Supplementary Figures

The carbon footprint and nutrient density of blue foods

Authors: James Robinson, Angus Garrett, Juan Carlos Paredes Esclapez, Eva Maire, Christina Hicks, Nick Graham

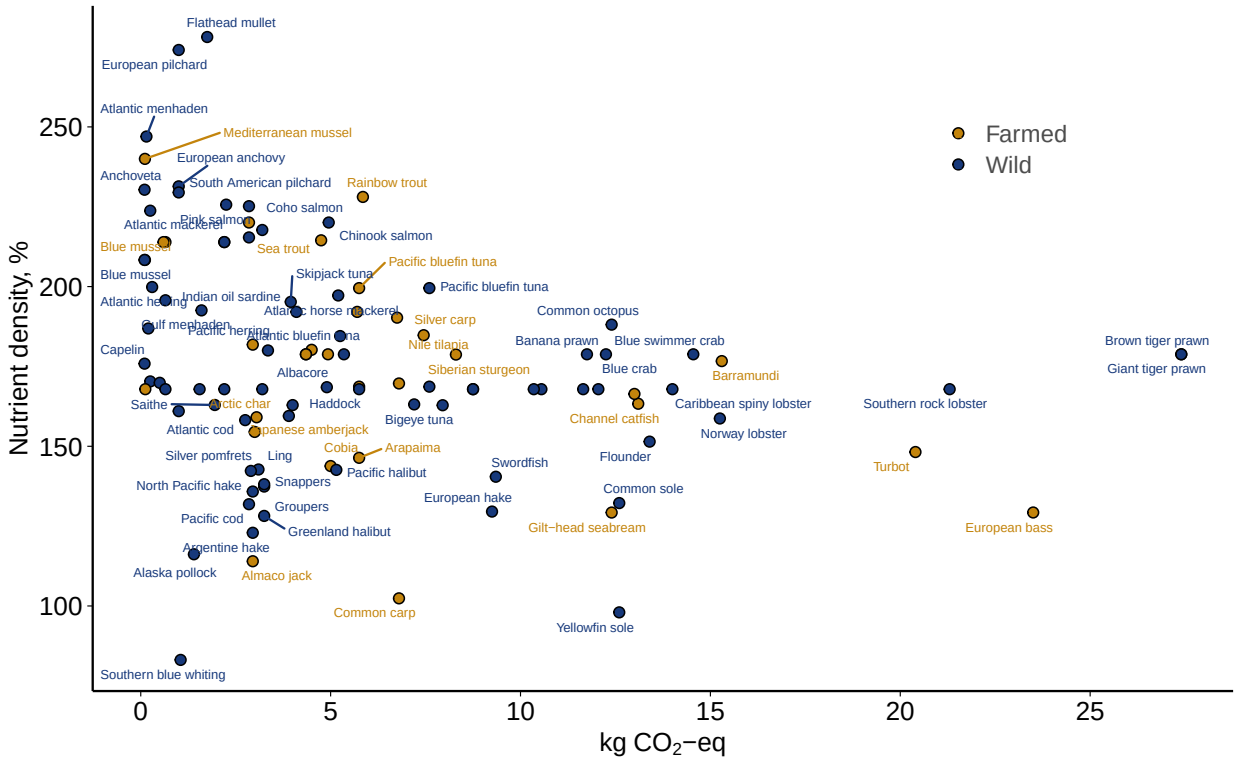

Fig. S1. Nutritional value and carbon footprint of seafood species Points are kg CO2-eq of each species and its corresponding the nutrient density (%). Nutrient density is the summed contribution of a 100g portion to recommended intakes of five nutrients (calcium, iron, selenium, zinc, omega-3 fatty acids) (recommended daily intakes for adults (18-65 years old)).

