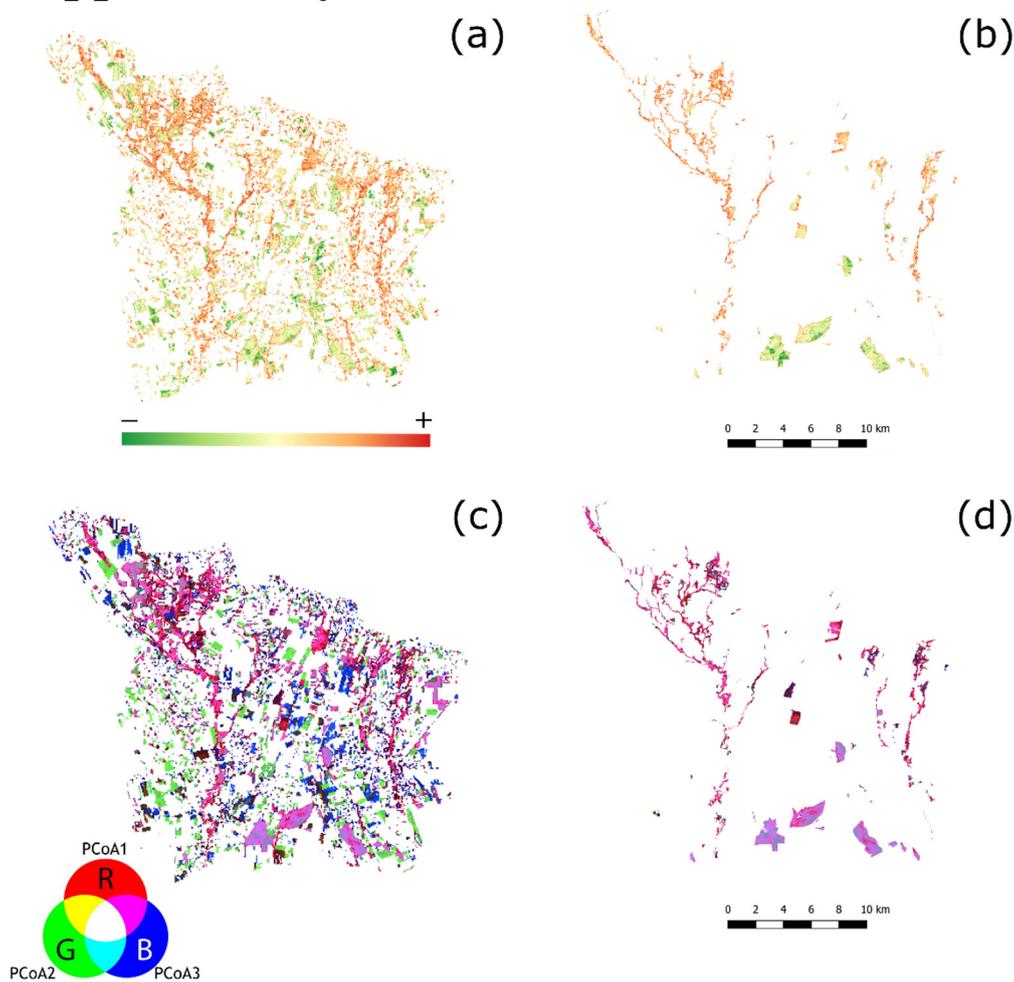
