



BOTTOMS-UP

PAPER PROJECT

Preliminary title: Community structuration and morphological traits of saproxylic beetles of conservation concern following the European distribution of the White-backed Woodpecker (*Dendrocopos leucotos*).

Target journals: Conservation Biology, Biological Conservation, Ecological Indicators.

Outline & Aim:

The umbrella species approach can provide a robust and cost-efficient way for assessing the conservation value of sites for rare and cryptic taxa. Yet, few studies have investigated whether the indicator value of umbrella species for high biodiversity can be transferred across regions. The White-backed Woodpecker (*Dendrocopos leucotos*) is accepted as an umbrella species for the conservation of deadwood-inhabiting organisms in Northern Europe. In this context, our goal is to empirically assess the value of the White-backed Woodpecker as an umbrella species for saproxylic beetles of conservation concern at the European scale. The distribution of the White-backed Woodpecker was derived from the recently published "European Breeding Bird Atlas 2" (<https://www.ebba2.info/>). Minimal distance between insects' sampling location and White-backed Woodpecker occurrence will be used as the principal explanatory variable. Habitat variables will be used as post-hoc explanatory variables.

The objective of this research project would be to:

- Explore the potential use of the White-backed Woodpecker as an umbrella species for Red-listed (a) and primeval forest relict (b) saproxylic beetle species with the hypothesis: If the White-backed Woodpecker is an umbrella species for saproxylic beetles in northern Europe (Martikainen 1998) as well as a specialist of old growth forest (Roberge 2008), it's role for conservation purpose should be the same among its European distribution.
- Explore the morphological traits amongst saproxylic beetle communities with the hypothesis: Considering the White-backed Woodpecker as a top-predator of the saproxylic food web in old-growth forests, its European occurrence would follow a higher mean specimen abundance (a) and a larger mean body size (b) of its prey community.
- Explore the morphological traits amongst saproxylic beetles of conservation concern occurring within the White-backed Woodpecker habitat with the hypothesis: Following findings in Hagge (2021), saproxylic beetles of conservation concern found within the White-backed Woodpecker habitat should share common morphological traits.

Litterature

- Hagge J, Müller J, Birkemoe T, Buse J, Christensen RHB, Gossner MM, et al. What does a threatened saproxylic beetle look like? Modelling extinction risk using a new morphological trait database. *J Anim Ecol.* 2021;90: 1934–1947. doi:10.1111/1365-2656.13512.
- Martikainen P, Kaila L, Haila Y. Threatened Beetles in White-Backed Woodpecker Habitats. *Conserv Biol.* 1998;12: 293–301. doi:10.1111/j.1523-1739.1998.96484.x
- Roberge JM, Mikusiński G, Svensson S. The white-backed woodpecker: Umbrella species for forest conservation planning? *Biodivers Conserv.* 2008;17: 2479–2494. doi:10.1007/s10531-008-9394-4.

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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 **01.03.2022** 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 the course of its preparation (in accordance with BOTTOMS-UP Bylaws and compliance to ethics in academy).

Data to be used:

Beetle abundance per species and per sampling unit (i.e., trap). The sampling period for every trap must be known to be considered as a random effect during the analyses.

Basic habitat inventory information (in available) for all sampling location corresponding to the observational data (i.e., trap): mean annual temperature, basal area/volume for living trees, volume of dead wood (standing/lying), tree species, mean dbh, presence of big trees (e.g. >70-80 cm dbh), canopy openness, ...

Basic stand information for all sampling location corresponding to the observational data (i.e., trap): management type (e.g. managed/unmanaged), mean annual temperatures, orientation (North, South, East, West), elevation, WGS84 geographical coordinates.

Timeline:

Deadline for permission of data usage from custodians: **November 2021**

Extraction of data from BOTTOMS-UP: **December 2021**

Data preparation and analysis: **February 2022**

Raw results to be sent to the wider author team: **February 2022**

Writing up of the paper (including preparation/optimization of figures): **March 2022**

Feedback round of co-authors to MS: **March 2022**

Submission: **April 2022**

Confirmation:

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

Date

20/09/2021

Signature

Romain Angeleri