

Master thesis

Sylvain SCHMITT

2017-05-30

Mémoire de stage

présenté par
Sylvain SCHMITT

pour obtenir le diplôme national de master
mention Biodiversité, écologie, évolution
parcours Biodiversité végétale et gestion des écosystèmes tropicaux (BIOGET)

Sujet :
(COMPLETER)

soutenu publiquement le XX xxxx 201X

à (COMPLETER par la ville du lieu de soutenance)

devant le jury suivant : (Titre = DR pour docteur et Pr pour professeur)

Titre Prénom NOM

Tuteur de stage

Titre Prénom NOM

Examineur

Titre Prénom NOM

Examineur

Titre Prénom NOM

Enseignant-référent

Contents

Résumé et Abstract	3
Acknowledgments	3
Introduction	3
1 Materials and methods	4
1.1 TROLL simulator	4
1.2 TROLL sensitivity analysis	4
1.3 Disturbance	4
1.4 Selective logging	4
2 Results	5
3 Discussion	5

Résumé et Abstract

Écrire le résumé français ici...

Write the english abstract here...

Acknowledgments

I would like to thank...

Introduction

- Introduce why tropical rainforest are such a good study case
- Define biodiversity
- Define ecosystem functioning
- Define ecosystem services
- Introduce tropical silviculture
- Define selective logging
- Introduce biodiversity erosion in tropical rainforests and its impact
- Introduce Loreau partitionning
- Introduce the interest of modelling
- Introduce the idea to look at biodiversity as both a parameter and an output

Tropical rainforests have fascinated ecologists due to their outstanding diversity [Connell, 1978].

Tropical forests are primary ecosystems in terms of biodiversity and carbon storage [Lewis et al., 2004].

High biodiversity from tropical rainforests is the source of many ecosystem functions, which support ecosystem services.

Biodiversity and ecosystem functioning field is emerging [Loreau, 2000].

Selective logging is increasing in tropical forests.

Tropical logging accounts for one eighth of global timber production [Blaser et al., 2011].

Selective logging represents a major threat to biodiversity [Gibson et al., 2013].

1 Materials and methods

1.1 TROLL simulator

1.1.1 Abiotic environment

1.1.2 Photosynthesis

1.1.3 Autotrophic respiration

1.1.4 Carbon uptake

1.1.5 Tree growth

1.1.6 Seed dispersion, production and recruitment

1.1.7 Mortality

1.2 TROLL sensitivity analysis

1.2.1 Functional traits

1.2.2 Seed rain

1.3 Disturbance

1.3.1 Disturbance module

1.3.2 Design of experiment

1.3.3 Outputs analysis ?

1.3.3.1 Resistance and resilience metrics

1.3.3.2 Biodiversity partitioning

1.4 Selective logging

1.4.1 Selective logging module

1.4.1.1 Designation

1.4.1.2 Selection

1.4.1.3 Rotten trees

1.4.1.4 Felling

1.4.1.5 Tracks

1.4.1.6 Gap damages

1.4.2 Design of experiment

1.4.3 Outputs analysis ?

1.4.3.1 Resistance and resilience metrics

1.4.3.2 Biodiversity partitioning

2 Results

3 Discussion

References

- J Blaser, A Sarre, D Poore, and S Johnson. No Title. *International Tropical Timber Organization, Yokohoma, Japan*, 2011.
- Joseph H Connell. Diversity in tropical rain forests and coral reefs. *Science*, 199(4335):1302–1310, 1978. URL <http://www.colby.edu/reload/biology/BI358j/Readings/Diversityinrainforestsandcoralreefs.pdf>.
- Luke Gibson, Tien Ming Lee, Lian Pin Koh, Barry W. Brook, Toby A. Gardner, Jos Barlow, Carlos A. Peres, Corey J. A. Bradshaw, William F. Laurance, Thomas E. Lovejoy, and Navjot S. Sodhi. Corrigendum: Primary forests are irreplaceable for sustaining tropical biodiversity. *Nature*, 505(7485):710–710, 2013. ISSN 0028-0836. doi: 10.1038/nature12933. URL <http://www.nature.com/doifinder/10.1038/nature12933>.
- Simon L. Lewis, Malhi Yadvinder, and Phillips Oliver L. Fingerprinting the impacts of global change on tropical forests. *Philosophical Transactions: Biological Sciences*, 359(1443):437–462, 2004. ISSN 0962-8436. doi: 10.1098/rstb.2003.1432. URL <http://rstb.royalsocietypublishing.org/content/359/1443/437.short><http://www.jstor.org/stable/4142193>.
- M Loreau. Biodiversity and ecosystem functioning: recent theoretical advances. *Oikos*, 91(May):3–17, 2000. ISSN 1600-0706. doi: doi:10.1034/j.1600-0706.2000.910101.x. URL <http://onlinelibrary.wiley.com/doi/10.1034/j.1600-0706.2000.910101.x/full>.