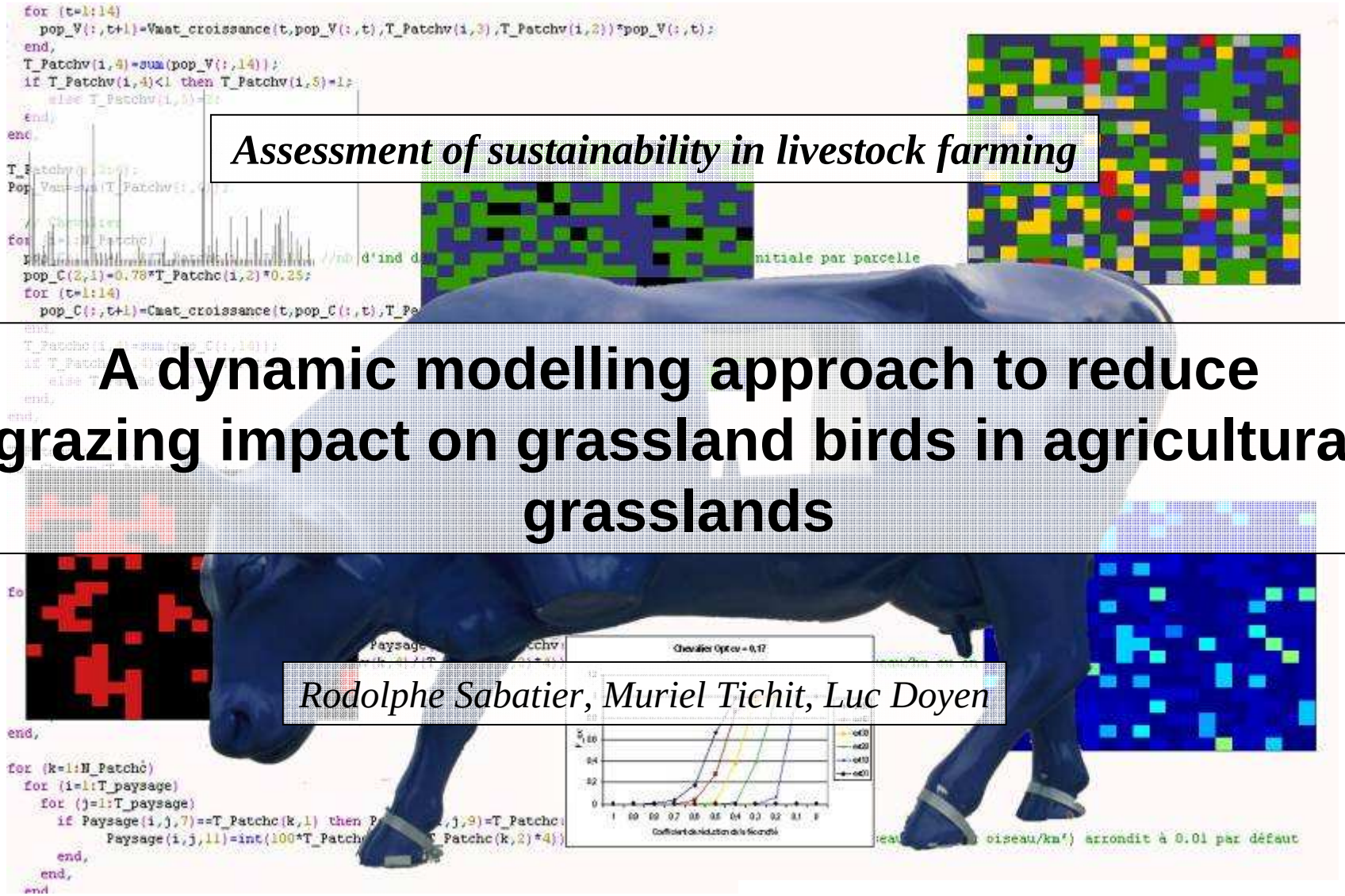
Assessment of sustainability in livestock farming

A dynamic modelling approach to reduce grazing impact on grassland birds in agricultural grasslands