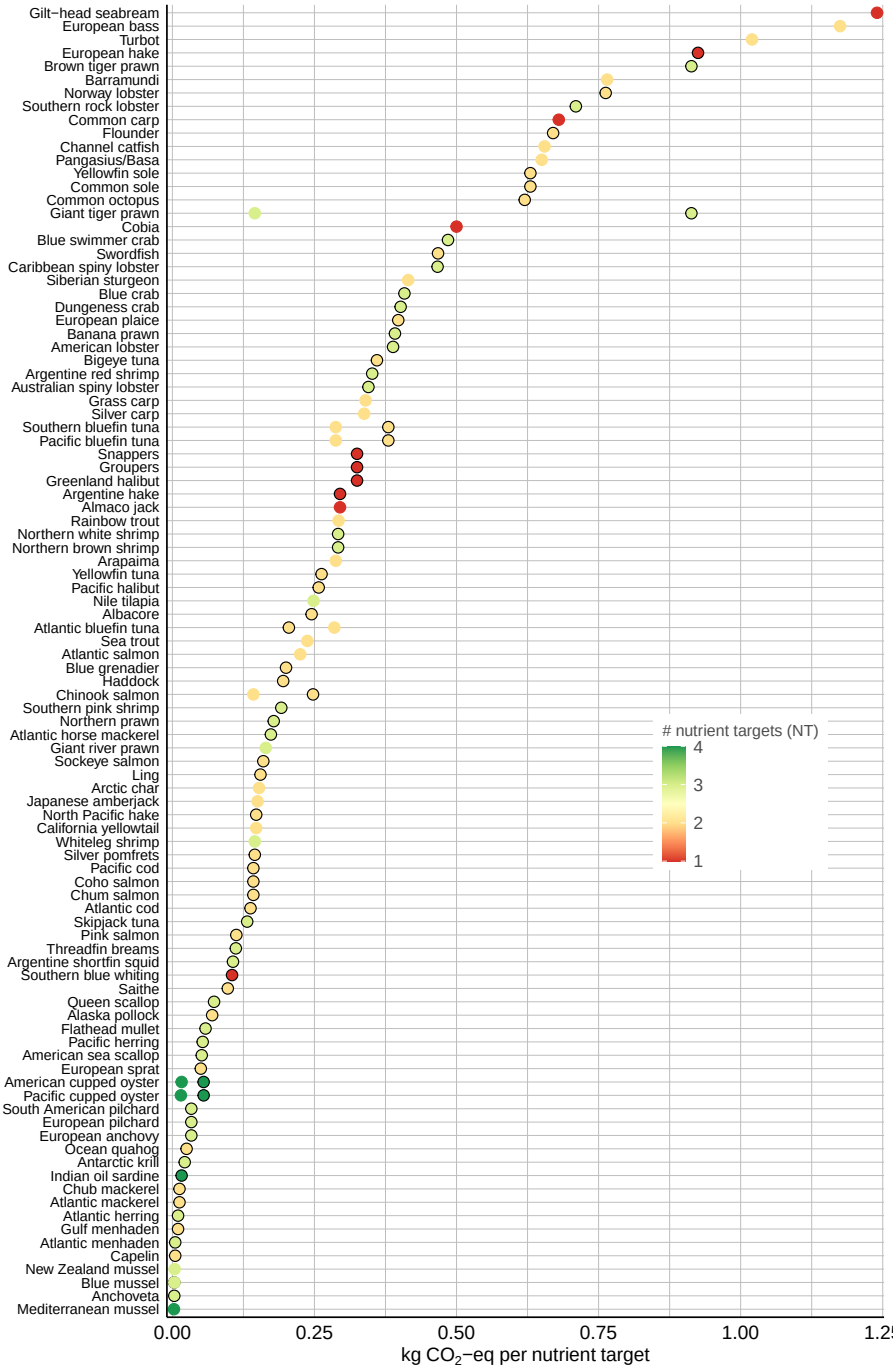

Fig. S2. Carbon emissions per nutrient target for all seafood products in the carbon emissions database Points are the mean kg CO2-eq per nutrient target for each seafood species, where a nutrient target was the recommended intake (adults 18-65 years old) contained in a 100g portion for 7 nutrients (calcium, iron, selenium, zinc, omega-3 fatty acids, vitamin A). Points are coloured by the number of nutrient targets in a 100g portion. Animal-source foods (beef, chicken, lamb, pork) are included for comparison using CO2 values from (Clune et al., 2017) and nutrient values from (Widdowson, n.d.).

