Effects of forest certification on biodiversity

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Making Knowledge Work for Forests and People

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Certification in the tropics

- Concern about tropical forest biodiversity has been a major driver of certification of sustainable forest management
- It has been a major, practical mechanism for reducing forest biodiversity loss (among other objectives) since the 1990s

Extent of forests certified

- >300 million ha of forest have been certified
- But did it work for tropical forests?

System	Countries	# Certificates	Area (m ha)	In Tropics
FSC	81	940	102.5	13%
PEFC	19	620	223.0	0%
MTCS	1	8	4.4	100%

Status November 2008

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Problems

The question of logging impacts on biodiversity is not easily answered

- Logging is very complex and variable
- Biodiversity is a complex concept, and hard to measure directly
- Certification is very hard to describe
  - 10 principles, >50 criteria, countless indicators
  - Variation between countries and systems

Logging

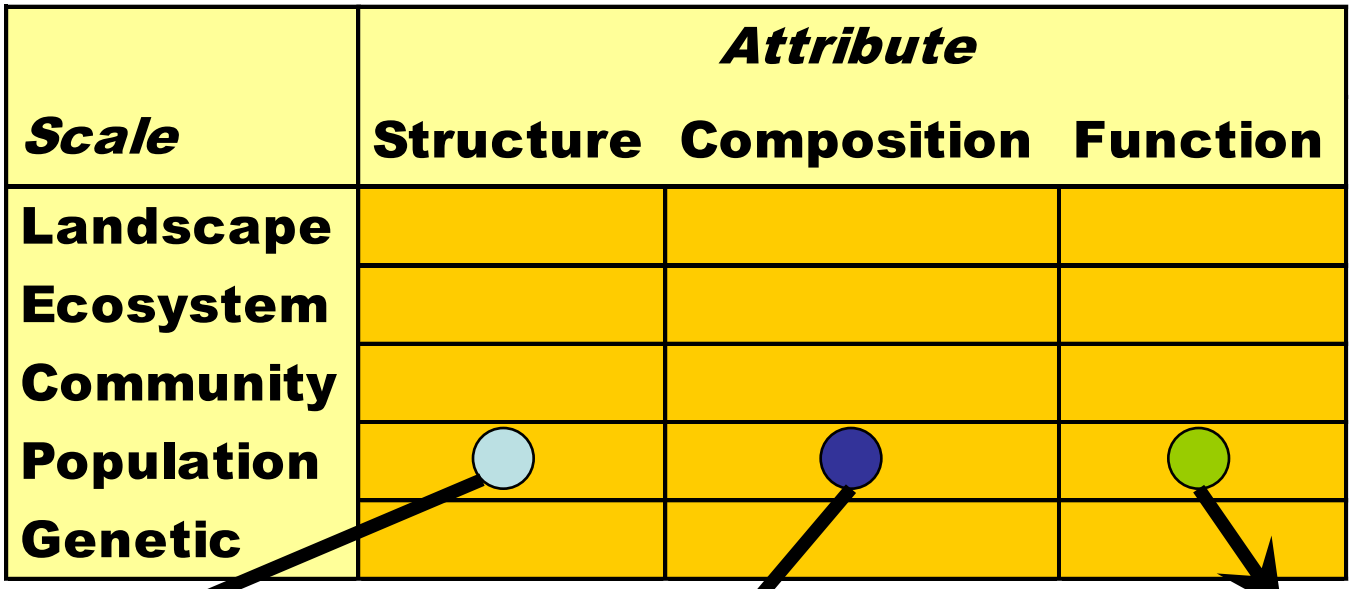
- Many components of logging affect biodiversity, in different ways
  - Logging intensity
    - Gap size, damage, direct removal of species and food resources
  - Extraction method
  - Species selection
  - Silviculture
    - Liana cutting, post harvest liberation, etc
  - Road building

Scales and attributes

- Biodiversity can be defined at different scales which can all be affected by logging
  - From landscapes to genes
- Each component has certain attributes
  - Structure
    - the physical organization or pattern of the elements
  - Composition
    - the identity and variety of the elements in each of the biodiversity components
  - Function
    - ecological and evolutionary processes acting among the elements

Putz et al 2000

Examples



Sex and age/size ratios; range and dispersion

Species abundance distributions, biomass, or density; frequency; importance or cover value

