More than the sum of the parts: annual partitioning within spatial guilds underpins community regulation

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Supplementary Material

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1. Table S1 – The 33 guild members

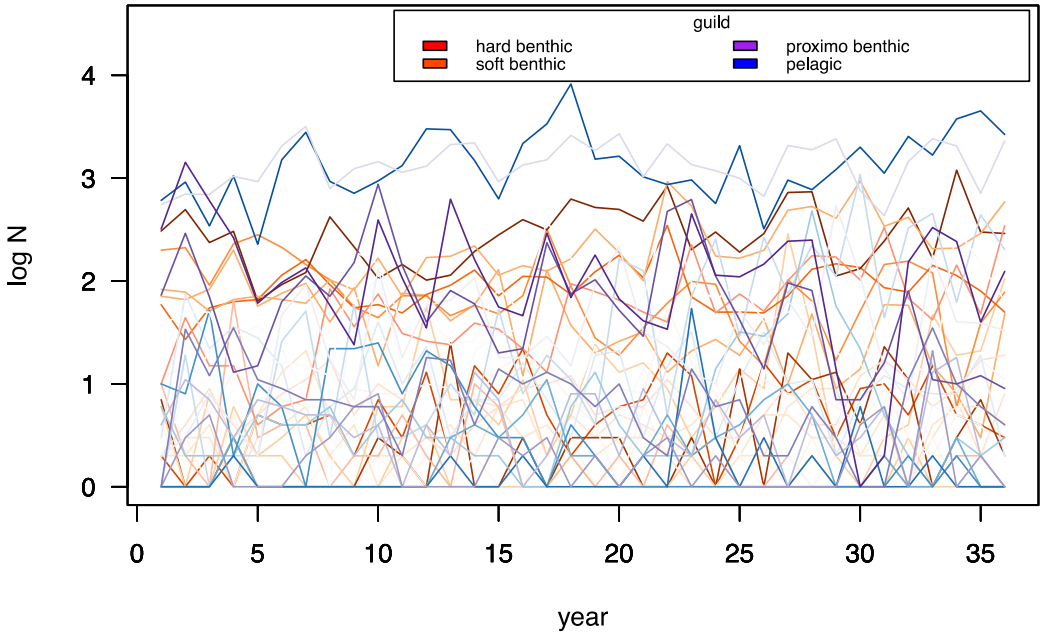
Species	**Common name**	**Abbreviation**	**Guild**
1. Agonus cataphractus (L.)	Hooknose (Pogge)	Ago.cat	HARD BENTHIC
2. Ciliata mustela (L.)	Rockling,5-Bearded	Cil.mus	HARD BENTHIC
3. Conger conger L.	Conger	Con.con	HARD BENTHIC
4. Cyclopterus lumpus L.	Lumpsucker	Cyc.lum	HARD BENTHIC
5. Alosa fallax (Lacepede)	Shad,Twaite	Alo.fal	PELAGIC
6. Aphia minuta (Risso)	Goby,Transparent	Aph.min	PELAGIC
7. Clupea harengus L.	Herring	Clu.har	PELAGIC
8. Entelurus aequoreus (L.)	Snake pipefish	Ent.aeq	PELAGIC
9. Maurolicus muelleri (Gmelin)	Pearlsides	Mau.mue	PELAGIC
10. Merluccius merluccius (L.)	Hake	Mer.merlu	PELAGIC
11. Micromesistius poutassou	Blue Whiting	Mic.pou	PELAGIC
12. Sprattus sprattus (L.)	Sprat	Spr.spr	PELAGIC
13. Dicentrarchus labrax (L.)	Bass	Dic.lab	PROXIMO BENTHIC
14. Gadus morhua L.	Cod	Gad.mor	PROXIMO BENTHIC
15. Merlangius merlangus (L.)	Whiting	Mer.merla	PROXIMO BENTHIC
16. Pollachius pollachius (L.)	Pollack	Pol.pol	PROXIMO BENTHIC
17. Trigla lucerna L.	Gurnard,Tub	Tri.luc	PROXIMO BENTHIC
18. Trisopterus esmarkii	Norway pout	Tri.esm	PROXIMO

