




**Dr. Rainer Raab**

CEO

TB Raab GmbH




WINGSPAN 2026

# From Partnerships to Practice

3 – 5 November 2026 | Berlin



## *Closing Words*

## Manon Thiel

Manager - Energy & Nature

Renewables Grid Initiative



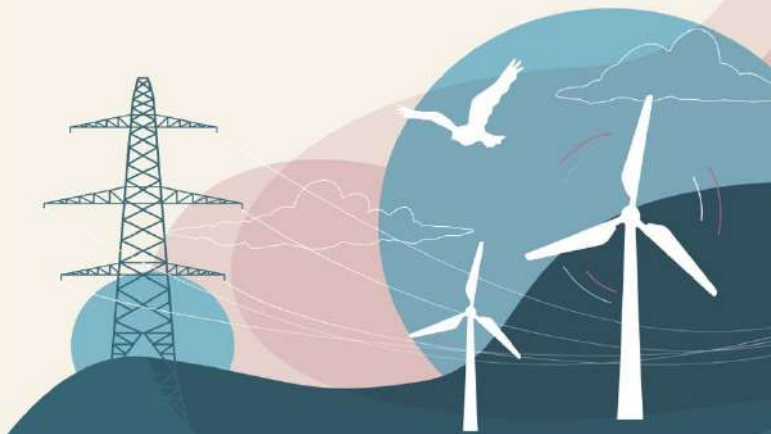
# Excursion information

**Meeting point and departure**

- Meet at Atelier Gardens **at 07:30**, next to the yellow building at the entrance
- Departure scheduled **at 07:50 sharp!**

**Please bring**

- Your **QR code and ID or passport**
- **Warm** clothing
- Drinking **water** for yourself
- **Binoculars**, if you have them



WINGSPAN 2026

# From Partnerships to Practice

## Accelerating Nature-Positive Energy Infrastructure

3 – 5 November 2026
Berlin



Renewables Grid Initiative · TB Raab Technisches Büro für Biologie · SafeLines4Birds · EUROKITE · LIFE EURO BUSTARD · 50hertz | Elia Group · elia group · NATURA 2000 · Co-funded by the European Union