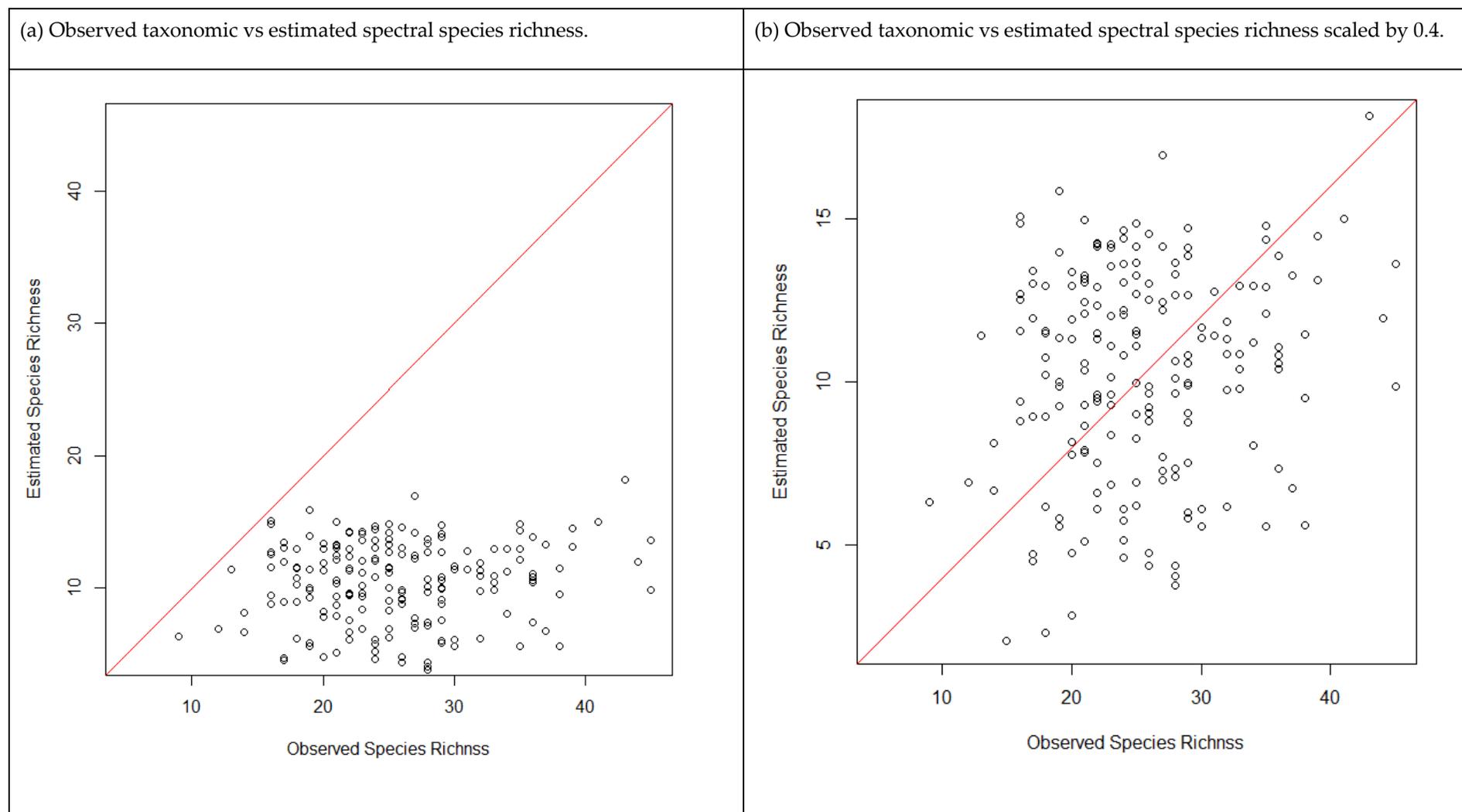


