Supplementary Figures

Navigating sustainability and health trade-offs in global seafood systems

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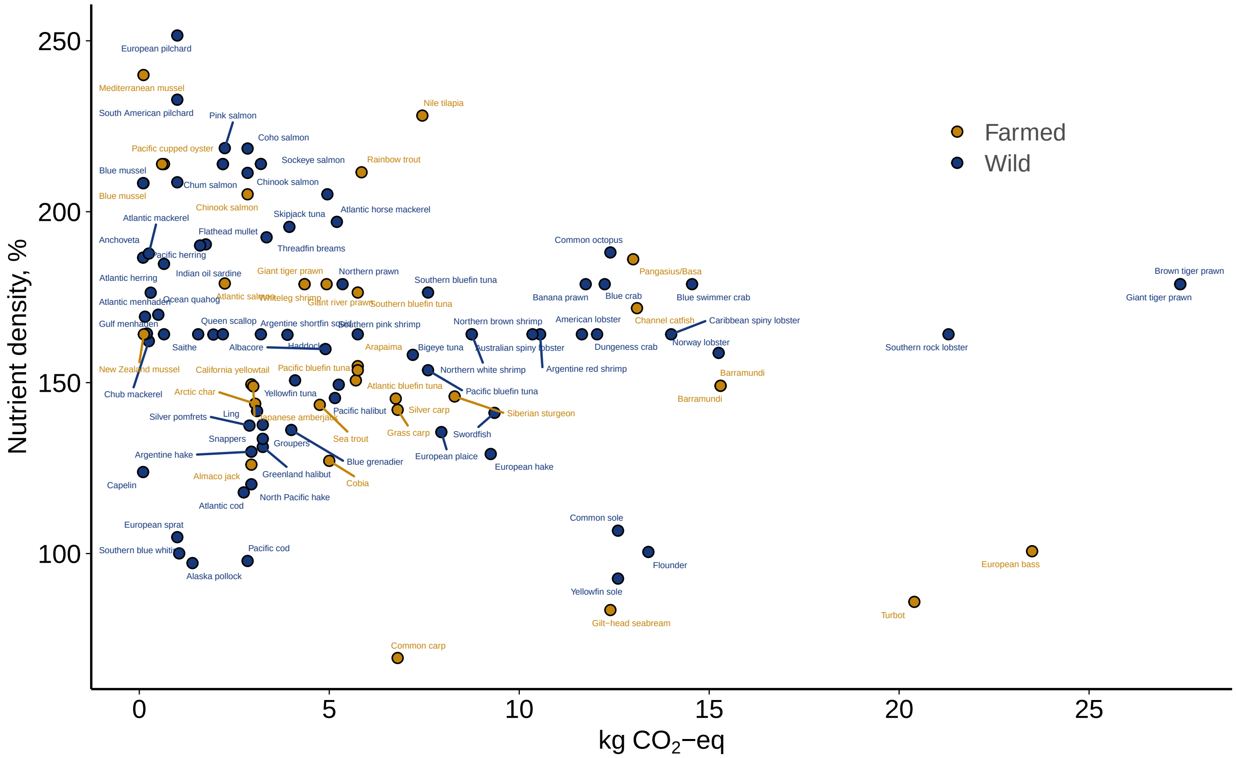

Fig. S1. Nutritional value and carbon footprint of seafood species Points are live weight kg CO2-eq of each species and its corresponding the nutrient density (%). Nutrient density is the summed contribution of a 100 g portion to recommended intakes of five nutrients (calcium, iron, selenium, zinc, omega-3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

