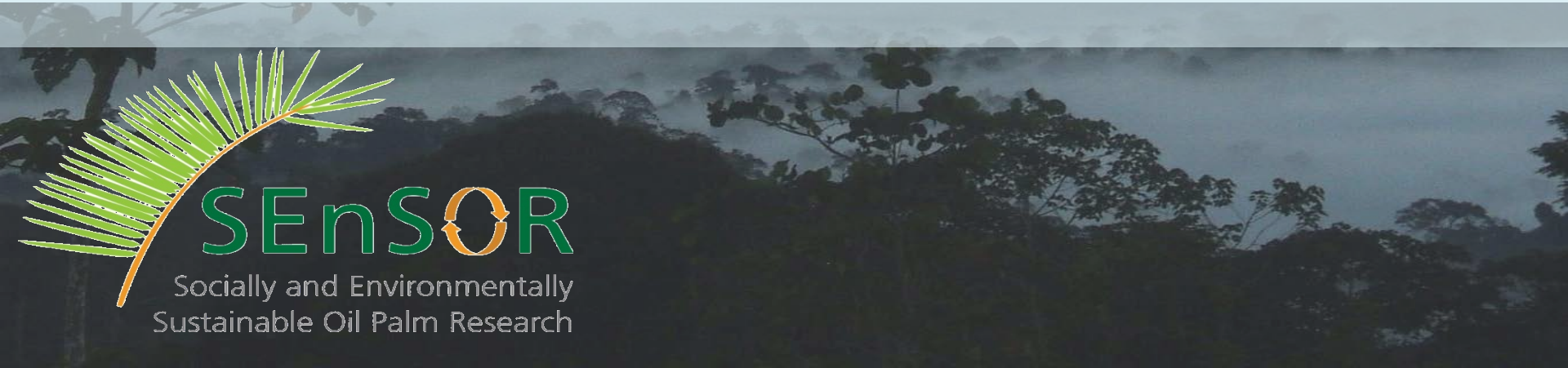
New Outputs from SEnSOR: Gaining Co-benefits for Biodiversity and Carbon Storage within Plantations

Dr Jennifer Lucey*
Co authors: Prof Jane Hill*, Dr Glen Reynolds^
*University of York/ ^SEARRP



SEnSOR

Socially and Environmentally Sustainable Oil Palm Research

Overall aim: to test the impact of RSPO certification on social and environmental sustainability

We do this by:

- establishing baselines
- testing the effectiveness of the application of RSPO's P&Cs
- identifying scope and methods for improvement

We received our first significant tranche of funding this September from the RSPO

- conducting new analysis of available data to answer key questions --biodiversity, soil, water and GHGs, and social issues.
- fieldwork to test a new forest quality assessment
- establishing the experimental network and looking for match funding to expand the project in year 2 two and beyond


Findings
from our
latest
study

One of the key areas of for policy development within the RSPO is how to incorporate criteria for conserving **high carbon stock** (HCS) land