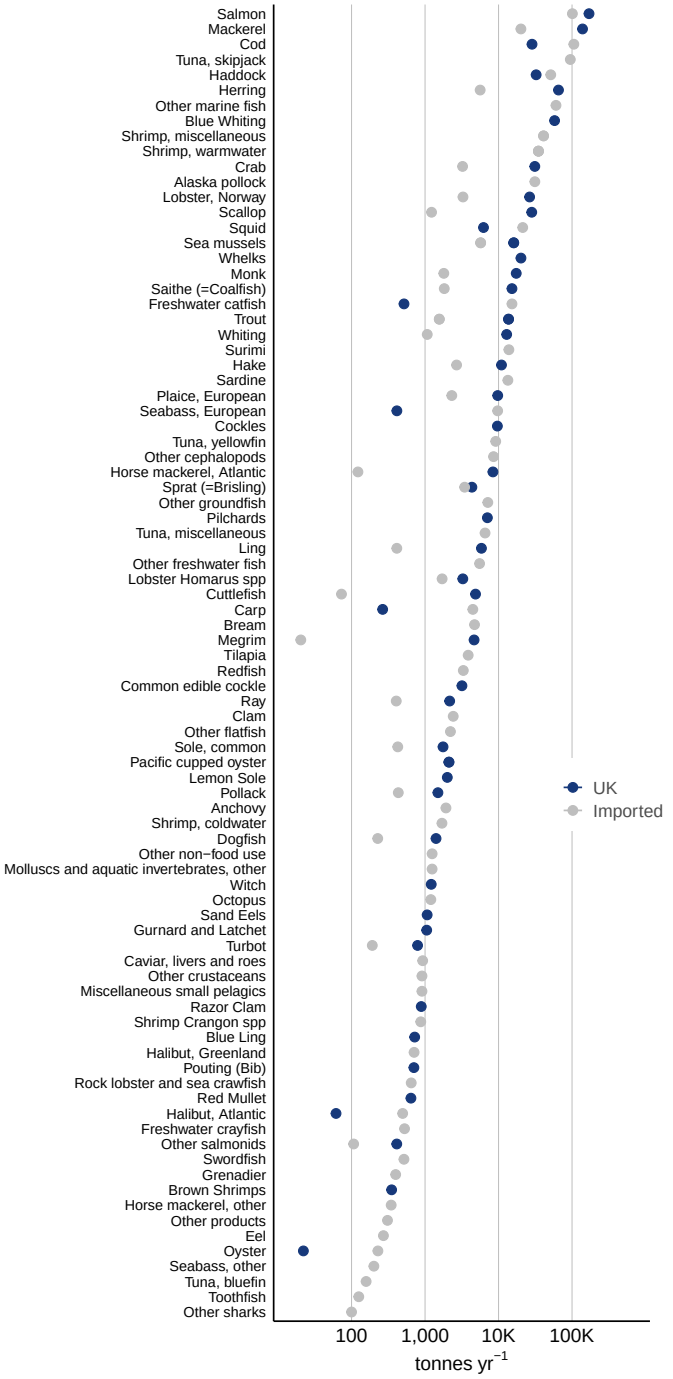

Fig. S3. Seafood available for UK consumers. Points are the estimated UK production (blue, landings and farms) and imported (grey) seafood per year, for all seafood with more than 100 tonnes total production.

