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Benefit of replacing pioneer tree species from ecological and social perspective

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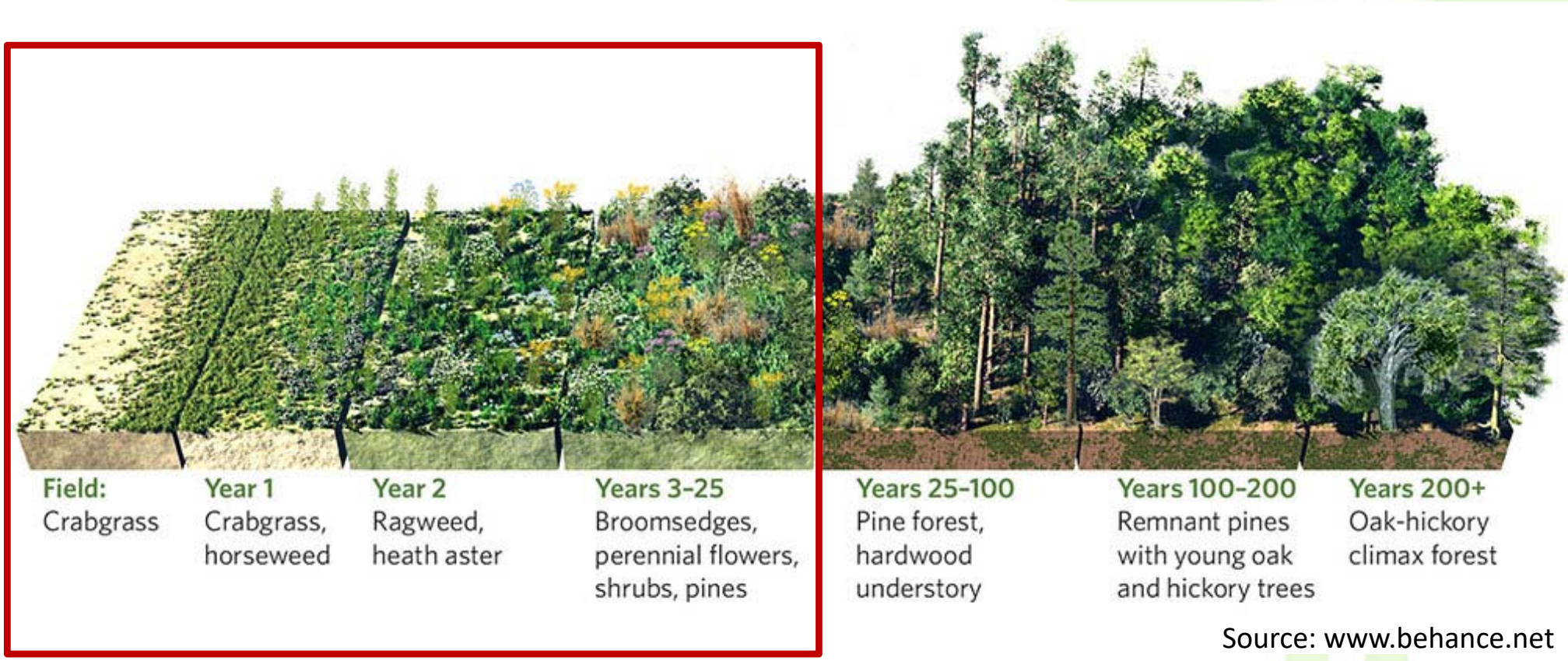
1. Introduction to pioneer tree species

- Pioneer and natural succession



Source: www.behance.net

Rely on pioneer species to improve the condition of the degraded site

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Importance and characteristics of pioneer species

- To adopt poor growing environment:
  - Can survive under exposed, drought, and poor soil condition
  - High competitiveness: fast-growing (*Acacia confusa*, 2m per yr!)[1], producing large amounts of seeds, self-spreading


Lophostemon confertus 紅膠木


Cratoxylum cochinchinense 黃牛木

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Use of pioneer species in Hong Kong


Source: AFCD

Rural area:

Afforestation: to restore degraded hillsides in Hong Kong since 1876[2].

e.g. *Pinus massoniana*, *Acacia confusa*

Urban area:

Planting on engineering slopes since 1970s[3].

2. Why does the replacement of pioneer species is needed? => Ecological Consideration

- Afforestation with few species of pioneer species: low biodiveristy and not regenerative


Nature forest


Exotic plantation

Any chance becoming invasive and widespread?

Leucaena leucocephala 銀合歡

Self-regenerated *Acacia confusa*
台灣相思

=> Social consideration

Public safety

Acacia confusa (台灣相思)

- Introduced to HK since 1927

- 60% trees for afforestation was Acacia by end of 1970s[2]

- Life span in Taiwan is around 70[4] and shorter in HK, such as 50-60 years[5]

- High failure rate in urban area

TMO: 35% of failed trees were *Acacia* (2012)[6]

95,909 in 2018 (high-traffic roadside pedestrians)[7]

Acacia confusa 台灣相思

Decay commonly found on lower trunk and roots of senescent *Acacia*

- Fungal species: *Ganoderma* spp. *and Amauroderma* spp.

