

Possibilities and limitations for the bridging of focal species between different countries

INTRODUCTION

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Focal species (FS) studies for **pesticide risk assessment** are often performed in a single country. In order to assess the risk to **birds** and **mammals** in other countries, an approach is to **extrapolate** a FS from one country to another in the EU. However, for **‘bridging’** a species, a widespread distribution and conformity of habitat selection are essential pre-requisites. The approach using surrogate species is not considered here.

Data from four FS studies on birds and mammals, respectively, conducted simultaneously in four EU countries, were used to evaluate to what extent identified FS fulfil this pre-requisites and justify the ‘bridging’ approach.

Information on species distribution obtained from literature and the prevalence and dominance on recorded birds and small mammals in our studies were used to rank the species with respect to their qualification for potential bridging within the central (CZ) and southern (SZ) regulatory zones (RZ).

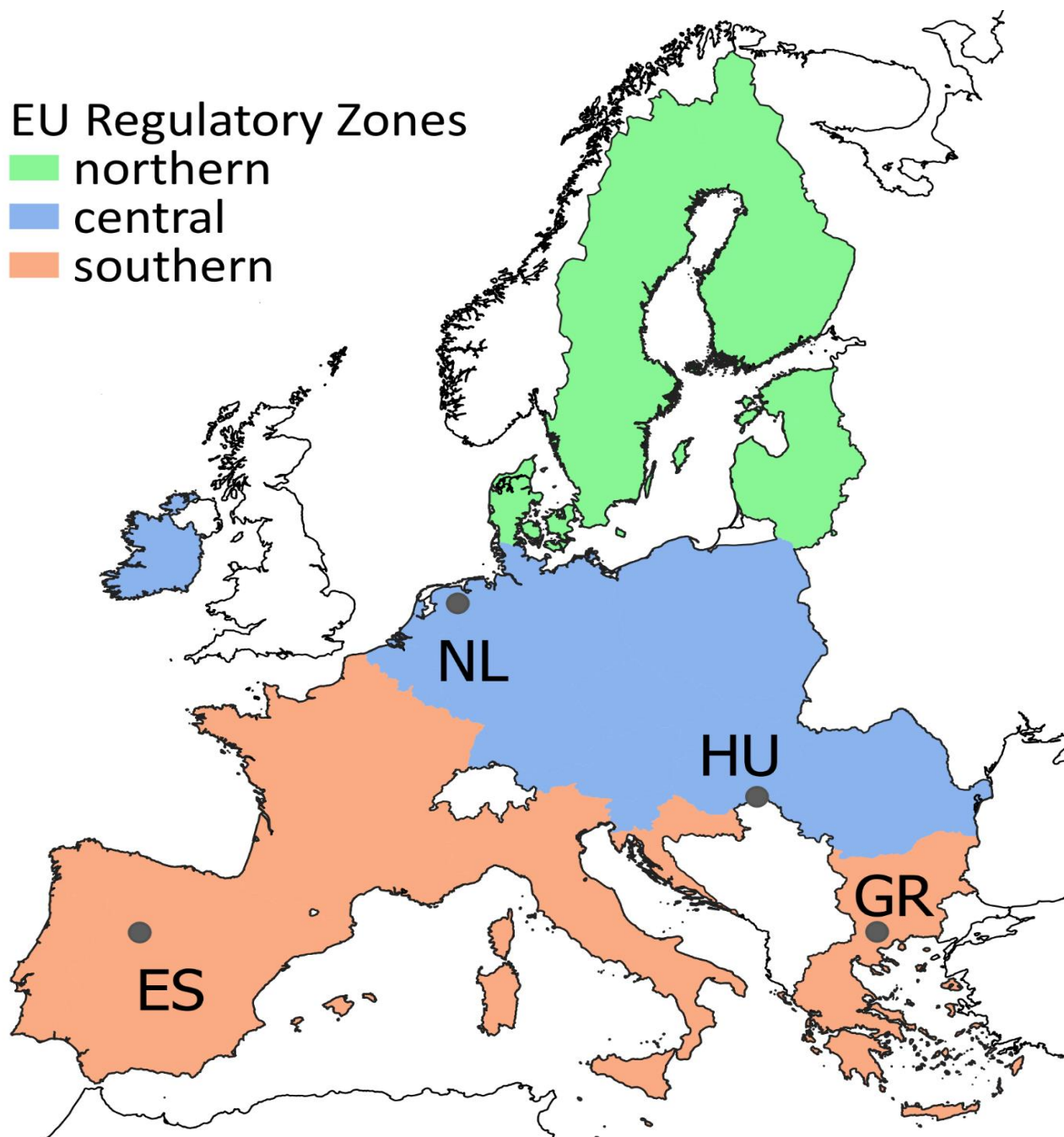


Figure 1: EU RZ and our study sites

Methods: Ranking of species for their suitability for bridging

Studies were performed in spring 2021 in the central (The Netherlands and Hungary) and southern (Spain and Greece) regulatory zones (Figure 1). Surveys were conducted in potato bare soil fields at pre and post emergence stages: 80 fields for birds and 20 fields for small mammals.

