Wild Plants Seed Mixture for Green Infrastructures

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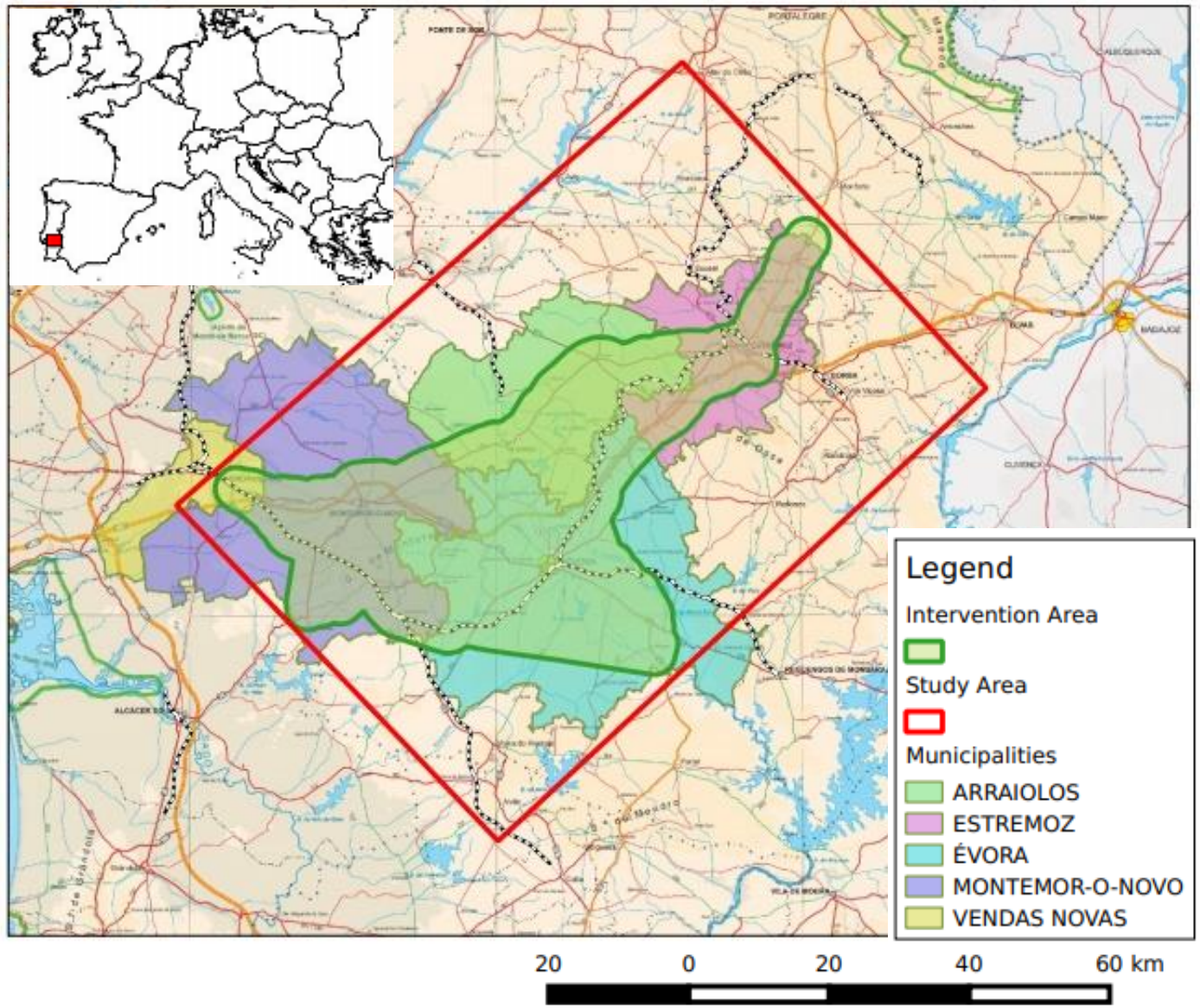
Tour du Valat

Study Area:

South of Portugal

High concentration of roads, ecotrails and powerlines



Principal aims:

Test, evaluate and disseminate mitigation measures

Promote the creation of a demonstrative Green Infrastructure

To mitigate negative effects of linear infrastructures and improve the local biodiversity

Principal aims

To promote:

- **Plants diversity**
- **Butterflies habitat**
- **Small mammals habitat**

Development of:

Two assortments of wild species biodiverse seed mixtures

Roads verges

Ecotrails verges

Species selections criteria:

Both mixtures:

- Autochthonous species
- Seeds harvest in the study region
- Some species with conservation interest

- 30% of Fabaceae
- 30% of Poaceae
- 10% of Asteraceae

Roads Mixture

- Respect roads security:
  - Low biomass = small amount of fuel
  - Low height
- Early flowering ≡ successful seed set