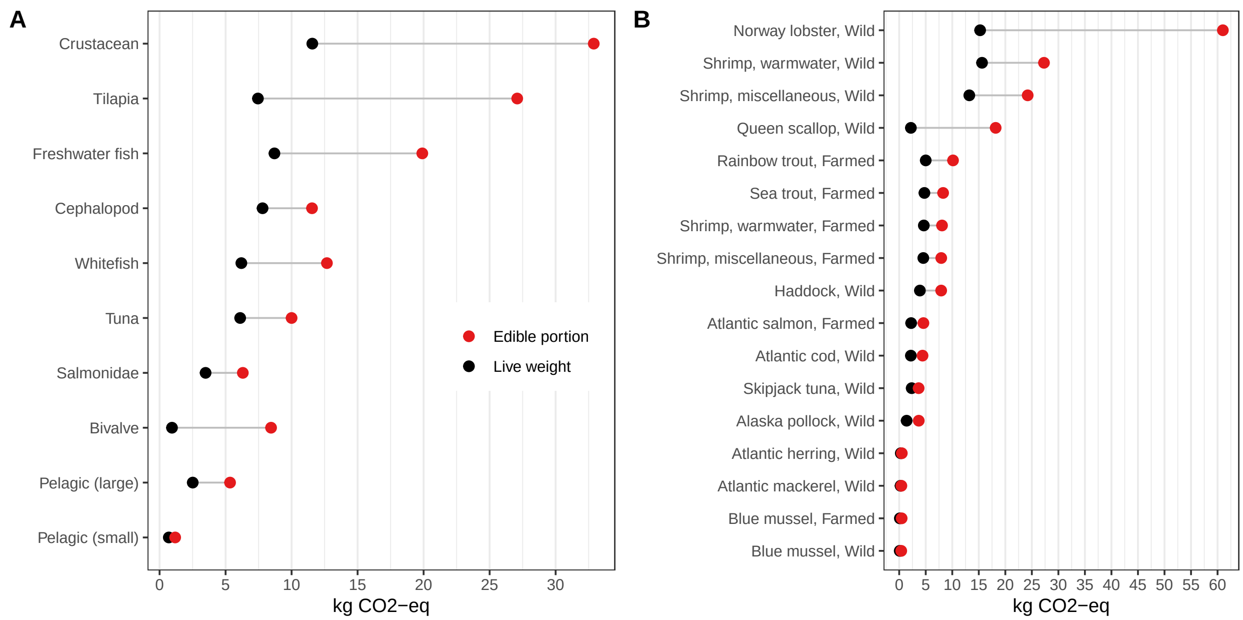

Fig. S2. Carbon footprint of seafood species corrected for edible portions Points are kg CO2-eq for groups of global seafood products (A) and UK-specific seafood productions (B), showing unprocessed live weight estimates (black) and estimates for processed, edible seafood (red).