			BENTHIC
19. Trisopterus luscus (L.)	Pout	Tri.lus	PROXIMO BENTHIC
20. Trisopterus minutus (L.)	Poor cod	Tri.min	PROXIMO BENTHIC
21.Ammodytes tobianus L.	Sand eel, Common	Amm.tob	SOFT BENTHIC
22. Ciliata septentrionalis (Collet)	Rockling,Northern	Cil. sep	SOFT BENTHIC
23. Eutrigla gurnardus (L.)	Gurnard,Grey	Eut.gur	SOFT BENTHIC
24. Limanda limanda (L.)	Dab	Lim.lim	SOFT BENTHIC
25. Liparis liparis (L.)	Sea snail,Common	Lip.lip	SOFT BENTHIC
26. Platichthys flesus (L.)	Flounder	Pla.fle	SOFT BENTHIC
27. Pleuronectes platessa L.	Plaice	Ple.pla	SOFT BENTHIC
28. Pomatoschistus microps (Kroyer)	Goby,Common	Pom.mic	SOFT BENTHIC
29. Pomatoschistus minutus (Pallas)	Goby,Sand	Pom.min	SOFT BENTHIC
30. Psetta maxima (L.)	Turbot	Pse.max	SOFT BENTHIC
31. Raja clavata L.	Ray,Thornback (Roker)	Raj.cla	SOFT BENTHIC
32. Scophthalmus rhombus (L.)	Brill	Sco.rho	SOFT BENTHIC
33. Solea solea L.	Sole (Dover sole)	Sol.sol	SOFT BENTHIC

A further 11 species occurred persistently in the assemblage: *Scyliorhinus caniculus* (L.); *Gasterosteus aculeatus* L.; *Mullus surmuletus* L.; *Atherina boye*ri Risso; *Trachurus trachurus* (L.); *Syngnathus acus* (L.); *Gobius niger* L.; *Syngnathus rostellatus* Nillson; *Callionymus lyra* L.; *Liza ramada* (Risso); *Anguilla anguilla* (L.). These species are associated with different habitats or are passage migrants.

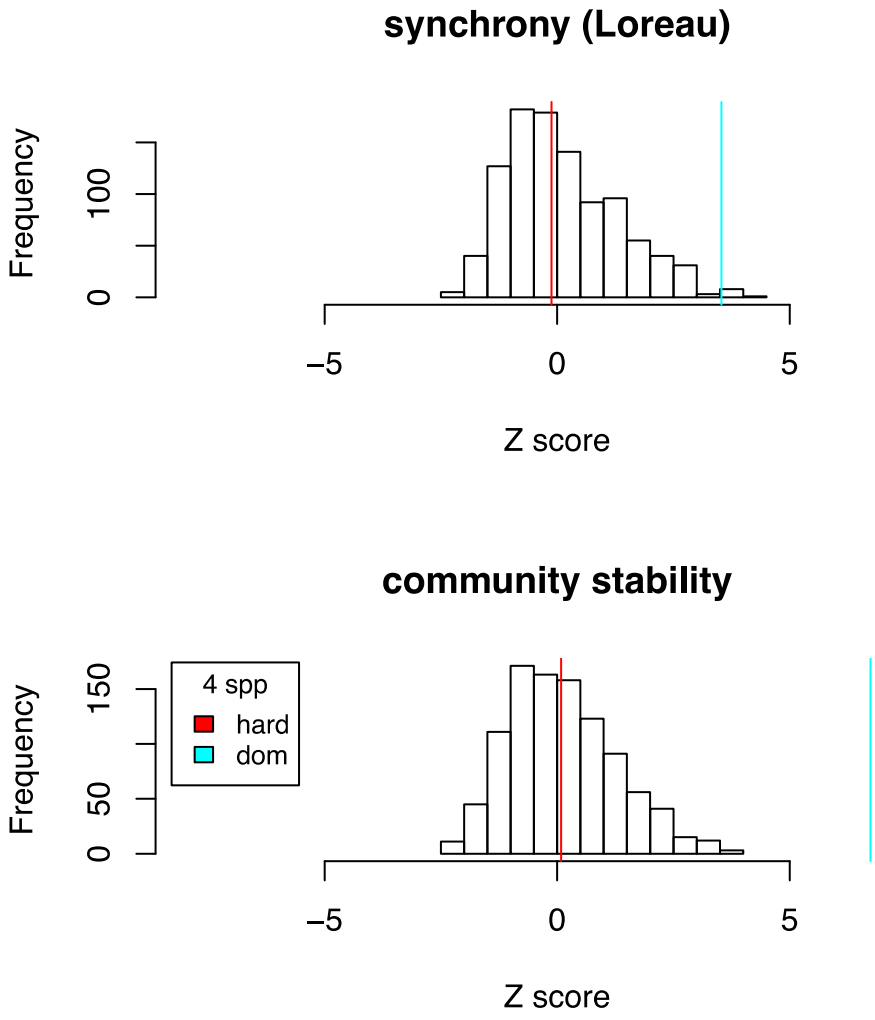
2. Data availability. Data are avaiable at:
https://risweb.st-andrews.ac.uk/portal/en/datasets/more-than-the-sum-of-the-parts-annual-partitioning-within-spatial-guilds-underpins-community-regulation-dataset(e678f99b-e170-4852-bf70-ab738c6a81b7).html
and will be assigned a DOI on publication

3. Figure S1 Time series of annual abundances of combined guild members. Abundance data are transformed ($\log_{10}(X+1)$) prior to plotting.