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Acacia confusa is commonly planted on slopes. Lower patches being shaded and lean without correct. With decline and decay, the chance of failure, even under normal weather conditions, is high.

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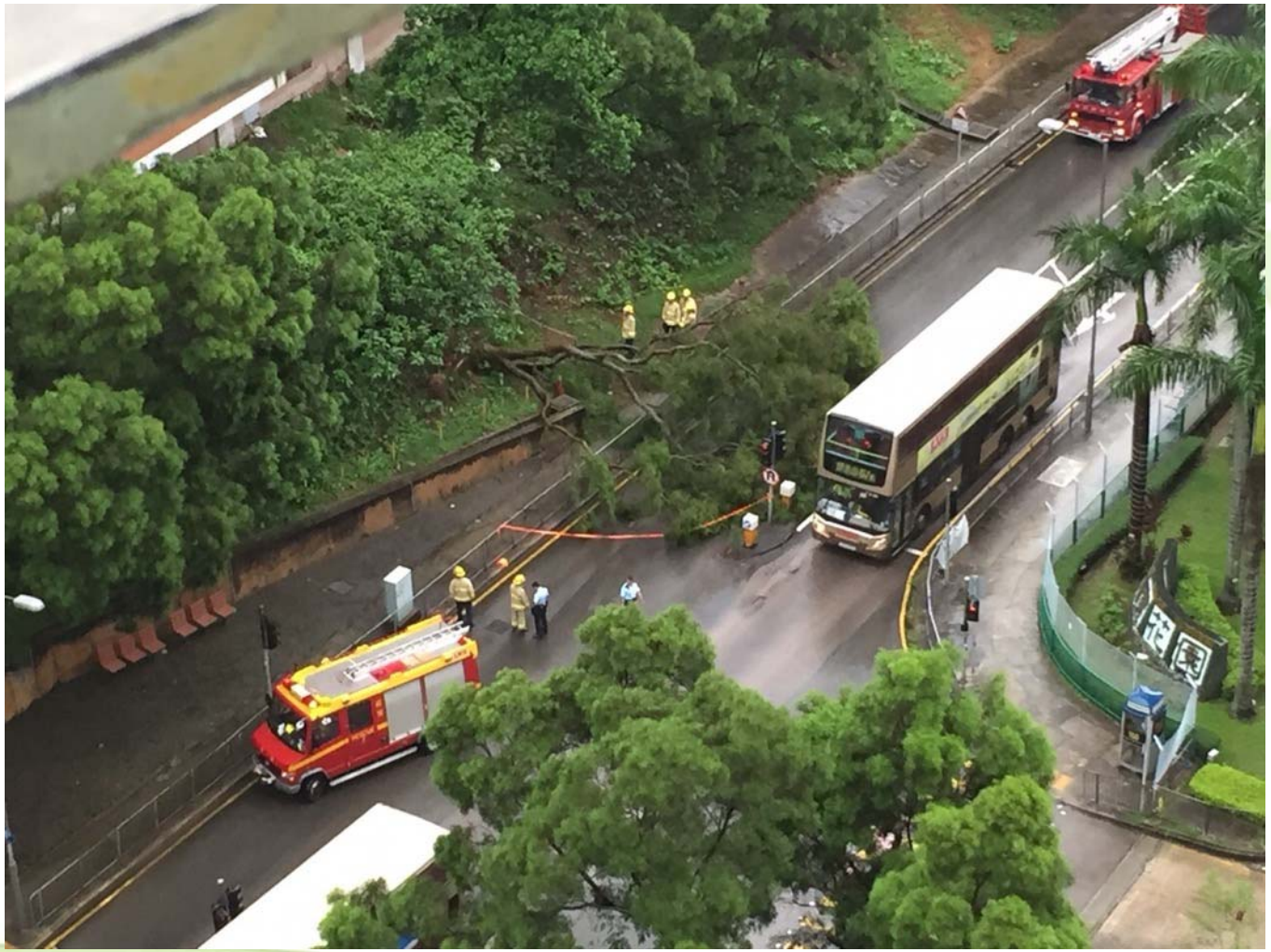
Ma On Shan - 2015



Failed with Root rot

Environment

What is the impact on the community if the *Acacia* trees decline and death?

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3. Examples of replacement planting of senescent exotic species by native species in Hong Kong

Replaced with native Species
Sterculia lanceolata
Cinnamomum burmannii
Viburnum odoratissimum
Litsea cubeba
Celtis timorensis
Schima superba
Rhaphiolepis indica

Yuen Chau Kok – Removed Acacia, planted with native species

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Country Parks Plantation Enrichment Programme (PEP)

- Proactively thin dense stands and remove exotic trees in poor condition and plant with diversified native tree species
- To enhance the biodiversity and long-term woodland sustainability

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Around 50% evenly removal

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4. Long-term benefits of the replacement works

- Biodiversity enhancement, establishing a self-regenerative and stable ecosystem
- Risk reduction: prevent tree failure
- Sustainable urban forest, sustainable benefits
- Enhance climate resilience and liveability

Pui Man Street, 2025

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Thank you!

The Conservancy Association: www.cahk.org.hk