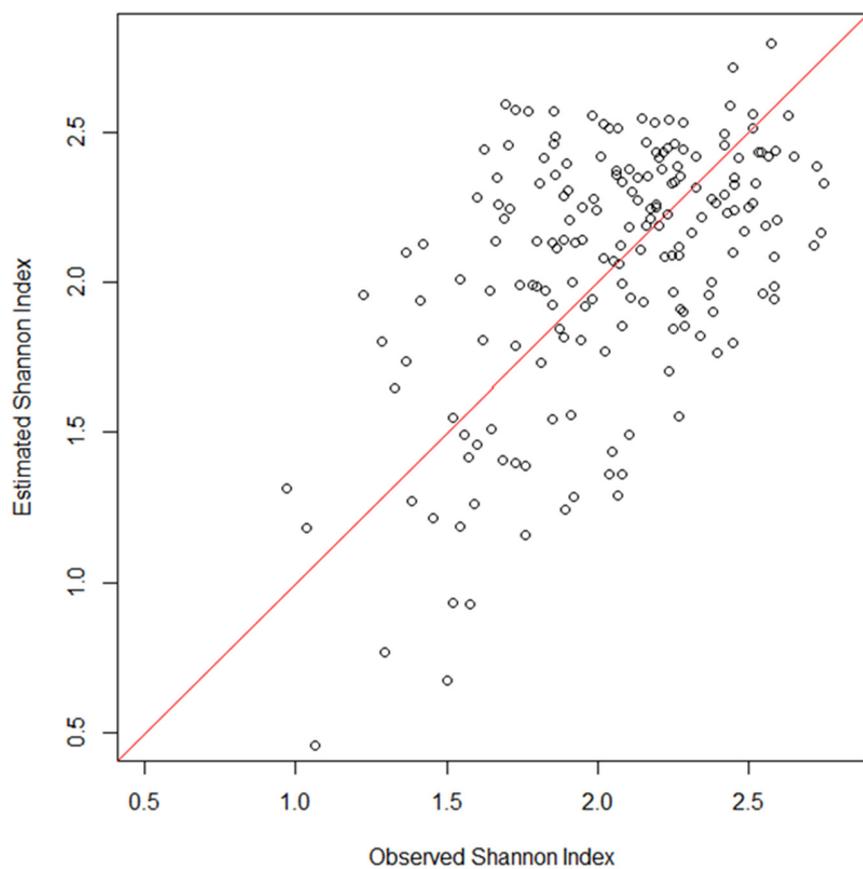
## Supplementary Materials



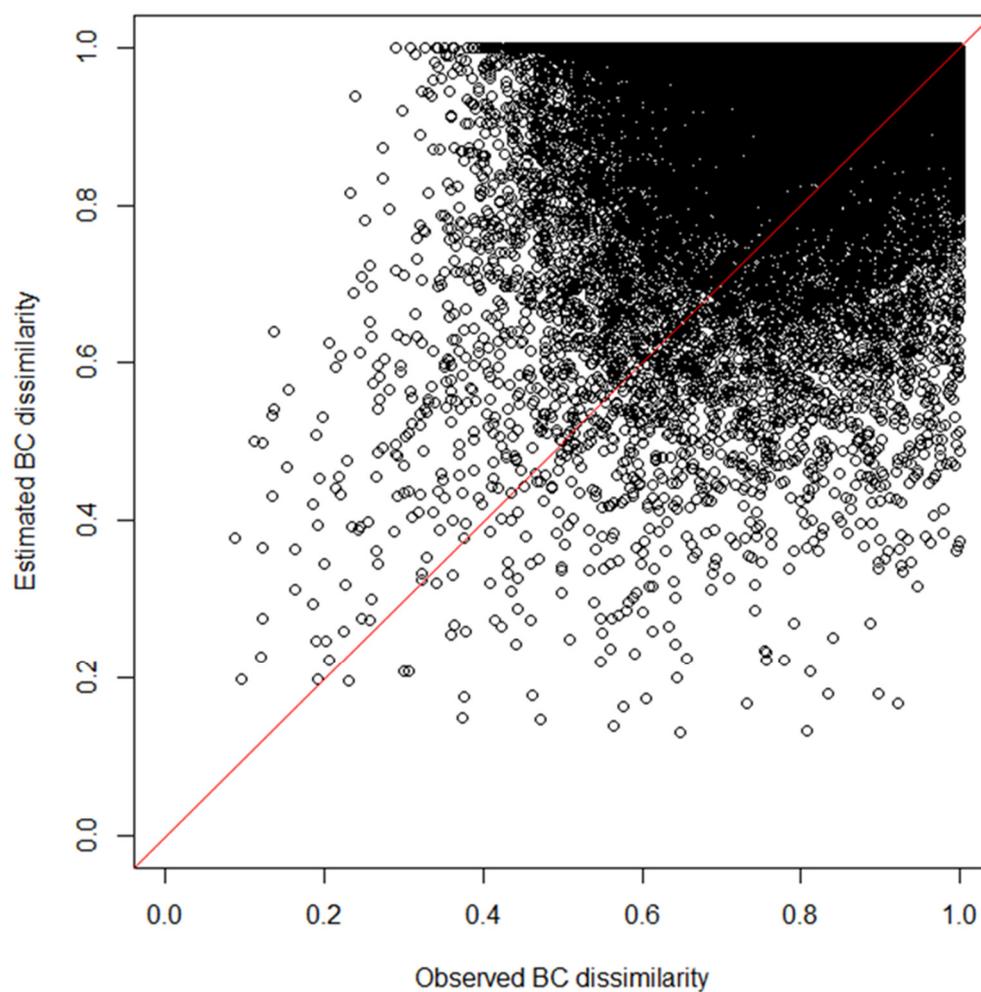
**Figure S1.** Spectral diversity maps obtained from the analysis of the satellite image of 03 June 2019. Spectral  $\alpha$  diversity map, expressed as Shannon index, of the study area (a) and of the EN nodes (b). Spectral  $\beta$  diversity map, expressed as Bray-Curtis dissimilarity index, produced by the projection of the  $n \times n$  dimensional space of the dissimilarity matrix into an  $n \times 3$  dimensional space (PCoAs), of the study area (c) and of the EN nodes (d)