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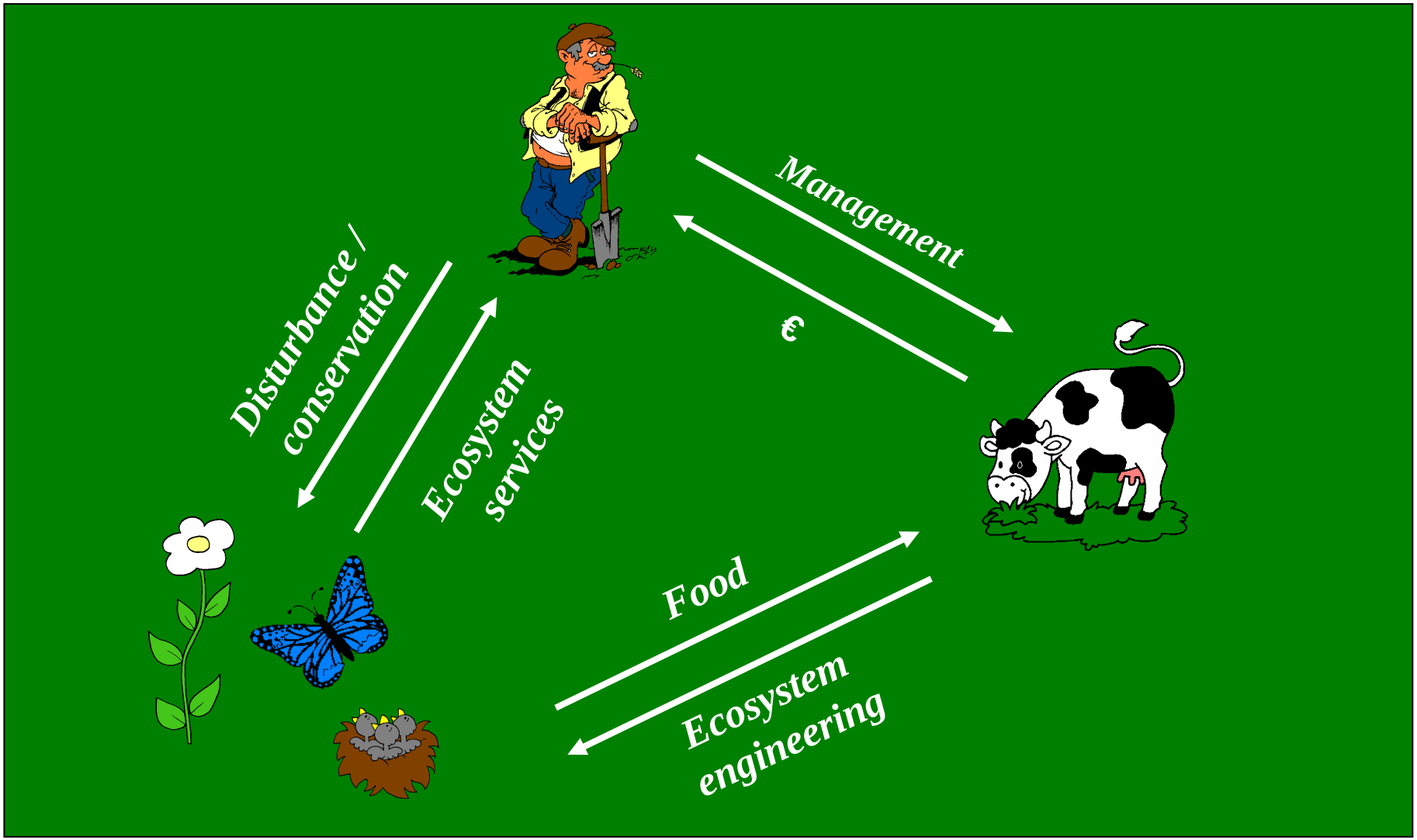
Rationale

- Negative impacts of intensification on biodiversity
- Shifts in agricultural aims : from productivity to sustainable production

Livestock farming system



Research question:

To develop a model integrating productive and ecological aims in order to predict sustainable grazing regimes

