Biodiversity impacts of building materials

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Acting for biodiversity

UNIVERSITY of TASMANIA

centre for sustainable architecture with wood CSAW

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Yellow-tailed black cockatoo with E. viminalis flowers, Montagu Bay, Tasmania

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Biodiversity basics

Biodiversity impacts of building materials

Transformation and occupation impacts

Summary

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Yellow-tailed black cockatoo with E. viminalis flowers, Montagu Bay, Tasmania

Biodiversity is:

The variability among living organisms from all sources including… terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

The United Nations (1992)

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Biodiversity provides ecological services that underpin human wellbeing.

Prize shorthorn bull, Royal Hobart Show, Tasmania

We conserve biodiversity to:

maintain the intrinsic value of biodiversity,

meet the current and future needs and wants of humanity

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Living organisms require ***time*** and ***space*** to grow and reproduce.

This ***space*** is any ecosystem that can support species of organisms over time

Living organisms will inhabit any suitable, available ecosystem.

Spider webs on a concrete retaining wall, Rosny Park, Tasmania

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Living organisms require ***time*** and ***space*** to grow and reproduce.

This ***space*** is any ecosystem that can support species of organisms over time

Living organisms will inhabit any suitable, available ecosystem.

Weeds on a driveway, Montagu Bay, Tasmania

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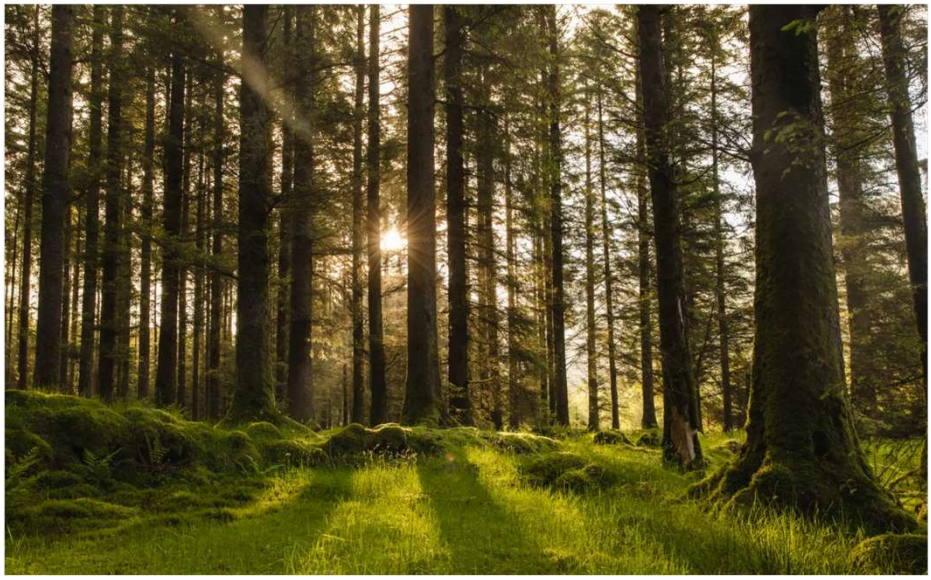

If deprived of adequate ***time*** and ***space,*** regeneration becomes impossible.

If provided with adequate ***time*** and ***space,*** *renaturalisation* can occur and the number, diversity, and resilience of organisms can increase.

Living organisms are *conditionally renewable resources*.

Irish forest, courtesy of Coillte

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Ecosystems are varied and dynamic.

Human interventions impact ecosystem processes.

These alter their potential to support specific organisms.