Each bird and mammal species were ranked separately in each RZ based on 2 components describing the extent of its distribution area (A) and its country-specific qualification as FS (B). Each component is based on the following parameters.

(A) ,Distribution area‘ parameters:

- Countries (Co): proportion of countries within each regulatory zone in which the species is present^{1,2}.
- Studies (St): for each regulatory zone: N° of countries in which the species is present^{1,2} x N° of our studies sites where the species was detected in the study fields, divided by 4.

(B) ,Focal species‘ parameters:

- Prevalence (Pr): frequency of occurrence in the study fields³
- Dominance (Do): proportion of individuals recorded for each species in relation to the total number recorded.

Values have been calculated as the product of their respective parameters. In order to compare between RZ, component values were Min-Max normalized prior to final calculations (see Figure 3 for calculation procedure), so ranking values span from nearly 0 (low ranked) to 1 (highest ranked).

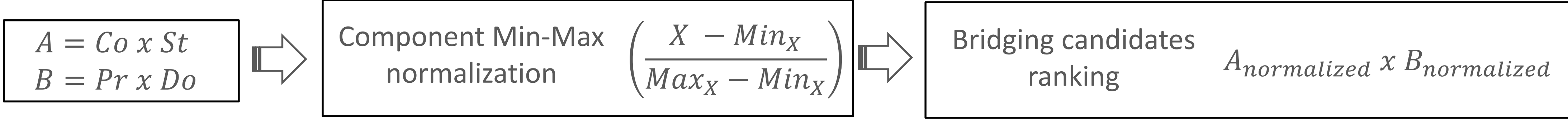


Figure 3: Calculation procedure to rank the FS



Figure 2: Recently planted potato field

Results: Species selection

97 bird species and 17 small mammals species were identified as potential FS in the 4 study areas.

Figure 4 shows the 15 highest ranked bird species for potential bridging, while Figure 5 ranks all 17 identified small mammals species.

According our results far more bird species are qualified for bridging within the CZ than in the SZ.

