The Challenges of Creating Low-Cost and Scientifically Robust Biodiversity Baselines

A project developer's perspective

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The Wallacea Methodology

The Wallacea Methodology uses a basket of five metrics that captures the conservation aims of the project

European grassland

1. Breeding birds
2. Herpetofauna
3. Plants
4. Butterflies
5. Soil inverts

Cloud forest

1. Breeding birds
2. Bryophytes
3. Amphibians
4. Aquatic inverts
5. Canopy inverts

Coral reef

1. Coral
2. Invertebrates
3. Fish
4. Sponges
5. Macroalgae

Credits are determined by the median % difference of the five metrics

The Wallacea Methodology and the role of tech

- The Wallacea Methodology is a framework that enables quantification and verification of biodiversity uplift in any ecosystem
  - It does ***NOT*** prescribe specific protocols for quantification of taxa
- Project developers propose the five metrics that will best indicate project success along with the methods they will use for quantification
- Tech solutions to quantification of specific taxonomic groups are essential to drive down costs and ensure auditability

Challenges

- Ecological validity
  - Quantification methods must measure changes that are demonstrably linked to project interventions
- Costs
  - High costs associated with obtaining baselines are the major barrier to entry for most projects
- Creating useable baselines
  - What to do with historic or pre-existing data?
- Sampling strategies and replicate numbers
  - Balancing rigour with resource

Challenges

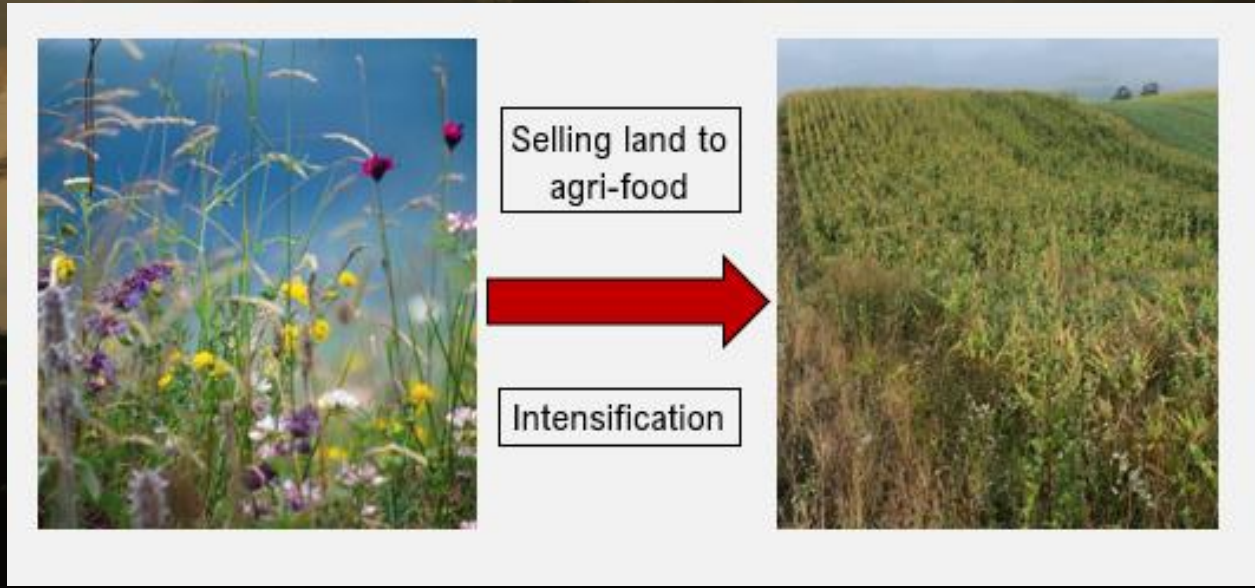
- Scale
  - 2000-ha versus 200,000-ha
- Logistics
  - E.g. road quality, permissions, disease outbreaks, weather etc.
- Auditing
  - Data must be auditable to prevent greenwashing
- Marine monitoring
  - HELP!!

