Distinguishing Between Condition & Capability

Dr Damien Field
**Inherent**

- Soil Depth
- Texture
- Clay Type (CEC)
- Stoniness

**Manageable**

- Soil organic matter
- Soil Nutrients
- pH
- Macropores
- Bulk Density
- Strength

Time ($t$)
## Soil functions

<table>
<thead>
<tr>
<th>Soil Function</th>
<th>Condition</th>
<th>Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) biomass production</td>
<td>nutrients, pH, Exch. cations, bulk density, ...</td>
<td>texture, CEC, depth, stoniness</td>
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<tr>
<td>ii) storing, filtering and transforming water, nutrients, substances</td>
<td>nutrients, pH, biodiversity, porosity, ...</td>
<td>texture, CEC, depth, ...</td>
</tr>
<tr>
<td>iii) provisioning for habitat and gene pool</td>
<td>biodiversity, ...</td>
<td></td>
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<tr>
<td>iv) cultural environment for mankind</td>
<td>Strength, ...</td>
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<td>v) a resource for building materials</td>
<td>Organic carbon, ...</td>
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<td>vi) acting as a carbon pool</td>
<td>pH, ...</td>
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<td>vii) an archive for archaeological heritage</td>
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</tbody>
</table>
Resilience

Reference State

Soil attribute (e.g. organic carbon)

‘Tipping point’

Change in condition

Re-evaluate the reference state, i.e. its capability
Condition & Capability

Capability

- use inherent soil properties and need to be developed for all soil functions
- reference state

Condition

- range soil properties specifically selected for each of the soil functions

Resilience

- the ability for the soil to return to the reference state
Goal

Reduce soil nutrient depletion by 50% by 2030