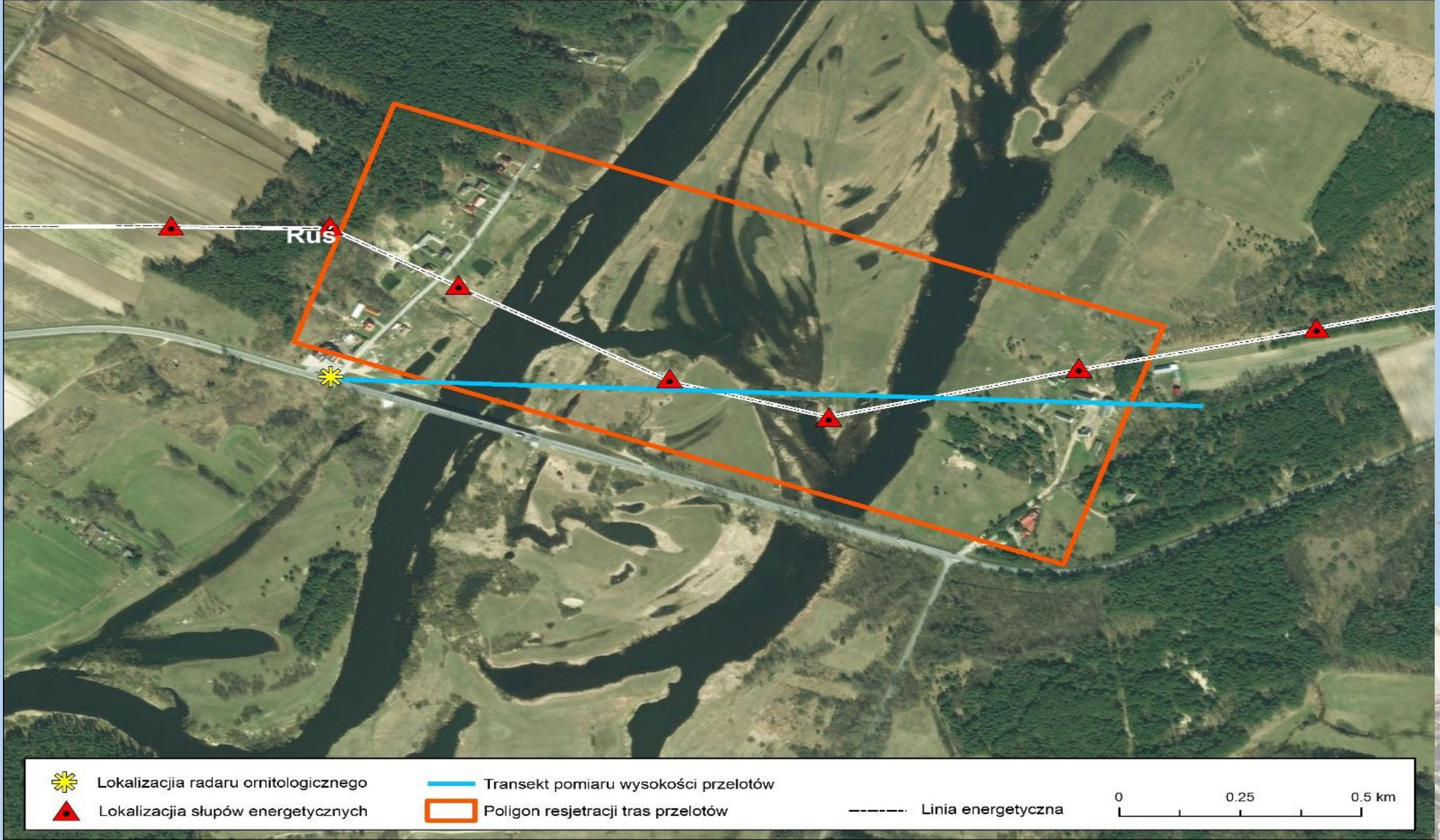
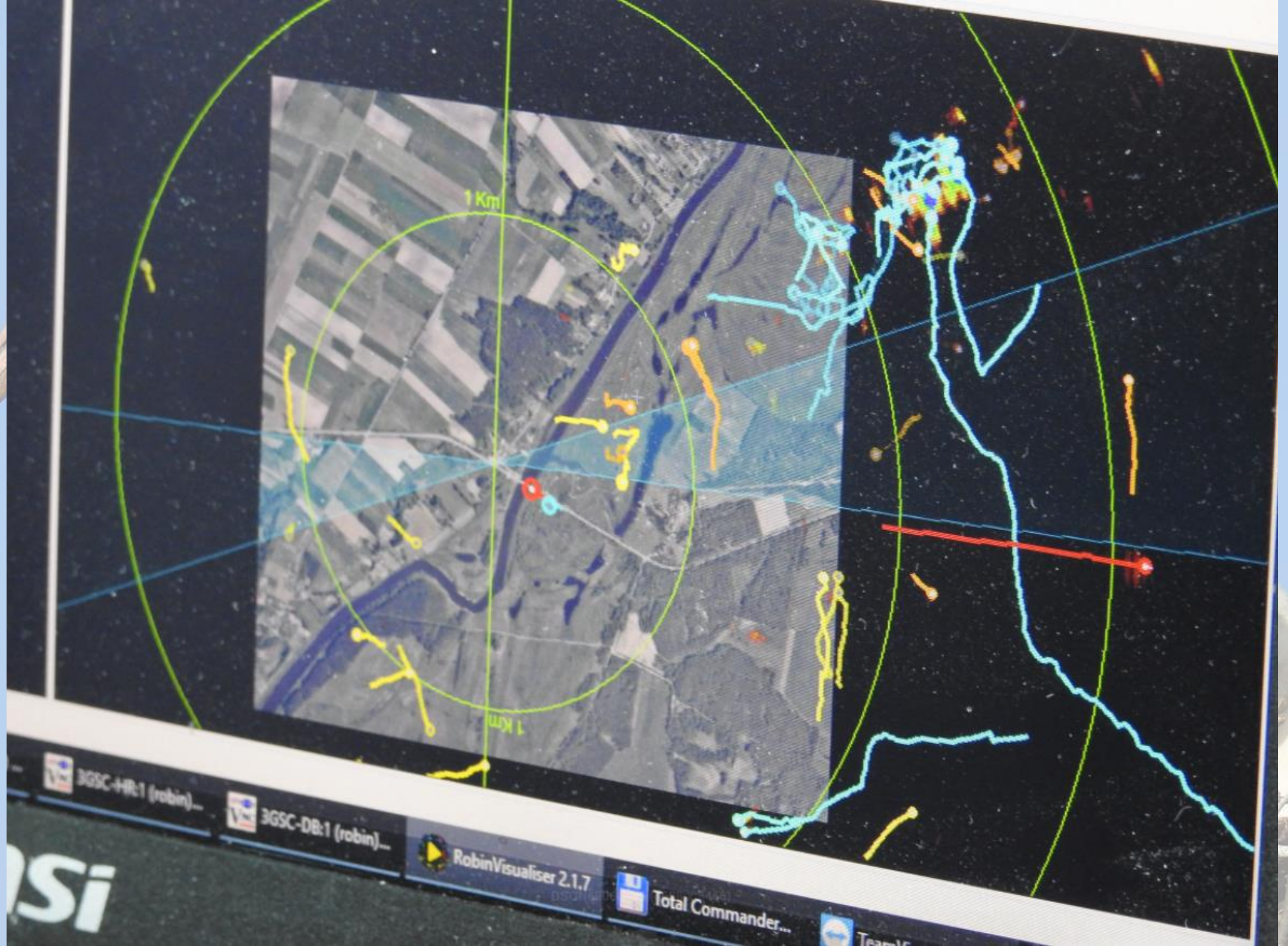
Ograniczanie śmiertelności ptaków na skutek kolizji z liniami wysokiego napięcia: badania radarowe