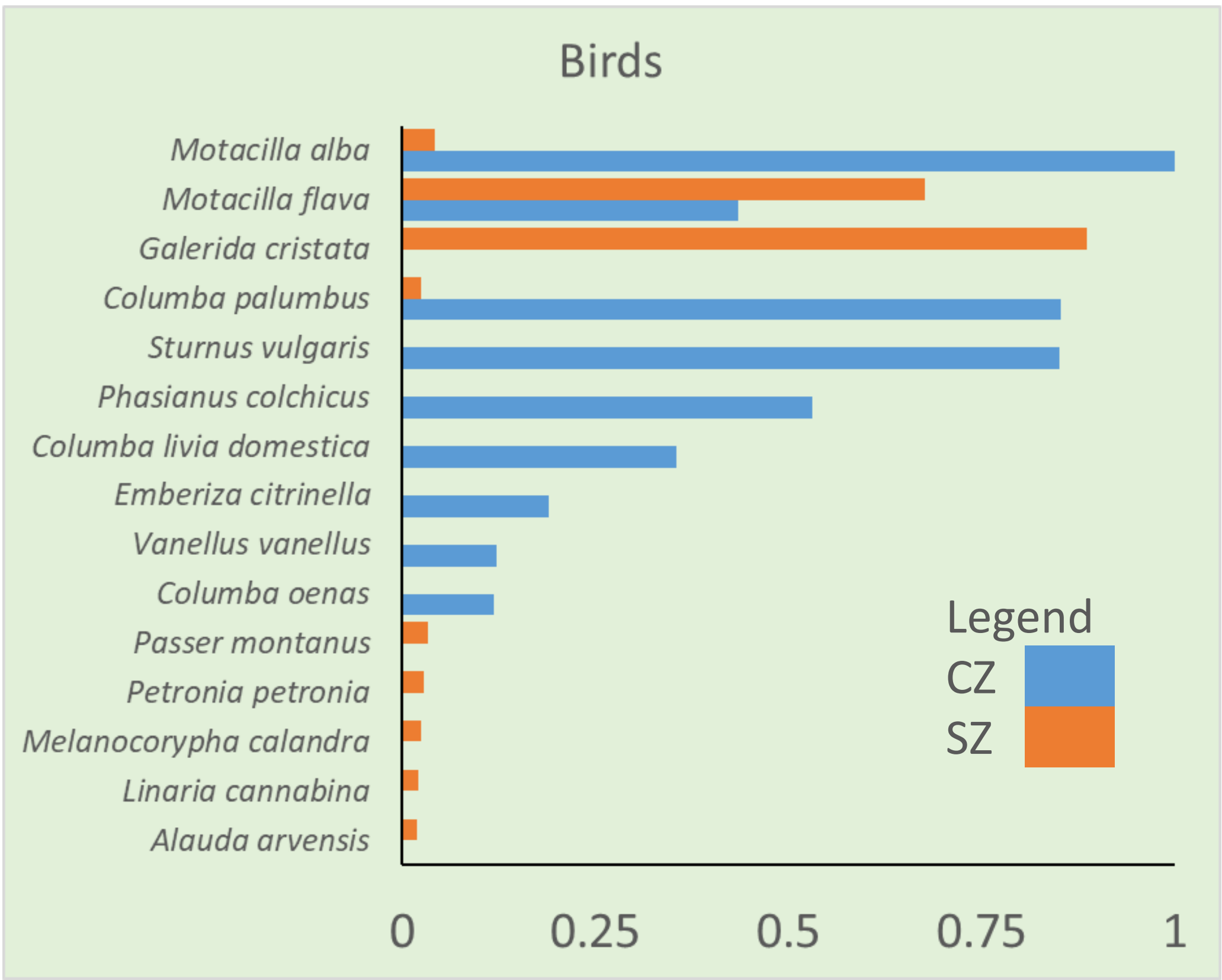


Figure 4: Selection index for the highest ranked bird species.

