

Estimating the impact of wind turbines mortality on the Red Kite (*Milvus milvus*) population in Wallonia

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Context

Wind turbines are a proven cause of mortality for diurnal birds of prey in Europe, including the Red kite (*Milvus milvus*), a species listed in Annex I of the Birds Directive and protected in Wallonia. The red kite nests in eastern Wallonia. This population has been expanding rapidly since its return in the 1970s, and is probably acting as a source for the recolonisation of neighbouring countries.

Methods

We estimated past and future impact of wind turbines on the Walloon Red Kite population using:

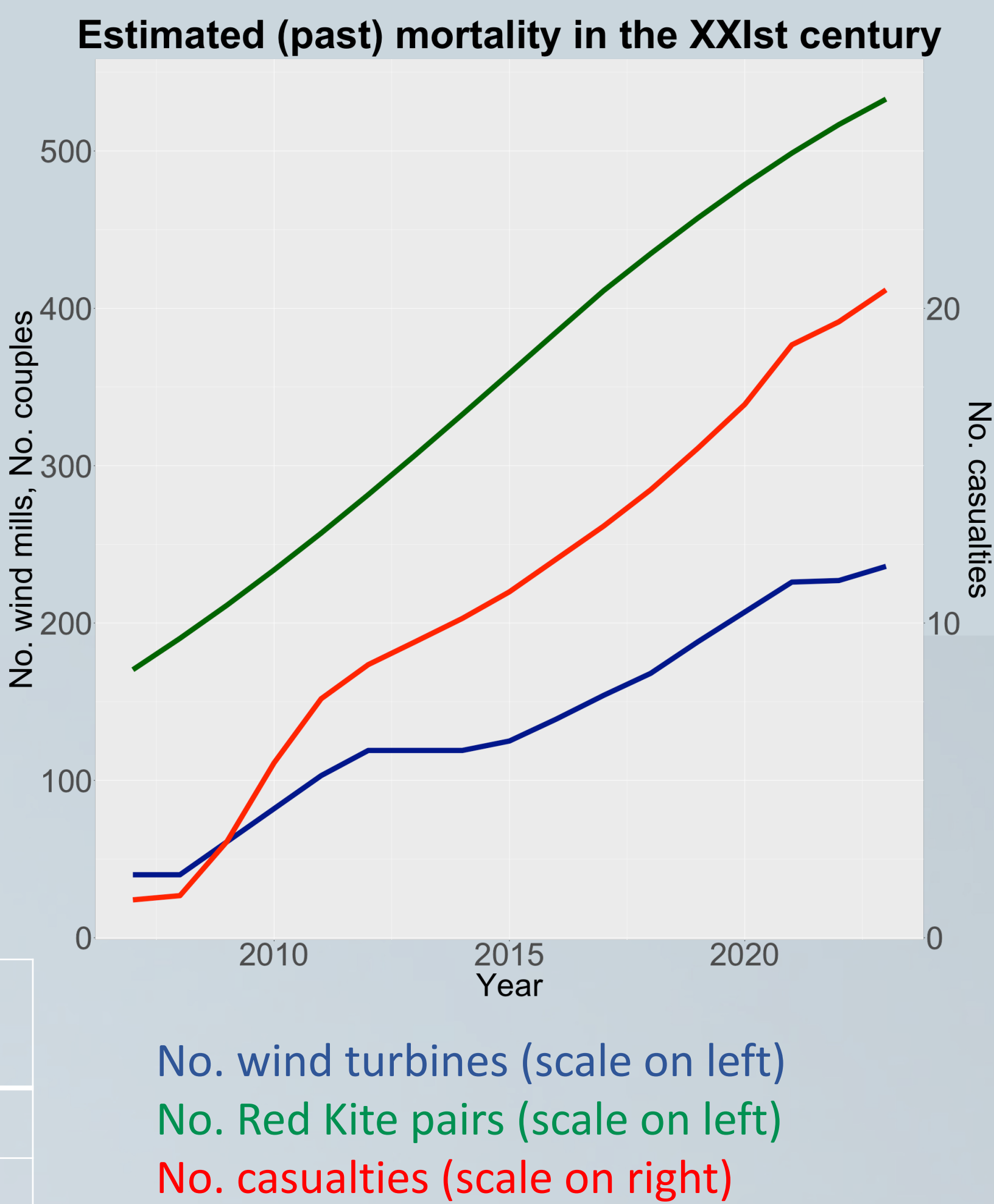