Adam Zbyryt[1], Krzysztof Gajko[2]
[1] Polskie Towarzystwo Ochrony Ptaków
[2] 3 Bird Radar System


Rūś
Lokalizacjia radaru ornitologicznego
Lokalizacjia słupów energetycznych
Transekt pomiaru wysokości przelotów
Poligon resjetracji tras przelotów
Linia energetyczna
0
0.25
0.5 km


2018


3BIRD
RADAR SYSTEM


1 Km
1 Km
3GSC-HR:1 (robin)...
3GSC-DB:1 (robin)...
RobinVisualiser 2.1.7
Total Commander...

Strefa C – powyżej linii odgromowej

50 – 100 m (C 5)

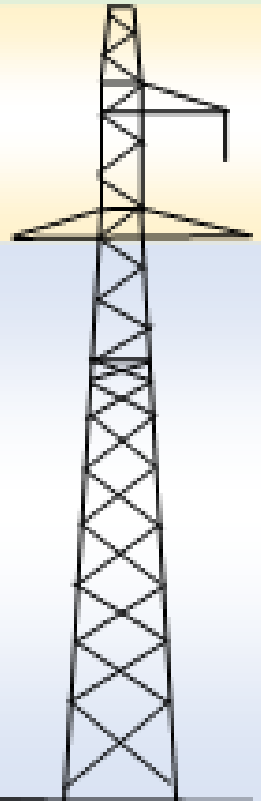
30 – 50 m (C 4)