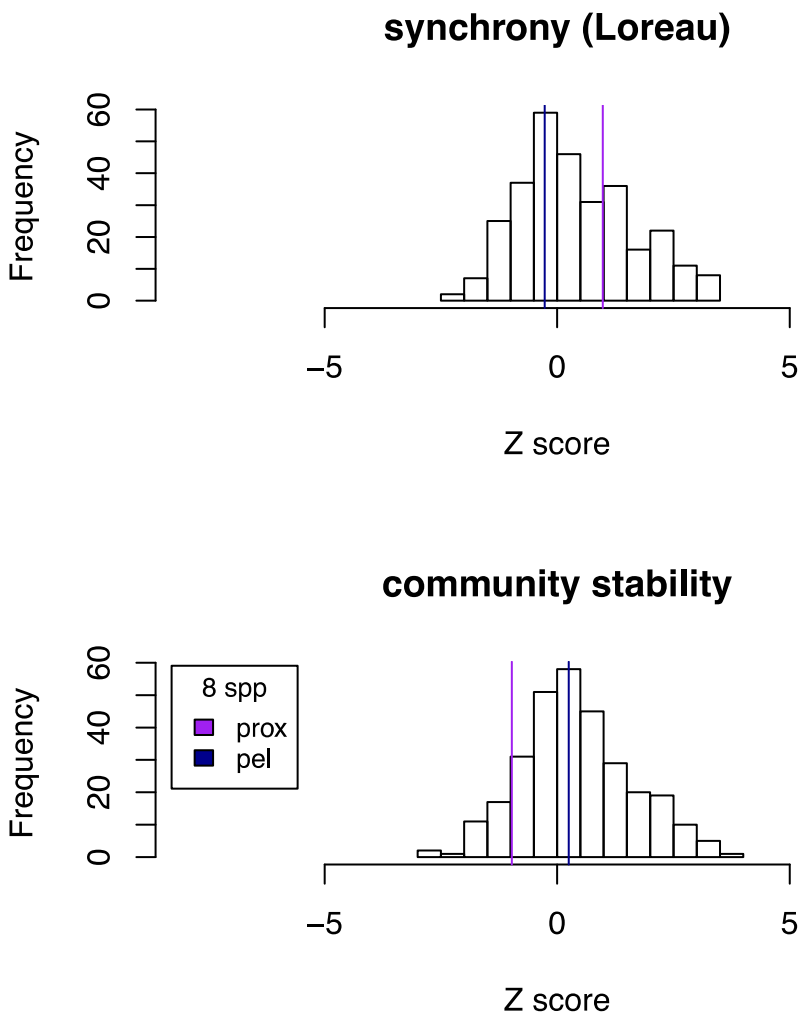
4. Figure S2 Summary of randomisation tests.

5. Figure S3 *Z* scores for observed guilds from a null distribution using a cyclic shift randomisation, in relation to the distribution of *Z* scores obtained using synthetic guilds of equivalent S (300 runs).



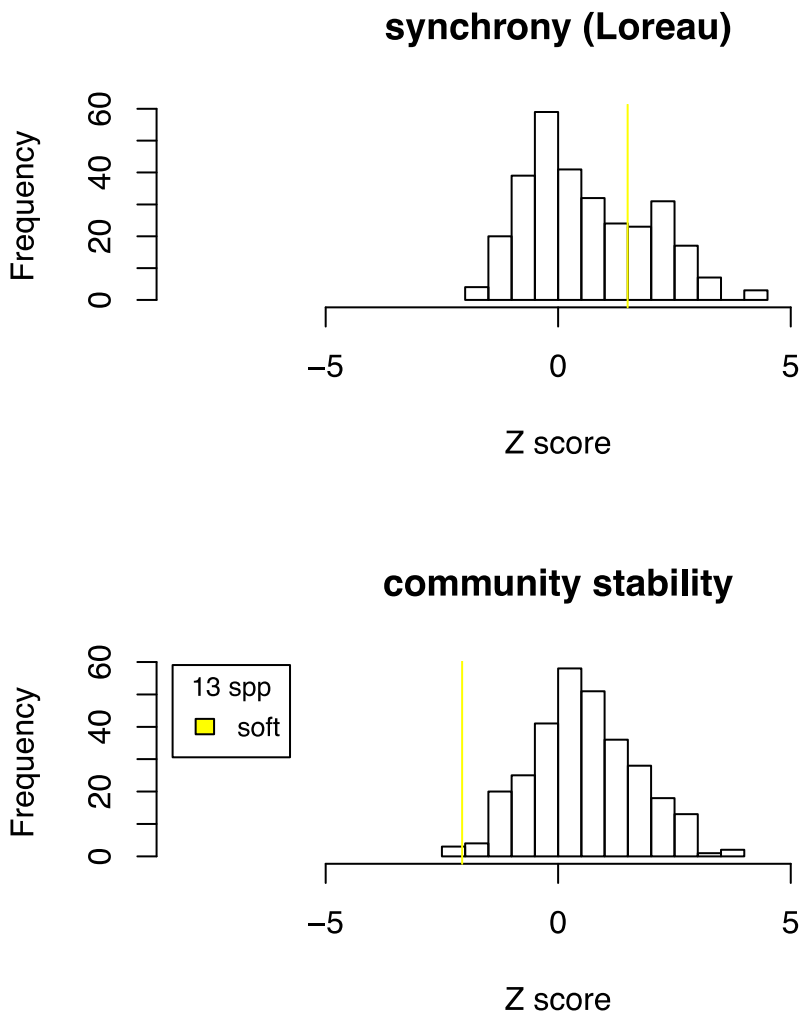
Z scores
dominant (dom) species: Loreau Z=3.65; dominant species: stability Z=6.79
hard benthic (hard): Loreau Z= -0.152; hard benthic stability Z=0.113