The RSPO stipulates that Growers should conserve areas of High Carbon stock

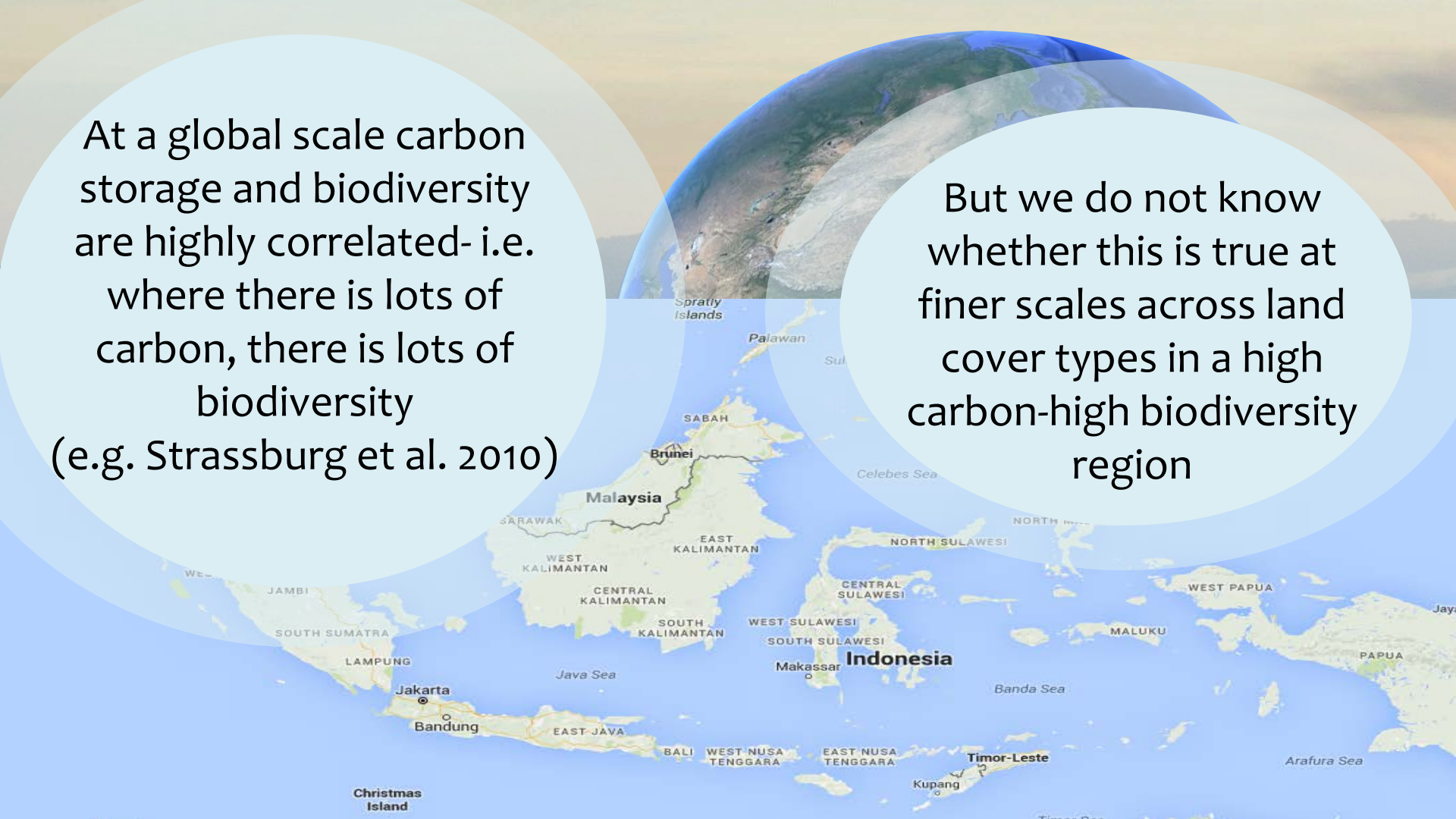
But a process for achieving this is not yet in place

The HCS approach and HCS study are attempting to define High Carbon Stock and how to identify it

There is already a process in place for setting aside important biodiversity areas- **the HCV process**

So if there is an overlap between HCS and HCV areas, policy for these two ecosystem services could be **streamlined**

At a global scale carbon storage and biodiversity are highly correlated- i.e. where there is lots of carbon, there is lots of biodiversity
(e.g. Strassburg et al. 2010)



But we do not know whether this is true at finer scales across land cover types in a high carbon-high biodiversity region

Aim

To synthesize current scientific information to **help** oil palm policy makers **make land-use decisions** which **jointly meet biodiversity and carbon conservation agendas**

Method

To establish the baseline to test whether RSPO is having an impact on biodiversity and carbon conservation

Compares **Above Ground Carbon (AGC)** and **Biodiversity** across a gradient of land-uses

Focus region

Malaysia and Indonesia

- >80% of global production
- Good level of data for a range of land uses

Biodiversity

In this study, **“biodiversity”** refers to the **number of species per unit area** and this is the unit of comparison across land-uses.

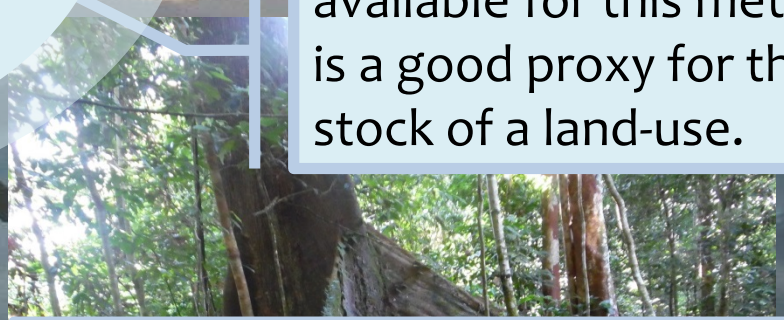
The number of species is important for understanding how healthy a habitat is

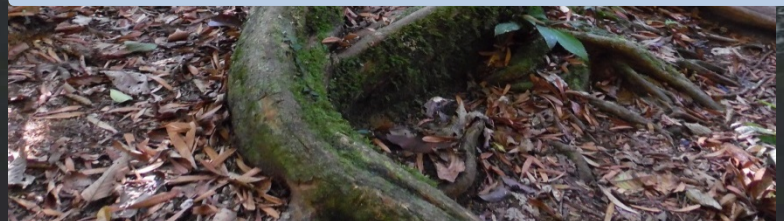
A wide variety of species creates resilience

