Making Forestry Compatible with Conservation

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The New Zealand Background

- 1,000 years ago, the country was 80% forest
- Moa hunters burned some forest, but still 65% forested when European settlers arrived
- From 1840 to 1920, many forestlands were converted to grasslands
Kauri
Podocarps
Rimu
Red Beech
NZ background continued...

- NZ Forest Service formed 1920 - pledged to create resource of exotic, plantation timber for when native forests could not sustain supplies of timber
- Planted European species – larch, Corsican pine + North American species
NZ Background continued...

- 1930 Identified Pinus radiata as most site-tolerant and best growth, Douglas-fir as closest rival
- 1980 remaining native forests protected as plantations supplied domestic demand
- 1987 Govt Forest Service disbanded, forests sold, Department of Conservation to manage native forests
NZ Background - present forest scene

- Native forest – 23% of land area, plantations 7%
- No timber harvesting from native forests, except on small area of private land – 90,000 ha
- No harvesting of native forests without a Sustainable Management Permit
- 99.9% of total NZ annual forest harvest comes from plantation forests of introduced species
- Radiata pine
- Age 28
- Good site
- Good breeding
Trees to fix weeds
Larch plantation
• Douglas-fir
• Age 77
Douglas-fir cone
ensis

Douglas-fir colonising
P. nigra spreading
Naturalised forest, Naseby
• P. contorta
• Cones early
• Profusely
• Cones open on tree
• Small, winged seeds
P. contorta cones
The crusher
The engine
Why worries?

Wildings are seen to threaten:

- **Landscape values**
  - disrupt existing open and often treeless landscapes

- **Conservation values**
  - dominate/degrade native flora/fauna habitats

- **Existing pastoral uses**
  - shade out grazing species

- **Future land use options**
  - often made more expensive

- **Existing hydrology**
  - lower catchment water yield (>20% catchment)
Major areas of conifer spread (>100/ha) in New Zealand

The majority of these sites involve species rarely planted today
Corsican pine at Mt Barker, L. Coleridge
Plantation design

Edge row of less spread-prone radiata pine around more spread-prone D-fir

Selwyn Plantation Bd
Species – spreading vigour varies
(age of significant coning)

- Contorta pine (*Pinus contorta*) (8)
- Scots pine (*P. sylvestris*) (12)
- Dwarf mountain pine (*P. mugo*) (8)
- Douglas-fir (*Pseudotsuga menziesii*) (12)
- Corsican pine (*Pinus nigra*) (13)
- European larch (*Larix decidua*) (12)
- Radiata pine (*Pinus radiata*) (10)
- Maritime pine (*P. pinaster*) (10)
- Bishops pine (*P. muricata*) (10)
- Ponderosa pine (*P. ponderosa*) (13)
Surrounding land use - grazing

Grazing and seedling survival

Benecke, 1967
Mitigating measures

- **Existing plantations**
  - Removal of spread before coning – particularly outliers
  - Plan for most cost-effective use of limited resources
  - Use of grazing and fertilisers

- **Future plantations**
  - Prevention - assess spread risk (assessment form)
    - Siting – beware of seed take-off sites
    - Surrounding land use
    - Design
  - Particular care with Douglas-fir
    - Improved seedling survival (mychorrizae), and display of cones
Conclusions

• The risk of wilding spread from conifer plantations has to be taken into consideration

• Importance of being knowledgeable about spread and aware of the facts

• Good knowledge means that wilding spread mitigation will become the ‘norm’.

• To use a pastoral analogy – it should be as normal as the awareness of the need to have barriers (normally fences) to mitigate the risk of spread by domestic animals.
The right tree in the right place presents no unwanted wilding risks
Forest Stewardship Certification (FSC)

- Designed to stop clearance of threatened native species
- Impacts on plantations of exotics
  - Need species biodiversity
  - Need plans and actions for controlling tree spread