

Land Sharing or Land Sparing?

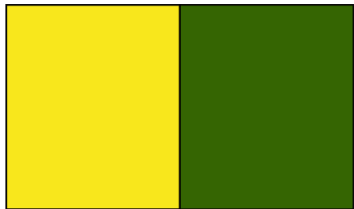
Implications for Farmland Birds of Conservation Concern in France

Adélie Erard, Ottmar Cronie, Raphaël Lachièze-Rey and Romain Lorrillière

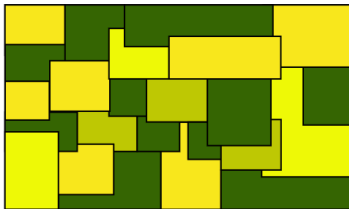
Rocheton 2026



Land Sparing and Land Sharing

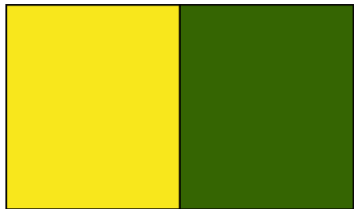


Land Sparing

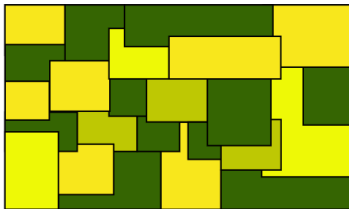


Land Sharing

Land Sparing and Land Sharing



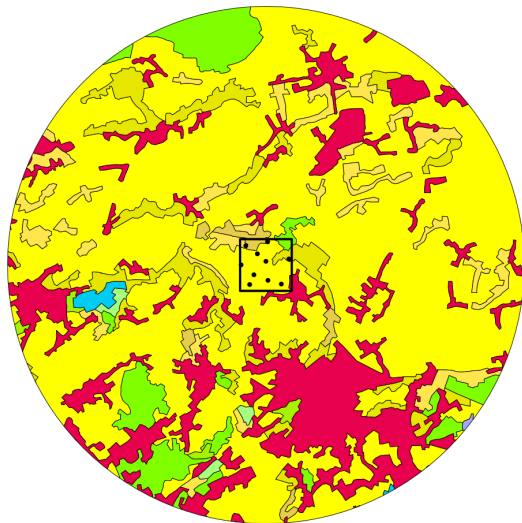
Land Sparing



Land Sharing

What is the best agricultural practice to conserve farmland birds ?

Indicators of Land Sharing and Land Sparring



CORINE codes

- Urban areas
- Non-irrigated arable land
- Pastures
- Complex cultivation patterns
- Land principally occupied by agriculture, with significant areas of natural vegetation
- Broad-leaved forest
- Moors and heathland
- Transitional woodland-shrub
- Inland marshes
- Water areas

Model

- We model bird counts using a **negative binomial regression model** to account for overdispersion.

Model

- We model bird counts using a **negative binomial regression model** to account for overdispersion.
- The expected count $\lambda(s, t)$ is modeled as:

$$\log \lambda(s, t) = \beta_0 + \sum_k \beta_k X_k(s, t) + \sum_{i, j} \beta_{i, j} X_i(s, t) X_j(s, t) + w_{s, t}$$

where:

- ▶ $X_k(s, t)$: environmental covariates (**land sharing and sparing indices**, **land cover of the square**, **climate**)
- ▶ $w_{s, t}$: spatio-temporal randomness

Model

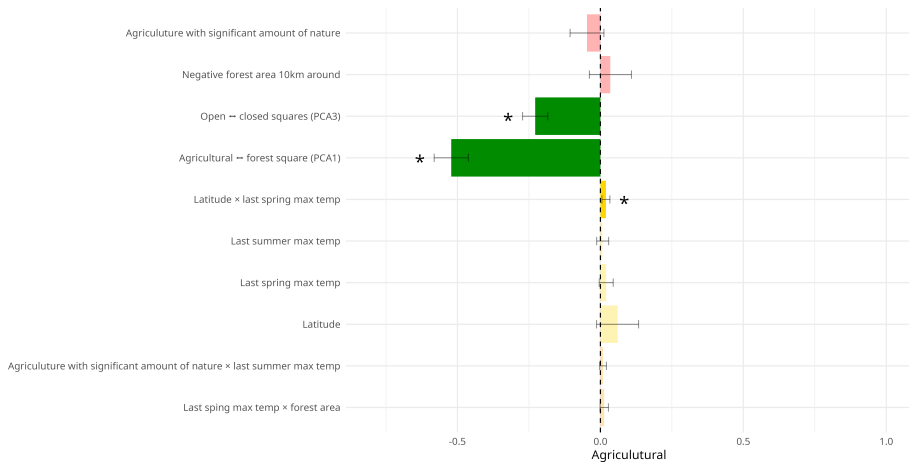
- We model bird counts using a **negative binomial regression model** to account for overdispersion.
- The expected count $\lambda(s, t)$ is modeled as:

$$\log \lambda(s, t) = \beta_0 + \sum_k \beta_k X_k(s, t) + \sum_{i, j} \beta_{i, j} X_i(s, t) X_j(s, t) + w_{s, t}$$