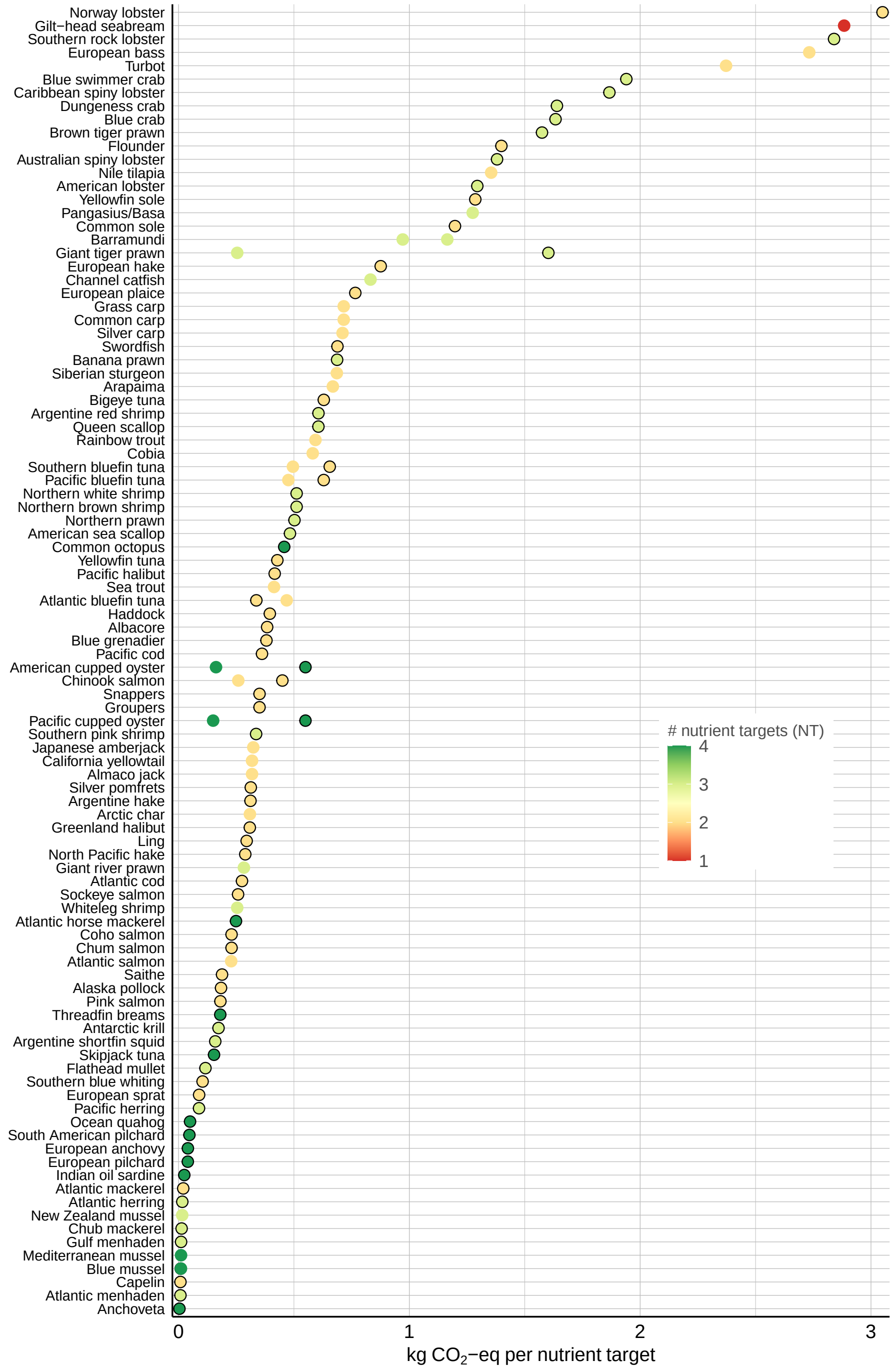

Fig. S3. Carbon emissions per nutrient target for all seafood products in the carbon emissions database Points are the mean kg CO2-eq per nutrient target for each seafood species, where a nutrient target was the recommended intake (adults 18-65 years old) contained in a 100 g edible portion for five nutrients (calcium, iron, selenium, zinc, omega-3 fatty acids). Points are coloured by the number of nutrient targets in a 100 g edible portion, and species with solid black outline are wild-caught (coloured outline are farmed).

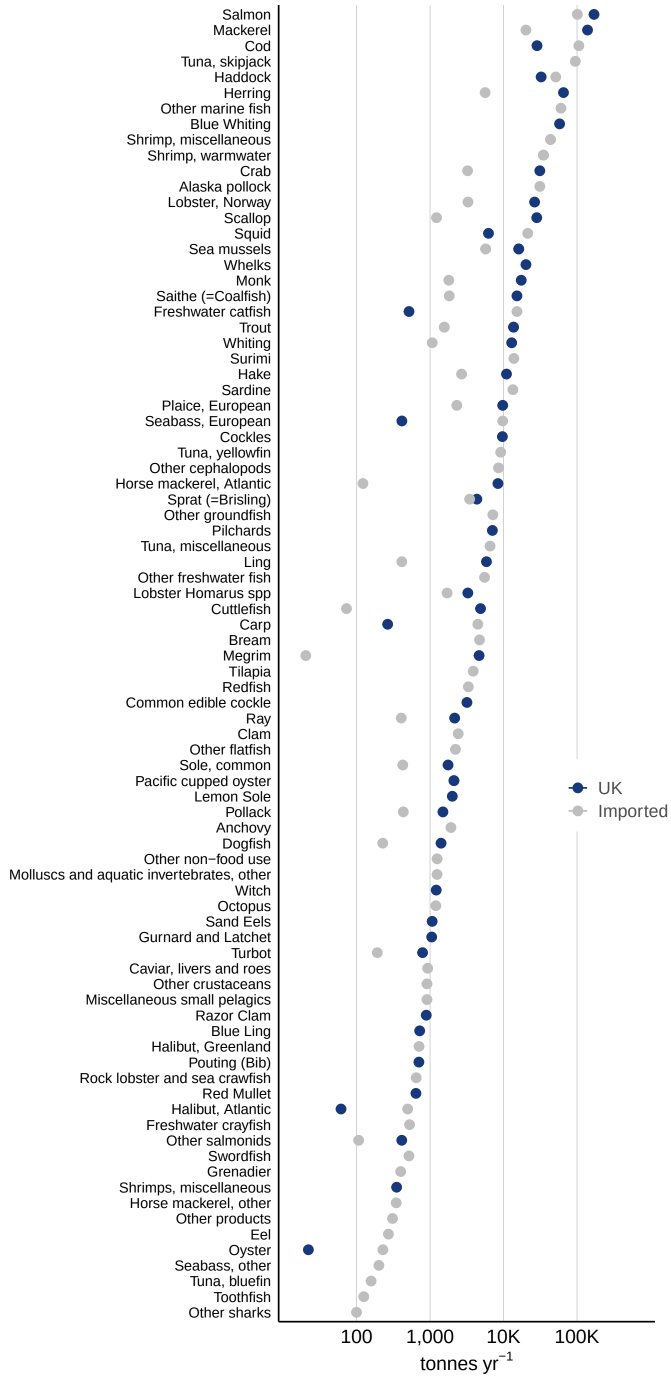

Fig. S4. Seafood available for UK consumers. Points are the estimated UK production (blue, landings and farms) and imported (grey) seafood per year, for all seafood with more than 100 tonnes total production.