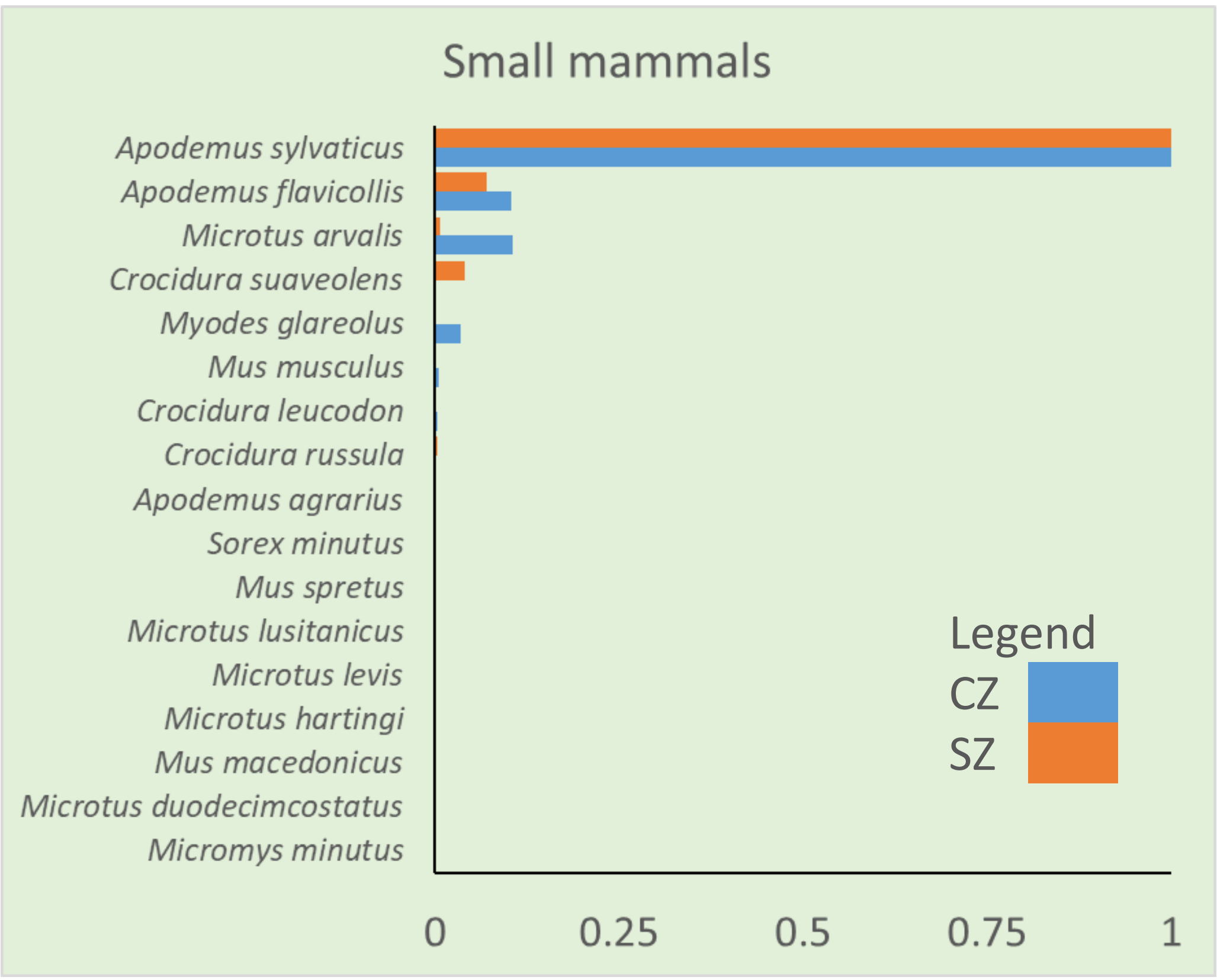


Figure 5: Selection index of small mammals.

CONCLUSIONS

The applied approach identified at least three bird and one small mammal species as most suitable candidates for bridging in both RZ. All have a wide distribution area across EU RZ and a high prevalence in freshly worked fields. Hence, for these species essential pre-requisites for bridging are fulfilled.

Bird bridging seems to be easier to justify between countries in the CZ than in the SZ, because several widespread species were prevalent in many study sites in both countries of the CZ while the bird community was more site-specific in the southern zone.

Beside *Apodemus sylvaticus*, small mammals could mostly be found in just a few study fields of the study sites or show a limited distribution, which considerably weakens their qualification for bridging even within one of the zones.

This approach shows that direct species bridging can at least sometimes be possible within EU RZ. The justification of this approach should require less additional ecological data than the application of surrogate species for risk assessment purpose.

References:

- ¹Mitchell-Jones et al. (1999). The Atlas of European Mammals. London: Academic Press.
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- ³Dietzen, C. et al. (2014) Focal species of birds in European Crops for higher tier pesticide risk assessment. Integrated Env. Assessment and Manag. 10(2): 247-259.