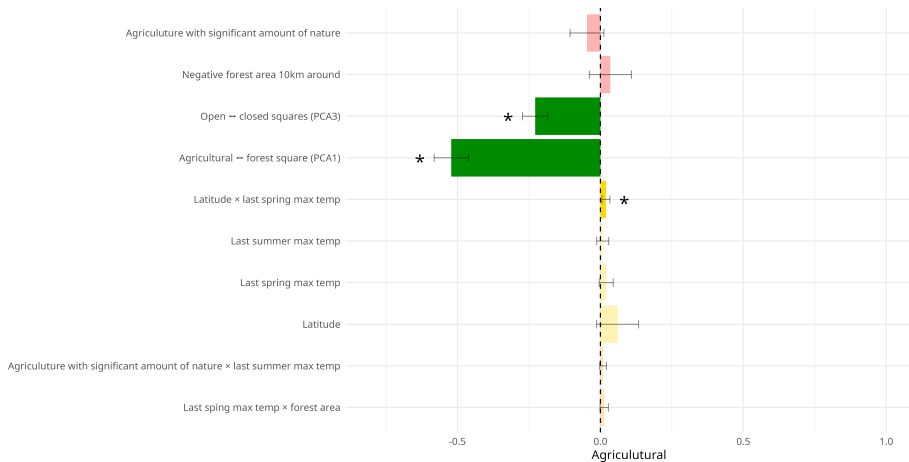
where:

- ▶ $X_k(s, t)$: environmental covariates (**land sharing and sparing indices**, **land cover of the square**, **climate**)
 - ▶ $w_{s, t}$: spatio-temporal randomness
- Inference with INLA [Rue et al. 2009]

Results for agricultural birds

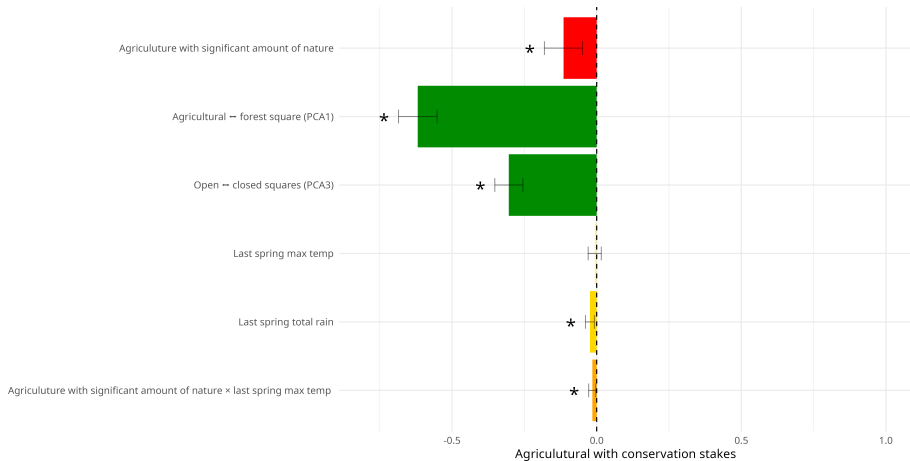


Results for agricultural birds

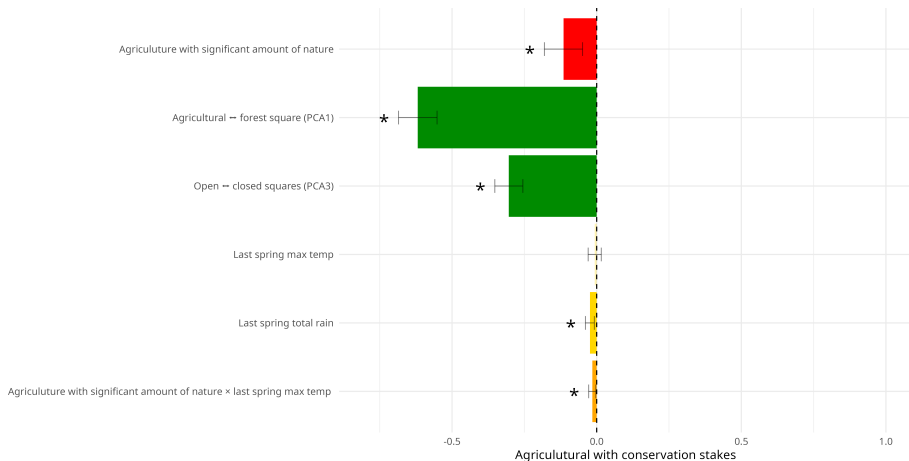


Land sparing is preferred

Results for agricultural birds with conservation concern



Results for agricultural birds with conservation concern



Land sparing is preferred

Thank you for your attention!