We don’t quantify the effects on any “special” group of species, e.g. iconic or endangered species- but I will talk about these

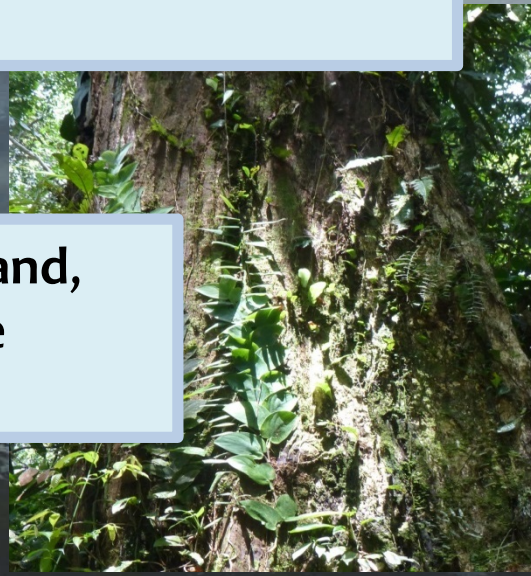
Carbon

This study focuses on **Above Ground Carbon** because there is good data available for this metric and in general it is a good proxy for the total carbon stock of a land-use.





The exception to this is for peat land, where vast amounts of carbon are stored in the soil.



