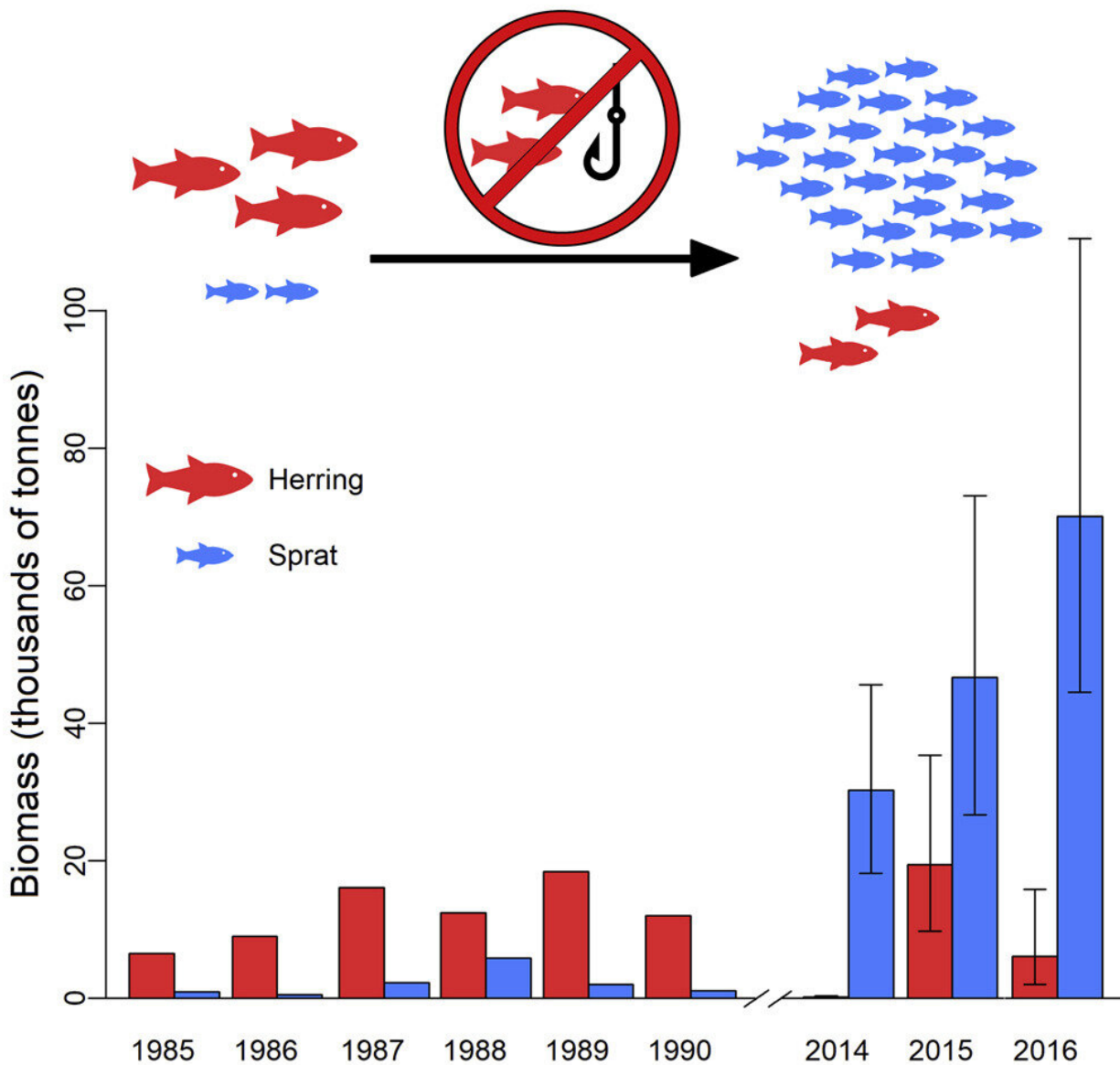


# Return of the sprat: 'Vital' small fish thrive in the Clyde Sea

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Graphical abstract. Credit: DOI: 10.1016/j.cub.2021.07.020

Small fish that live in open water and form a significant part of the base of the marine food chain have returned in huge numbers to the Clyde Sea, according to new research from scientists at the University of Aberdeen.

Sprat—a fish which is food for many other [marine species](#)—has increased its numbers 100-fold since the late 1980s, the study shows.

The Clyde Sea was once a thriving marine ecosystem with large fisheries for herring and other species such as cod and haddock. In recent decades, these fisheries have disappeared, largely due to overexploitation in the latter part of the 20th century, although a sustainable prawn fishery now operates. Herring fishing, in particular, disappeared in the late 1990s.

The new Aberdeen-led study, published in the journal *Current Biology*, has shown that although herring are still present, populations of sprat, a [related species](#), are now 100 times more numerous, with the combined total biomass (or weight) of herring and sprat now almost four times the size it was in the late 1980s, which was the last time they were measured.

The authors, working with Marine Scotland Science on their vessel *Alba na Mara*, used scientific sonar equipment to detect enormous schools of sprat—some were over 2km long and over 30m (100 ft) deep. They then used advanced sonar processing techniques to estimate the numbers of each species over three years from 2014 to 2016. The total weight of sprat in 2016 was estimated at over 70,000 tons, equivalent to a [population size](#) of 23 billion individuals.

Dr. Joshua Lawrence, who led the study which was funded by the Marine Alliance for Science and Technology Scotland (MASTS), was surprised by the results: "The Clyde Sea is famous for its herring, but although there has been virtually no fishing pressure on herring in over 20 years, it is the sprat population that has bounced back, not the herring. We can only speculate as to why this has happened—perhaps it is the warming seas, which may favor the sprat, or their more favorable reproduction strategy, as [herring](#) need particular gravel beds to spawn, whereas sprat do not.

"We also found a large concentrations of krill in the Clyde Sea—a major food source for the fish and for other larger animals such as [minke whales](#) which are known to visit the area. So there are large populations at various levels of the marine food chain, which tells us that the Clyde Sea's marine ecosystem is faring better than previously thought, despite centuries of overexploitation."

Professor Paul Fernandes, a fisheries scientist at the University's School of Biological Sciences, who supervised the study, said: "Sprat form a critical part of the marine food chain, and are vital for other larger fish such as cod and whiting, as well as other animals further up the food chain such as seabirds, whales, dolphins, and sharks. It is fantastic to see these parts of the [food](#) chain recover. This should, in time, lead to recovery of the populations of the larger animals that feed on them."

He added: "It does now provide an interesting dilemma for fisheries managers and the local seafaring community. A sprat fishery could operate, but perhaps a more sustainable and more lucrative opportunity could present itself through whale watching. There have been anecdotal reports of more whales and dolphins appearing in the Clyde Sea; and in a related study, we detected large numbers of porpoises in the area. As these whale populations themselves recover, they may find their way into these rich feeding grounds, much as they once did, and I am sure people

would pay to see them, as they do in other parts of the world where [marine ecosystems](#) have recovered. The key will be to do this responsibly to ensure a long-term future for the Clyde's historic seafaring community."

**More information:** Joshua M. Lawrence et al, A switch in species dominance of a recovering pelagic ecosystem, *Current Biology* (2021). DOI: [10.1016/j.cub.2021.07.020](https://doi.org/10.1016/j.cub.2021.07.020)

Provided by University of Aberdeen

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