Developing Landscape Scenarios: Obtaining and Integrating Expert Knowledge

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US-IALE 25TH ANNIVERSARY SYMPOSIUM
Changing Environment of Conservation

- Ownership patterns
- Drivers of landscape change
- Management goals

- ‘Distributed’ conservation strategies
Motivation

- Are ‘distributed conservation strategies’ effective mechanisms for biodiversity conservation?
- Are they robust to anthropogenic and climate change pressures over the coming centuries?
- Compare different strategies and different spatial arrangement.
- Complement traditional monitoring and adaptive management tools.
Project Aims

Develop and model spatially explicit landscape scenarios to provide insight into possible landscape futures and their outcomes for biodiversity and ecosystem services.
Approach

**Workshop 1: Scenario & Target Advising**
- Construct initial land cover and biophysical conditions map
- Define Alternative Scenarios
  - Conservation Strategy
  - Demand for Woody Biomass
  - Climate Change
  - Select biodiversity & ecosystem service targets

**Workshop 2: Technical Advising**
- Define alternative scenarios
- Form Spatial Narratives Describing Alternative Futures
  - Define transition probabilities (VDDT)
  - Run landscape simulations (TELSA)
  - Map alternative landscape futures
- Evaluate biodiversity & ecosystem service targets

**Workshop 3: Review & Revise, Form Spatial Narratives**

**Workshop 4: Discuss Results & Process**
Approach

Stage 1

- Construct initial land cover and biophysical conditions map
- Define Alternative Scenarios
- Conservation Strategy
- Demand for Woody Biomass
- Climate Change
- Select biodiversity & ecosystem service targets

Workshop 1 SCENARIO & TARGET ADVISING

Workshop 2 TECHNICAL ADVISING

- Form Spatial Narratives Describing Alternative Futures
  - Define transition probabilities (VDDT)
  - Run landscape simulations (TELSA)
  - Maps of alternative landscape futures
  - Evaluate biodiversity & ecosystem service targets

Workshop 3 REVIEW & REVISE, FORM SPATIAL NARRATIVES

Workshop 4 DISCUSS RESULTS & PROCESS

Demand for Woody Biomass
Climate Change
Select biodiversity & ecosystem service targets
Approach

**Stage 2**

- **Workshop 1**
  - **Scenario & Target Advising**
    - Construct initial land cover and biophysical conditions map
    - Select biodiversity & ecosystem service targets

- **Workshop 2**
  - **Technical Advising**
    - Define Alternative Scenarios
    - Conservation Strategy
    - Demand for Woody Biomass
    - Climate Change

- **Workshop 3**
  - **Review & Revise, Form Spatial Narratives**
    - Run landscape simulations (TELSA)
    - Evaluate biodiversity & ecosystem service targets
    - Define transition probabilities (VDDT)
    - Maps of alternative landscape futures

- **Workshop 4**
  - **Discuss Results & Process**
    - Stage 2
Benefits of a collaborative approach

- Local knowledge fills in gaps
- Compensate for irreducible uncertainty
- **Engages** diverse set of experts and practitioners
- **Balance** multiple perspectives and goals
- Generates **locally relevant**, **transferable** outcomes
- Increased **credibility** and **legitimacy** of outcomes
- Sets the stage for **continued cooperation**
Study Sites

Wild Rivers Legacy Forest

26,300 hectares

Two Hearted River Watershed

46,500 hectares
Landscape Scenarios

- **Exploratory scenarios**
  - Extend past trends
  - Anticipate change different from past

- **On-site workshop at each study location**

- **Local experts**
  - Foresters
  - TIMO managers
  - DNR biologists and managers
  - TNC experts
Scenario Development

Which climate variables are most important?

What conservation strategies could be applied in this landscape?

Will there be a demand for woody biomass for energy production?

How might these components influence forest dynamics?

Landscape Scenario
## Workshop Outcomes

<table>
<thead>
<tr>
<th>Conservation Strategies</th>
<th>Drivers of Landscape Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No conservation action</td>
<td>• Climate Change</td>
</tr>
<tr>
<td>• Current action</td>
<td>○ Seasonal precipitation</td>
</tr>
<tr>
<td>• All working forest</td>
<td>○ Seasonal temperature</td>
</tr>
<tr>
<td>conservation easement</td>
<td>• Harvest of Woody Biomass</td>
</tr>
<tr>
<td>• No Forest Stewardship</td>
<td>○ 25 yr time horizon</td>
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<tr>
<td>Council certification</td>
<td>○ Decreased residue</td>
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<tr>
<td>• Cooperative ecological</td>
<td>○ Changes in harvest</td>
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<td>forestry</td>
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</tbody>
</table>
Special Considerations

- Selection of participants
- Past experiences of participants
- Drawing boundaries
- Careful mediation
- Continued participation
Next Steps: Integrating Scenarios and Modeling

Model landscape scenarios

Generate land cover maps for alternative scenarios

Expert evaluation and feedback
Anticipated Outcomes

- Enable comparison of conservation strategies
- Complement long-term monitoring
- Enable adjustment of strategies to anticipated future conditions
- Inform ongoing and future conservation opportunities
- Useful tool for pre-assessing landscape scale conservation strategies
Questions?

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