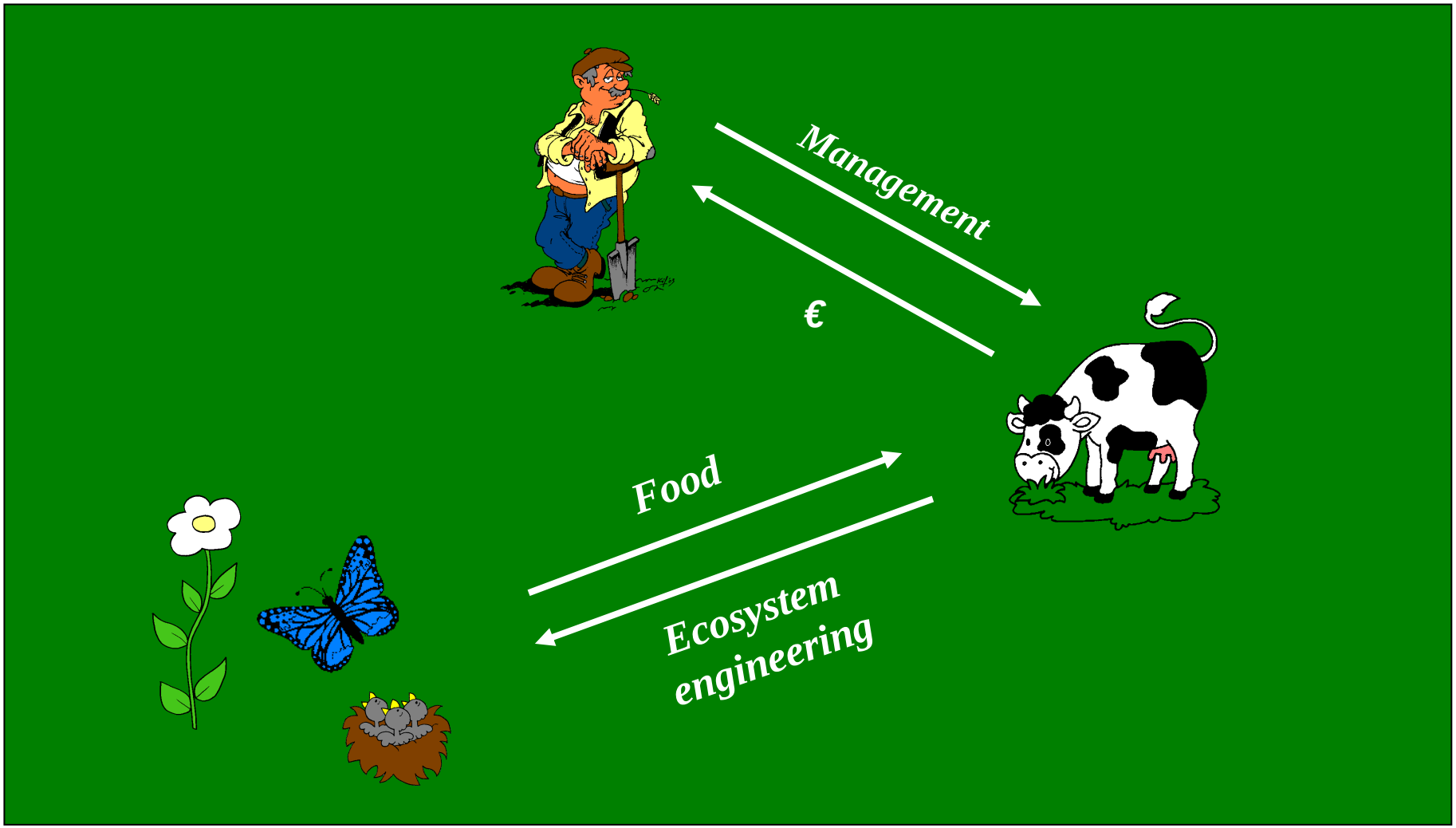
Outline:

Modelling a grassland Agroecosystem

Some results: drawing the trade-off between ecological and productive aims

Modelling grassland agro-ecosystem

Our Model



Modelling grassland agro-ecosystem

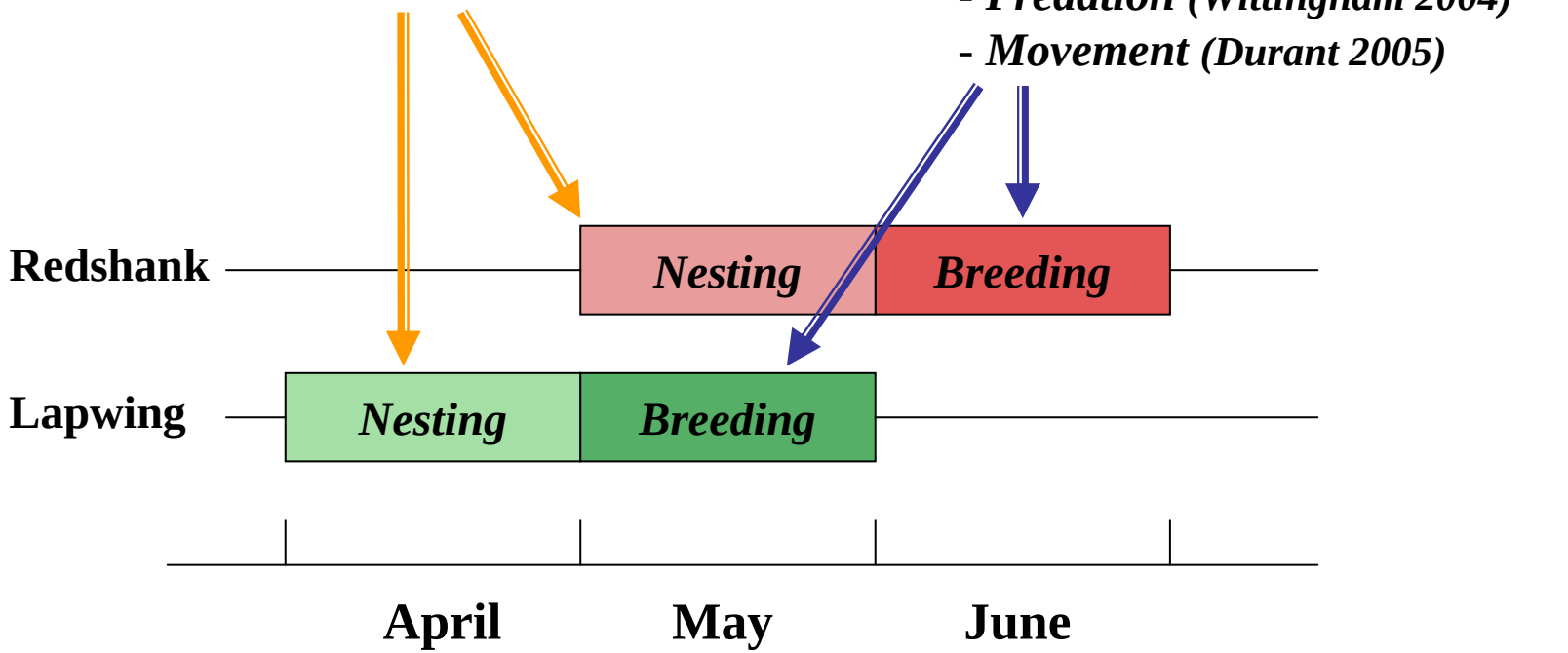
Impacts of grassland management on wader demography