Ecotrails Mixture

- Species less common and/or conservation interest
- Species attractive for fauna
- Extended flowering period
- Without known toxicity

Ex situ plots:

Roads Mixtures:

Mixture 1 – 19 Species

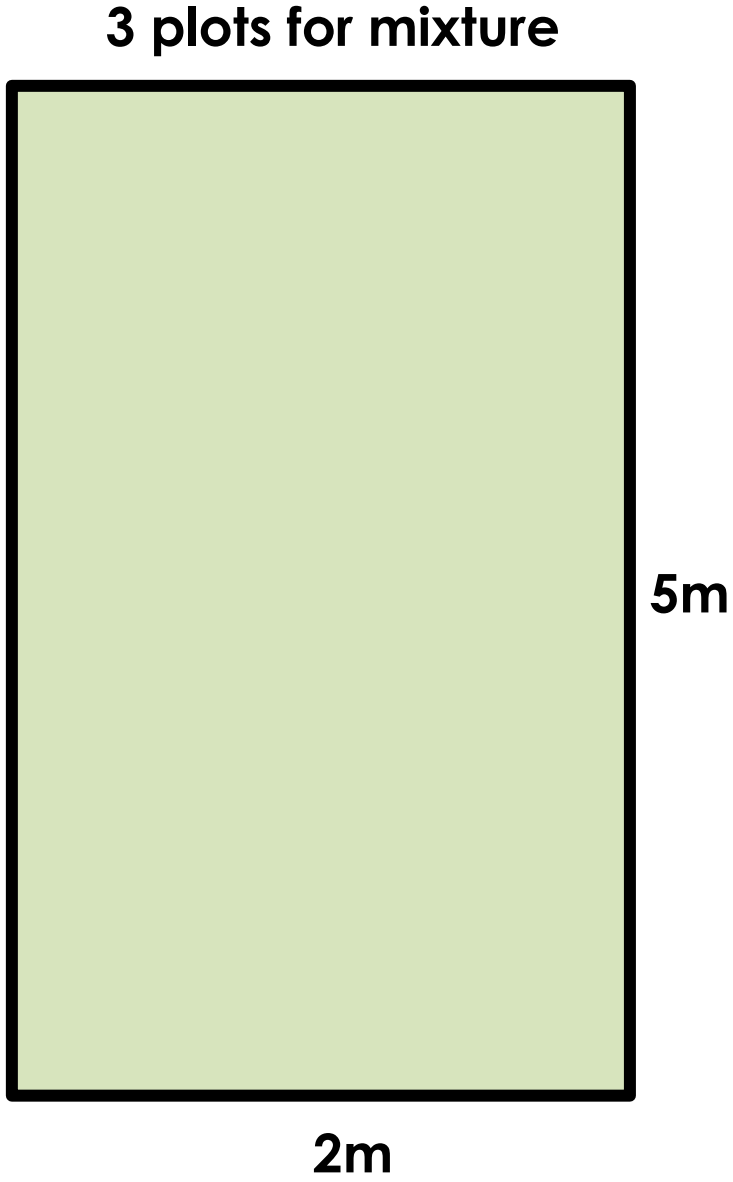
Mixture 2 – 19 Species

Ecotrails Mixtures:

Mixture 1 – 23 Species

Mixture 2 – 23 Species

50 Species in total from 13 families

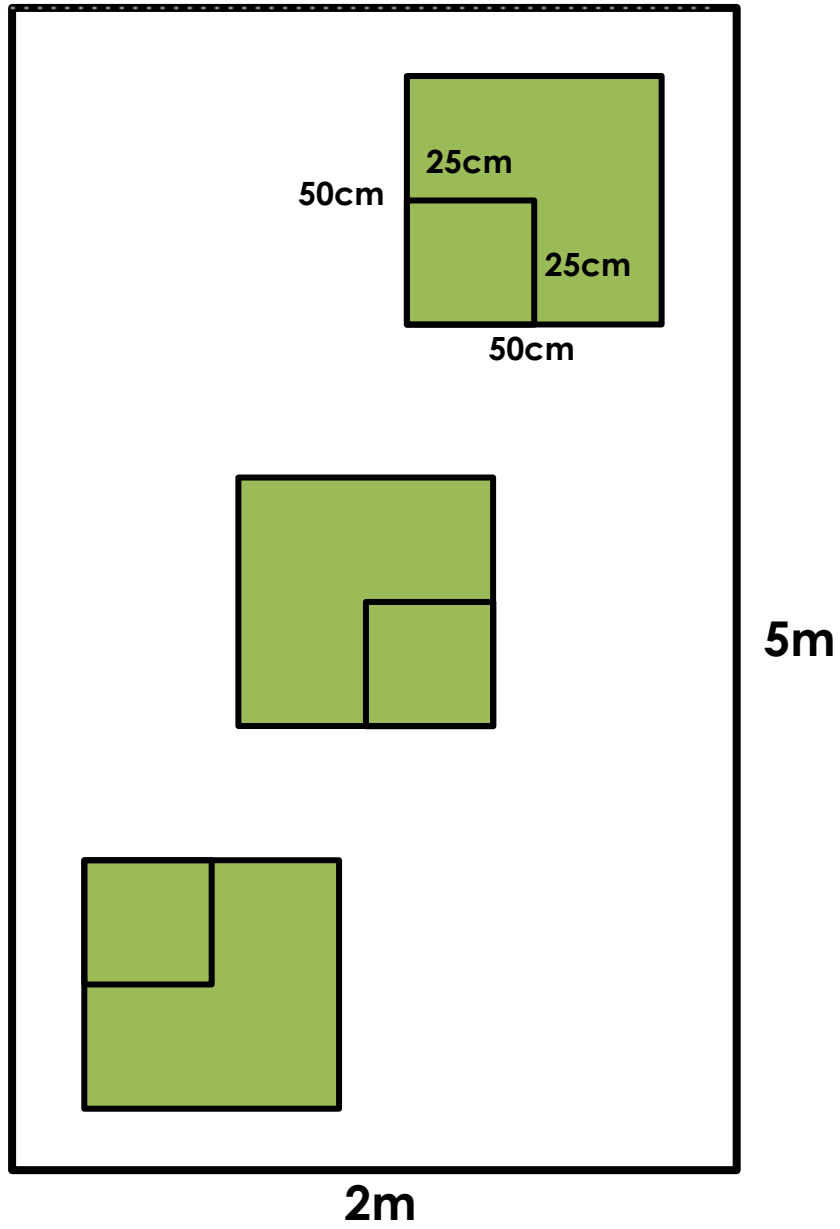


Ex *situ* plots - Evaluation

Each plot had:

- ✓ **Seeded species**
- ✓ **Non Seeded species**

- ✓ **Frequency of seeded species**
- ✓ **Abundance - % coverage**
- ✓ **Height**
- ✓ **Aerial Biomass (in quadrats of 25x25cm)**



Main Results

Germinated in both types of plots:

- ✓ *Briza maxima*
- ✓ *Silene scabriflora*
- ✓ *Pterocephalidium diandrum…*

Species tested showed different behaviors:

- ✓ In the biodiverse mixtures
- ✓ In the single species plots

Didn't germinate:

- ✓ *Campanula lusitanica*
- ✓ *Campanula rapunculus*
- ✓ *Gynandriris sisyrinchium*
- ✓ *Papaver rhoeas…*

Germinated only in the mixtures plots:

- ✓ *Briza minor*
- ✓ *Dactylis glomerata*
- ✓ *Phagnalon saxatile*

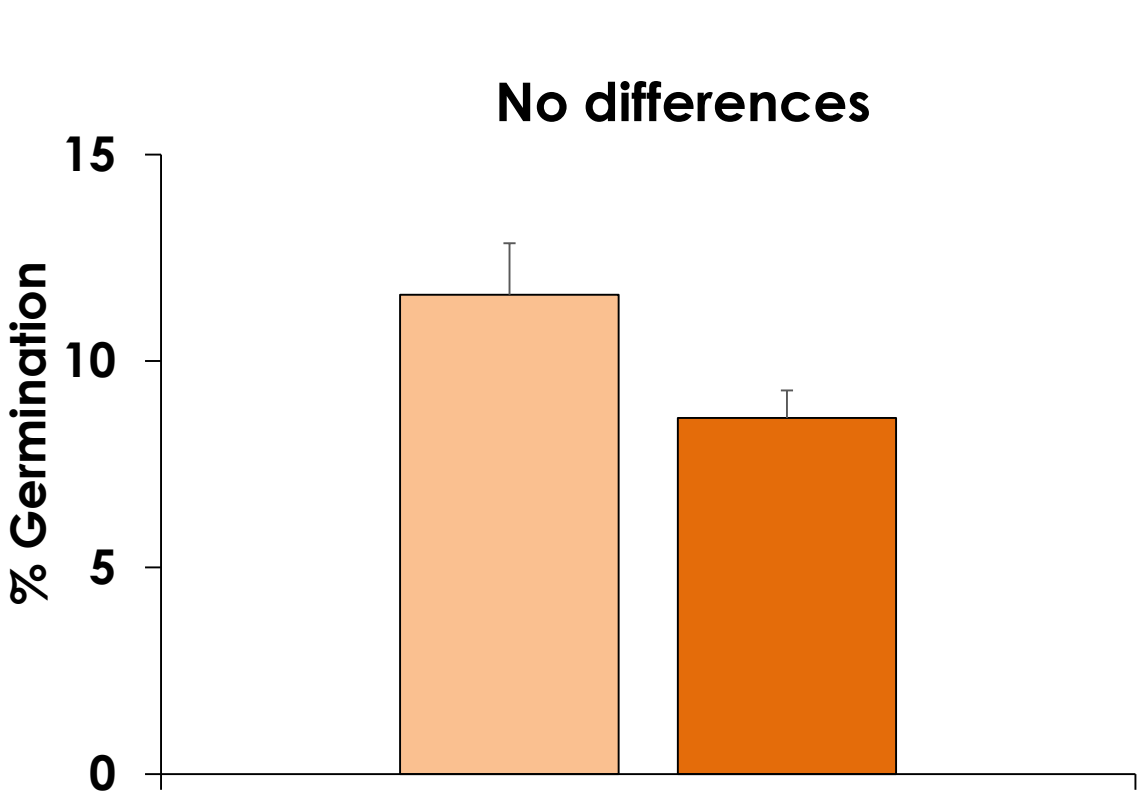
Germinated only in the single species plots:

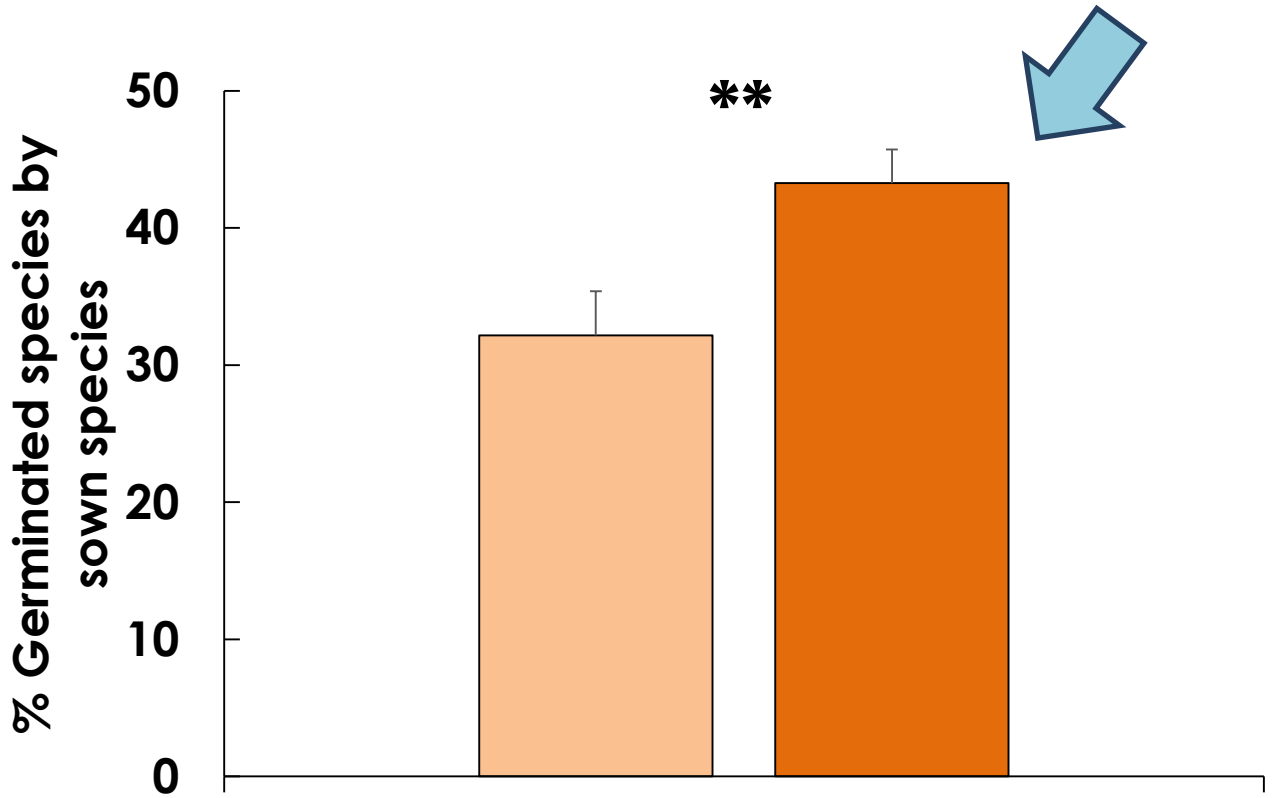
- ✓ *Anchusa undulata* subsp. *granatensis*
- ✓ *Linaria spartea*
- ✓ *Linaria viscosa*
- ✓ *Papaver hybridum…*