Constitution dock, Hobart, Tasmania

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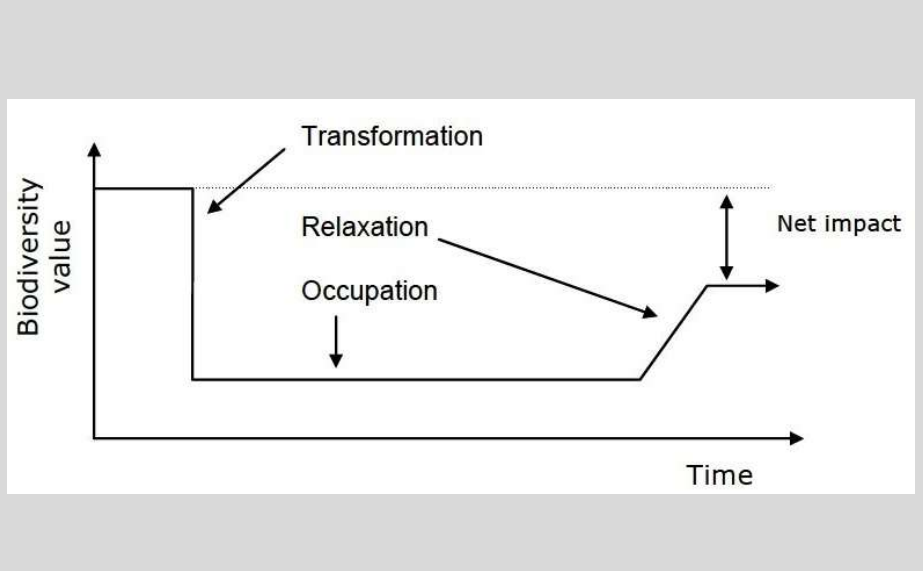

Conceptually, resource acquisition and production for building materials has *transformation*, *occupation* and *relaxation* stages on the biodiversity of a given area of land.

Accounting for transformation impacts for building material and land use in LCAs.

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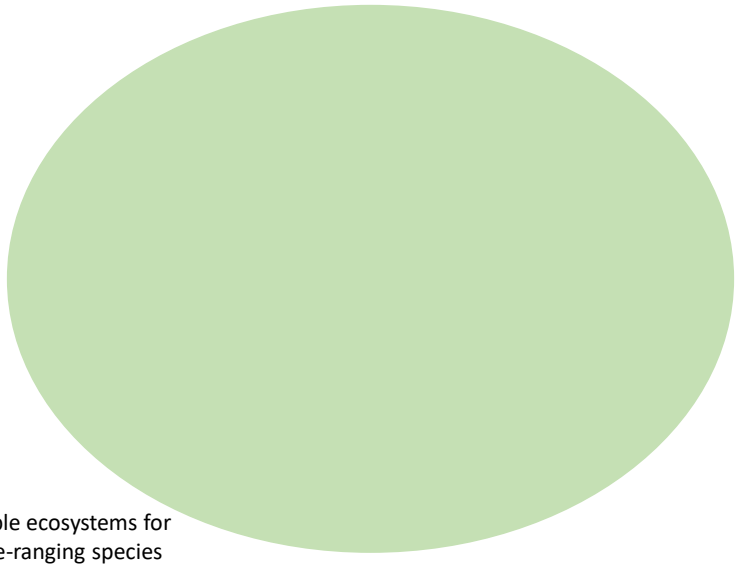
Biodiversity impacts of building materials.

Species interactions in ecosystems vary considerably.