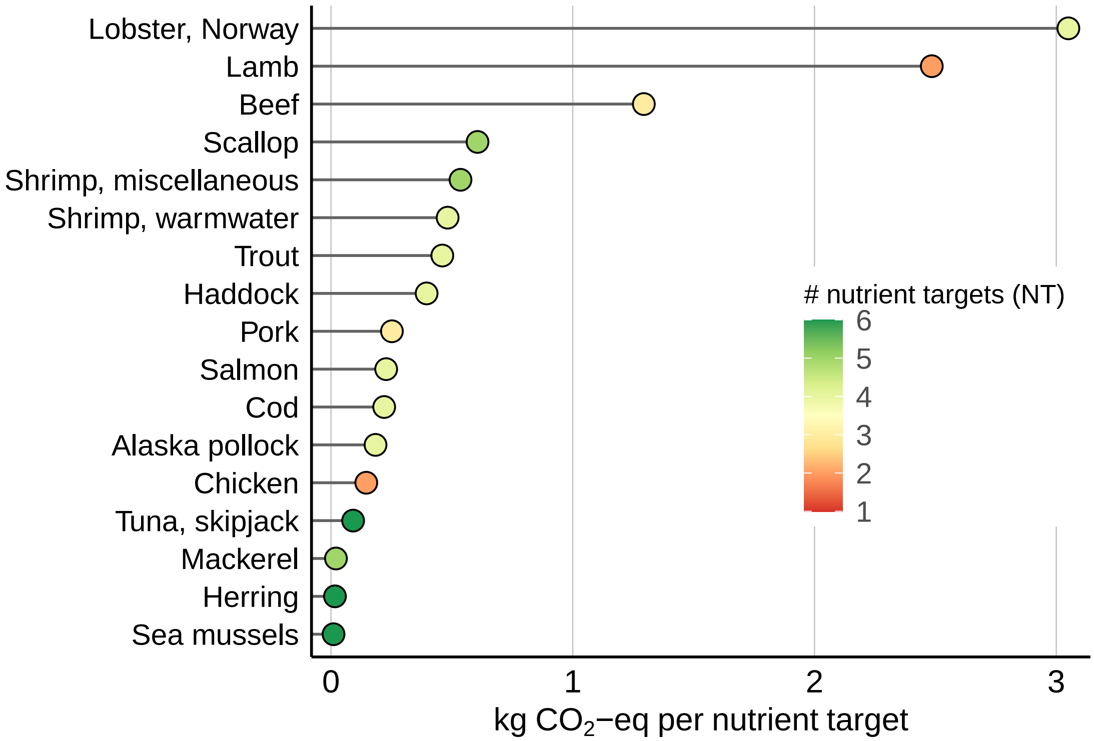

Figure S5. Carbon emissions per nutrient target for UK seafood products for ten essential dietary nutrients. Points are kg CO2-eq per nutrient target (averaged across species), coloured by the number of nutrient targets in a 100 g edible portion. A nutrient target was 15% of the recommended intakes for adults (18-65 years old) of ten nutrients (calcium, iodine, 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.).