Main Results

% Germination

Roads Mixtures





Mixture 1 Mixture 2

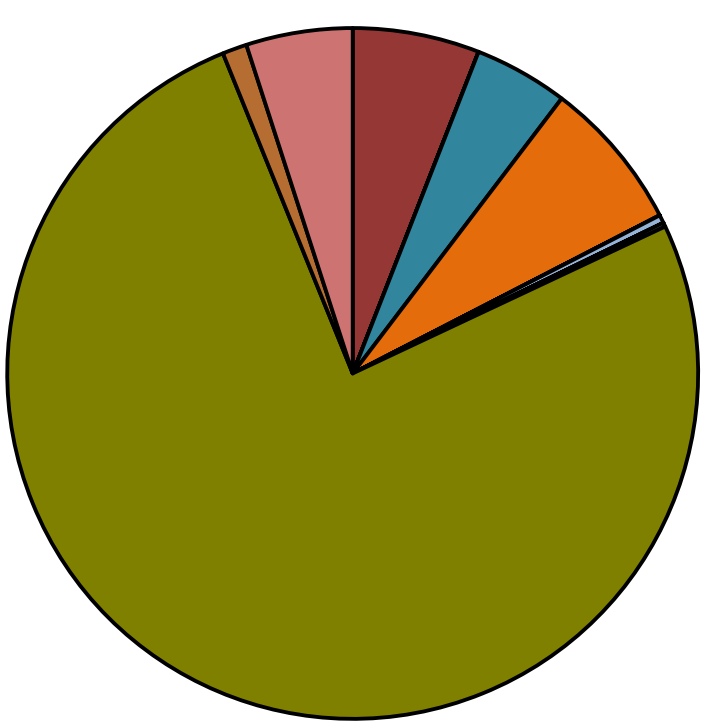
Main Results

Roads Mixtures

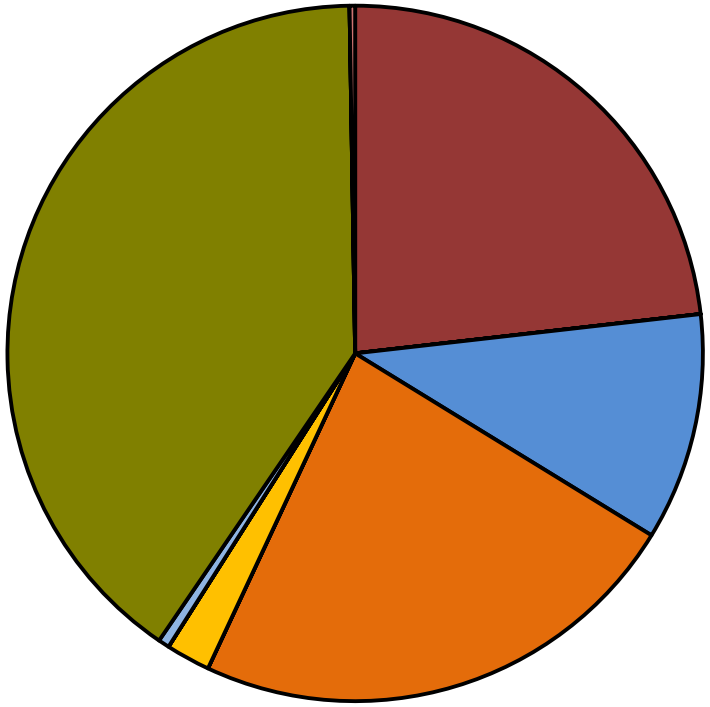
% Germination

More % of families germinated

Dominant family - Poaceae



Mixture 1



Mixture 2

Less % of families germinated

Greater balance between families

Asteraceae Caryophyllaceae Fabaceae Lamiaceae Plantaginaceae Poaceae Primulaceae Rosaceae