15 – 30 m (C 3)

5 – 15 m (C 2)

0 – 5 m (C 1)

Strefa B – pomiędzy liniami fazowymi a linią odgromową



Strefa A – poniżej linii fazowych

0 – 5 m (A 3)

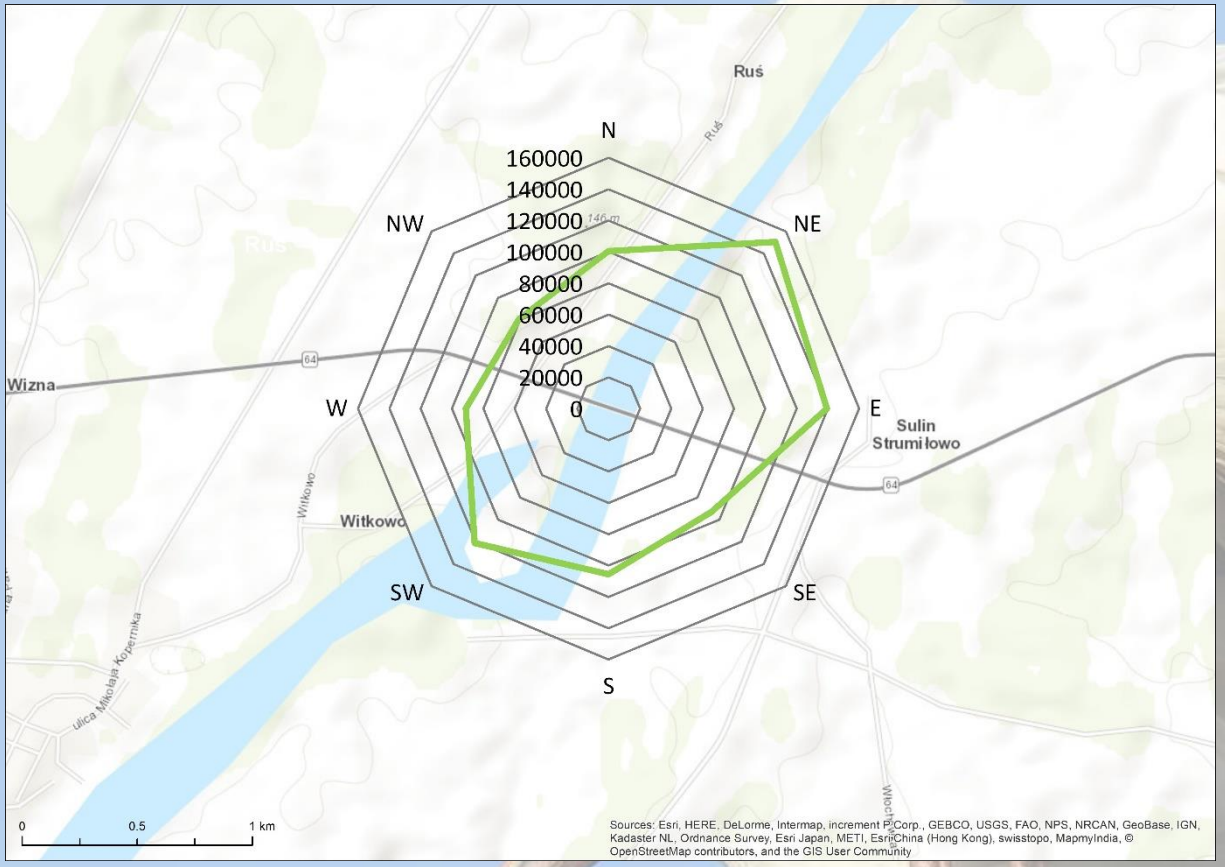
5 – 15 m (A 2)

>15 m (A 1)

