

Defining rarity and commonness in boreal bryophyte species

What is a common and rare species?

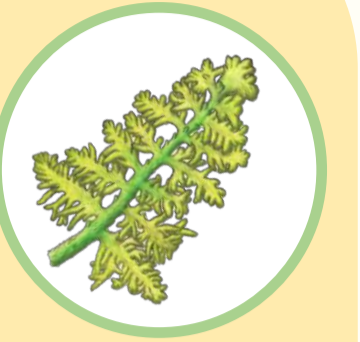
COMMON

Species that exploit a variety of environmental conditions over wide geographic ranges.



RARE

Species restricted either in the environmental conditions they tolerate, the abundance of individuals, or their distribution range.



Common and rare species play essential roles in ecosystems:

- Common species are pivotal parts of food webs and ecological processes.
- Rare species increase and promote species richness and functional diversity at different scales and support ecosystem functioning and services.



Identifying the commonness and rarity forms of the species is essential for biodiversity conservation.

How did we define bryophytes as common or rare?

a) Geographic distribution

In the Western Quebec boreal forest

- 966 sampling sites (~50 m²).

- Two ecological regions:

Coniferous boreal forest

Mixed boreal forest



b) Habitat preference

Four forest stands sampled in each ecological region



Coniferous



Mixed



Deciduous



Open ecosystems



c) Population size

Number of occurrences throughout all microhabitats per sampling site

Occurrences of 290 species:

- 92 liverworts
- 165 mosses
- 33 sphagna

living in microhabitats like:



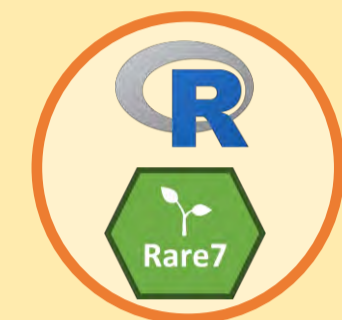
Tree bases



Dead logs

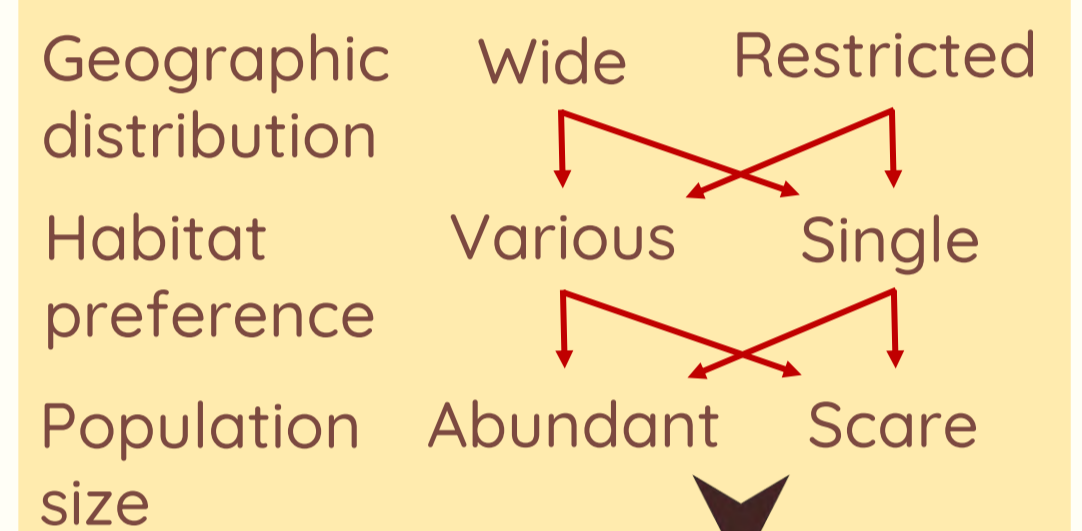


Soil

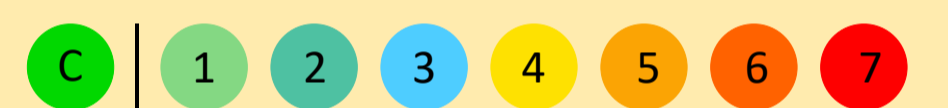


d) Analysis

Rabinowitz (1981) rare species classification framework



Common and seven rarity forms



Our research reveals...

How common or rare the bryophytes are

We identified species distributed over a wide geographic range, inhabiting between one and four habitats and showing scarce or abundant populations.



C

Pleurozium schreberi
(Willd. ex Brid.) Mitt.



