Validation testing ecological monitoring tools

Food Forestry & Citizen Science

Sien Roof
Student Environmental Science

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Project goal

‘To quantitatively analyse the reliability of the ecological monitoring tools biodiversity level, CO_2-sequestration in trees and soil composition and pH, in order to determine what the points of improvement are for each tool.’

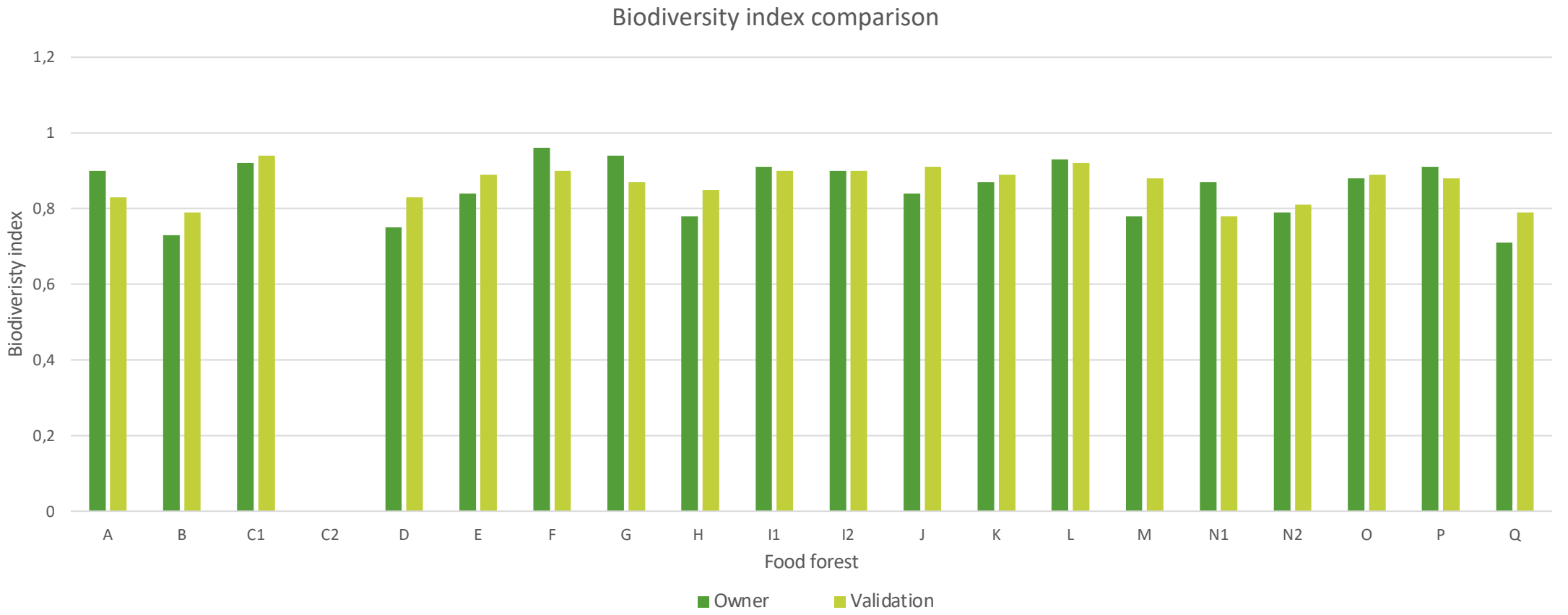
Methodology research

- Comparison results owners – validation
- Quantitative analysis
- Feedback

Methodology biodiversity

- Biodiversity test
  - Plant species in herbaceous layer
  - PlantNet & ObsIdentify apps
  - Cover