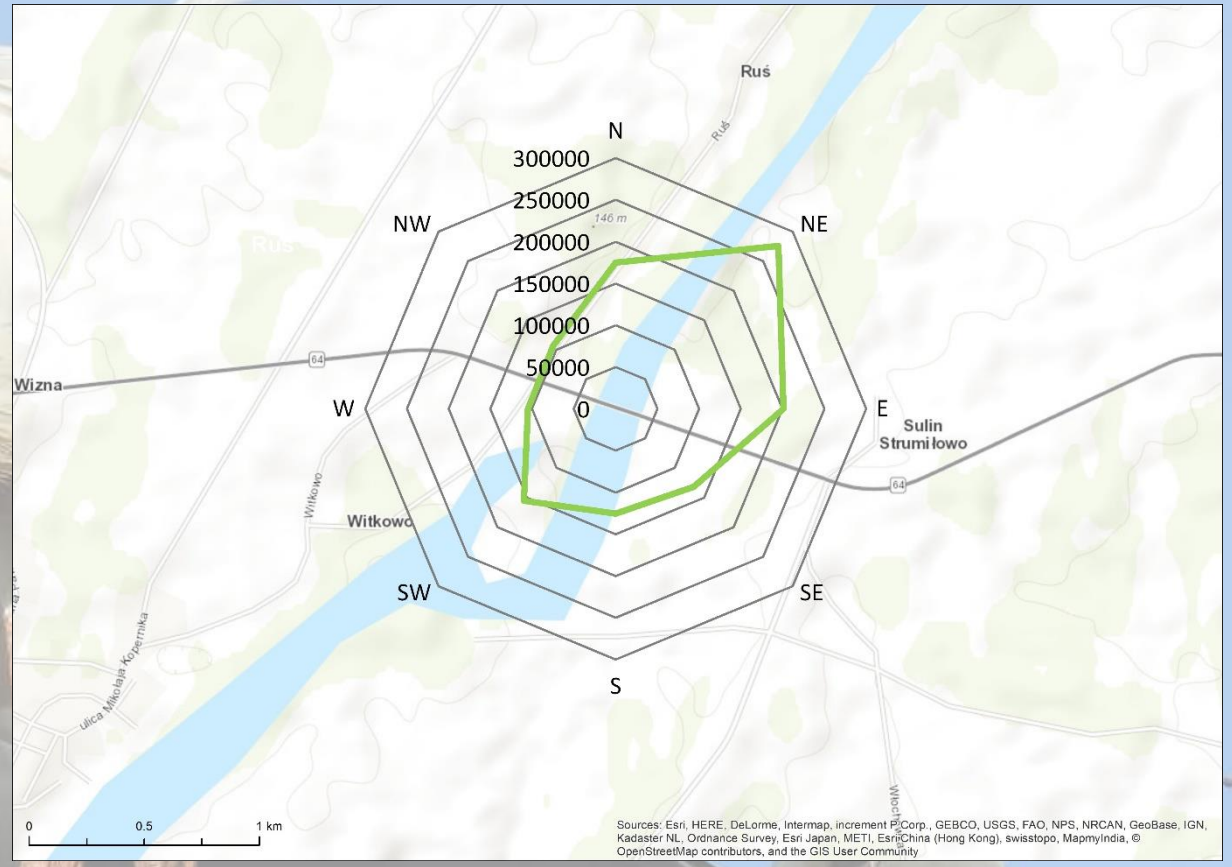
Co daismy:

Kod reakcji	Rodzaj reakcji
X	Brak reakcji
PPO	Powolne podniesienie lotu z odległości
PPB	Powolne podniesienie lotu z bliska
N	Nagła bliska reakcja (wirowanie, gwałtowne hamowanie, nagłe wzniesienie itp.)
O	Obniżenie lotu
Z	Zawrócenie lotu
Kkon	Kolizja z linią i kontynuacja lotu
Kup	Kolizja z linią i upadek
L	Lądowanie na linii

2019



Rys. 4.14. Kierunki przelotów ptaków zarejestrowane w 2018 roku



Rys. 4.15 Kierunki przelotów ptaków zarejestrowane w 2019 roku

Skład gatunkowy ptaków – 2018

- 49 gatunków,
- 3 208 stwierdzeń,
- 90 289 osobników,
- dominującymi gatunkami były (>5%) :

✓ szpak 42 822 osobniki (47%),
✓ gęsi 18 306 os. (20%),
✓ batalion 14 097 os. (16%),
✓ śmieszka 8 884 os. (10%).