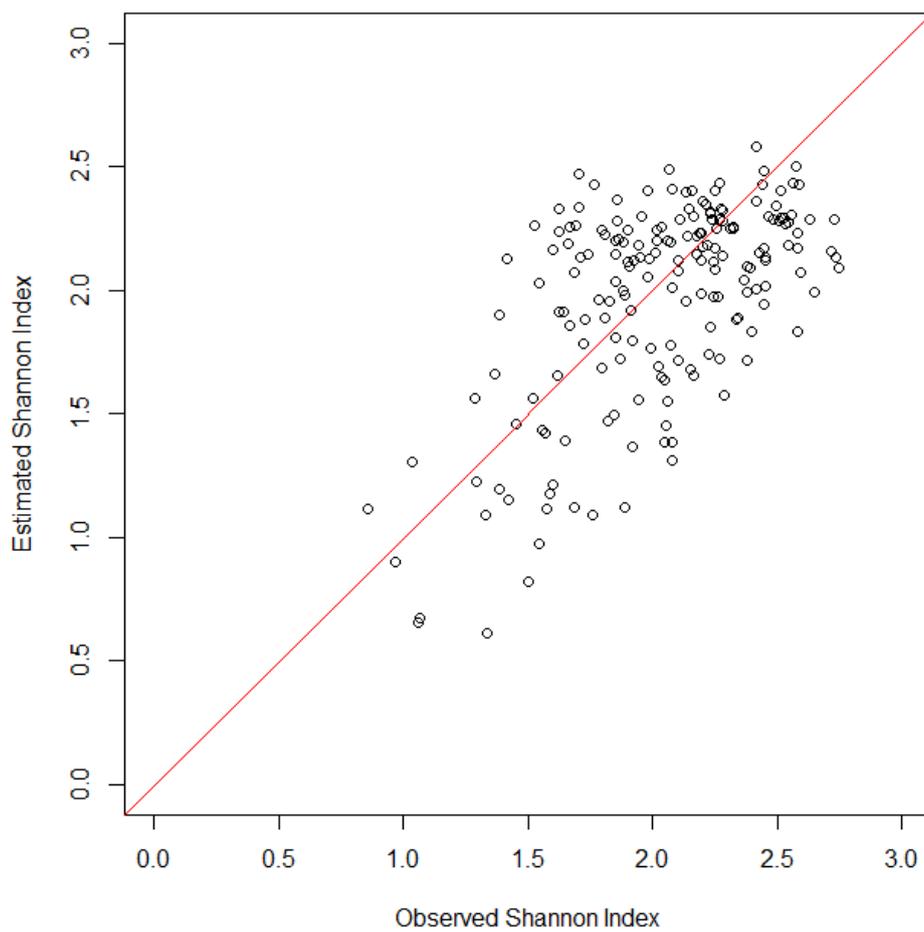
**Figure S2.** Relationship between observed taxonomic and estimated spectral species richness unscaled (a) and scaled by 0.4 (b), using the single image (3 June 2019). The red line represents the relationship of 1 to 1.



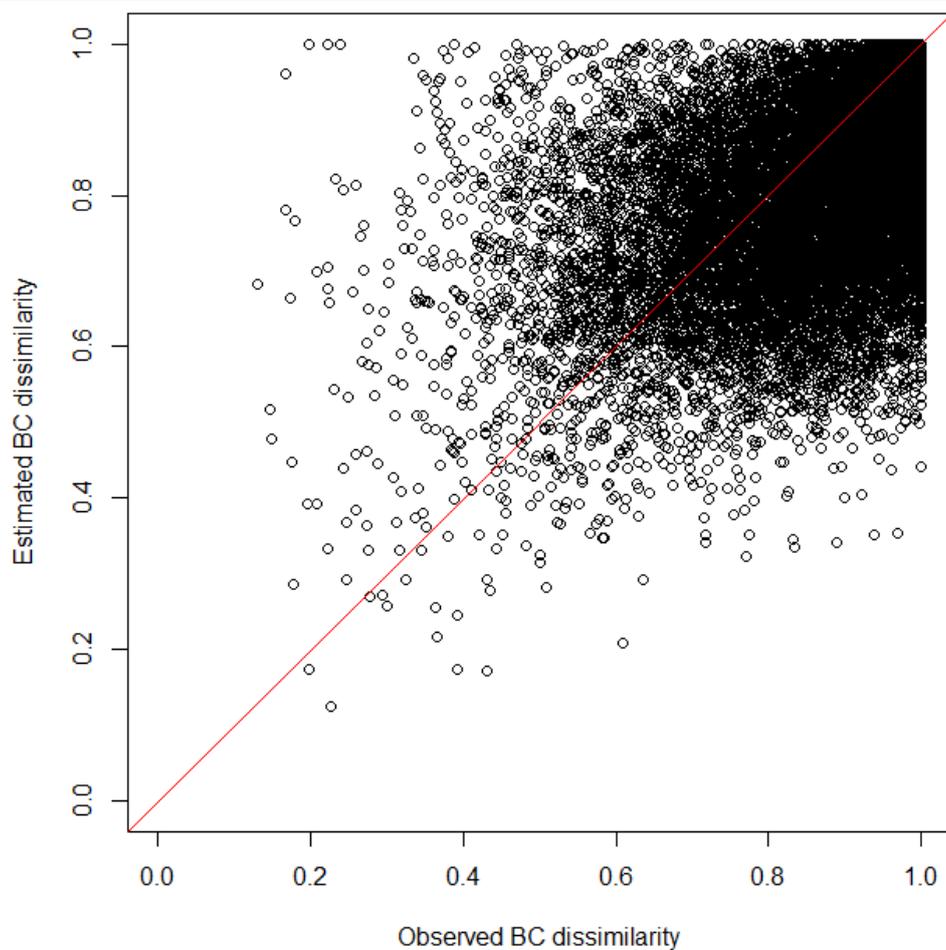
**Figure S3.** Relationship between observed taxonomic Shannon index ( $H'$ ) and estimated spectral Shannon index ( $H'$ ), using the single image (3 June 2019). The red line represents the relationship of 1 to 1.



