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The State and Status of Fishes and Aquatic Invertebrates: A Retrospective

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Abstract

We reflect on the profound transformation over the last two decades in society's relationship with fishes and aquatic invertebrates, animals who were often previously referred to as simply 'seafood' and killed at now unimaginable rates: at its peak, trillions of individuals per year. A combination of rapid changes in scholarly research, pedagogy, technological developments, and youth-driven, animal-related campaigns and activism, provoked political will at national and international levels. We highlight some key moments in the transition to embracing a reciprocal relationship with fishes and aquatic invertebrates, including the changes in marine biology and ecology curricula to incorporate perspectives on individual animals (not only the species-level view that previously characterized the fields), the decision by major media outlets to adopt a new language (e.g., referring to 'fishes' instead of 'seafood'), and the role of architectural design in enhancing our interspecies interactions--to the benefit of aquatic non-humans and humans alike. In terms of political action, the key developments were the elimination of fisheries subsidies at the WTO and the protection of 80% of the oceans, including designated no-entry zones. The leadership of Queen Victoria of Sweden, civil society groups, especially youth activism in Korea, China, and Japan, and technological developments, including the creation of affordable, nutritious and wildly-popular 'animal-free' seafood products, all made major contributions to ending industrial fisheries and the expansion of animal aquaculture.

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1. INTRODUCTION

Our modern, mutually-beneficial relationship with fishes and aquatic invertebrates is now so predominant and pervasive, it is easy to forget that until recently, we exploited these animals at an unprecedented global scale. For example, in 2018 alone, hundreds of billions of individual carp, salmonids, crabs, shrimp and other aquatic animals belonging to more than 400 species across six phyla were farmed for human consumption[1]. In the same year, another 110 million tonnes of nearly countless aquatic individuals were captured at sea and subsequently slaughtered or simply discarded as ‘waste’[2]. The industrial fishing fleet, which included nearly 40,000 factory trawlers, accounted for at least 75% of the global fish catch and resulted in the destruction of seafloor habitat and bycatch of countless turtles, sharks, and seabirds [3]. All this destruction to aquatic life reaped few necessary gains: only ~3% of the global tonnage was caught by subsistence fisheries to feed food-insecure people; the rest went to luxury or food-secure markets or secondary applications, like animal farming [2]. The trillions of animals killed in this process were thought of merely as ‘seafood’ and fisheries science focused on maximizing profits or, at best, making fisheries ‘sustainable’ for continued exploitation. Shifting the moral calculus on a global scale required no less than a revolution in science, education, technology, social norms, and built structures, but was achieved with unexpected speed through the effort of multiple actors and the collective realization of the benefits of a relationship in which both humans and aquatic species could thrive.

The picture from twenty years ago is almost impossible to imagine today. Our relationship with aquatic animals, especially fish and invertebrates, has been completely transformed. Here we trace this recent history and highlight some key events that contributed to this shift. We begin by recounting the relation-