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mNCEA policy brief - PELCAP: Natural Capital in Plankton & Pelagic Habitats

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Plankton is vital for the functioning of marine ecosystems but is hard to value monetarily. According to the Office of National Statistics, plankton in UK waters provides services valued at up to £3.4 billion per year. PHEG members think that this is an underestimate.

Valuation units: i.e. the assets or stocks: we distinguish spatially-defined asset units, such as the OSPAR COMP4 sea-areas, from stock assets, such as a population of fish, that can be quantified as state variables within a mathematical model. The former correspond to an instance of a (pelagic) habitat type, the latter to a stock as defined by fisheries scientists. Fish stocks may range over several COMP4 areas, and thus monetary valuation of UK marine ecosystems may only be possible on the large scale, such as that of the ‘Greater North Sea’.

Figure 2: Plankton: phytoplancktons (left) are fed on by zooplanktons (right), which are food for fish

Figure 3: The two kinds of ecosystem accounting used in the PNCA, adapted for pelagic habitats

Table 1: Estimated value (2010–2019) of selected ecosystem services supported by plankton and pelagic habitats in UK waters, and corresponding natural capital asset values. From ONS and other official papers.

Ongoing issues

Logic chains: there is a need to understand and quantify the causal links between anthropogenic pressures and the States of pelagic habitats, and the links from phytoplankton through zooplankton to commercial fisheries - the latter investigated in the PIT-PAF project.

Negative impacts: some plankters can harm human well-being, as exemplified by Harmful Algal Blooms; however, PNAC do not allow negative valuations of ecosystem services.

‘One breath in two’: phytoplankton photosynthesis made about half the free oxygen in the air and sea. Taking this, and other supporting services, into account may substantially increase plankton’s monetary valuation.