Figure S3 continued



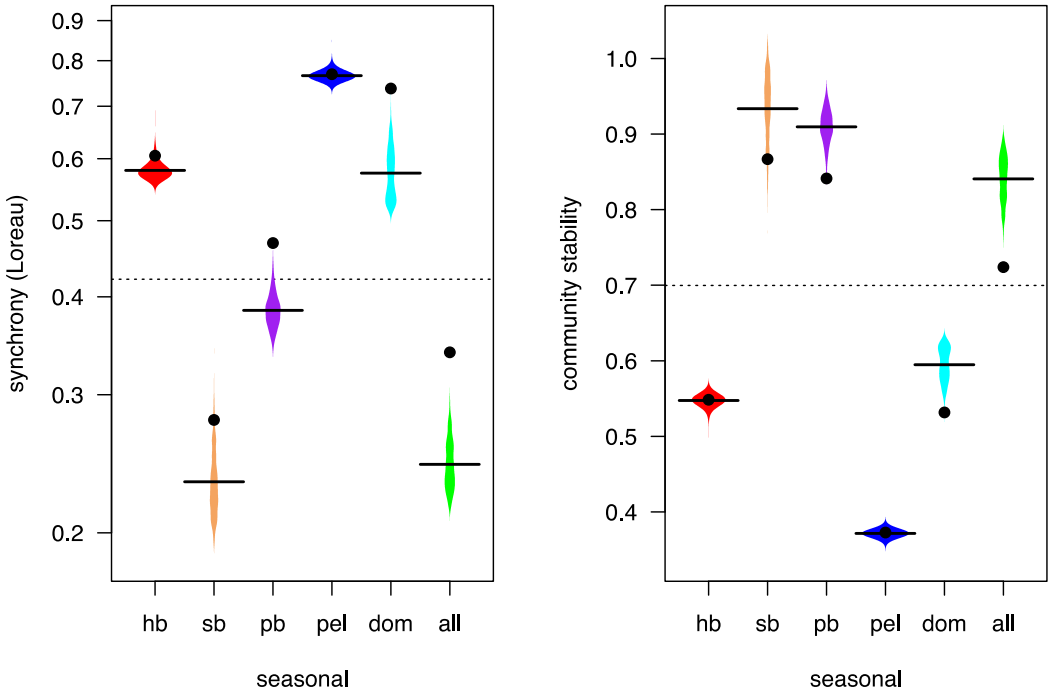
Z scores
proximo benthic (prox): Loreau Z=0.98; proximo benthic: stability Z=-0.975
pelagic (pel) Loreau Z= -0.271; pelagic: stability Z=0.249

Figure S3 continued



Z scores
soft benthic (soft) Loreau 1.22; soft benthic: stability Z= -1.15

6. Figure S4. Synchrony and community stability analysis using monthly data. The analysis presented in Figure 1 was repeated using the entire time series (t=442 time points, with n=300 runs). In each case a black dot represents the observed value. The quantiles of these are as follows: synchrony: hb=0.94, sb=0.94, pb=1, pel=0.70, dom=0.99, all=1; stability: hb=0.51; sb=0.10; pb=0.003; pel=0.71; dom=0.01; all=0.



8. Figure S6 Distribution of correlation coefficients (Pearson), showing temporal correlation between pairs of species in group or guild of interest. Note that the temporal abundances of species tend to positively covary (there are good years and bad years) and that this is notably strong for dominants.