Landuses examined

Primary forest

Logged forest

Fragmented forest

Oil palm

Rubber and acacia

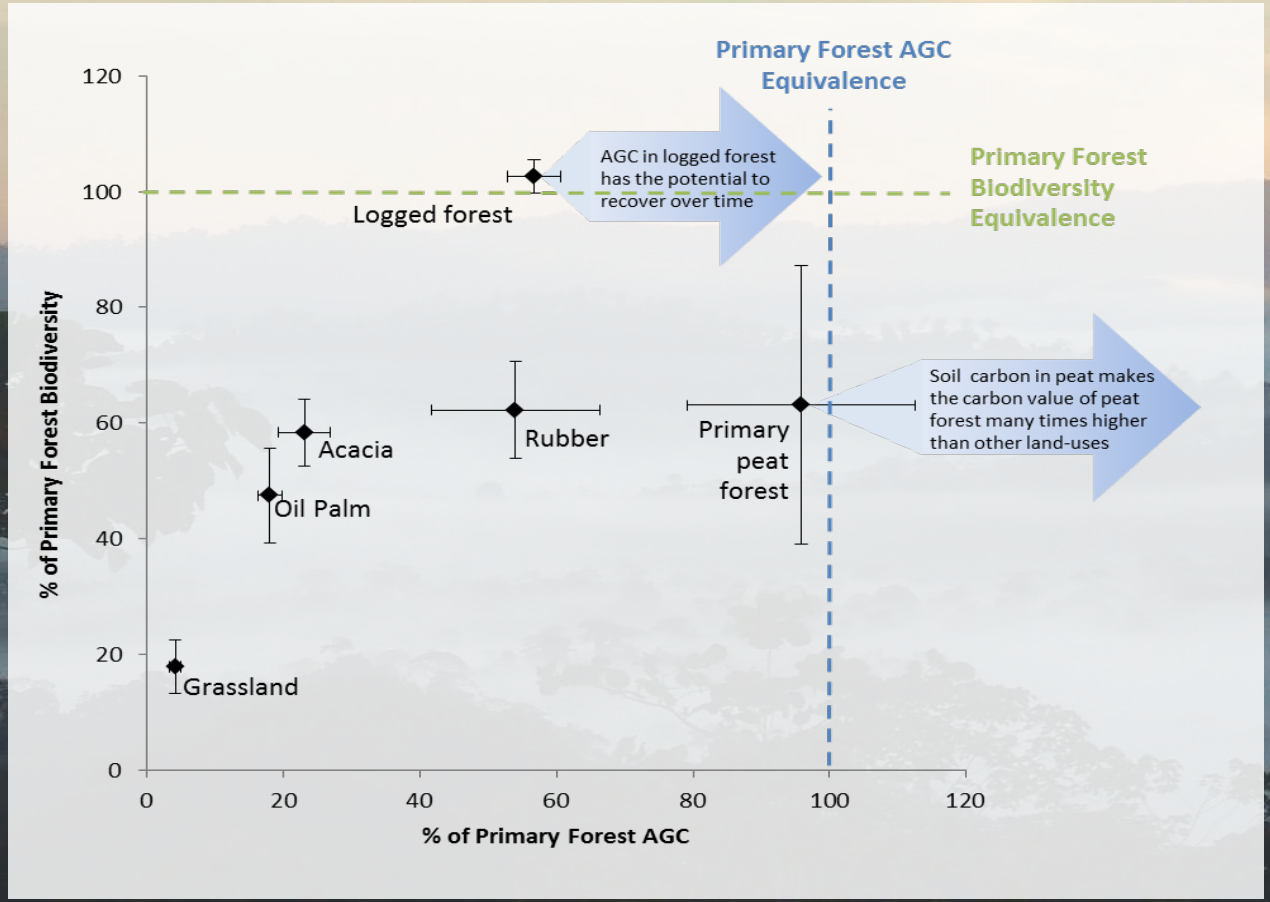
Grassland and scrub

Biodiversity data: over 40 published studies

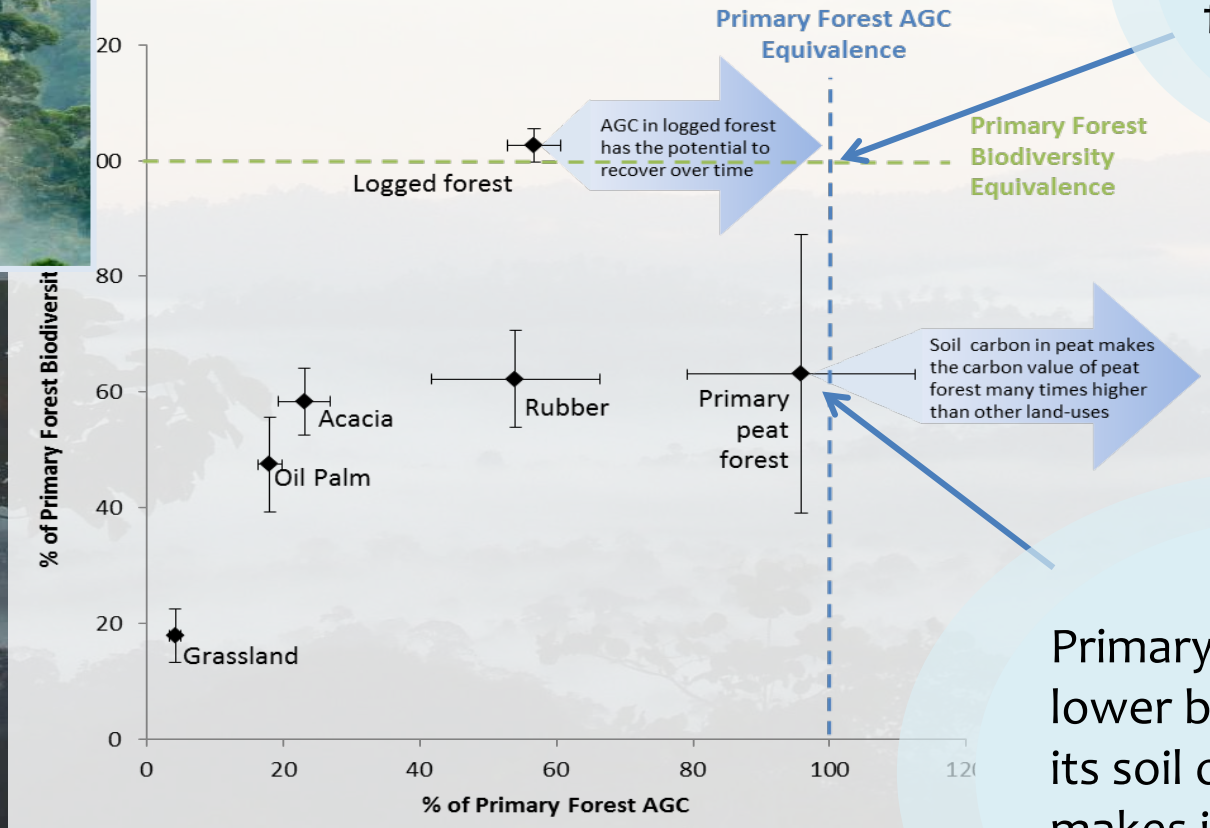
Carbon data: from the exhaustive set of published carbon information collected by Zeigler et al. (2012)

Reference point: primary forest

We converted all values for biodiversity and carbon to a percentage of what is found in lowland primary forest in mineral soil


Primary Forest AGC Equivalence
Primary Forest Biodiversity Equivalence
AGC in logged forest has the potential to recover over time
Soil carbon in peat makes the carbon value of peat forest many times higher than other land-uses
Logged forest
Acacia
Oil Palm
Rubber
Primary peat forest
Grassland
% of Primary Forest Biodiversity
% of Primary Forest AGC
0
20
40
60
80
100
120