Skład gatunkowy ptaków – 2019

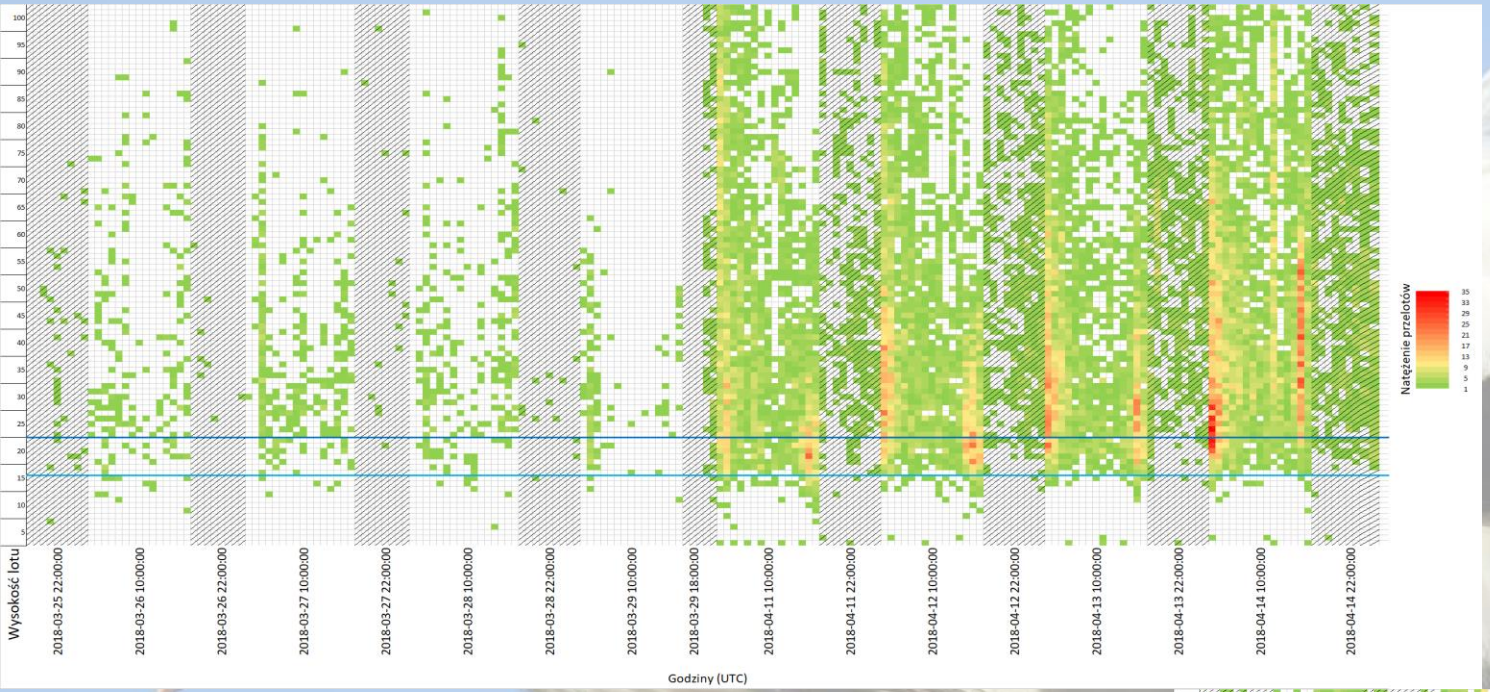
- 48 gatunków,
- 4 206 stwierdzeń,
- 74 317 osobników ptaków,
- dominującymi gatunkami były (>5%) :