Main Results

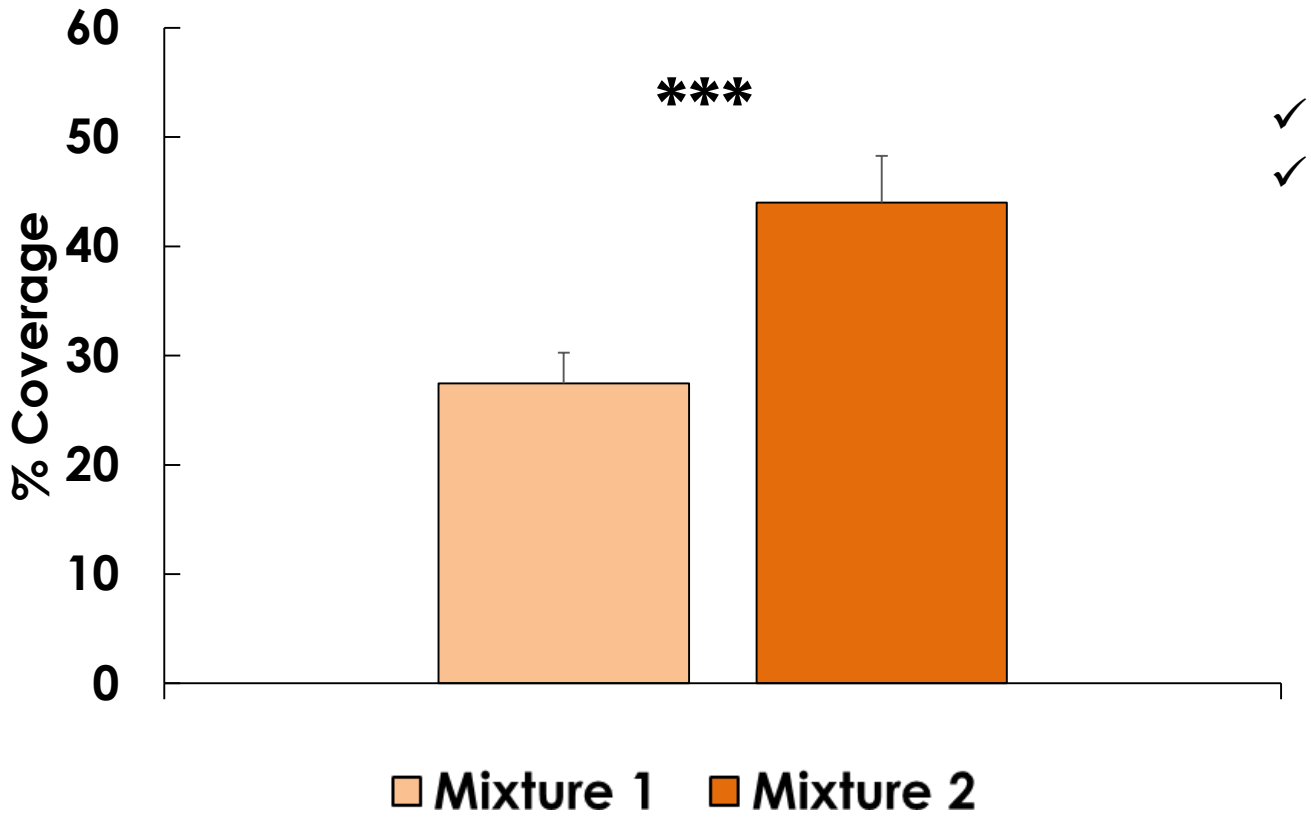
% Coverage and Biomass

Roads Mixtures

Mixture 1

- ✓ Less % of coverage
- ✓ Less aerial biomass

Biomass positively related with coverage and height



Mixture 2

- ✓ More % of coverage
- ✓ More aerial biomass

Biomass positively related only with coverage

Roads Mixtures

Mixture 2

- More species germinated
- More balanced family representation
- More coverage
- Biomass related only with coverage