Available ecosystems for a wide-ranging species

Available ecosystems for a narrow-ranging species

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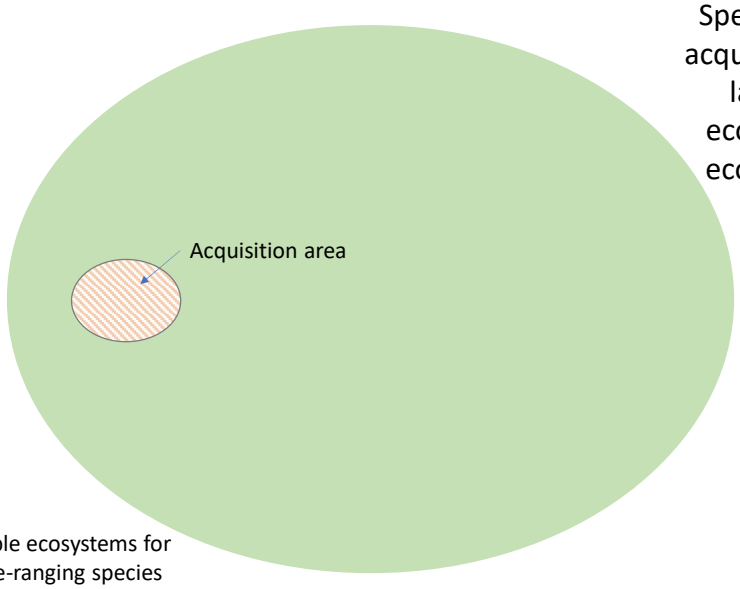
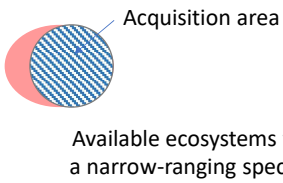
Biodiversity impacts of building materials.

Species may be at risk if resource acquisition or production impacts a large proportion of available ecosystems. Risks are reduced if ecosystems can be regenerated.





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For concrete production, quarrying for limestone and other minerals can impact caves and similar ecosystems for narrow-ranging species.

Regeneration potential of these ecosystems for species may be low.

Mole Creek limestone mine, Mole Creek, Tasmania

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Regeneration potential of these ecosystems for species may be high.

Harvesting in an Irish forest, courtesy of Coillte

For wood product processing, harvesting may have significant local impacts, but only on a small section of the available ecosystem for wide-ranging species.

This assumes sustainably managed forests

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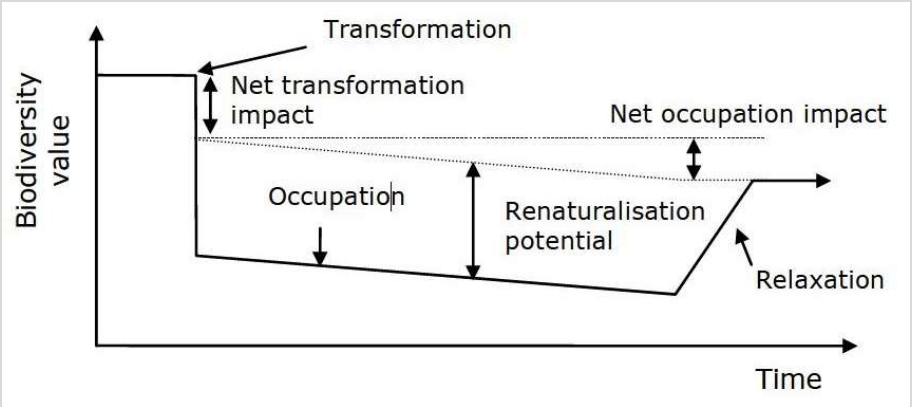

Accounting for transformation and occupation impacts in LCAs.

Biodiversity impacts results from both transformation and occupation.

Occupied sites have a renaturalisation potential that can be realised.

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Accounting for transformation and occupation impacts in LCAs.

Nyrstar zinc production facility in Hobart, Tasmania.

The occupation of material acquisition and production sites and their associated infrastructure:

- Has direct impacts.
- Can suppress renaturalisation. This is the 'biodiversity' opportunity cost.

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Summary

- Biodiversity is a *conditionally* renewable resource.
  - If species or ecosystems are overexploited, regeneration may become impossible.
- Resource acquisition and production of building materials has impacts on the biodiversity of given areas of land.
- These impacts relate to the range and characteristics of affected species, the extent of their available ecosystems, and the area required for resource acquisition.
- Biodiversity impacts results from both the transformation and occupation of land.
- LCA methodology has difficulty in accommodating the temporal and special aspects of organic renewables and biodiversity.

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