Direct effects

- ***Trampling** (Beintema 1987)*

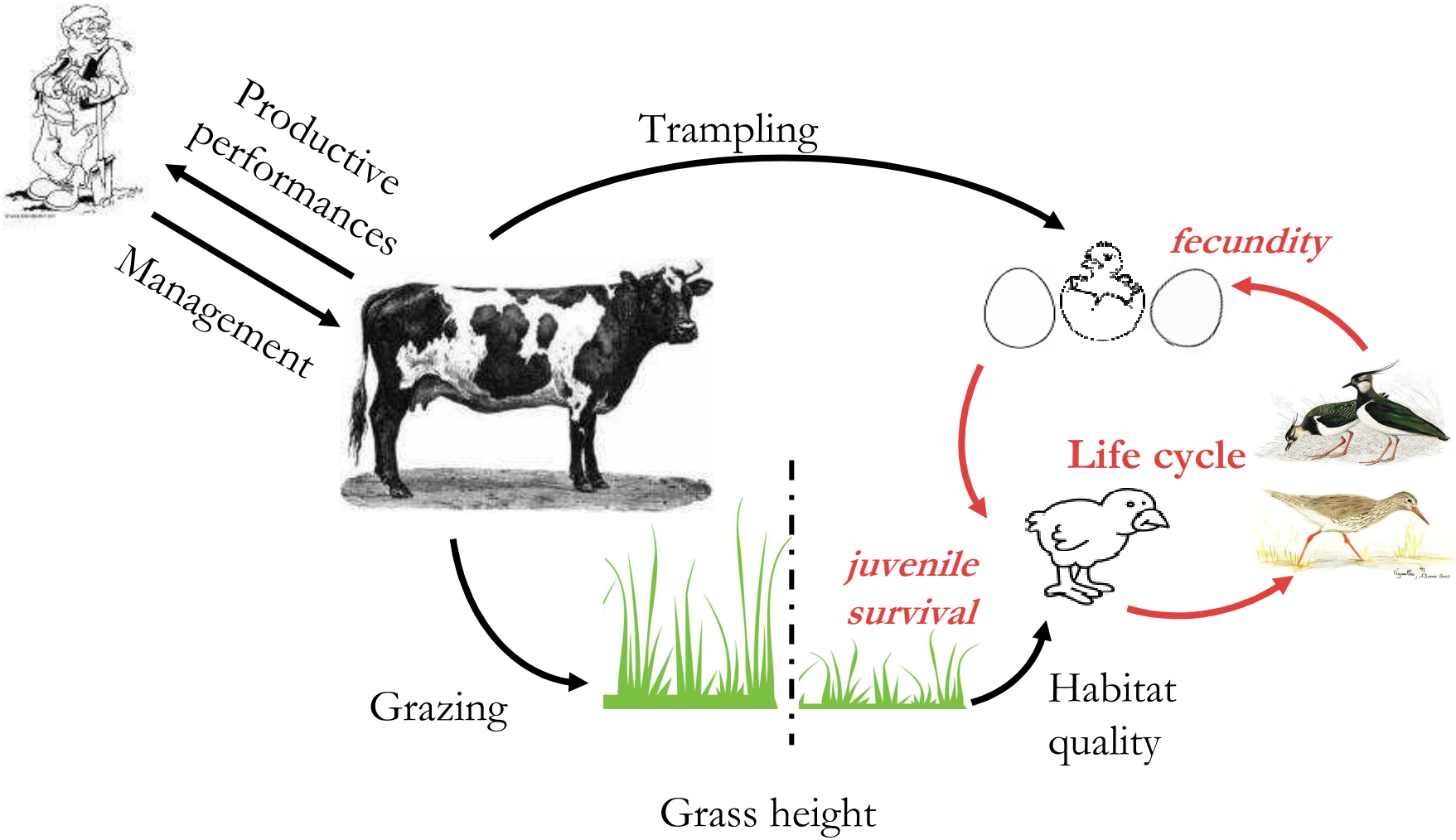
Indirect effects

- ***Sward structure :***
  - ***Food availability** (Dennis 2002)*