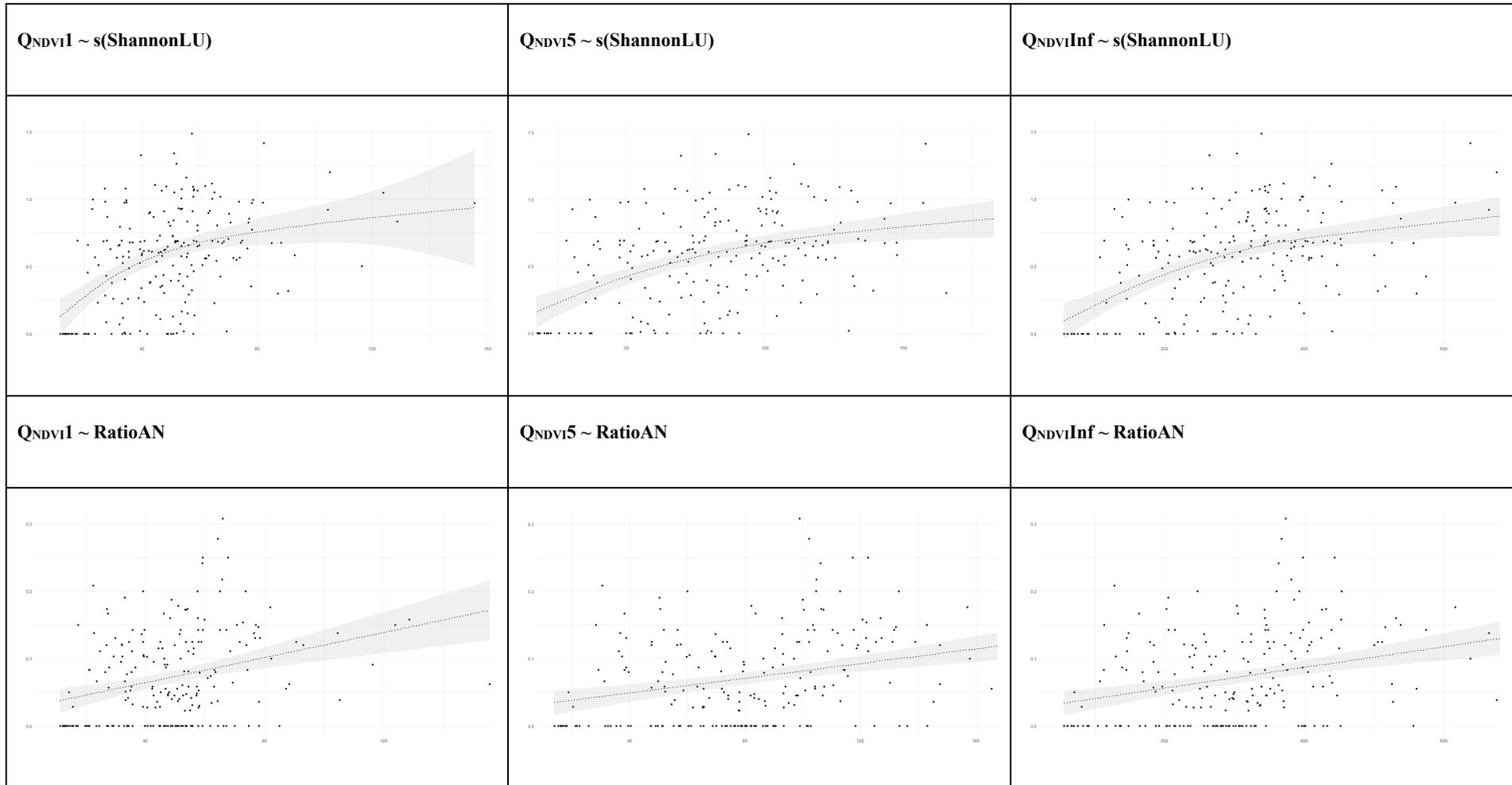
**Figure S4.** Relationship between observed taxonomic Bray-Curtis dissimilarity index (BC) and estimated spectral Bray-Curtis dissimilarity index (BC), using the single image (3 June 2019). The red line represents the relationship of 1 to 1.