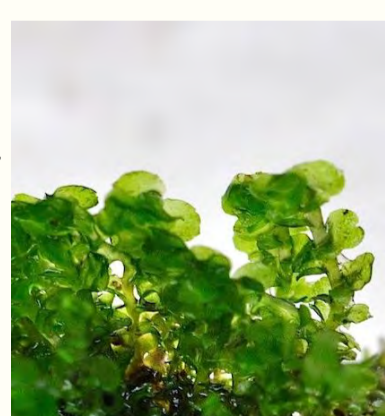
1

Aneura pinguis
(L.) Dumort.



2

Rhytidiadelphus subpinnatus
(Lindb.) T.J. Kop.



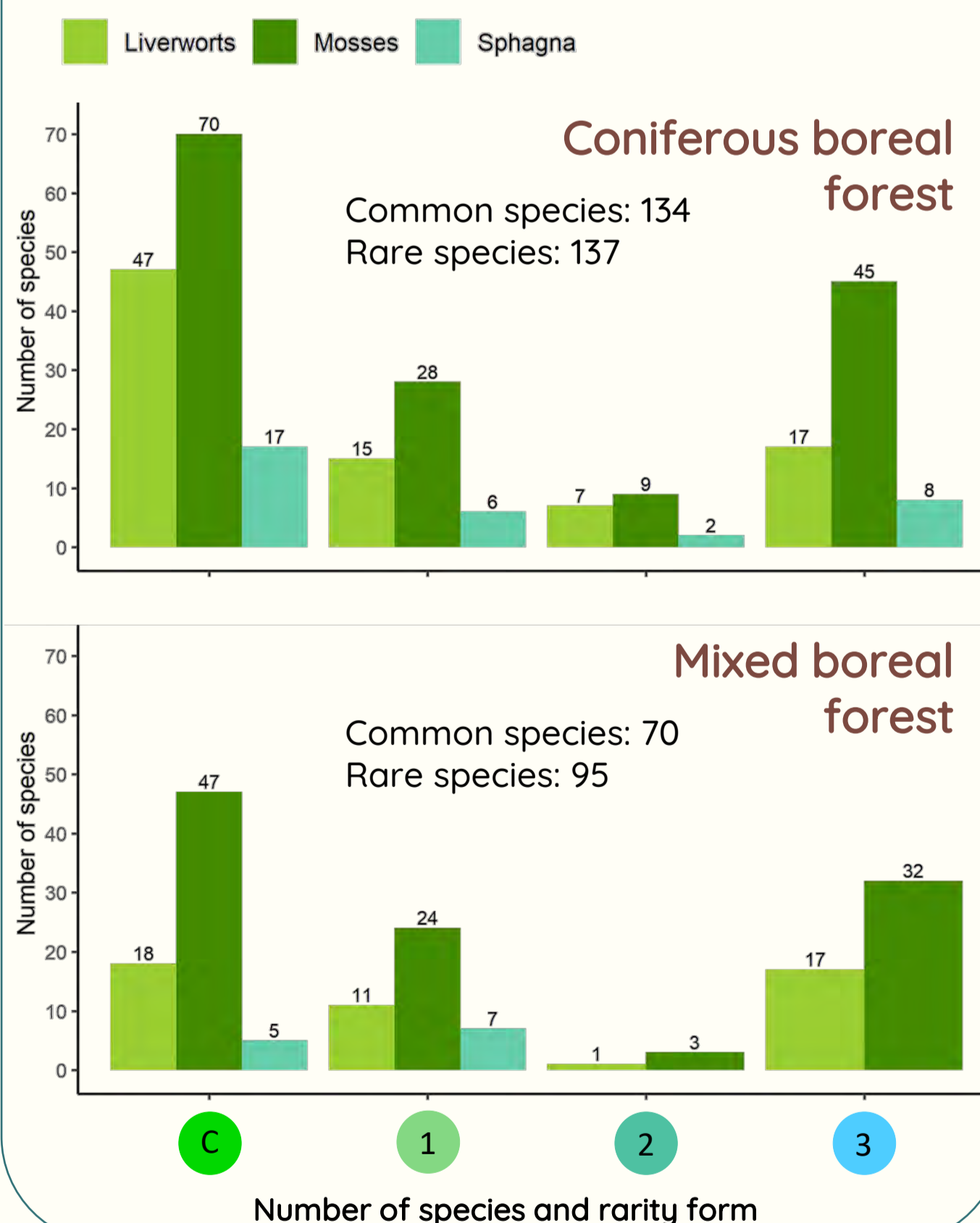
3

Scapania praetervisa
Meyl.

