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EFFECTIVENESS OF CONSERVATION POLICY ON THE VALUE OF ECOSYSTEM SERVICES IN A PROTECTED AREA. THE CASE OF THE BIOSPHERE RESERVE OF URDAIBAI (SPAIN)

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INTRODUCTION:

Ecosystem services (ES)
The benefits we obtain from the ecosystems:

- Provisioning
- Regulating
- Cultural

Human well-being and development base!

Trouble:

- Not visible
- No markets

→ Overexploitation: Priority to those services with direct economic value (e.g. wood)

→ **Combination of biophysical, economic and cultural valuation**

Objectives:

- To analyse land use changes within the Urdaibai Biosphere Reserve over the last 44 years
- To analyse the resulting effects of these changes on the ES
- To examine the effectiveness of conservation policy of the Biosphere Reserve

METHODS AND RESULTS:

1. **Land uses** - Aerial photos interpretation (1965, 1983 and 2009 years)

Cultural landscape ⟶ Forest landscape

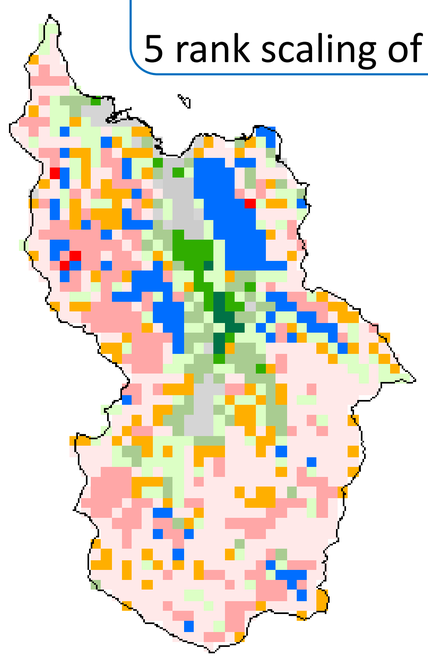
- **1965-2009:** Croplands ↓ Conifer plantations ↑↑
- **1965-1983:** Native forests ↓ Scrublands ↓
- **1983-2009:** Native forests ↑ Grasslands ↑

2. **ES economic valuation** for each land use (Literature review)

- **Economic impact:** In 44 years → losses of 20,628,000 €
- **Ecological impact:** Regulating services ↓↓ Food provision ↓
- **Socio-cultural impact:** Cultural services ↓

3. **Priority areas** – Multifunctional biophysical map (biodiversity, carbon storage, water flow regulation and recreation quantification)[1] and economic map integration

5 rank rescaling of multifunctional ES map
vs.
5 rank scaling of economic value of land uses



DISCUSSION:

The establishment of the Biosphere Reserve has contributed to the **conservation of core areas**, **but outside them the total value of the ecosystem services decreased by nearly 25%**.

Challenges:

Change of woodlands management:
- Replacement of pine and eucalyptus plantations by native species in areas >30º and with riparian forest
- Desynchronization of logging
- Economic incentives to foresters

Enhancement of local food production

Involvement of local population: Socio-cultural valuation of ES to know the preferences of the society

Methodology caveats?

- Study based on **worldwide data** (benefit transfer methodology)
- Static monetary value of ES throughout the time
- Big land use grain size due to poor resolution of photos
- Inclusion of more ES in the biophysical valuation

Future steps: Application of the Choice Experiment approach

CONCLUSIONS:

- ✓ **Management focused on only a few marketed services** (e.g. wood exploitation) **impacts negatively** on the supply of regulating and cultural services principally, but also economic values in general.
- ✓ Broader landscape management necessary to enhance the effectiveness of the Urdaibai Biosphere Reserve → **Monetary valuation** (and socio-cultural) **offer(s) additional and complementary information** to traditional conservation strategies based on biophysical valuation.

Nature, basis of well-being
Ecosystem Services of the **Basque Country**

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[1] Onaindia, M., Fernández de Manuel, B., Madariaga, I., & Rodríguez-Loinaz, G. (2013). Co-benefits and trade-offs between biodiversity, carbon storage and water flow regulation. *Forest Ecology and Management*, *289*, 1-9.