Validation and enhancement of the spatial economic model for planted forests

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Outline

• Introduction
• Model validation ($)
• Gathering ecosystem services info and need
• Next steps
• Outcomes
Ecosystem services (ES) approach

- Considers the full range of benefits to humans from ecosystems
- Integrates various disciplines to encourage conversations about ecological, social and economic dimensions of complex issues
- Provides the true value of an ecosystem
- Increases visibility of ecosystem services in decision making
Ecosystem services provided by planted forests

The spatial economic model (FIF+)

- A spatial economic model for New Zealand forestry
  - NZ government agencies (policy)
  - Helps identify land where new forests would be economically viable/unviable (NPV)
- Quantifies environmental benefits
  - C-sequestration, avoided sedimentation, flood mitigation

Research motivations

• FIF+ economic component not yet validated
  → Test the validity of economic estimates by applying it on existing forests (case studies)

• There are several ES. FIF+ can accommodate additional ES spatial value layers
  → Identify ecosystem services that can be added into the model
Validation methodology ($)

• Collect spatial and economic data from case study forests
• Test the reliability of estimates
  – FIF+ estimates vs. actual data
• Face-to-face interview with forest managers regarding the:
  – data provided
  – model design and estimates
  – comments on the model
Development methodology (ES)

- Web browsing re ES in the case study forest
- 2nd phase of the face-to-face interview
  - Brief overview of ES
  - Questions on the main ES provided by the case study forests
- Additional information collected via telephone and/or email
### Summary of case studies

<table>
<thead>
<tr>
<th>Case Study Area</th>
<th>Combined Forest Size (ha)</th>
<th>Location</th>
<th>Steps</th>
<th>% Difference (FIF+ vs. Actual)</th>
<th>Data Collection</th>
<th>Test</th>
<th>Interview</th>
<th>Costs</th>
<th>Revenue</th>
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</table>
Validation findings

• Forest managers interviewed satisfied with FIF+
  – Revenue estimates similar to actual
  – Most costs are similar
• Model appropriate for regional and national analysis
• Variation across regions
  – more branchy trees in SI
  – ↑ hindrance factor due to weeds in some NI regions
  – Resource consent for harvesting required in some regions
ES identified in case study forests

• Provisioning
  – Logs, drinking water, native tree timber, firewood, game meat
  – Tree fern for fences, biofuel for cogen of heat and power

• Regulating
  – Carbon sequestration, flood mitigation, avoided sedimentation, avoided N

• Biodiversity conservation
  – Habitats for brown kiwi, fern bird, kereru, blue duck, native fish, kakabeak
  – Participation in biodiversity conservation planning

• Recreation
  – Mountain biking, walking, motor biking, hunting, fishing

• Cultural heritage
  – Native reserves, wetlands
Next steps

• Complete the economic validation

• Model development/enhancement
  – Recreation
    • MTB clubs
  – Biodiversity
    • Species conservation
  – Water quality (e.g. avoided nutrients)
    • Nutrient trading ($400 per kg of N)
    • Nutrient models
Outcomes

• The ability to make forest investment decisions that incorporate the full value of key ecosystem services (e.g. forest products, recreation, biodiversity)

• Better understanding of the full value of planted forests at local and national levels and ability to communicate those values.
http://research.nzfoa.org.nz/
www.scionresearch/gcff

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