Case Study 1: Transylvania

- Avoided loss project preventing conversion of HNV grasslands to industrialised agriculture in an important socioecological landscape

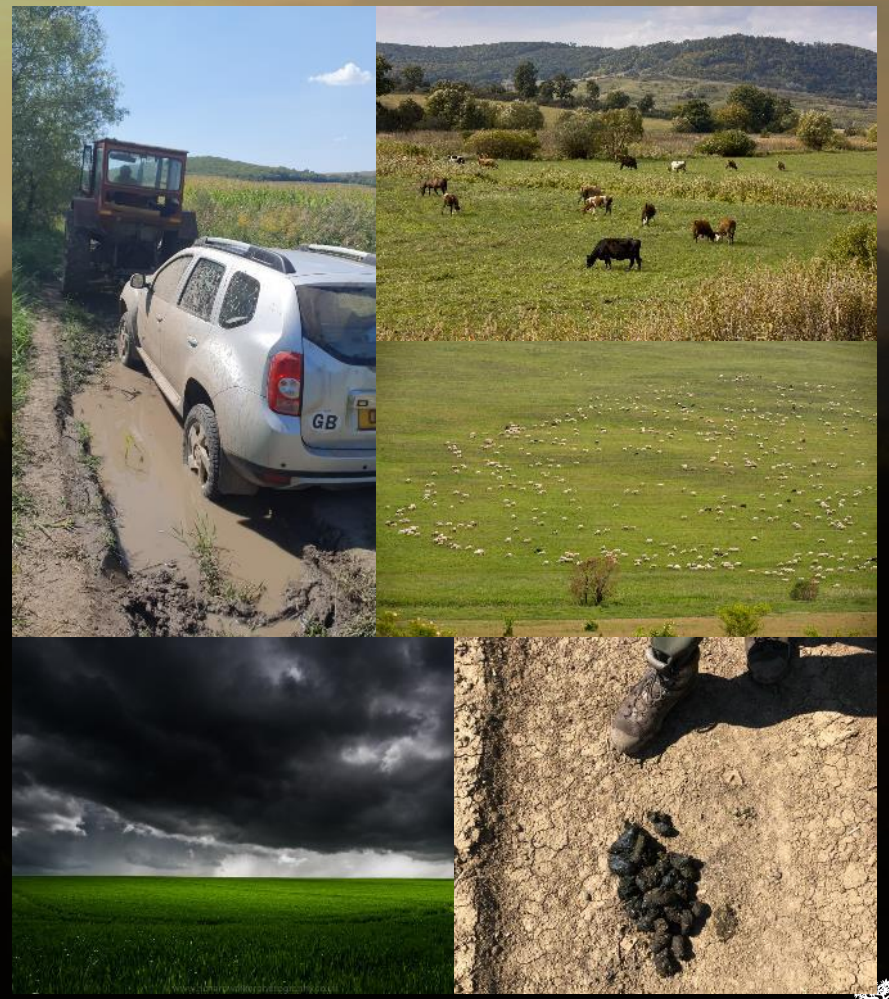
The basket of metrics

1. Breeding birds
2. Herpetofauna
3. Plants
4. Butterflies
5. Aboveground arthropods
6. Soil inverts



Case Study 1: Transylvania Challenges

- Sampling design in a mosaic landscape
- Vehicle problems
  - Flat tyres, old engines, irresponsible drivers, and inaccessible roads
- Animals
  - Sheep dogs, bulls, and bears
- Vandalised malaise traps
- Weather
- Accommodation
- Permissions



Case Study 2: Costa Rica

- Restoration of riparian habitat corridors and introduction of rotational cattle grazing to promote biodiversity and carbon capture

The basket of metrics

1. Canopy cover
2. Breeding birds
3. Aboveground arthropods
4. Aquatic invertebrates
5. Herpetofauna

Case Study 2: Costa Rica Challenges

- Deciding *t0* sampling locations in a project where the habitat will change over time
- Sampling under a thick canopy
- Obtaining abundance measures from eDNA and/or bioacoustics
- Poor access to electricity and Wi-Fi
- Site access issues

Case Study 3: Anguilla

- Improved management project that will allow the rules of the Anguillan MPA to be properly enforced

The basket of metrics

1. Hard-coral-to-macroalgae ratio
2. Rugosity
3. Herbivorous fish
4. Carnivorous fish
5. Hard coral cover
6. Macroinvertebrates
7. Juvenile coral recruits

Case Study 3: Anguilla Challenges

- Disentangling global and local threats
  - Even the best coral reef project is likely to see climate induced declines in biodiversity
- Costs are very high
- Logistical constraints associated with working underwater
  - Technological solutions may help
- Defining project areas is difficult because of high connectivity

Case Study 4: UK

- Regenerative agriculture and rewilding projects looking to track progress and project success over time

The basket of metrics

1. DEFRA Metric
2. Breeding birds
3. Plant diversity
4. Pollinator diversity
5. Detritivore diversity

Case Study 4: UK Challenges

- Ecologist's costs in the UK are very (prohibitively?) high
- The funding landscape is very unclear
  - ELMS?
  - BNG?
  - Woodland and Peatland Carbon Codes?
- Land ownership is complex
  - Ambitious projects require communication and agreement between dozens of landowners

Thank you for listening!