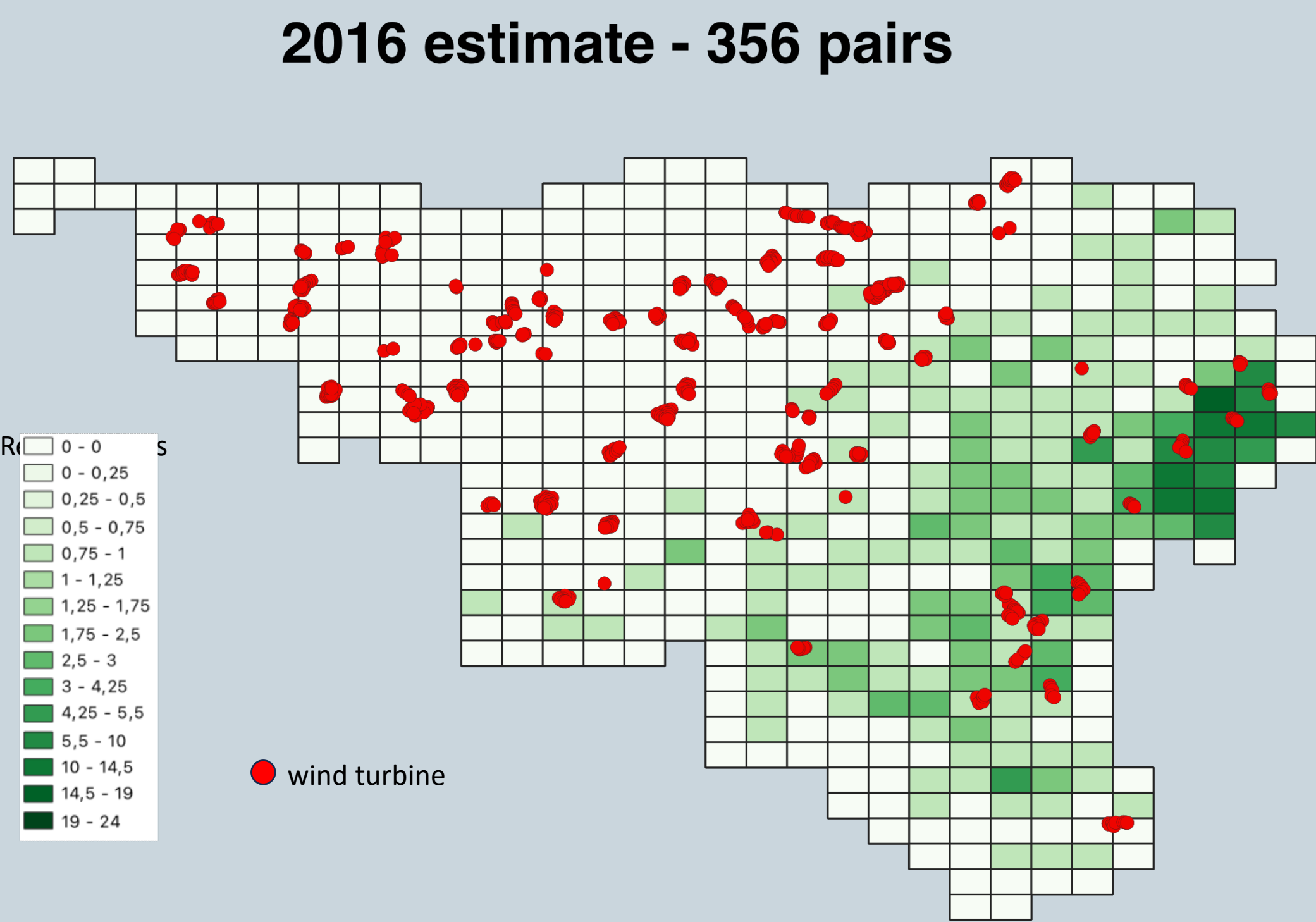
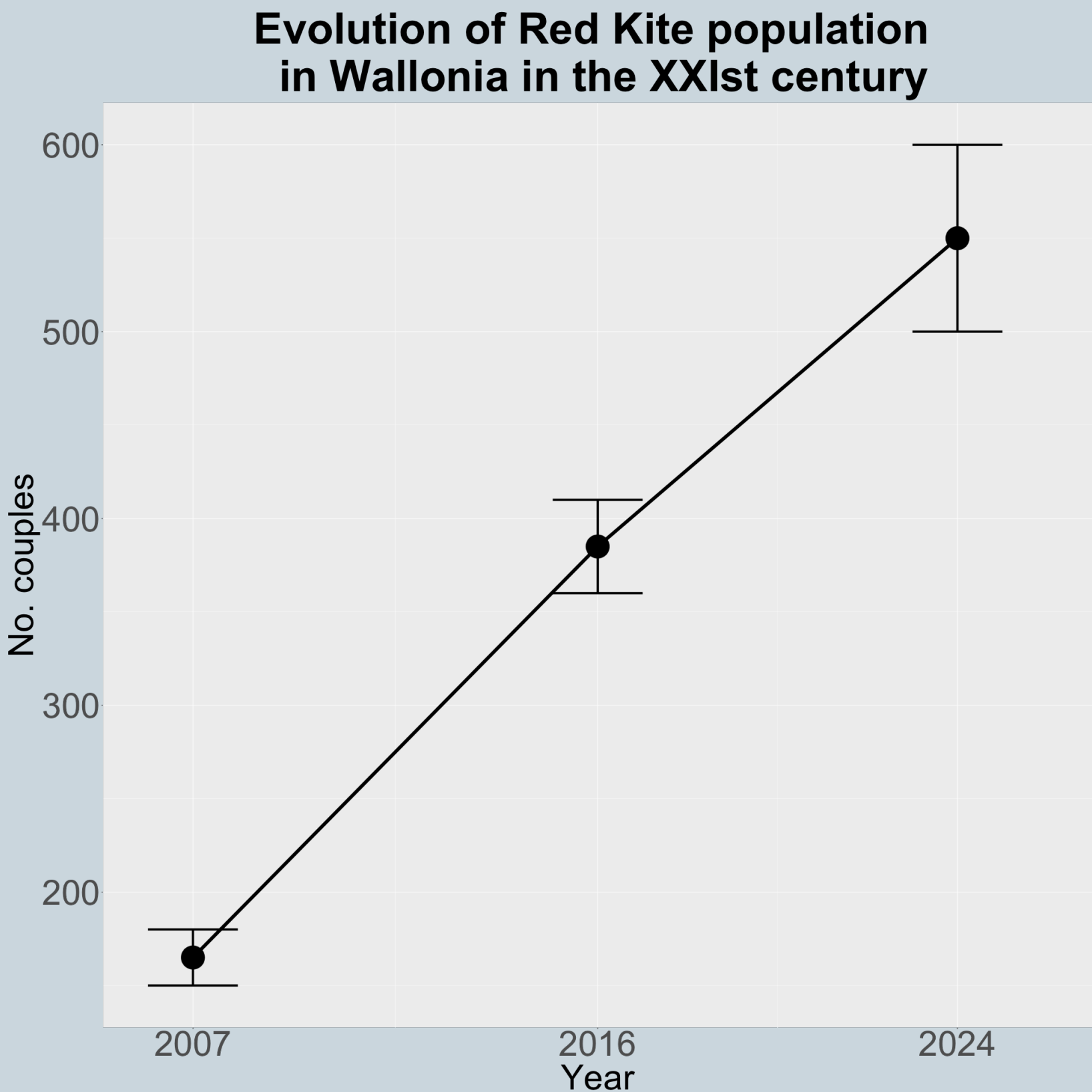
- Population estimates from AVES (2007, 2016, 2024)
- Mortality rate extrapolated from carcasse searches on two wind turbine parks in 2023
- Number of wind turbines on the Walloon territory
- Estimates of growth rates and carrying capacity
- Scenarios of wind turbines development and expansion (2024-2054)