Class	Number of plants
Rare	1 – 5
Scarce	5 – 20
Numerous	20 – 100
Dominant	>100



Results - Biodiversity

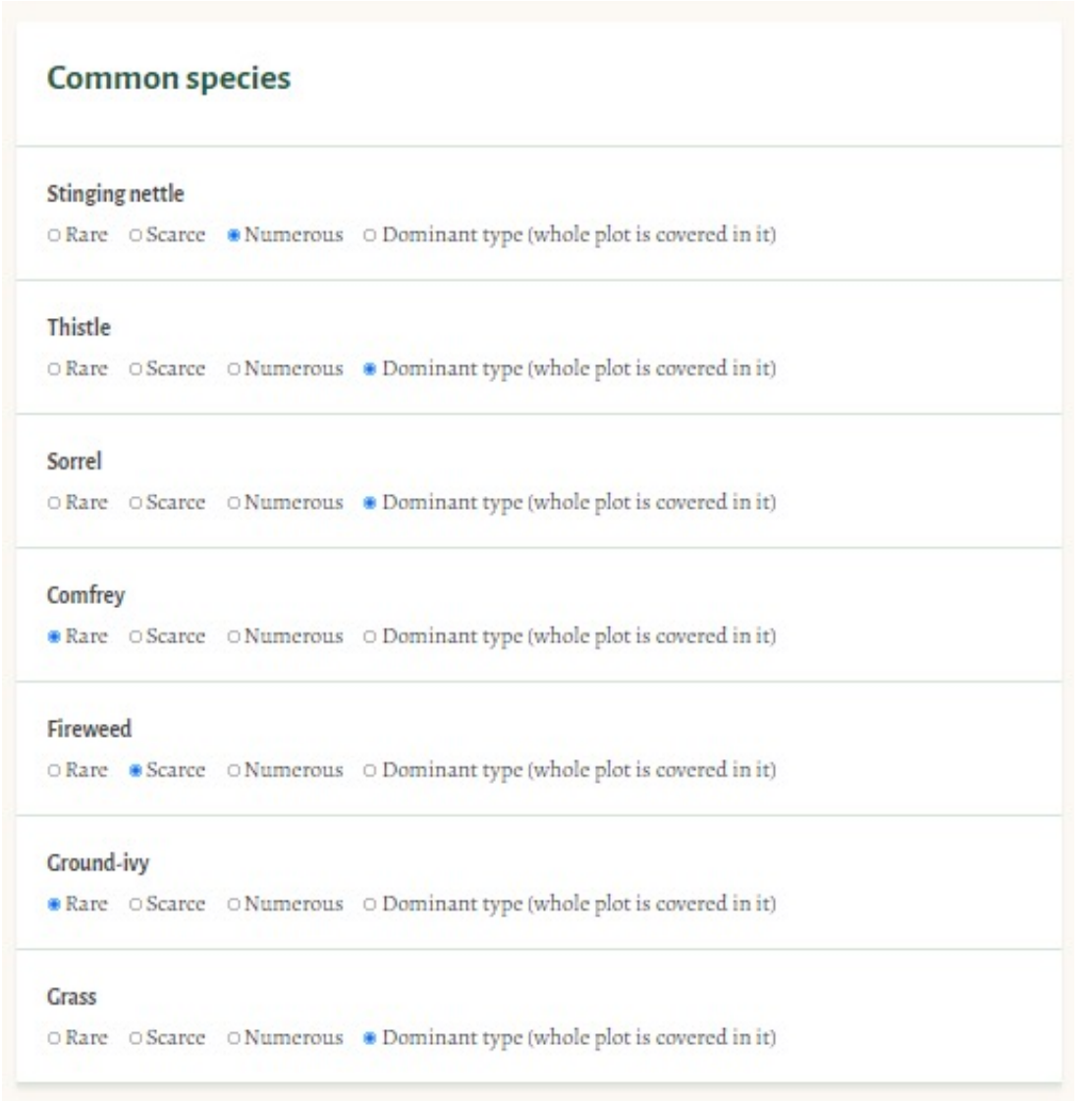
- Correction results owners
- On average 3 plant species difference
- Cover class similar or one class difference
- Richness x abundance
- On average 0.05 difference

Class	Number of plants
Rare	1 – 5
Scarce	5 – 20
Numerous	20 – 100
Dominant	>100

Results - Biodiversity

Improvements

- 30 minutes time limit
- Expanding common species list
- Add box with ‘not present’ to common species list
- Clearer about herbaceous layer
- Connect PlantNet/ObsIdentify with biodiversity tool



Methodology CO2-sequestration

CO2-sequestration in trees test

- Diameter at breast height
- Height
- Arboreal app

Results – C02-sequestration in trees

- On average 2 trees difference
- Shrubs and in- or exclution trees with diameter < 5 cm
- 44% at least twice as much kgCO2/ha