We did not identify species with narrow geographic ranges related to the rarity forms:

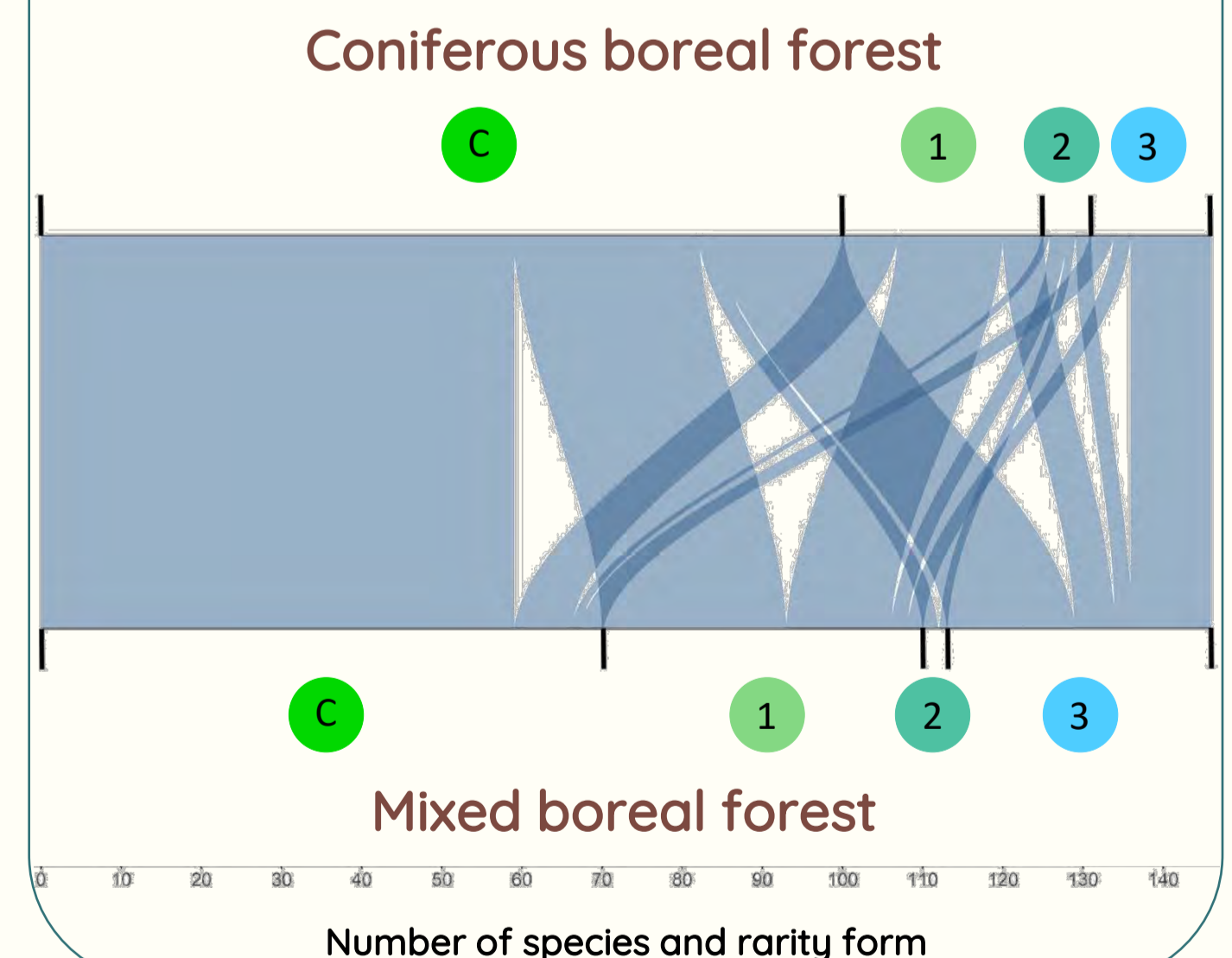


Common and rare species proportion varies between regions



Some bryophytes are common or rare depending on the ecological region

For example, of 100 common species in the coniferous region, 59 were equally common in the mixed boreal forest. However, the remaining 41 common species became rare (form 1, 2, or 3) in the mixed boreal forest region.



To take at HOME

- Species exhibit different forms of rarity.
- Identifying the rarity form of a species can help prioritize its conservation.
- Our study highlights that bryophytes have wide geographical ranges, which supports the premise of their long dispersal capacity.
- Regarding the mixed boreal forest, our findings agree with the assumption that most bryophyte species are rare. But this contrasts with the coniferous boreal forest where the common species number is similar to rare.
- Our results can be used to identify and prioritize conservation areas in Western Quebec boreal forest.