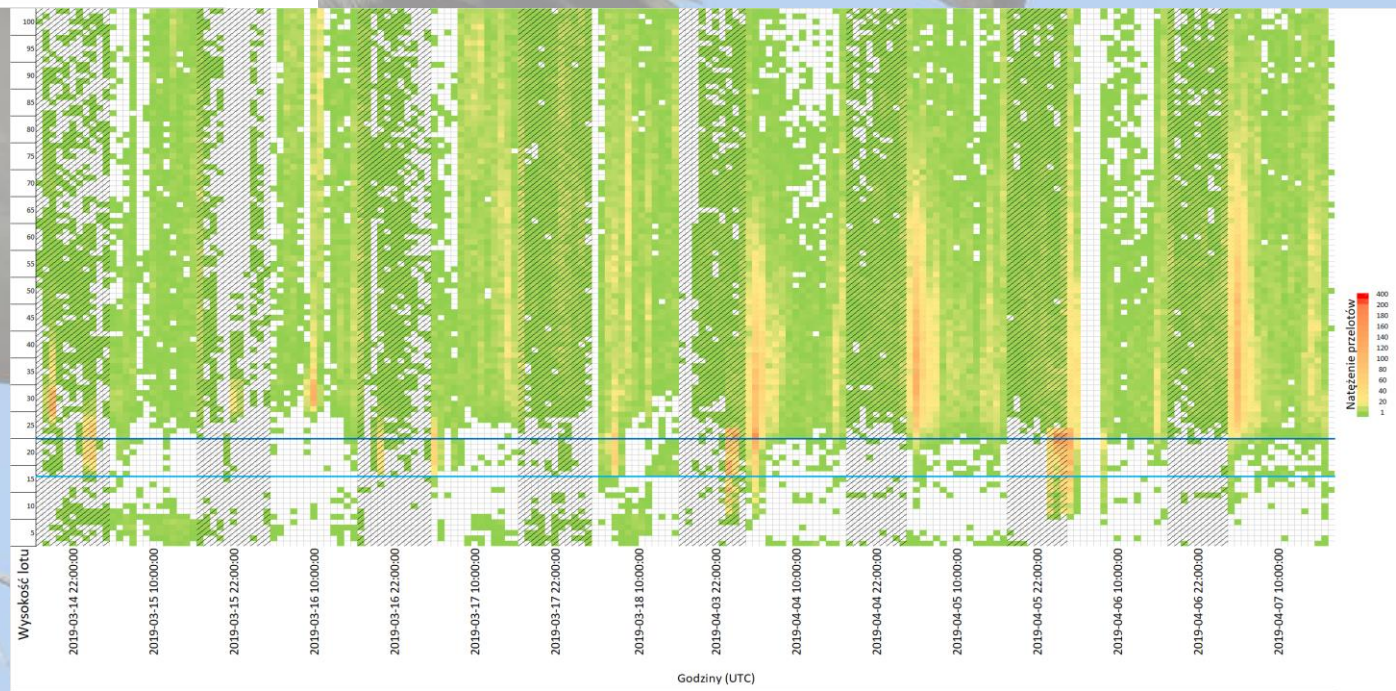
✓ batalion 39 752 os. (53%),

✓ śmieszka 15 900 os. (21%),

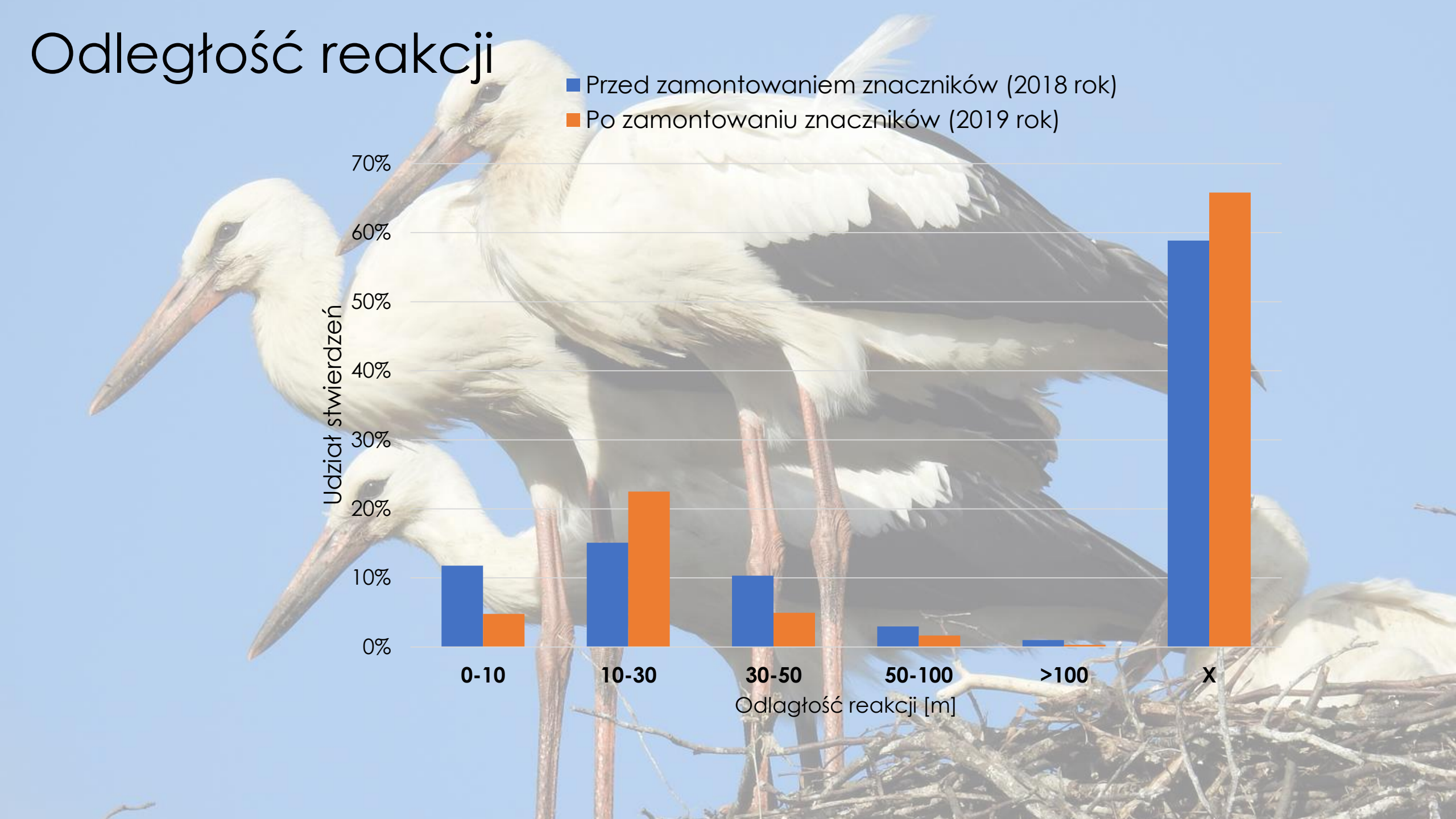
✓ gęś białoczelna 3 740 os.(5%).