  - ***Predation** (Wittingham 2004)*
  - ***Movement** (Durant 2005)*



Modelling grassland agro-ecosystem

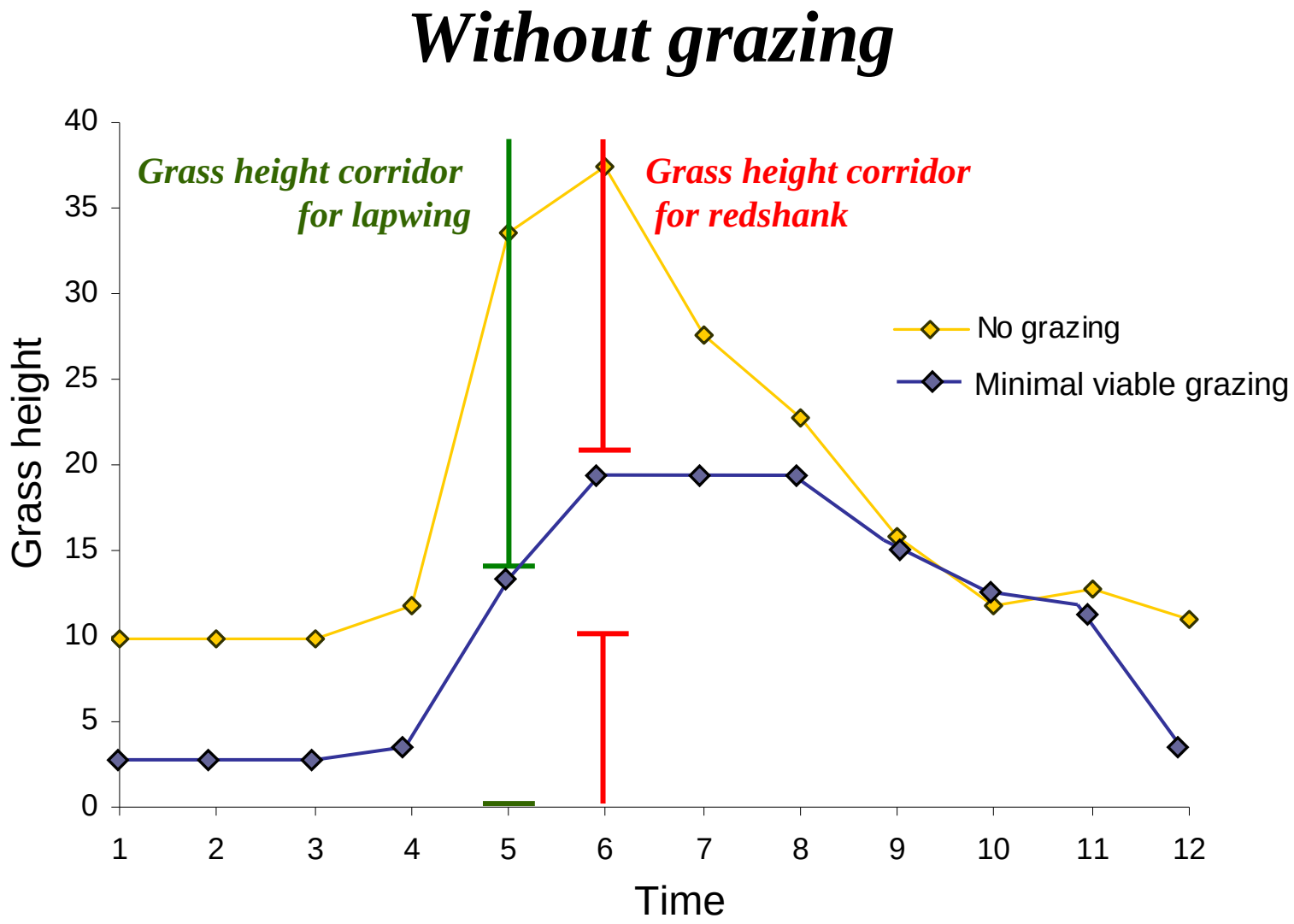
Dynamic modeling of cattle-bird interactions