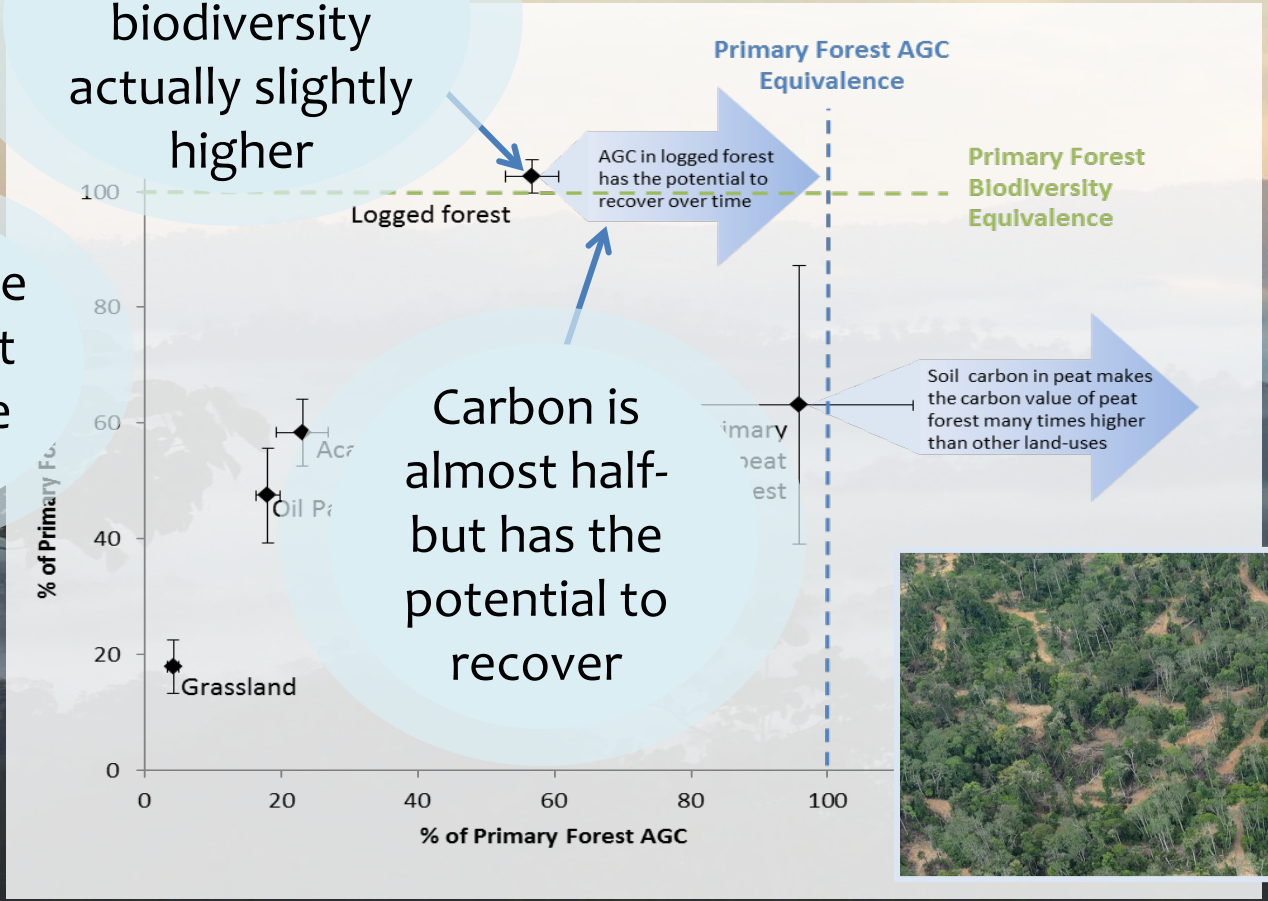
Primary forest levels



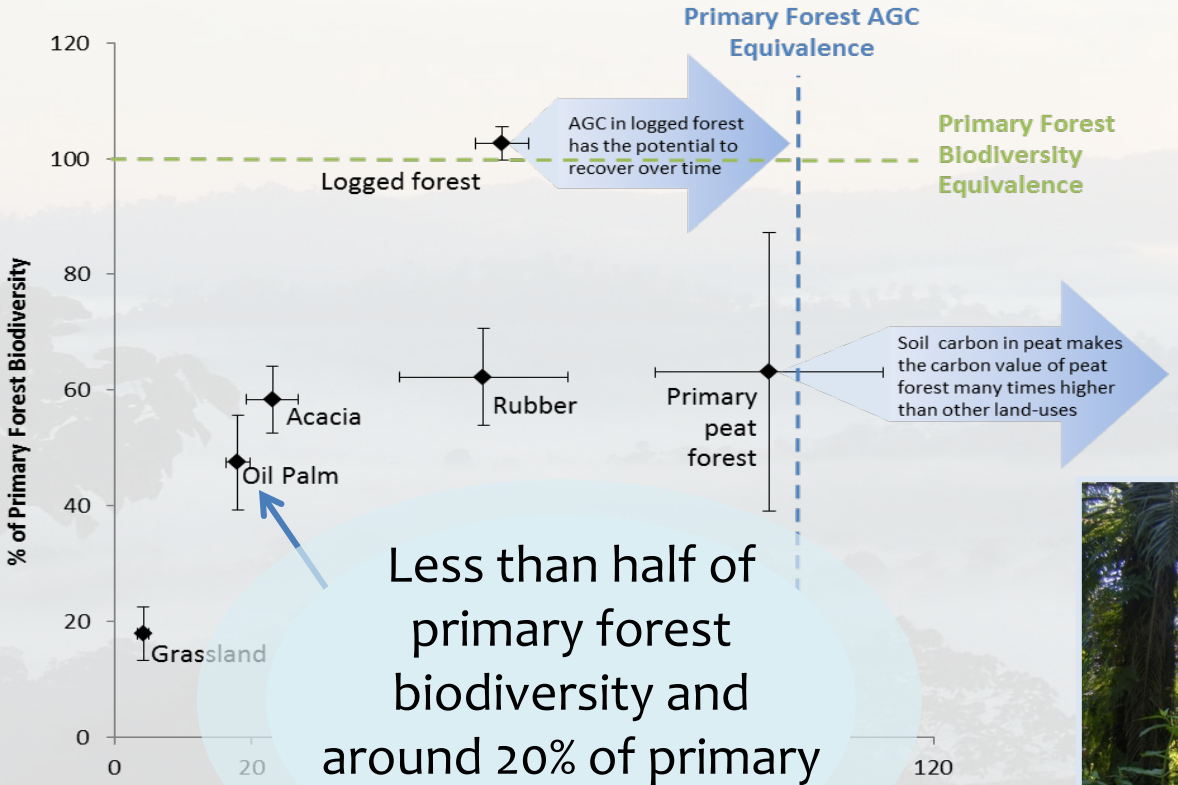
Primary peat forest has lower biodiversity, but its soil organic carbon makes it extremely important for carbon

Total biodiversity actually slightly higher

Although some primary forest specialists are missing



Carbon is almost half- but has the potential to recover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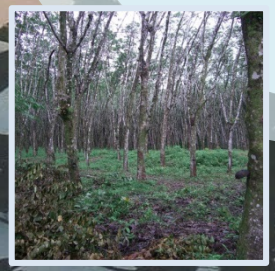
Less than half of primary forest biodiversity and around 20% of primary forest carbon

Rubber and acacia seem to be slightly better for carbon and biodiversity than oil palm