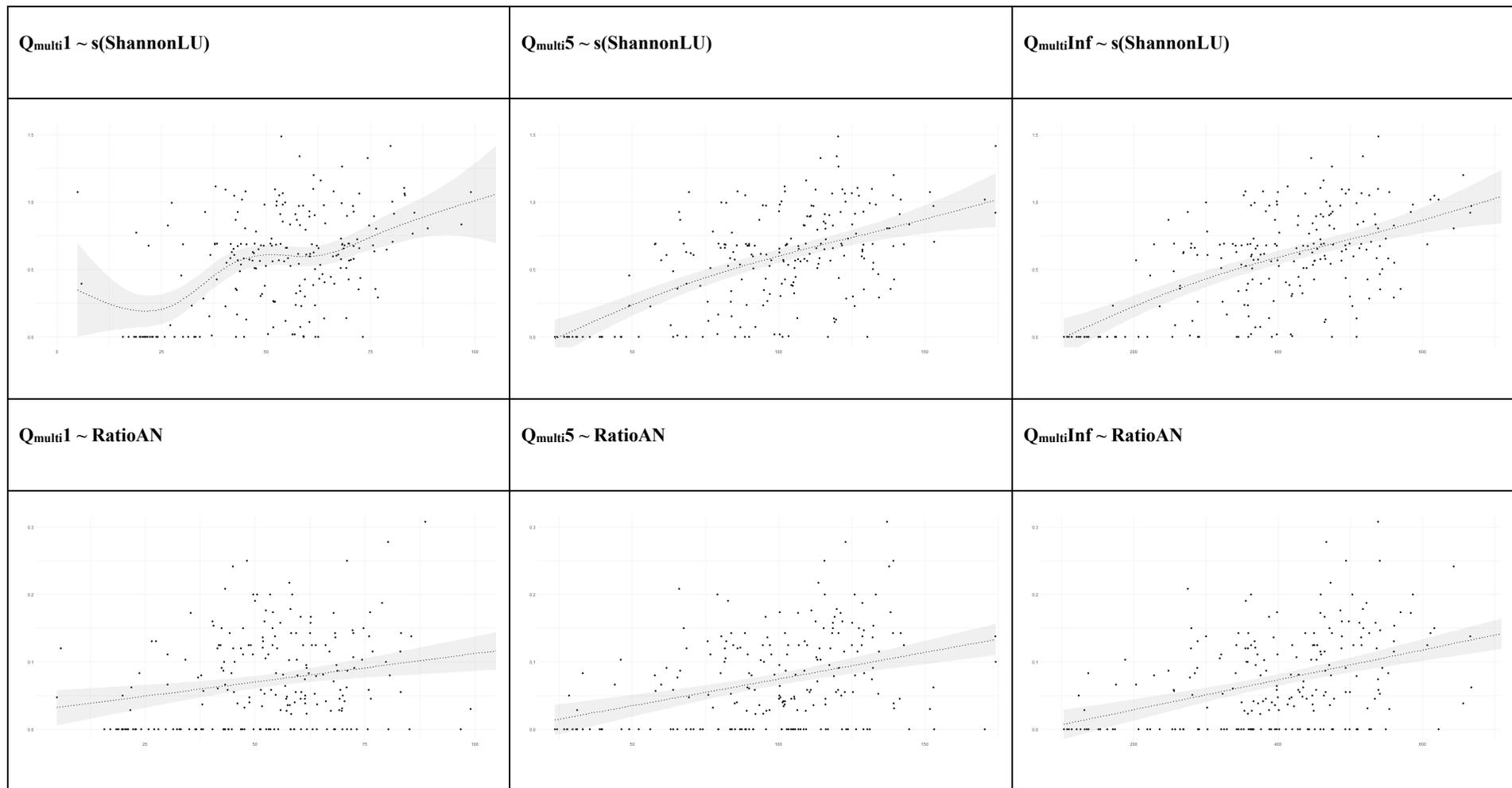


**Figure S5.** Relationship between observed taxonomic Shannon index ( $H'$ ) and estimated spectral Shannon index ( $H'$ ). The red line represents the relationship of 1 to 1.