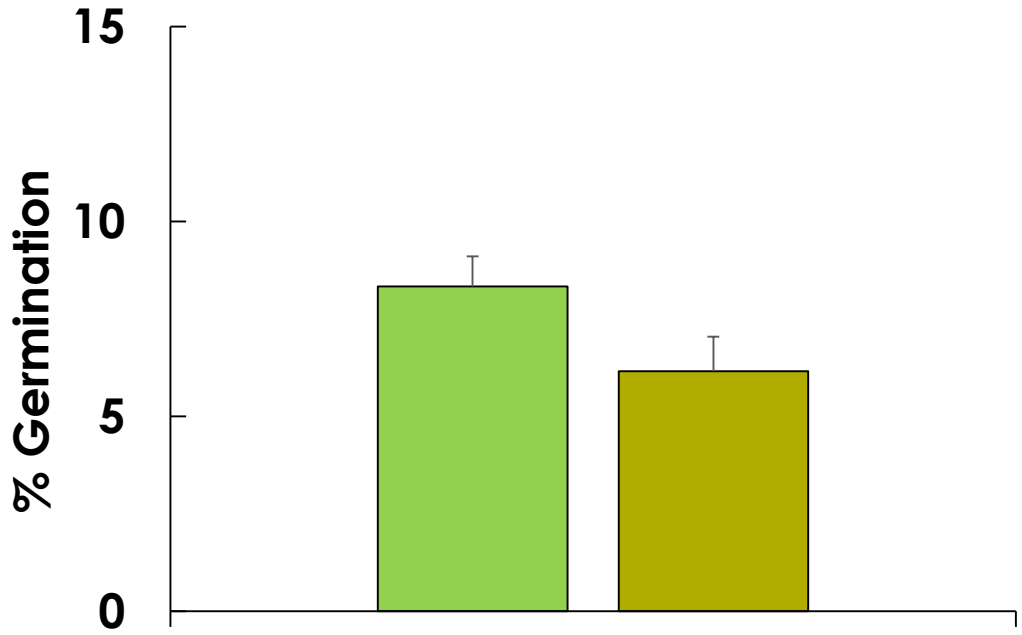
→ **Apparently more suitable**

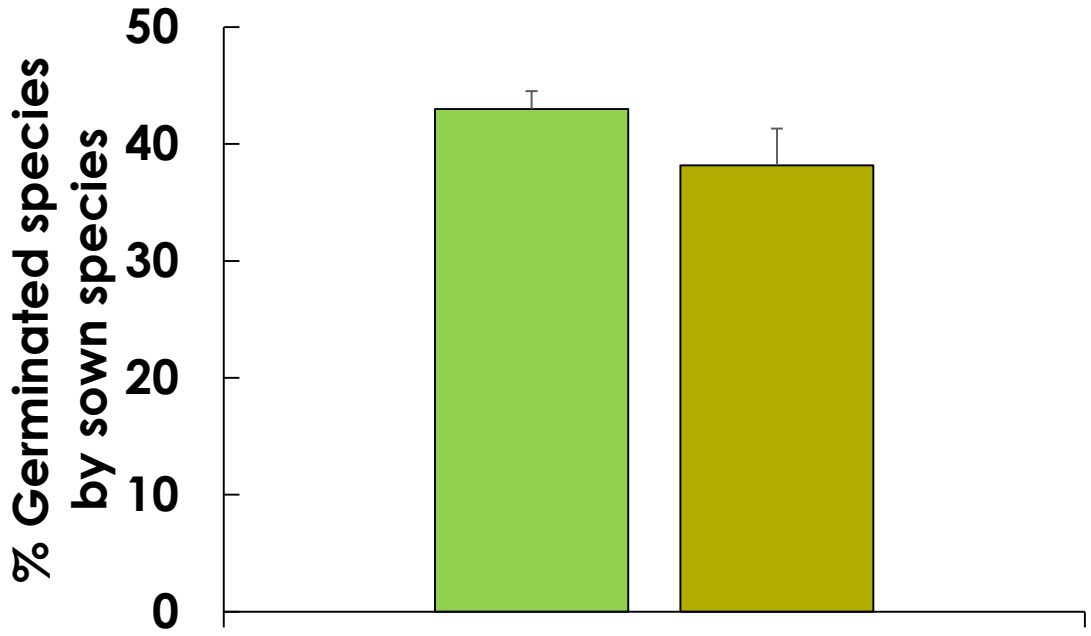
Main Results

Ecotrails Mixtures

% Germination

No differences





Mixture 1 Mixture 2

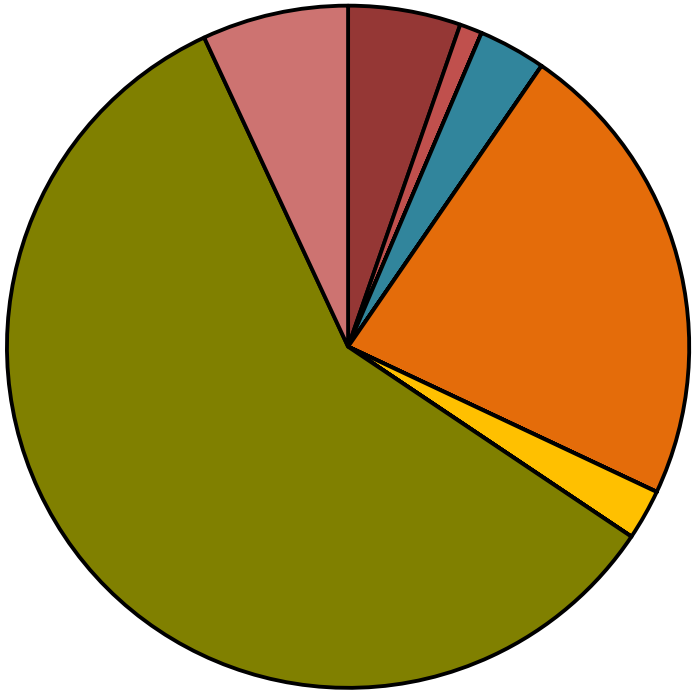
Main Results

Ecotrails Mixtures

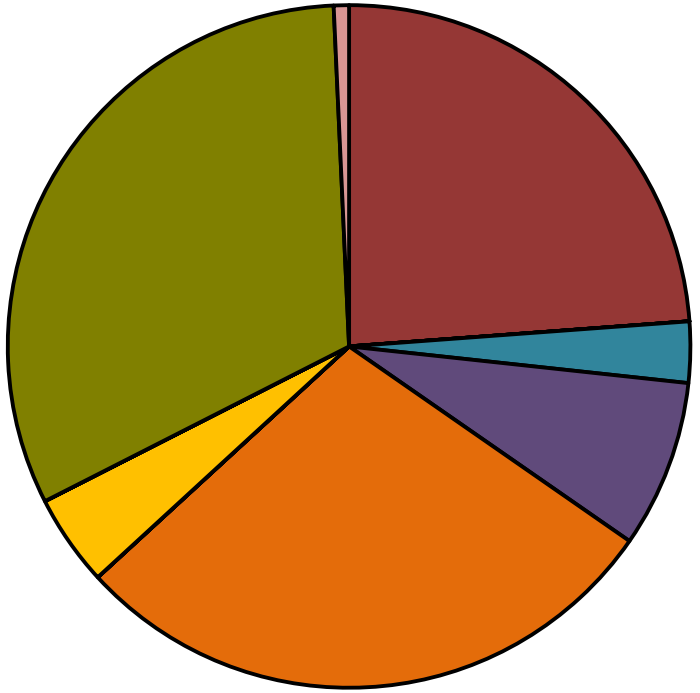
% Germination

Same number of families

Dominant family - Poaceae



Mixture 1



Mixture 2

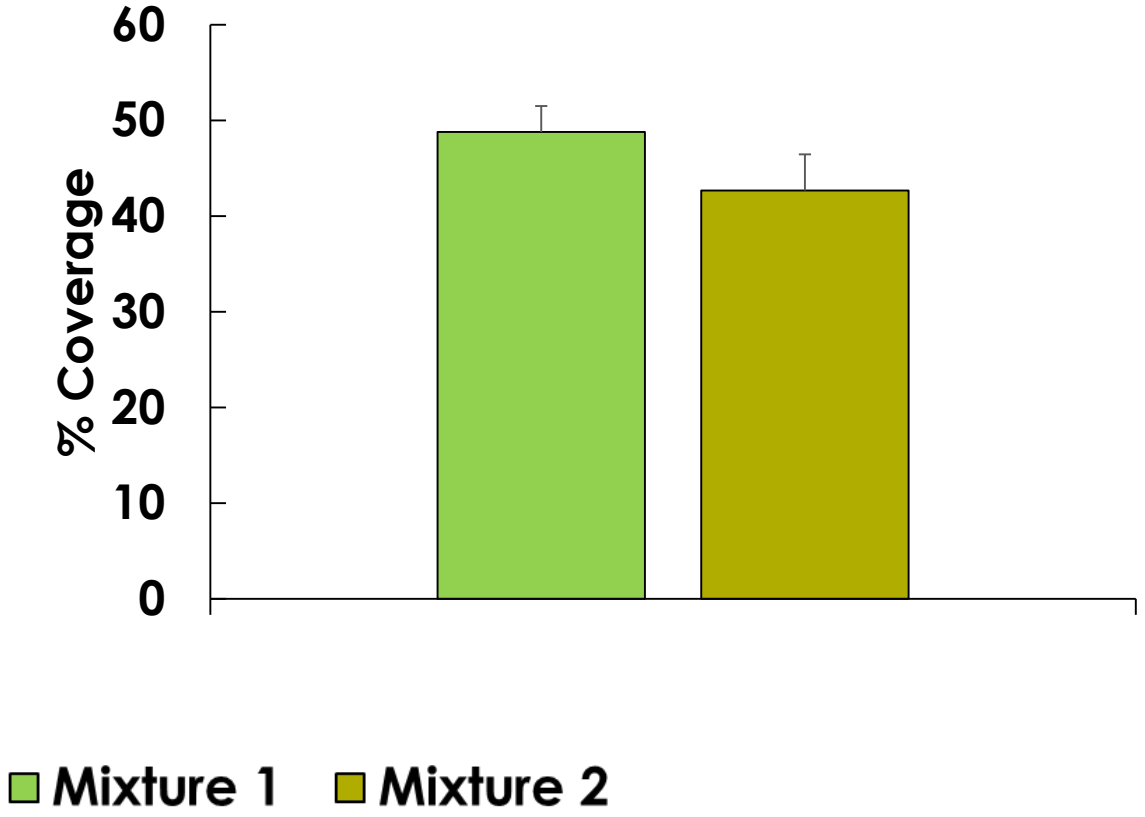
Greater balance between families

Asteraceae Boraginaceae Caryophyllaceae Dipsacaceae Fabaceae Lamiaceae Poaceae Rosaceae

Main Results

% Coverage and Biomass

Ecotrails Mixtures



Between Mixtures - Equal coverage and aerial biomass

Mixture 1 → **Biomass positively related with coverage and height**

Mixture 2 → **Biomass no related with coverage or height**

Ecotrails Mixtures

The mixtures had:

- Same % germinated species
- Same % coverage
- Same % aerial biomass

Mixture 2:

- More balanced family representation

A combination of the two mixtures is required ??

Conclusions

- **Road mixture** – Mixture 2 seems more suitable
- **Ecotrails mixture** – Probably a combinations of the mixtures is necessary

A conclusive evaluation of the results is premature

✓ Some of the tested species will probably germinate over the next years

Spring 2018 – better germination of:

- *Dactylis glomerata*
- *Linum bienne*

✓ The sustainability of the mixtures must be evaluated over time

Spring 2018 – same germination of:

- *Sanguisorba verrucosa*
- *Silene colorata*

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