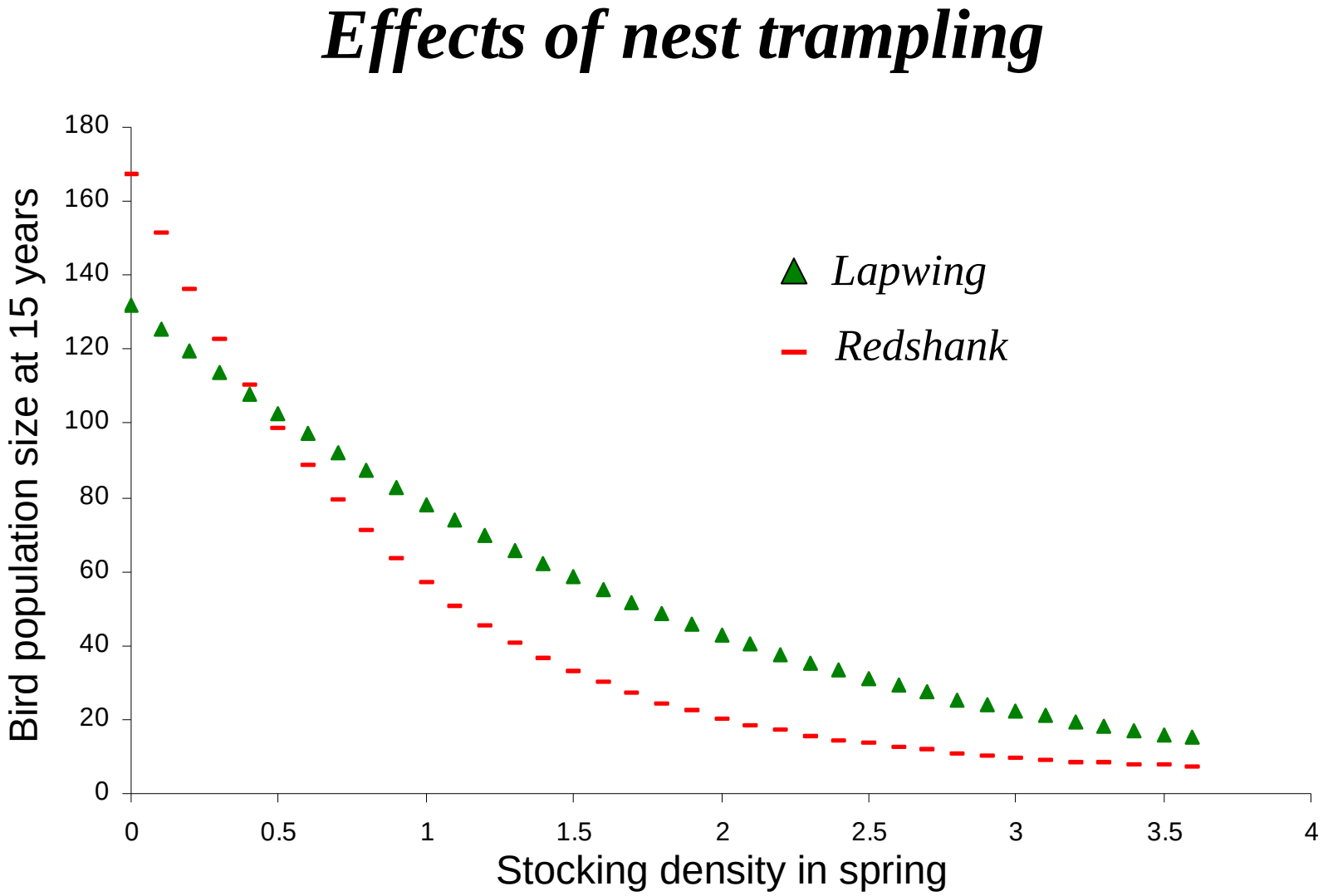
Results

Drawing the productive-ecological trade-off

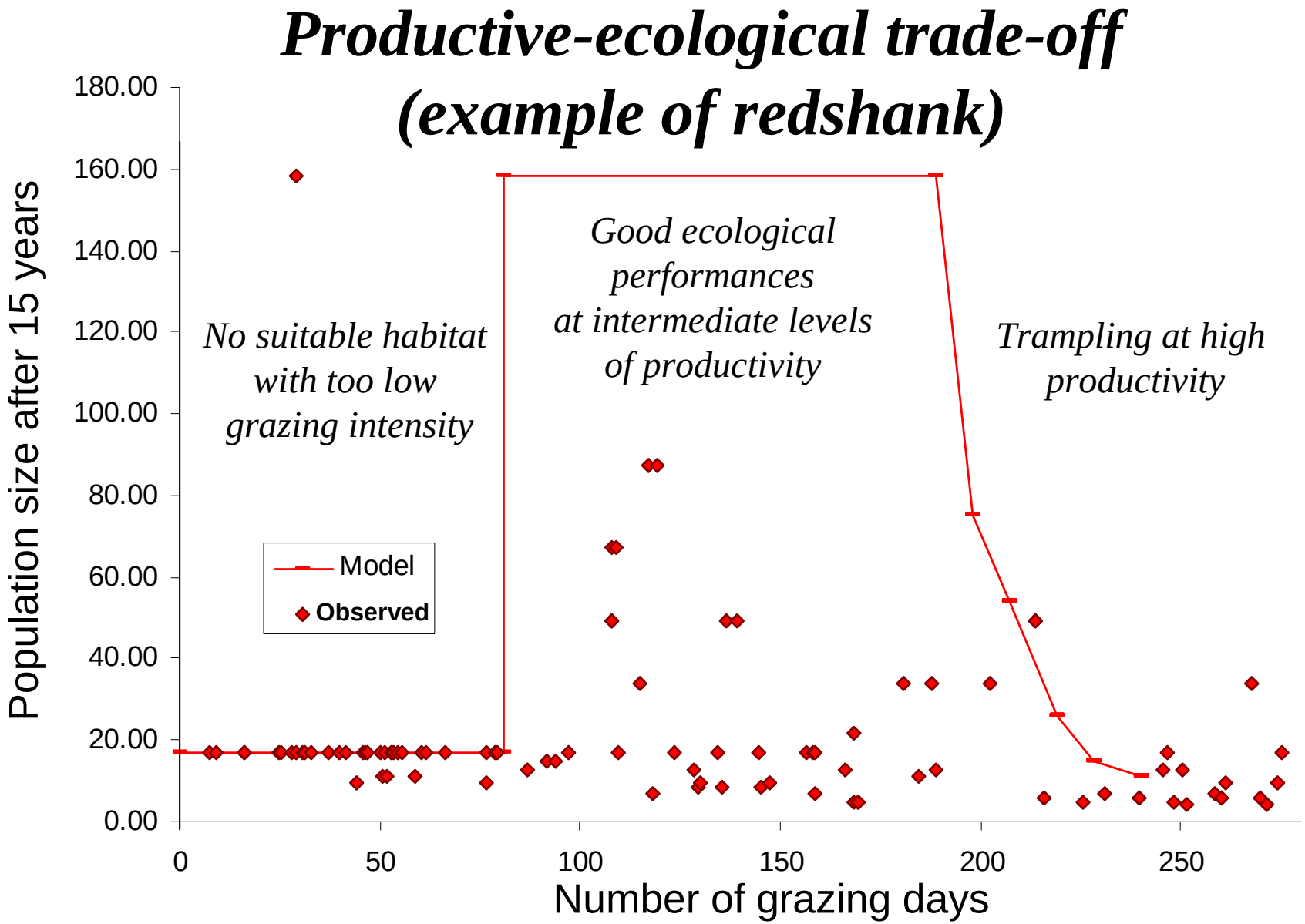
Results: Drawing the productive-ecological trade-off