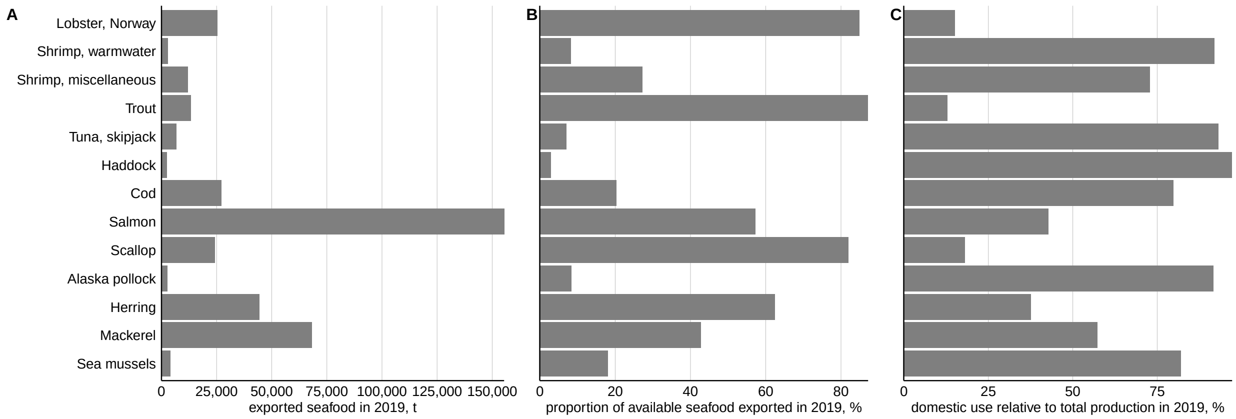

Fig. S6. Seafood exported from the UK in 2019 A) Export volume in tonnes of live weight, B) export volume as a proportion of available seafood, and C) domestic use as a proportion of available seafood. Seafood products shown had more than 100 tonnes total production (i.e. those in Fig. 2). Available seafood was the sum of landed, farmed, imported and domestic use was the total available seafood minus exports, using data for 2019.

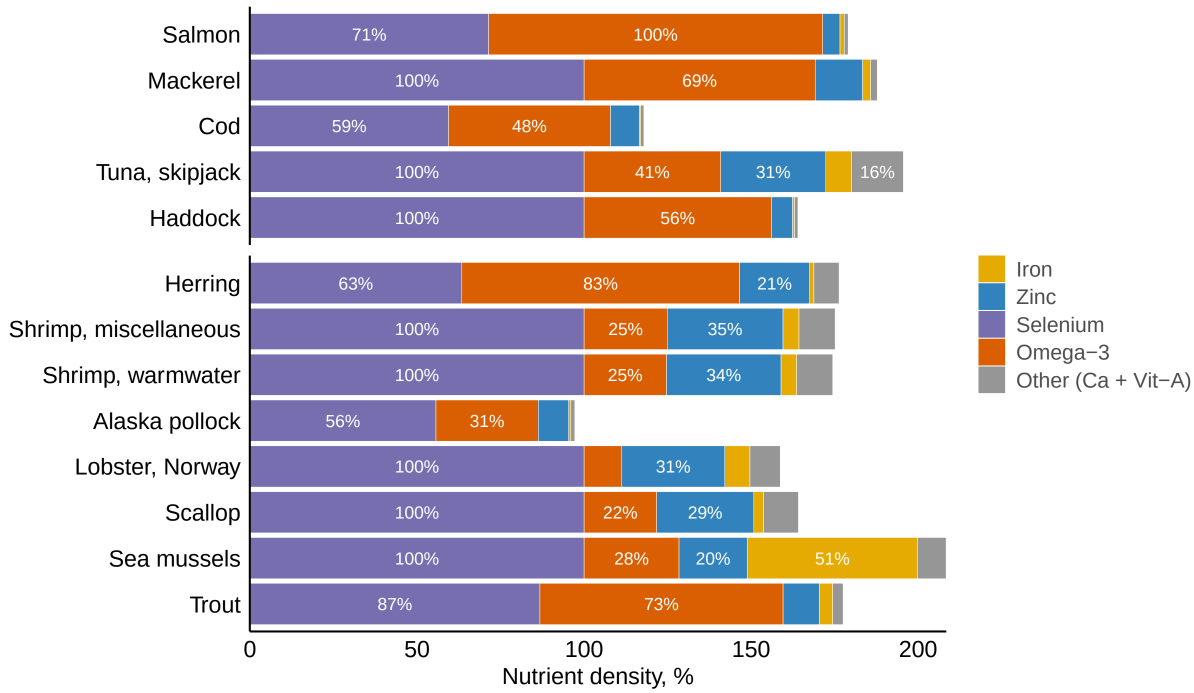

Fig. S7. Nutrient density for major UK seafood products estimated for five nutrients (calcium, iron, selenium, zinc, omega-3 fatty acids). Nutrient density based on recommended daily intakes for adults (18-65 years old), recalculated here for comparison with Fig. 1 (nutrient content of global seafood products).

