PAPER PROJECT

Preliminary title: What would a network for monitoring European forest multi-taxon biodiversity look like?

Target journals: Biological Conservation, Conservation Biology

Outline: Statistically-designed inventories and biodiversity monitoring programs are extremely relevant for biological conservation and natural resources management, especially in view of the current environmental issues, i.e. climate change and biodiversity loss.

Since the XVth century, starting with the Republic of Venice, forests have been subjected to inventories aimed at assessing and managing timber resources. Over the last decades, such large-scale forest inventories, hereafter National Forest Inventories (NFIs), have gained ground as a tool to fulfill reporting obligations under international agreements such as the FAO Global Forest Resource Assessment, the Kyoto protocol, the United Nations Convention on Biological Diversity (CBD), the Ministerial Conference for the Protection of Forests (MCPFE‐ Forest Europe), and the Montreal Process, as well as for the monitoring framework of Natura 2000 habitats (Alberdi et al., 2019). In the last decades, a debate developed regarding the role of forest inventories in biodiversity assessment and monitoring (Corona et al., 2011). However, traditional NFIs measurements are focused on tree species, with a limited consideration of other taxa and habitat components, which limit a comprehensive multi-dimensional forest biodiversity assessment.

Following this approach, attempts were made to link biodiversity data to NFI variables, resulting in general trends, e.g., the positive relationship between bird species diversity and forest age and deadwood amount (Reise et al., 2019). But overall, NFI-derived biodiversity indicators are poorly documented regarding their actual link with biodiversity there are supposed to indicate (Gao et al. 2015, Lier et al. 2013).

The ongoing biodiversity crisis and the impact of climate change on forest ecosystems point to the urgent need of a direct assessment of forest biodiversity in Europe, with a special focus on its response to climate change and to management strategies. Despite European efforts to face biodiversity loss, a monitoring system to assess the role of forests in reducing the impact of climate change and providing ecosystem services still does not exist, not even within the Natura 2000 sites (Alberdi et al., 2019). In this regard, FAO (2017) has defined guidelines for planning and implementing multi-purpose national forest monitoring systems with the aim of providing a tool to strengthen sustainable forest management on both a local and global scale. Therefore, the new institutional challenge of FAO (2017) is to constitute a National Forest Monitoring System (NFMS) to provide a sound basis for data harmonization and comparability, which we still lack.

Although substantial efforts are already being performed locally or nationally, there is a urgent need of a coordinated monitoring network toward which European countries should converge, following general frameworks for biodiversity assessments (Pereira et al. 2013).

Such a network could not be defined without a sound basis that acts as a pilot for the definition of the effort that would be needed to identify trends in forest species richness and composition.

The current work will use the data of the BOTTOMS-UP platform to assess the sampling and efforts needed in order to have an effective monitoring network for European forest biodiversity, not limited to trees or woody vegetation.

We will use species accumulation curves, power analysis and simulation (Green and MacLeod, 2016), as well as multivariate tools (Package SSP) to define taxon-specific sampling effort in terms of the number of sites and plots needed within each European forest category.

References

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Please note that if the outline changes substantially (more than 1 aim is revised substantially), or co-author(s) are added to the above lists the governing board should re-vote on the project.

Further opt-in authors:

According to the BOTTOMS-UP Bylaws any member of the BOTTOMS-UP Consortium can declare his/her interest to become opt-in author. The first author is required to preliminarily accept one such offer from each dataset that represents at least 2% of the data in the analysis. It is upon the discretion of the first author whether to accept any opt-in offer beyond this requirement.

Persons interested in opt-in authorship can be nominated until …. with e-mail to the first author (and cc: to the BOTTOMS-UP Governing Board), explaining which dataset(s) they represent and preferentially also how they could contribute. Note however that such a nomination only means the option to become co-author. In the end only those persons will be retained as actual co-authors who have made a significant intellectual contribution to the paper during its preparation (in accordance with BOTTOMS-UP Bylaws and compliance to ethics in academy).

Data to be used:

Biodiversity data for vascular plants, bryophytes, fungi, beetles, lichens, spiders, bats.

Time line:

Deadline for permission of data usage from custodians: January 31st 2021

Extraction of data from BOTTOMS-UP: January 31st 2021

Data preparation and analysis: March 31st 2021

Raw results to be sent to the wider author team: April 30th 2021

Writing up of the paper (including preparation/optimization of figures): May 31st 2021

Feedback round of co-authors to MS: July 31st 2021.

Submission: September 30th 2021

Confirmation:

I confirm that I will adhere to the BOTTOMS-UP Bylaws.

Date, December 22nd 2020

Signature