Improvements

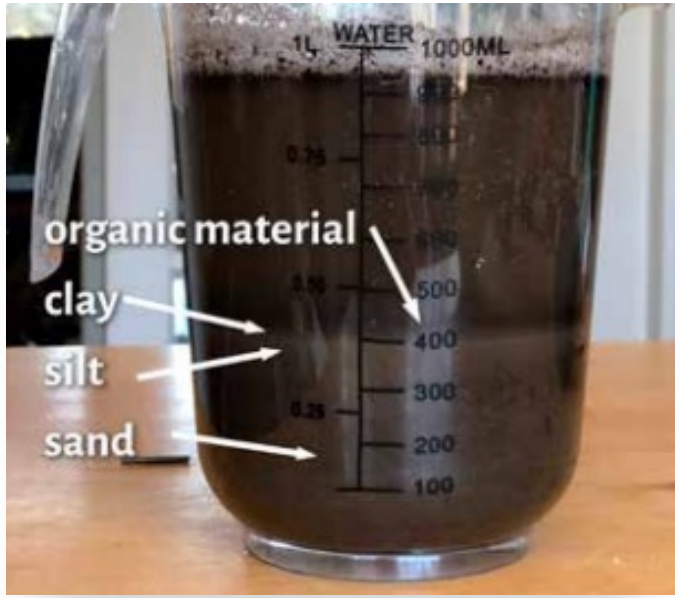
- Explanation measuring shrubs with multiple stems

Food forest	Owner ($kgCO_2$/ha)	Validation ($kgCO_2$/ha)
A	148	238
B	103	321
C1	4	10
C2	8	7
D	0	0
E	**No test**	
F	4,716,568	116,226
G	119,729	129,731
H	**No test**	
I1	527	117
I2	243	50
J	3,910	15,183
K	1,691	1,984
L	2,143	340
M	52,055	48,582
N1	243,320	129,991
N2	97,276	77,171
O	3,724	3,342
P	1,576	124
Q	22	33,071

Methodology soil composition

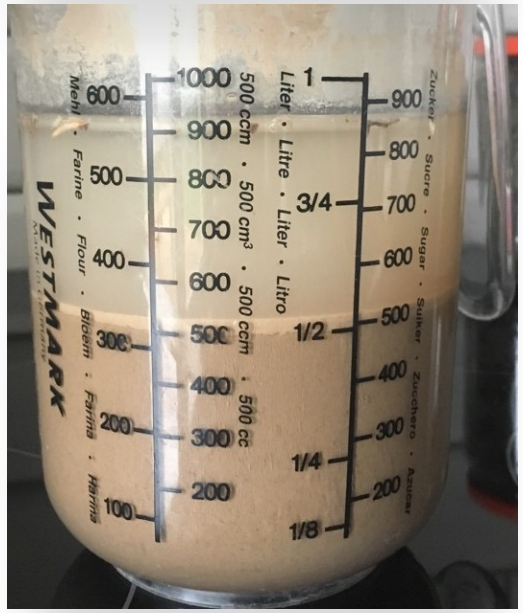
Soil composition and pH test

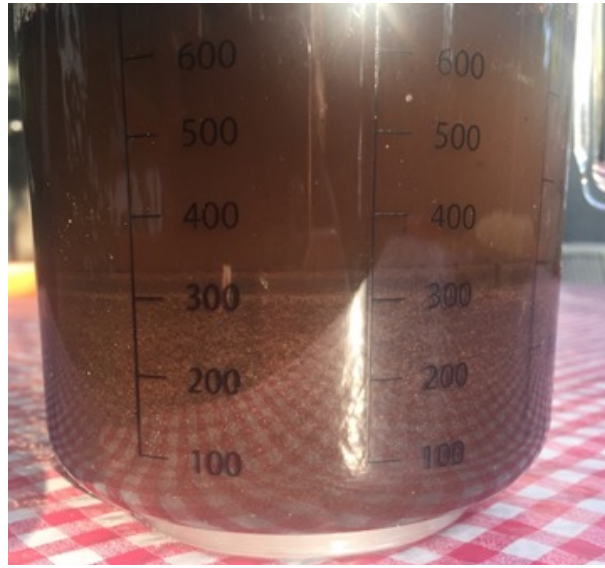
- Soil layers (sand, silt, clay, OM)
- pH



Results - Soil composition and pH

- 15x picture
  - 10 clear
  - 5 unclear
- 4x no picture





Soil composition and pH

Points of improvement

- **Guidelines clear picture**
- Identification of soil layers difficult

➢ **Picture checked by soil expert**

Conclusion & Advice

- **Biodiversity test** – Integrating PlantNet or ObsIdentify
- **CO2 sequestration** – Method for measuring shrubs with multiple stems
- **Soil test** – Layer identification and clear picture too difficult > other options?

- Validation tests 2022

A word of thanks!