



THE ALLIANCE FOR
BEVERAGE CARTONS
AND THE ENVIRONMENT



„Wood products circularity and the biodiversity challenge“

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Authors: Samuel Vionnet¹, Christian Bauer², David Cockburn³, Bengt Brunberg⁴, Martha Stevenson⁵

Organisations: 1: Valuing Nature; 2: SIG; 3: Tetra Pak; 4: BillerudKorsnäs; 5: WWF - US

Working with Nature

Introduction

- The advantages of renewable materials need to be balanced in view of their life cycle impacts
- Land Use is an important aspect of renewable raw material supply chains and linked to a variety of impacts on natural ecosystems.
- Maintenance and protection of biodiversity as an ecosystem service and as an endpoint is a prerequisite for the sustainable use of land.
- Impacts to biodiversity have largely been left out of LCA applications due to a lack of practical and accepted measures.
- New methods to characterize biodiversity impacts are emerging, but require improvement.

An ideal characterization method would therefore...

- Recognize positive and negative impacts of a given land use on biodiversity over time;
- Scale appropriately from plot level to landscape level to global biodiversity protection;
- Be sensitive to meaningful land management activities to signal toward improvements in land management;
- Remain adaptive to developments in the ecological sciences.

Two current approaches

1. UNEP/SETAC Recommendation:
Potential regional species loss is calculated based on Species Area Relationships (SAR) and plot level information (method by Chaudhary et al.)
2. Naturalness/hemeroby class driven interpretation of land use type to deliver damage potential
-> recently published forestry case e.g. Rossi et al.

Our proposed approach

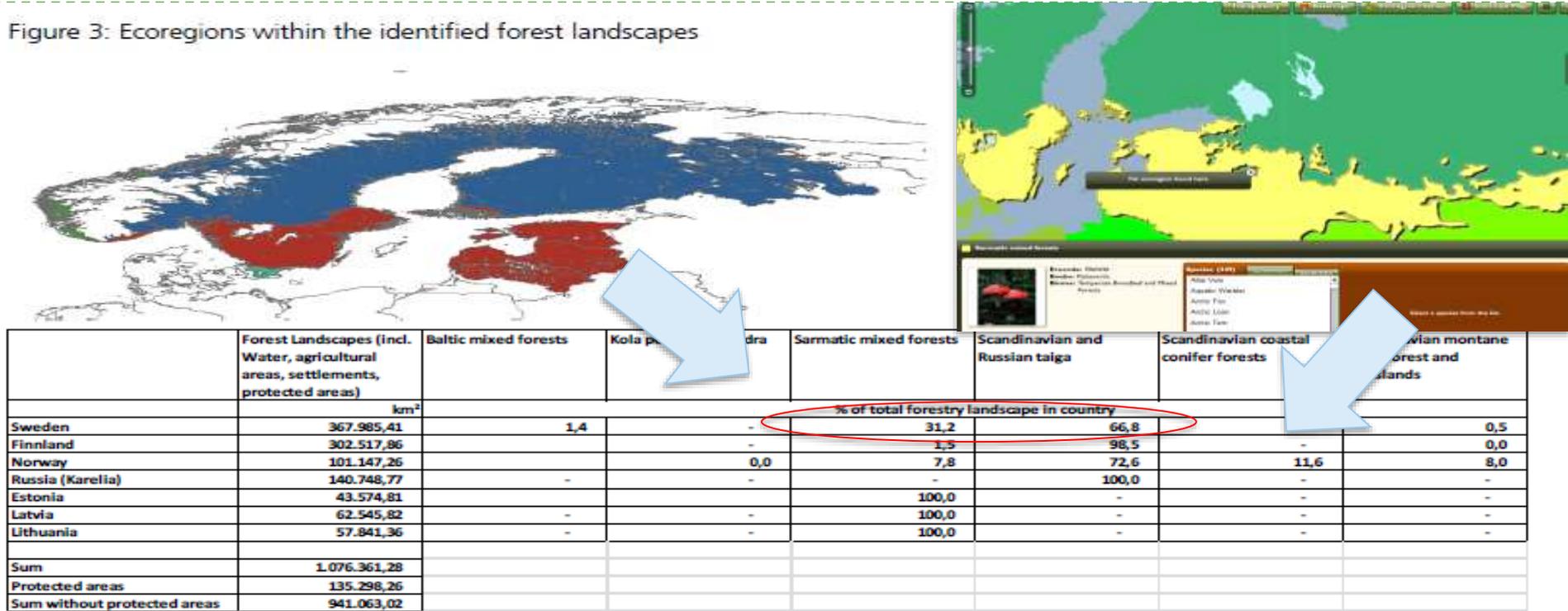
Develop new characterization factors considering **landscape management system** (instead of plot assessment).

- **Step 1:** Identify eco-region with specific biodiversity metrics (species richness and threat levels)
- **Step 2:** Identify prevailing landscape management and related indicators
- **Step 3:** Derive appropriate parameters to re-calculate characterization factors based on the method of Chaudhary
- **Step 4:** Use newly created CFs in LCIA application.