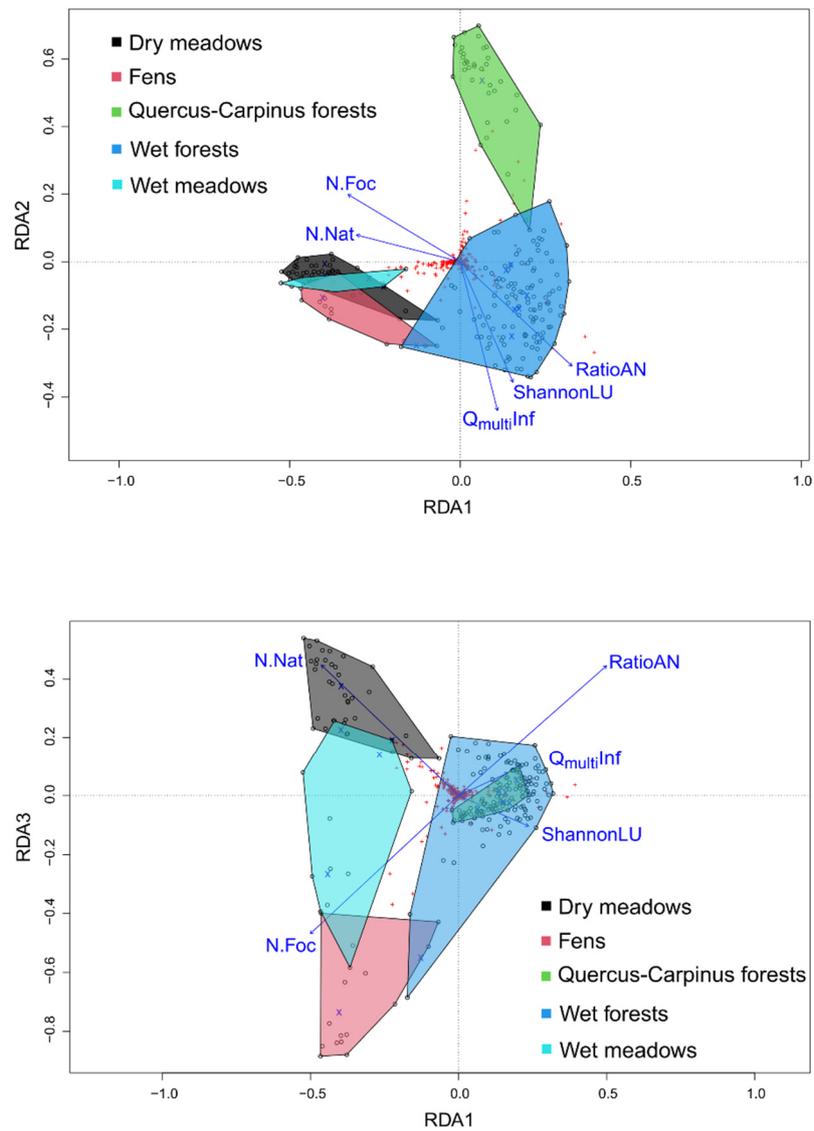


**Figure S6.** Relationship between observed taxonomic Bray-Curtis dissimilarity index (BC) and estimated spectral Bray-Curtis dissimilarity index (BC). The red line represents the relationship of 1 to 1.

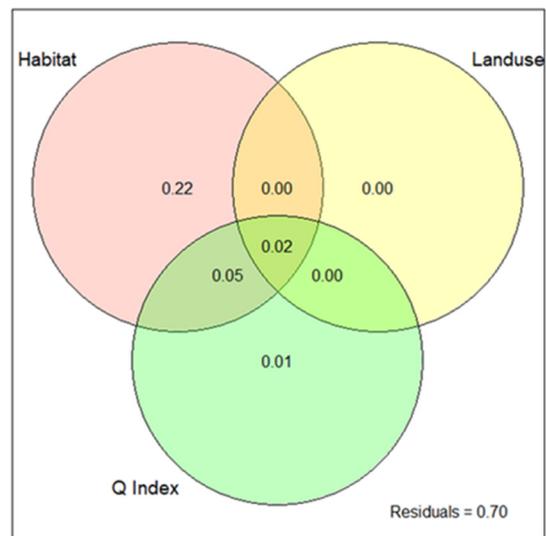




**Figure S7.** Relationships between spectral heterogeneity (Q), land use diversity (ShannonLU; smooth term), and alien to native species richness ratio (RatioAN; linear term), resulting from the six GAMs. Rao's Q values derived from the NDVI time series ( $Q_{NDVI}$ ) and the multispectral single image ( $Q_{multi}$ ) and the weight for the distance matrix was set to 1, 5 and infinite.



