

Consequences of regional scale forest management on future forest resources where a number of decision makers exist

B-1

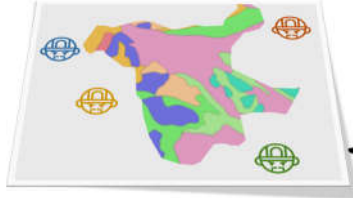


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The consequences of zoning on individual forest activities were simulated by using Bayesian network model. As a result, zoning influences where and when harvest occurs. It means that regional scale forest management can achieve sustainable forest management (SFM).

Introduction

While forming a regional level forest management plan, plural and independent decision makers may exist and not fully understand or obey the intent of the regional manager. In order to achieve sustainable forest management (SFM), it is needed to reveal how this relationship effects future forest resources.

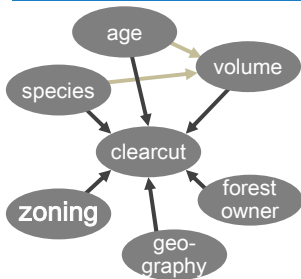


Objectives

- To estimate relationships between zoning and individual forest activities.
- To predict the consequences of forest zoning as regional level forest management on forest activities.

Model to predict future forest

Constructing Bayesian Network



To know relationships between forest activities and each forest condition

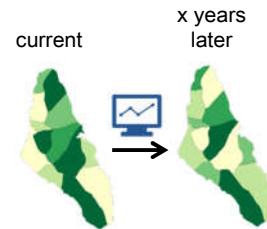
Extracting conditional probability (CPT)

Ex.

age	volume	zoning	clear-cut
A	A	A	0.50
A	A	B	0.25
B	B	A	0.05
B	B	B	0.01
⋮	⋮	⋮	⋮

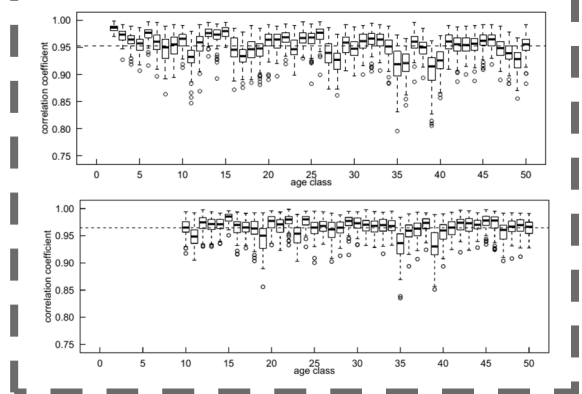
To calculate a probability of forest activity occurring for each forest condition

Simulating future forest activities



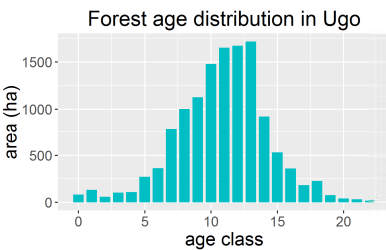
To predict WHERE and WHEN forest activities occur with CPT

Model verification



Application to Study Area

Study area : Ugo, Akita



Factors considered :

- age
- slope angle
- species
- dist. from road
- area
- stand volume
- zoning
- absence of forest owner

Zoning :

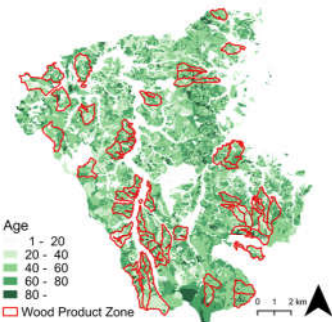
Current forest zoning

Old forest area was assigned as wood product zone by municipal government.

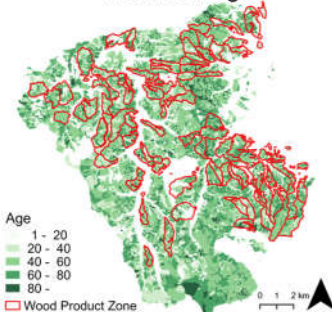
Forest zoning emphasizing wood product (EWP)

Wood product zone was assigned considering slope angle, stand index, and Sugi plantation area ratio.

Current Forest Zoning in Ugo

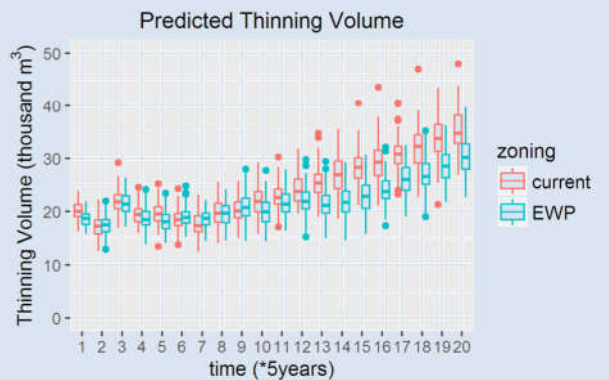
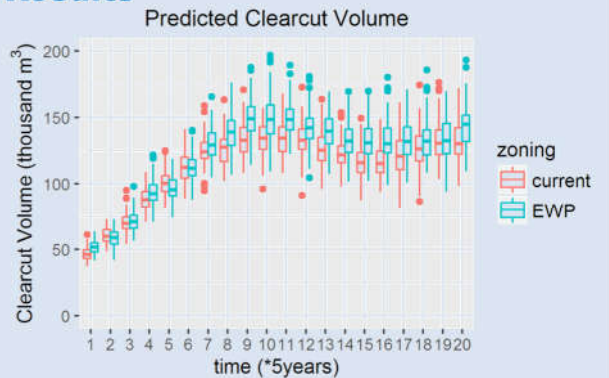


Forest Zoning Emphasizing Wood Product in Ugo



Initial year : 2015
Years learned : 2013, 14, 15
Simulation period : 100 years
Number of trials : 100

Results



Conclusion

- Bayesian network can be a useful tool to understand the relationship between regional scales and individual decision makings for forest activities,
- Regional scale management influences where and when harvest occurs.

➡ Regional scale management can achieve SFM by inducing individual forest activities.