Step 1: Identification of ecoregions

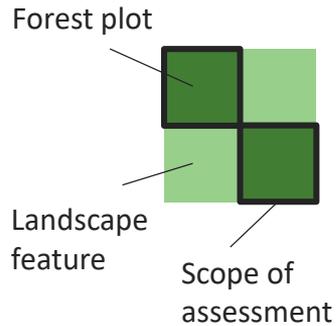
GIS project – forests -> areas -> ecoregions

Figure 3: Ecoregions within the identified forest landscapes



Step 2: Landscape management technique and indicator

From plot to landscape for forestry land use in Sweden Boreal forests



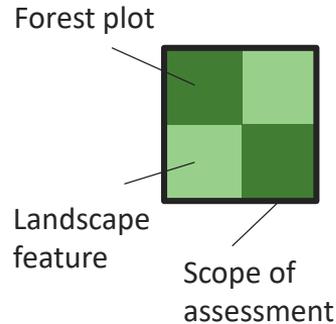
Default approach in Chaudhary method

LCA and Chaudhary base approach, consideration of land use only where forest is grown and cut.

Proposed new approach

All features of landscape management (Sustainable Forest Management – SFM) are considered, including – as required by FSC:

- Set aside of 5% of land (instead of roughly 2% in the FA)
- No logging in woodland key habitat
- Increase proportion of deciduous forest
- Leave buffer zones
- Leave eternity trees and high stumps, burn 5% of clear-cut plots



Step 2: Landscape management technique and indicator

From plot to landscape for forestry land use in Sweden Boreal forests

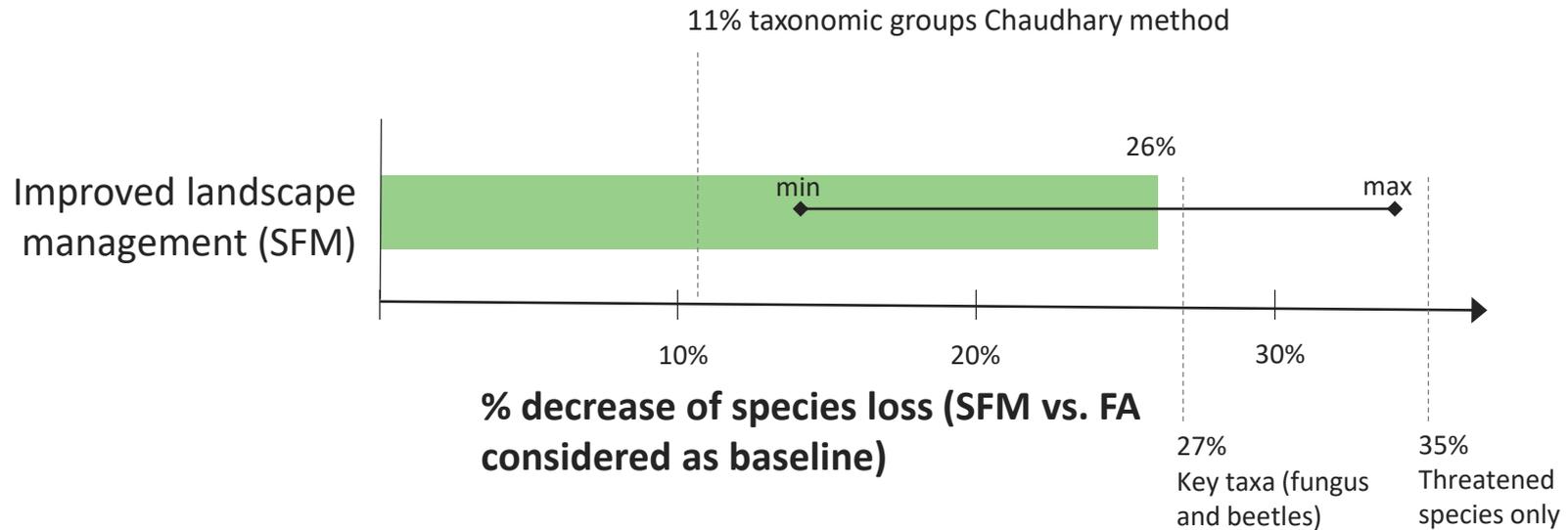
Following amendments are supported based on an extensive literature review specific to the Swedish Boreal forest:

- 1. Area of land set-aside** considered (additional 5% of land)
- 2. Affinity factor** – i.e. how the land occupied is suitable for specific taxa (additional 10% considering the specific indicators of SFM)
- 3. Taxa list increased** (17 taxa instead of 5) and focused on relevant taxa for the ecosystem studied (fungi and beetles for instance in our case)

Step 3: Results overview – Species loss indicator

Relative reduction of species loss

Application of the Chaudhary method to calculate species loss relative to Forest management according to the forestry act (FA)



Discussion

Case study

- Reference situation for habitat change not tested in this study (historical natural state vs. current land use vs. future desired state)
- Positive impacts (depending on preceding land use) of changing forest management over time are not (yet) measurable
- The connectivity and function of set aside areas may not be adequately addressed (linearity assumed).
- Significance & uncertainty analyses and normalization need further discussion given the underlying assumptions and value judgements.

Conclusion

- It is possible to integrate landscape SFM (in view of maintaining biodiversity) consistently into an operational LCIA method (with some limitations).
 - Linking field data and management indicators into a coarse LCIA model is extremely important to support conclusions.
 - CFs for SFM managed forests are smaller compared to forests for which mgmt practice is not known.
- This allows to better reflect corporate contributions for improving the environmental performance of renewable raw material supply chains
 - The proposed approach enables to balance land use related impacts of bio-based materials with their advantages in a circular economy.
 - The selection of a baseline for maintained biodiversity needs to be discussed further also in view of planetary boundaries in order to work towards achieving the sustainable development goals.



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Thank You

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