Demographic processes (e.g., survivorship, fertility, recruitment, and dispersal); growth rates; phenology

Practical definition

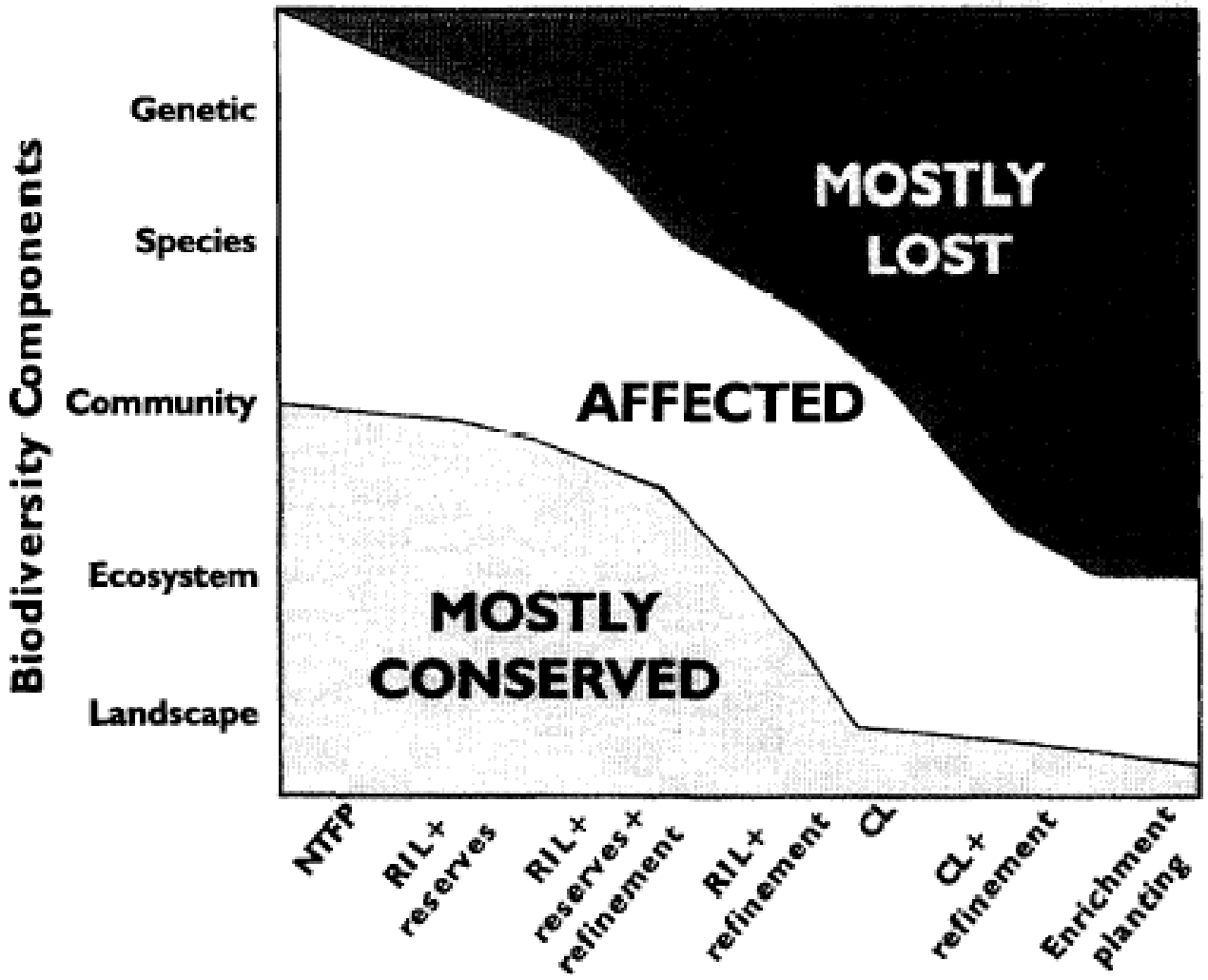
- Most practical definitions of biodiversity relate to the number of species (in a community) and the abundance of individuals (of a species)

Scale	*Attribute*		
	Structure	**Composition**	**Function**
Landscape			
Ecosystem			
Community			
Population			
Genetic			