Primary Forest AGC Equivalence

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Logged forest

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Primary peat forest

Rubber

Acacia

Oil Palm

Grassland

% of Primary Forest Biodive

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40

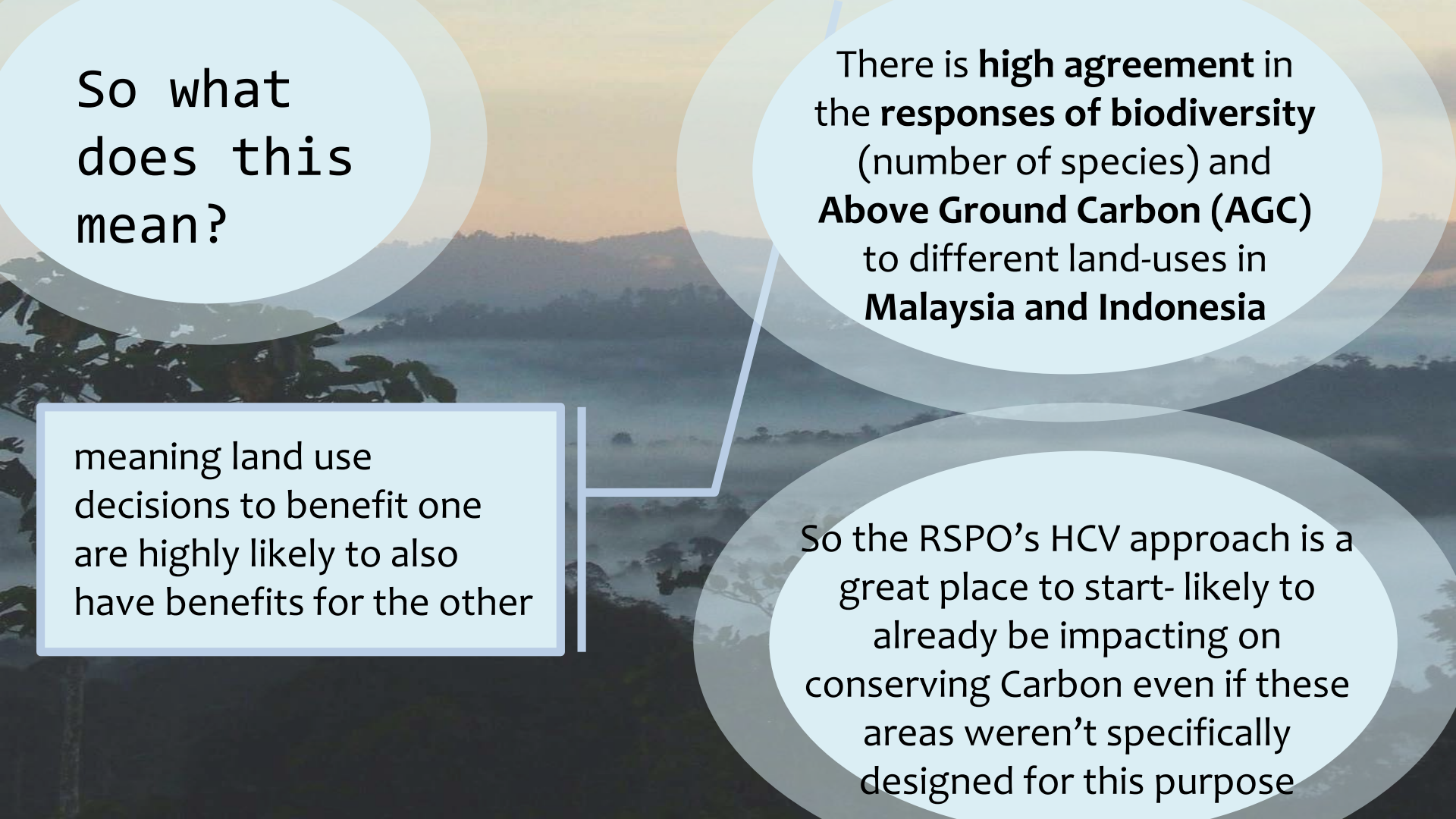
20

0

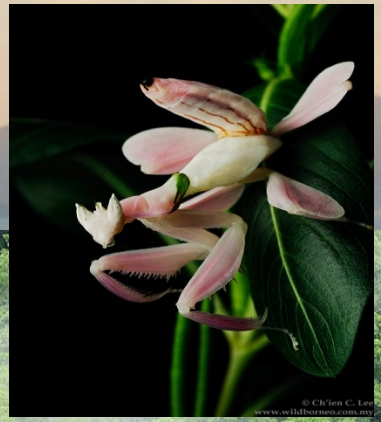
120

%

Grass and scrubland are much worse for both C and Biodiversity


So what does this mean?
There is **high agreement** in the **responses of biodiversity** (number of species) and **Above Ground Carbon (AGC)** to different land-uses in **Malaysia and Indonesia**
meaning land use decisions to benefit one are highly likely to also have benefits for the other
So the RSPO's HCV approach is a great place to start- likely to already be impacting on conserving Carbon even if these areas weren't specifically designed for this purpose

RSPO's policy of avoiding all primary forest means the top places for carbon and biodiversity are off limits to conversion b
RSPO member