**Figure S8.** tb-RDA ordination based on Hellinger pre-transformed species composition matrix, with site grouped per habitat and displaying the following variables: focal species richness (N.Foc), native species richness (N.Nat), Rao's Q index, calculated from the 10 bands of the Sentinel 2 image of 03 June 2019 with the weight for the distance matrix set to infinite (Q<sub>multi</sub>INF), and ratio of alien to native species richness (RatioAN), Shannon index on land use diversity (ShannonLU).



**Figure S9.** Partition of the variation of the community matrix according to the three explanatory variable groups, namely habitat, land use heterogeneity, and spectral heterogeneity (Rao's Q index).

**Table S1.** Habitat of the area according to EUNIS habitat classification along with descriptive statistics of the study area (i.e., total area, mean area  $\pm$  standard deviation, number of patches, number of plots and average total, native and alien richness).

EUNIS Habitat	Total area (ha)	Mean area $\pm$ SD (ha)	N. Patches	N. Plots	Average richness ( $\pm$ SD)	Average native richness ( $\pm$ SD)	Average alien richness ( $\pm$ SD)
C3.21 - <i>Phragmites australis</i> beds	3.7	3.7	1	1	21.0	20.0	1.0
D4.11 - <i>Schoenus nigricans</i> fens	77.5	2.8 $\pm$ 2.0	28	12	15.1 $\pm$ 5.7	15.0 $\pm$ 5.5	0.1 $\pm$ 0.3
D5.24 - Fen <i>Cladium mariscus</i> beds	9.9	5.0 $\pm$ 5.6	2	3	14.3 $\pm$ 4.2	14.3 $\pm$ 4.2	0.0 $\pm$ 0.0
E1.55 - Eastern sub-Mediterranean dry grassland	33.6	11.2 $\pm$ 12.9	3	4	34.8 $\pm$ 7.3	34.8 $\pm$ 7.3	0.0 $\pm$ 0.0
E2.2 - Low and medium altitude hay meadows	149.2	3.7 $\pm$ 3.6	40	30	32.0 $\pm$ 7.7	29.7 $\pm$ 8.1	2.3 $\pm$ 1.5
E3.4 - Moist or wet eutrophic and mesotrophic grassland	8.5	4.3 $\pm$ 0.2	2	3	17.0 $\pm$ 13.2	17.0 $\pm$ 13.2	0.0 $\pm$ 0.0
E3.51 - <i>Molinia caerulea</i> meadows and related communities	50.4	3.7 $\pm$ 5.6	19	8	33.9 $\pm$ 7.4	33.5 $\pm$ 7.0	0.4 $\pm$ 0.5
F3.23 - Tyrrhenian sub-Mediterranean deciduous thickets	186.2	3.6 $\pm$ 3.4	46	30	22.4 $\pm$ 5.0	19.9 $\pm$ 5.2	2.5 $\pm$ 1.3
F9.2 - <i>Salix</i> carr and fen scrub	46.6	5.2 $\pm$ 4.9	9	12	25.0 $\pm$ 5.2	23.0 $\pm$ 4.9	2.0 $\pm$ 1.3
G1.A1A - Illyrian <i>Quercus</i> - <i>Carpinus betulus</i> forests	603.4	31.8 $\pm$ 56.2	19	36	23.2 $\pm$ 5.6	22.9 $\pm$ 5.7	0.3 $\pm$ 0.7
G1.11 - Riverine <i>Salix</i> woodland	199.2	6.0 $\pm$ 7.9	34	40	23.4 $\pm$ 6.9	20.7 $\pm$ 6.3	2.7 $\pm$ 1.3
G1.223 - Southeast European <i>Fraxinus</i> - <i>Quercus</i> - <i>Alnus</i> forests	112.5	5.6 $\pm$ 4.7	20	9	26.1 $\pm$ 4.6	23.0 $\pm$ 4.9	3.1 $\pm$ 2.5
G1.224 - Po <i>Quercus</i> - <i>Fraxinus</i> - <i>Alnus</i> forests	1.9	1.9	1	1	18.0	15.0	3.0
G1.41 - <i>Alnus</i> swamp woods not on acid peat	416.4	11.0 $\pm$ 15.2	38	30	22.6 $\pm$ 5.7	20.7 $\pm$ 5.7	1.9 $\pm$ 1.5