Results: Drawing the productive-ecological trade-off



Results: Drawing the productive-ecological trade-off



Conclusions

- Grasslands of the studied area were most of the time used in an extensive way that however did not necessarily imply good ecological performances

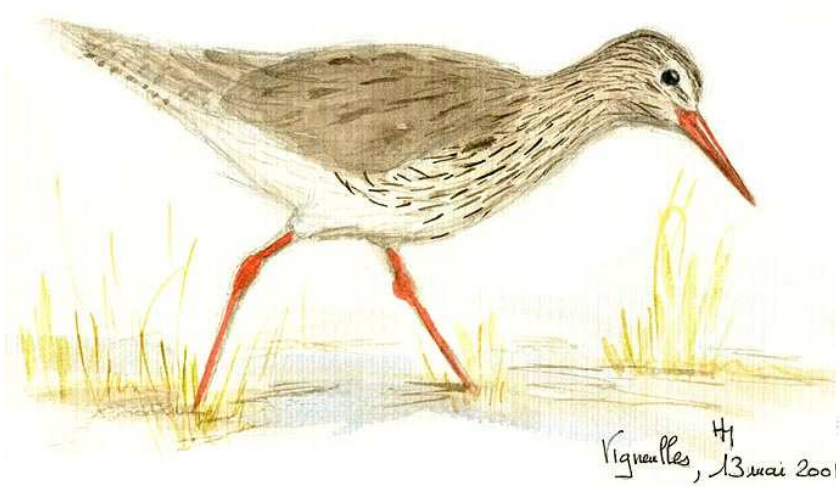
- A shift in grazing sequences may in many cases improve both ecological and productive performances

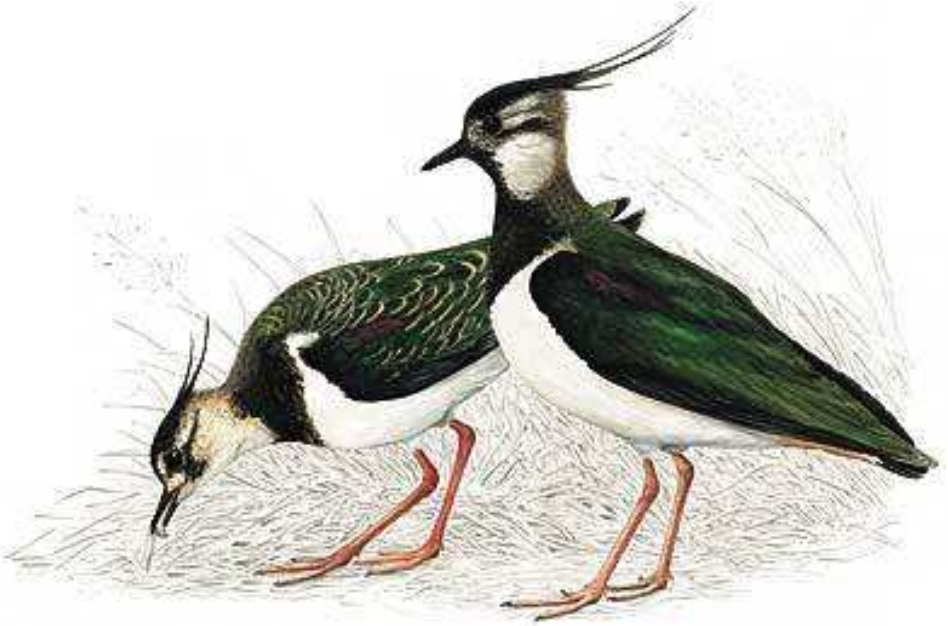
Conclusions

- Agroecosystem modelling enables quantification of ecological-productive trade-offs

Grazing is compulsory for waders but a sustainable one

Thank you





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