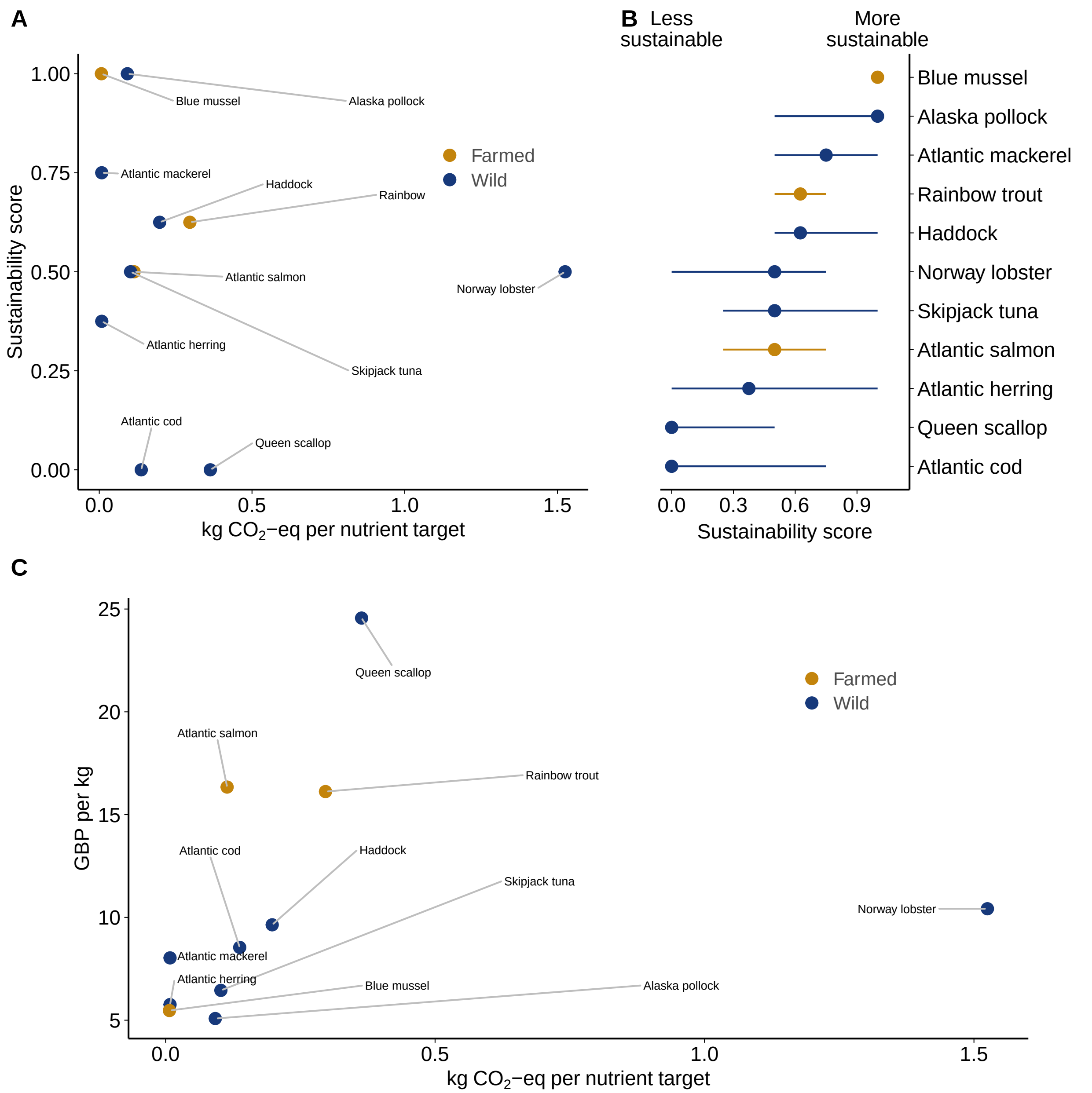

Fig. S8. Sustainability and price of UK seafood products. A) Carbon emissions per nutrient target by sustainability score, where points are the mean sustainability score of each product against the mean kg CO2-eq per nutrient target. B) is the range in sustainability scores by seafood product and C) 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 based on meeting 15% of adult recommended intakes for ten nutrients (calcium, iodine, iron, selenium, zinc, omega-3 fatty acids, vitamins A, B12, D and folate) from a 100 g edible portion.

Fig. S9. 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 A) fishing mortality relative to F_{MSY} and B) stock biomass relative to biomass limit (B_{lim}). Data from CEFAS (Lynam et al. 2021).