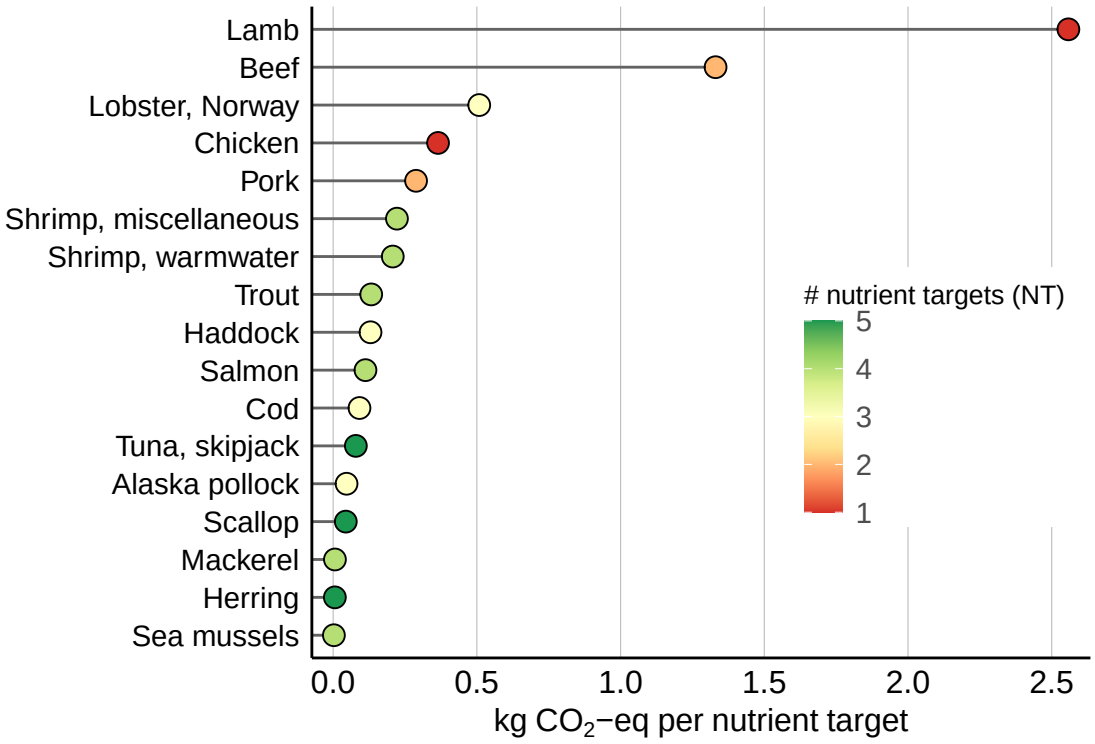

Figure S4. Carbon emissions per nutrient target for UK seafood products, for nine essential dietary nutrients. Points are kg CO2-eq per nutrient target (averaged across species), coloured by the number of nutrient targets in a 100g portion. Targets were recommended intakes for adults (18-65 years old) of nine nutrients (calcium, iron, selenium, zinc, omega-3 fatty acids, vitamins A, D, B12, folate). Animal-source foods (beef, chicken, lamb, pork) are included for comparison using CO2 values from (Clune et al., 2017) and nutrient values from (Widdowson, n.d.).