Impacts of logging

- Some generalizations
  - Decline of harvested species, of understorey and food specialists
  - Increase of gap-loving, generalist species
  - In general, the more ecologically specialized a species is, the higher the probability of a decline in population size or even local extirpation after logging
  - Short-term increases in species diversity are not uncommon
  - Long-term effects poorly known
  - Indirect effects (hunting!, human invasion!) can be more important than direct effects

Impacts depend on scale and management intensity



Putz et al. 2000

Variability

- Impacts vary with logging intensity, method and time scale
- Responses between species are variable
- Responses within species, too, e.g. depending on the time of the year

Conclusions

- on the effect of logging on biodiversity:
  - Managed forests contain a high degree of biodiversity
  - Well-managed forests can be an important element of conservation strategies (in addition to protected areas)
  - Management has a large influence on the amount of biodiversity that can be protected in managed forests

Certification study

- Well-managed forests…

… forest certification

- Are certified forests in the tropics better off in terms of biodiversity?
- Comparison between certified and conventionally logged forests
- Literature study on the effects of ‘certified forest management’ on biodiversity
  - Commissioned by Netherlands Environmental Assessment Board
  - Carried out by Tropenbos International

Certification study

- Literature study on effects of certification and of associated 'good management practices':
  - Reduced Impact Logging
  - Riparian buffers
  - Protected areas
  - HCVF
  - Corridors
- Not considered: hunting, chemical and waste management, human invasion, and indirect effects

First conclusion

Fairly little is known about the effects of certification on biodiversity

Published studies about the relation of certification practices and biodiversity in the tropics	
Certification	1
RIL	17
Riparian buffers	1
Protected areas	1
HCVF	0
Corridors	4

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Certification

- (Only) one study on ‘certification’ (Sabah)
- RIL and HCVF
- denser populations of endangered large animals including orangutans and elephants than elsewhere in Sabah
- trees and soil macrofauna showed that use of RIL had biodiversity benefits
- No data!

RIL

- RIL effects are relatively well-studied
- Effects on biodiversity are generally positive

Group	Effect	Source
Bats	+	Castro-Arellano et al 2007
Mammals	+	Mannan 2008
Trees	+	Mannan 2008
Tree regeneration	-	Kukkonen et al. (2008)
Dung beetles	+	Davis 2000
Soil macrofauna	+	Mannan 2008
Flying insects	+	Mannan 2008

Other

- Protection of buffer zones is positive by protecting habitat specialists
- Protected areas within concessions have a positive effect on biodiversity
- Protection of corridors between patches of undisturbed forests is positive
- Conclusions are based on very few studies
- No studies on HCVF!

Conclusions

- There is uncertainty
  - Conclusive, quantitative evidence about the effect of forest certification on biodiversity is lacking
  - Little quantitative evidence about the long-term effects of certified forest management
  - There is a very high variation, both in forest management practices associated with certification and in responses between and even within species

Main conclusion

In general, good forest management practices associated with forest certification appear to benefit biodiversity in managed forests

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Constraints

- Our ability to make statements about certification effects is limited by
  - a lack of detailed species knowledge
  - variation in species responses
  - the absence of comprehensive research protocols suitable for establishing certification impacts
  - poor articulation of biodiversity objectives in forest management units
  - variation in certification standards between countries, forest types and certification systems
  - variation in auditing standards

- The last four points have nothing to do with effects of forest management, but with setting goals and the process of research and of certification itself

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What to do about it?

- The setting of objectives is critical
- Biodiversity objectives in forest management units are poorly articulated
  - All species are not equal.
  - Different stakeholders value different species in a different way according to their interests and values.
  - Different species have different functions in the forest ecosystem according to the role they play and their abundance in natural forests.

Negotiation

- The setting of goals of SFM requires debate and negotiation at the local level (but not dismissing global interests).

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Goals of SFM

- Must be translated into practical management objectives
- Directed at specific, measurable biodiversity targets
  - Which species, at what levels of abundance?
- Subject to periodic revision to accommodate
  - Changes in value perception by stakeholders
  - Changes in the state of biodiversity in the forest.

Scientists

- Must provide solid, quantitative, field-based evidence about the relation between forest management practices and species responses,
- and about the need for further modifications of forest management practices required.
- Develop comparable protocols

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Certifiers and auditors

- Monitoring of biodiversity and auditing of certified forest management should focus on these management objectives, rather than on general, unspecified biodiversity goals which are almost impossible to measure and, if they are measured, hard to interpret.


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