Strumień przelotu

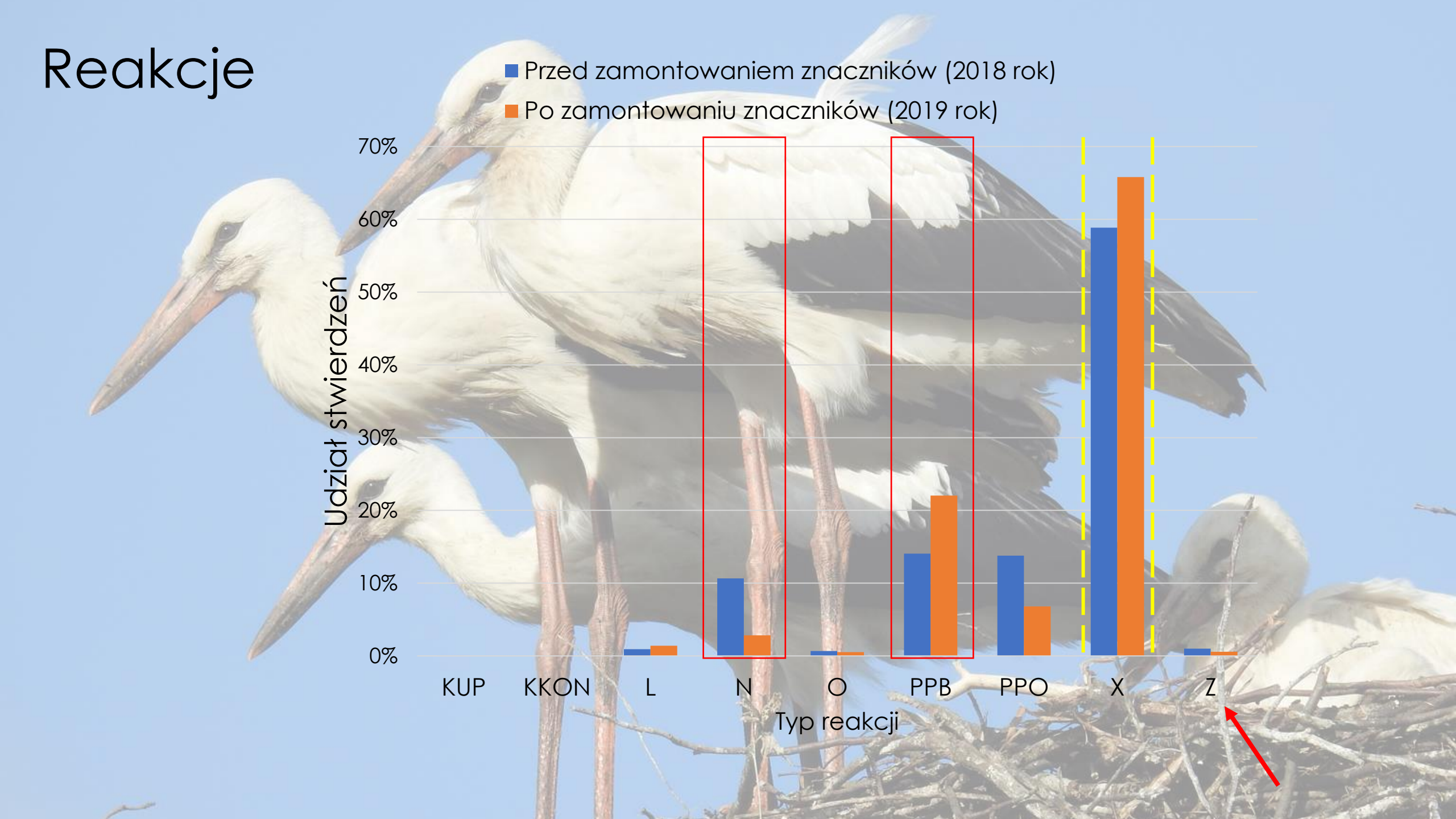




Odległość reakcji



Reakcje


Przed zamontowaniem znaczników (2018 rok)
Po zamontowaniu znaczników (2019 rok)
70%
60%
50%
40%
30%
20%
10%
0%
Udział stwierdzeń
KUP
KKON
L
N
O
PPB
PPO
X
Z
Typ reakcji

Konkluzje

- Skuteczne.
- Lekkie i tanie.
- Łatwe i szybkie w montażu.
- Trwałe?
- Nie dla łabędzi.

Biological Conservation 222 (2018) 1–13

Contents lists available at ScienceDirect

Biological Conservation

journal homepage: www.elsevier.com/locate/biocon

Review

Bird collisions with power lines: State of the art and priority areas for research

J. Bernardino[a,*], K. Bevanger[b], R. Barrientos[c,d], J.F. Dwyer[e], A.T. Marques[a,d,f], R.C. Martins[a,d], J.M. Shaw[g,h], J.P. Silva[a,d,f], F. Moreira[a,d]

[a] REN Biodiversity Chair, CIBIO/InBIO – Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade do Porto, Campus Agrário de Vairão, 4485-661 Vairão, Portugal
[b] Norwegian Institute for Nature Research (NINA), P.O. Box 5685 Torgarden, NO-7485 Trondheim, Norway
[c] Infraestruturas de Portugal Biodiversity Chair, CIBIO/InBIO - Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade do Porto, Campus Agrário de Vairão, 4485-661 Vairão, Portugal
[d] CEABN/InBIO – Centro de Ecologia Aplicada "Professor Baeta Neves", Instituto Superior de Agronomia, Universidade de Lisboa, Tapada da Ajuda, 1349-017 Lisboa, Portugal
[e] EDM International Inc., 4001 Automation Way, Fort Collins, CO 80525, USA
[f] cE3c – Centro de Ecologia, Evolução e Alterações Ambientais, Faculdade de Ciências da Universidade de Lisboa, Edifício C2, Campo Grande, 1749-016 Lisboa, Portugal
[g] FitzPatrick Institute of African Ornithology, DST-NRF Centre of Excellence, University of Cape Town, Private Bag X3, Rondebosch 7701, South Africa
[h] Scottish Natural Heritage, Stilligarry, Isle of South Uist HS8 5RS, United Kingdom

ARTICLE INFO

Keywords:
Bird mortality
Collision risk
Impact assessment and mitigation
Energy
Knowledge gaps
Transmission and distribution lines

ABSTRACT

Transmission and distribution electricity grids are expanding rapidly worldwide, with significant negative impacts on biodiversity and, in particular, on birds. We performed a systematic review of the literature available on bird collisions with power lines to: (i) assess overall trends in scientific research in recent decades; (ii) review the existing knowledge of species-specific factors (e.g. vision, morphology), site-specific factors (e.g. topography, light and weather conditions, and anthropogenic disturbance), and power line-specific factors (e.g. number of wire levels, wire height and diameter) known to contribute to increased bird collision risk; and (iii) evaluate existing mitigation measures (e.g. power line routing, underground cabling, power line configuration, wire marking), as well as their effectiveness in reducing collision risk. Our literature review showed (i) there is comparatively little scientific evidence available for power line-specific factors, (ii) there is a scarcity of studies in Asia, Africa and South America, and (iii) several recommendations of good practice are still not supported by scientific evidence. Based on knowledge gaps identified through this review, we outline suggestions for future research and possible innovative approaches in three main areas: bird behaviour (e.g. further use of loggers and sensors), impact assessment (e.g. understanding the drivers of mortality hotspots, assess population-level impacts, develop methods for automatic detection of collisions) and mitigation measures (e.g. further need of BACI approaches to compare the effectiveness of different wire marking devices). The complex and region-specific interactions between collision drivers and bird ecology continue to limit our ability to predict impacts and the success of mitigation measures.


Dziękuję za uwagę!