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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8. Table S1 – The 33 guild members

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| **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 available at: <https://dx.doi.org/10.17630/e678f99b-e170-4852-bf70-ab738c6a81b7>

3. Figure S1 Time series of annual abundances of combined guild members. Abundance data are transformed (log10 (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.