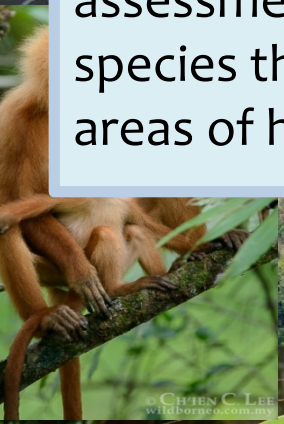


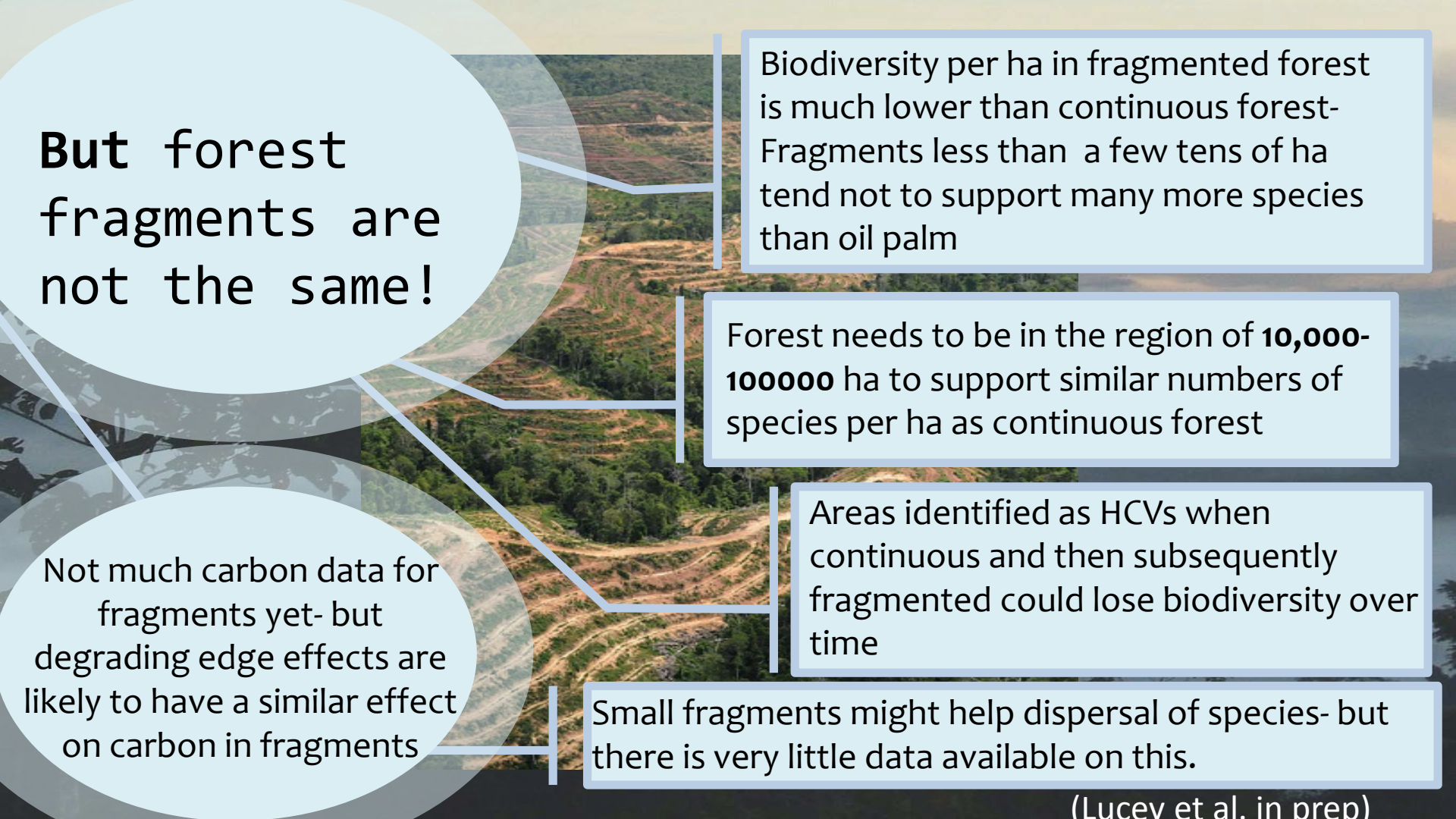
About the same number of species as in primary forest- even if the forest is quite badly degraded

Although about 25- 30% of primary forest specialists are lost (if HCV assessments only look for specific species they may not be identifying areas of high overall biodiversity)

Carbon can be halved by logging- BUT has the potential to recover over time

BUT- logged forest is also vital- even if it is quite degraded





But forest fragments are not the same!

Biodiversity per ha in fragmented forest is much lower than continuous forest- Fragments less than a few tens of ha tend not to support many more species than oil palm

Forest needs to be in the region of **10,000-100000** ha to support similar numbers of species per ha as continuous forest

Areas identified as HCVs when continuous and then subsequently fragmented could lose biodiversity over time

Small fragments might help dispersal of species- but there is very little data available on this.

Not much carbon data for fragments yet- but degrading edge effects are likely to have a similar effect on carbon in fragments

(Lucey et al. in prep)


What is the average size of HCVS?
Can we connect them better?
Can we make them bigger?
Could off-site offsetting have better biodiversity and carbon benefits?
Can we boost biodiversity and carbon by management such as enrichment planting?

- Funding to match the contribution from RSPO in year two and beyond
- Developing a network of fieldsites

Talk to Glen Reynolds or myself if you are interested to find out how to be involved

The co-authors and reviewers:

Professor Jane Hill, University of York

Dr Glen Reynolds, SEARRP

Comments kindly provided by:
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Dr Yeong Kok Loong, University of Nottingham Malaysia

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SEARRP South East Asia Rainforest Research Programme

RSPO Roundtable on Sustainable Palm Oil

University of York

SEnSOR Socially and Environmentally Sustainable Oil Palm Research

NERC Science of the Environment

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