Initial natural capital accounts for the UK marine and coastal environment

FINAL REPORT Summary

June 2019

Department for Environment Food & Rural Affairs

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This report should be cited as:

Thornton, A., Luisetti, T., Grilli, G., Donovan, D., Phillips, R. and Hawker, J., 2019. *Initial natural capital accounts for the UK marine and coastal environment. Final Report.* Report prepared for the Department for Environment Food and Rural Affairs.

Acknowledgements

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Summary

The aim of this project was to advance the development of natural capital accounts for the UK marine and coastal environment. Limited to the use of existing, available data, this analysis built on previous work, some very recently completed. The scale and complexity of the task was considerable not only because of the extent of the UK marine environment--approximately three times that of terrestrial environment, and much less accessible--but because of overlapping attribution of assets in coastal zones, the high mobility of marine natural assets and scarcity of information.

Following ONS guidance we assessed the extent of UK marine and coastal assets defined using EUNIS habitat classification. Examining UK marine and coastal habitats for the variety of ecosystem goods and services delivered, we focused on those services that provide significant and important benefits to the UK economy and societal wellbeing. Using logic chain analysis, we assessed the critical conditions for the sustainable delivery of services from these habitats, undertook an economic valuation of each of these key ecosystem services and discussed potential beneficiaries of UK marine ecosystem goods and services. Outputs include a systematic dataset, with gaps identified, in support of these accounts and prioritised recommendations for the improvement of the data and asset coverage.

Even with the consideration of only seven ecosystems services, some narrowly described, the value of the flow of goods and services from UK marine and coastal ecosystems is impressive, both in its scale and growth over the past 5 years. The harvest of finfish and shellfish is the ecosystem service that is perhaps most familiar to people for several reasons ---employment, cultural history, culinary tradition--- but in the larger context its economic value appears relatively minor. The relative importance of regulating services, namely climate regulation (specifically carbon sequestration), waste remediation and natural hazard protection, compared to the other services is most notable, in 2016 more than double the other services considered combined. Cultural value is clearly underestimated as limited to recreation, here only coastal visits, it leaves behind on-the-water experience as well as the broader cultural appreciation of UK maritime heritage.

Although not generally included in natural capital accounts, abiotic services are significant from two important perspectives: firstly, the significance of their contribution, materially and economically, and secondly, the potential impact of their development on the areas from which they are sourced. Exploitation of abiotic resources can have a significant detrimental influence on surrounding ecosystems. A better understanding of the interactions and trade-

offs between these two types of resources is essential if both biotic and abiotic natural capital assets and their services are to be developed with minimal detrimental effect to each other and the wider environment. Valuing marine and coastal ecosystems is difficult for many reasons, not least of which is the paucity of data and information on the broad spectrum of ecosystem services delivered, the interaction between several services, the associated critical supporting ecosystem services, and the conditions required to ensure the sustainable delivery of renewable services.

Although developing at a rapid pace the basic science remains inadequate to address the global challenges faced in this field. Data that we were able to access much was incomplete or inconsistent, often lacking the benefit of regular monitoring. Over a third of UK marine and coastal habitats fall in the category of just 'Seabed' or 'Known unknown'. Extent of our broad-scale habitats, the necessary first level of understanding, must be the priority.

In terms of natural capital accounting a number of methodological issues remain widely debated: overlap between marine and coastal accounts with other UK natural capital; suitability of information developed from survey data as opposed to modelling; appropriate level of spatial disaggregation. Other issues that may need to be addressed with implications for the direction of funds for filling data gaps is the development of new technology and software and how analysis should reflect changing environmental conditions, whether due to extreme weather events, ecological recovery, restoration or an altered management regime.

We need to better understand the various ecological processes associated with the delivery of key ecosystem services, such as related to heavy metal movement in the marine environment, nutrient remediation in the deep sea, effectiveness of natural hazards and the boundaries relevant for carbon processing (at present not matching well EUNIS habitat categories). A better scientific understanding will enable more appropriate condition indicators to be developed. With much of UK history and culture having definite maritime links, more effort is needed to develop a better understanding of society's appreciation and valuation of marine and coastal habitats. Better knowledge of the potential users and beneficiaries could open opportunities for joint working and civil society involvement.

Natural capital accounting by its very nature, i.e., the stepwise progression of the analysis, the link between biophysical and social science, the need for regular monitoring, will help place science and economic evidence at the forefront of decision-making. Identifying gaps in monitoring and evaluation will need to be addressed to enable policy to be more securely based on a sound understanding of the costs and benefits, including biophysical trade-offs,

of different policy and development options. Understanding the ecosystem services associated with coastal habitats will be increasingly important for developing policy and management plans to address climate change impacts and enhance ecological as well as economic resilience in the UK coastal and marine environment.