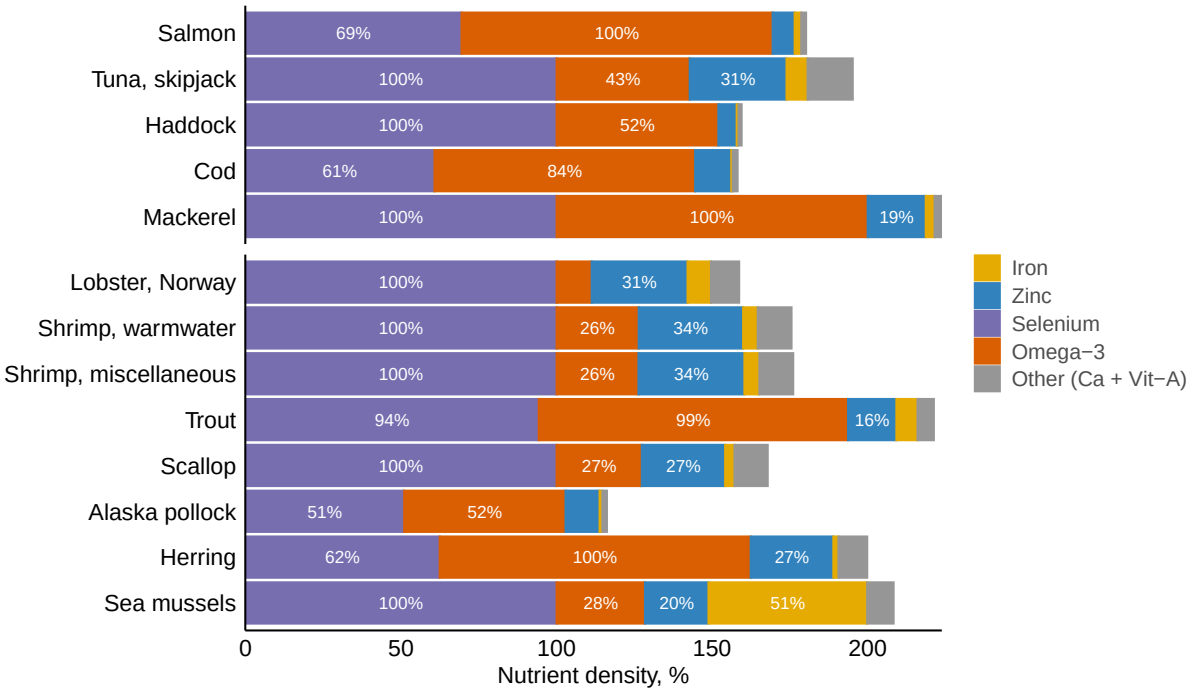

Fig. S5. Nutrient density for major UK seafood products estimated for five nutrients (calcium, iron, selenium, zinc, omega-3 fatty acids). Nutrient density based on recommended daily intakes for adults (18-65 years old), recalculated here for comparison with Fig. 1 (nutrient content of global seafood products).