For Population Viability Analyses (PVA), we used EolPop (Chambert et al. 2023) to model the impact on the population for the next 30 years.

Results and discussion

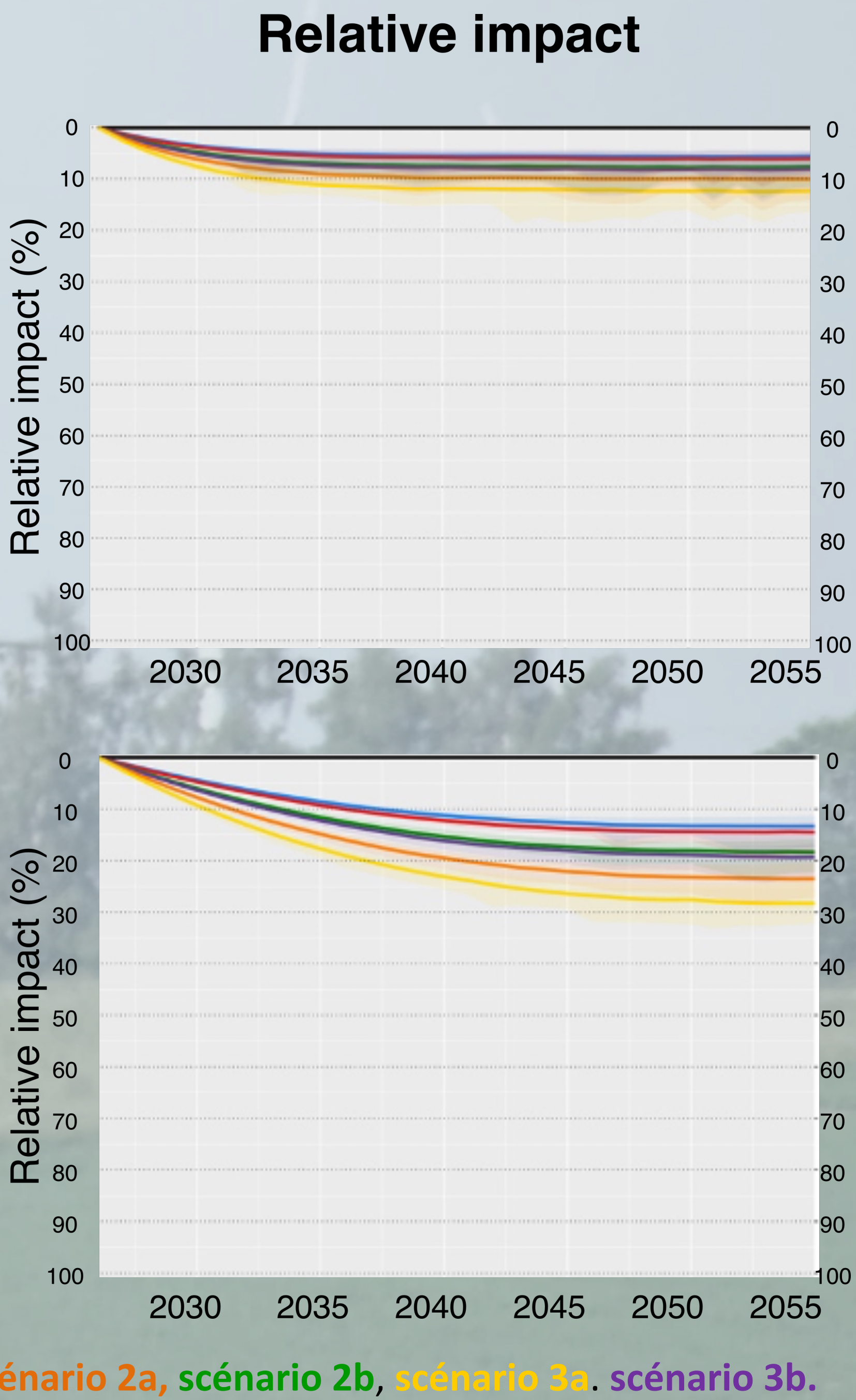
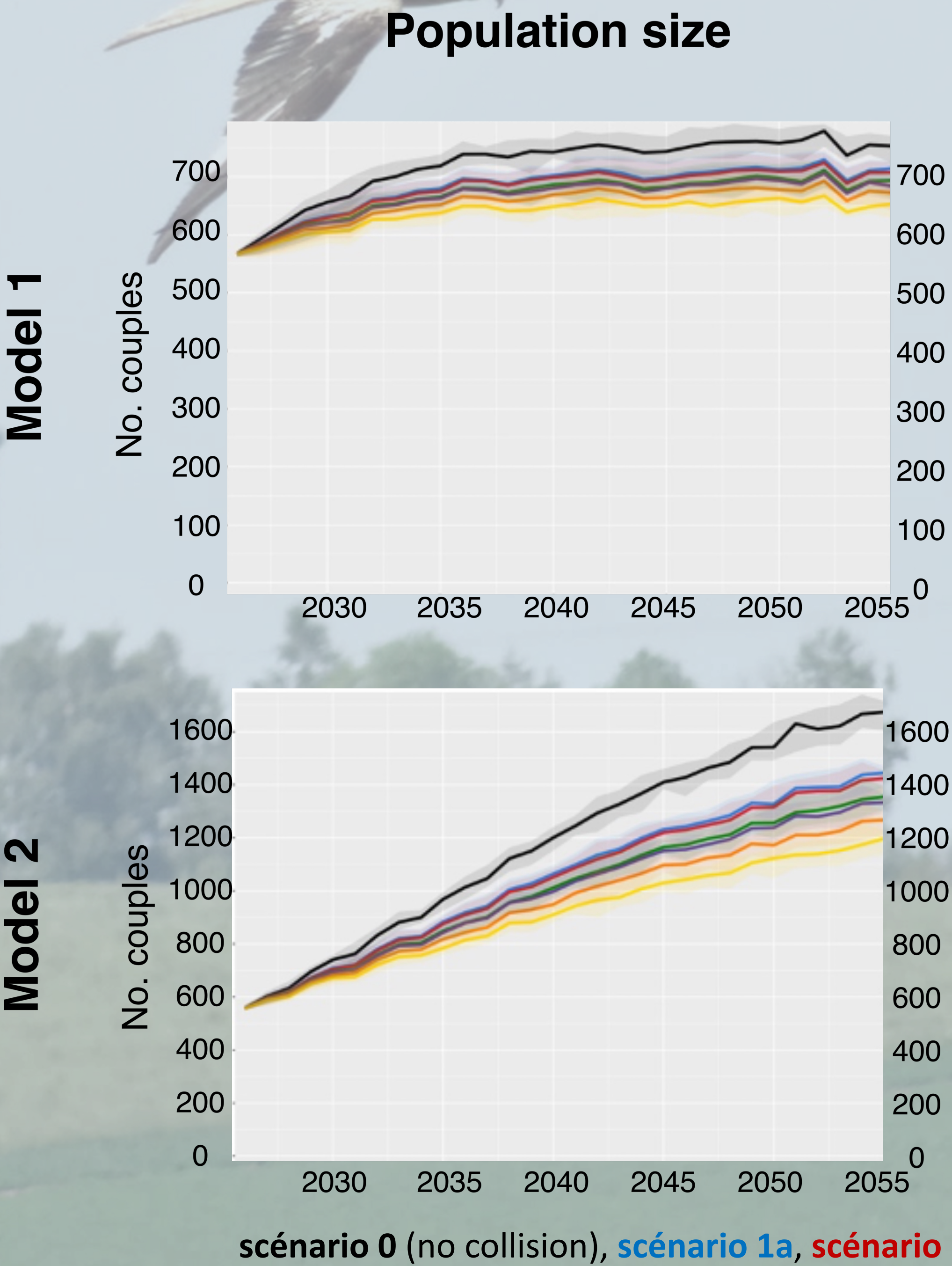
- Population estimates went from 180 to 385 pairs for 2007-2016 (9,8% avg. growth rate), and from 385 to 550 for 2016-2023 (4,6% avg. growth rate)
- We found one carcasse of Red Kite per surveyed wind farm
- We estimated a mortality of **21 Red Kites** in Wallonia for 2023, which represents **1.1% of the population**
- Based on our reconstruction, mortality was low (<1/year) before 2010, but quickly increased in the following decade due to increases in numbers of wind turbines **AND** Red Kites
- We estimated a total of ca. 200 casualties for the period 2007-2024, but half of this mortality for 2019-2024 alone
- Models are very sensitive to the carrying capacity, which is very difficult to estimate
- None of the considered wind farms development scenarios resulted in a decrease of the population
- However, the extent of wind turbine development will affect number of casualties and population size
- We present cumulated relative impact and projected evolution of population size based on two models of carrying capacity and growth rate, and 6 scenarios of wind turbine development (see tables and figures on the right)
- The population in 2054 could be 8% to 20% lower in the maximalist scenario of wind energy development, compared to a scenario with no new wind turbines

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	Growth rate	Carrying capacity (pairs)
Model 1	5,4%	780
Model 2	6,7%	2020

Scenario	No. wind turbines	Production (GWh/an)	Estimated mortality
0	0	0	0%
1a-1b	596	3000	1,2-1,3%
2a-2b	931	6200	1,6-2,1%
3a-3b	1180	10.000	1,7-2,5%



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