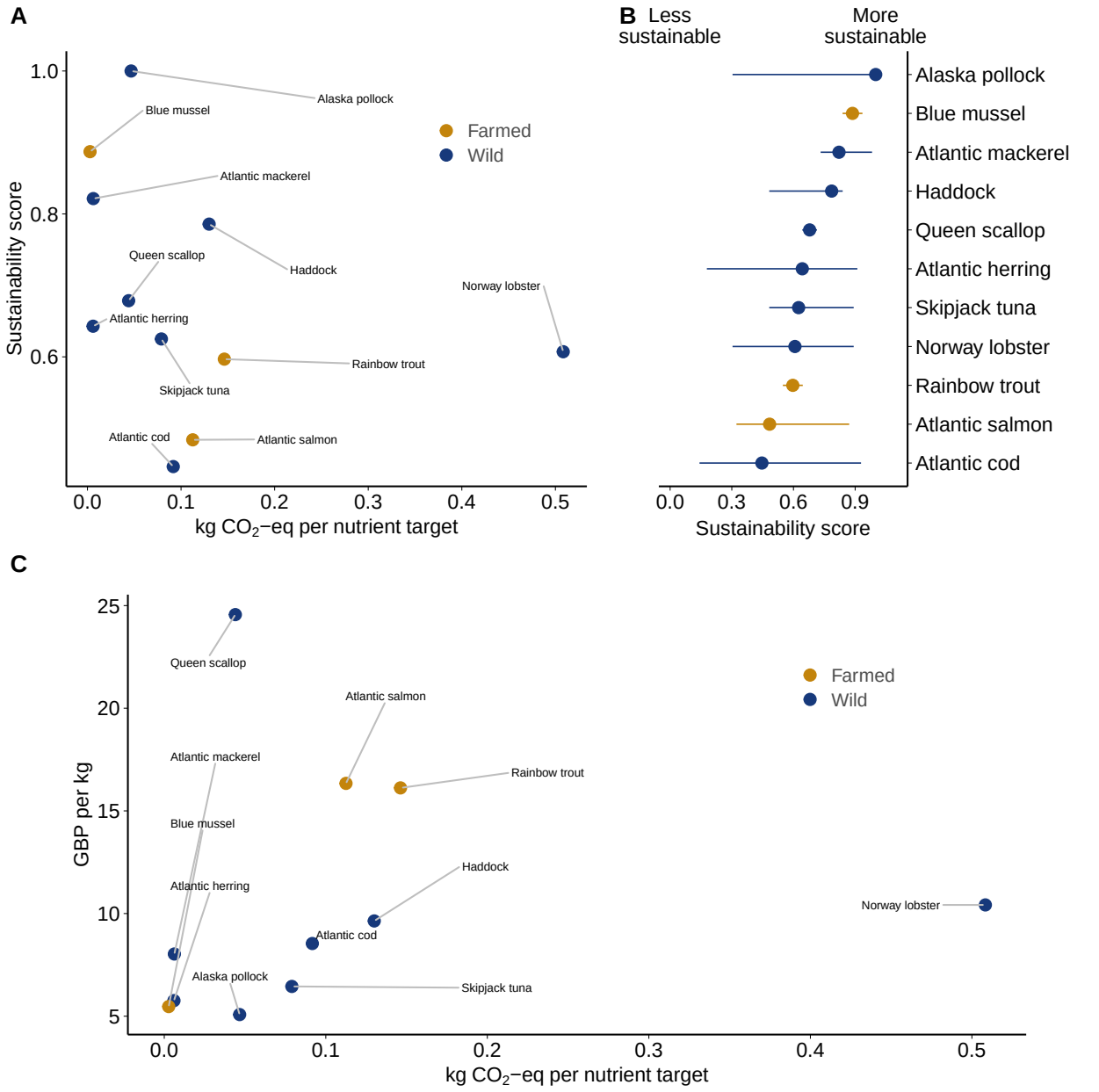

Fig. S6. Sustainability and price of UK seafood products. A) Carbon emissions per nutrient target by sustainability score, where points are the mean sustainability score of each product against the mean kg CO2-eq per nutrient target. B) is the range in sustainability scores by seafood product and C) is the price per kg (Seafish 2021) against kg CO2-eq per nutrient target. Sustainability scores were rescaled such that 0 = low sustainability and 1 = high sustainability, and kg CO2-eq per nutrient target was estimated from recommended intakes of nine nutrients (calcium, iron, selenium, zinc, omega-3 fatty acids, vitamins A, B12, D and folate).

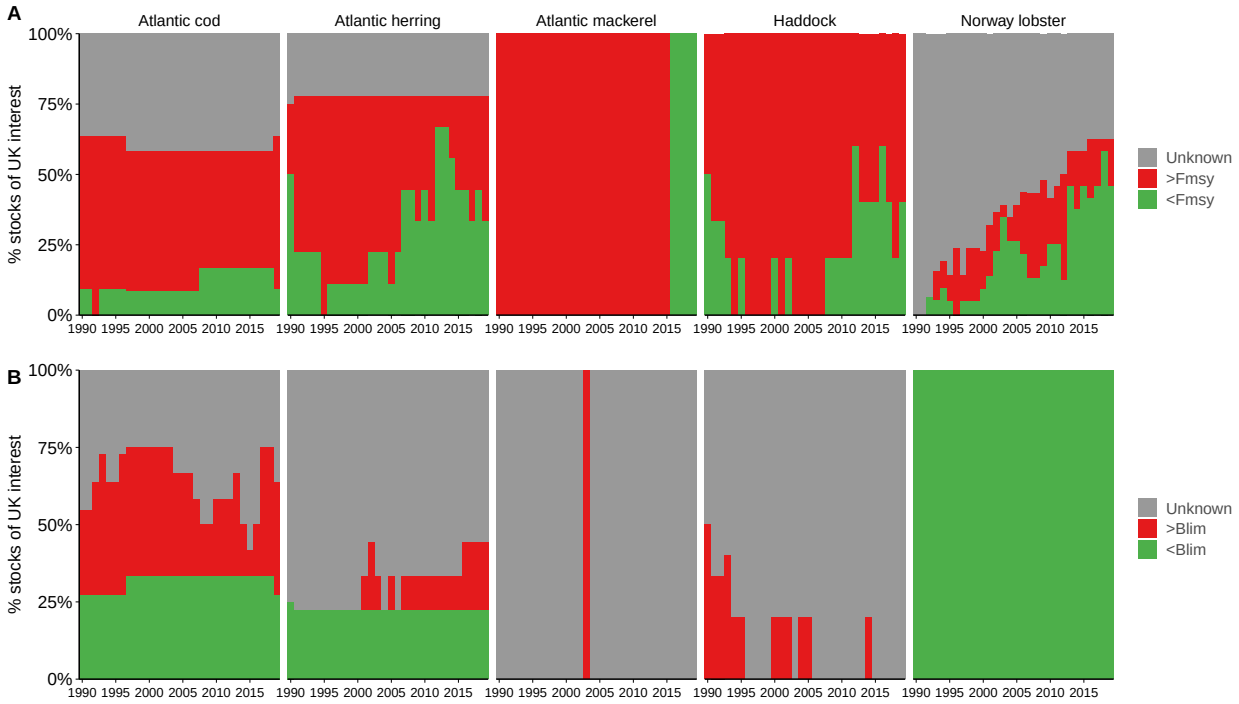

Fig. S7. Pressure and state thresholds for wild fisheries stocks relevant to UK seafood production from 1990-2019. Bars indicate the proportion of stocks that are underfished (green), overfished (red), or data deficient (unknown), according to estimates of fishing mortality (A, F_MSY_) or spawning stock biomass (B_lim_). Data from CEFAS [REF].