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CASE STUDY

Innovative genetic stock identification method leads to re-opening of herring fishery

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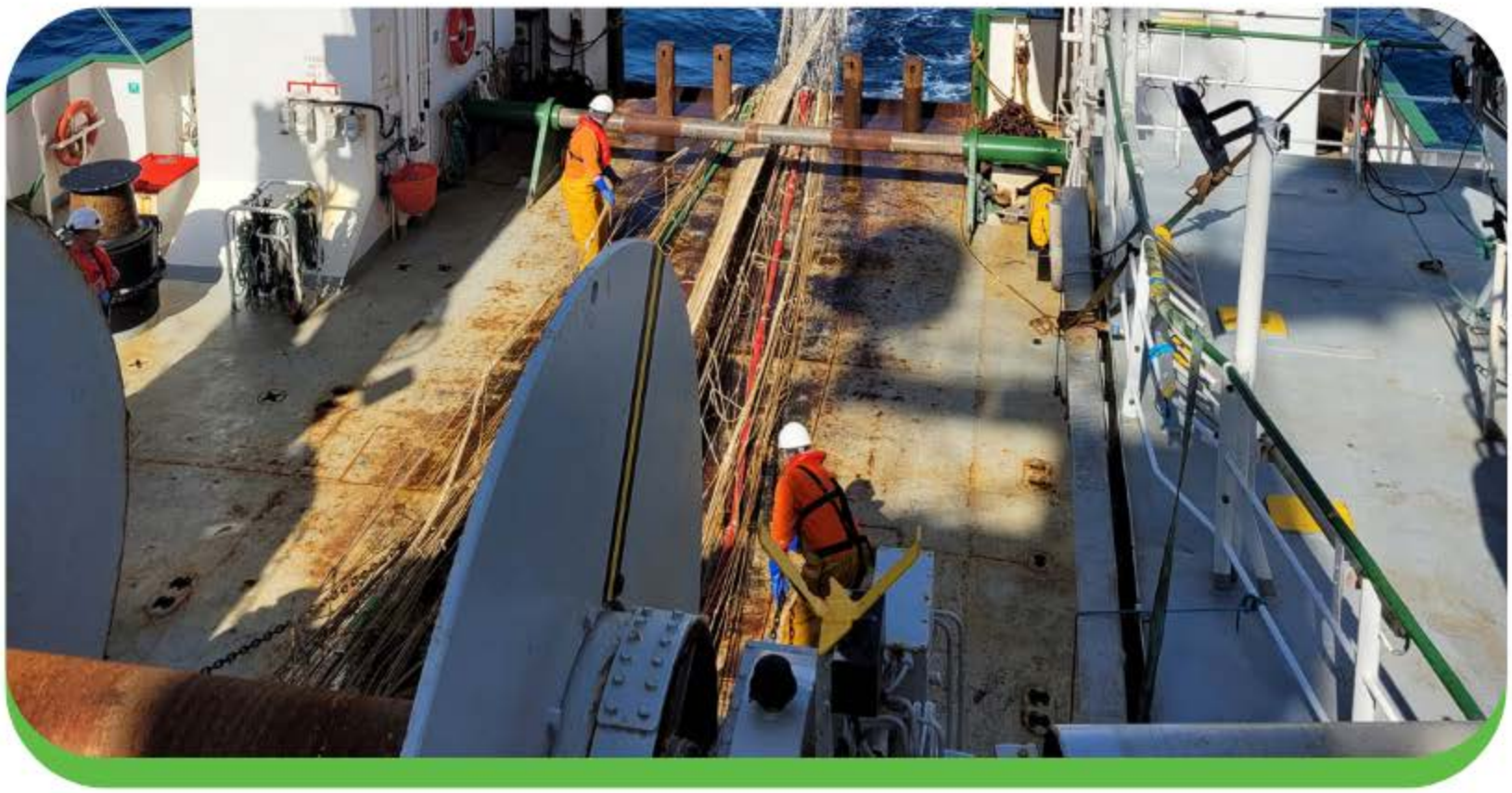

Since 2015, the Marine Institute has partnered with the Killybegs Fishermen's Organisation (KFO) in Co. Donegal and other Irish industry organisations, as well as international bodies, to address a long-standing challenge in the management of herring in ICES (International Council for the Exploration of the Sea) Division 6.a.

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Herring in this zone to the north of Ireland and west of Scotland belong to different populations, or stocks, which spawn at different times and places, most notably 6.a South (which is to the northwest of Ireland) and 6.a North (which is to the west of Scotland).

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When scientists surveyed these fish at sea, however, the stocks were mixed together, making it impossible to estimate the biomass of each individual stock. These mixed aggregations of herring were a roadblock to the development of stock-specific assessments, leading to precautionary zero-catch advice and a monitoring Total Allowable Catch that restricted fishing opportunities.

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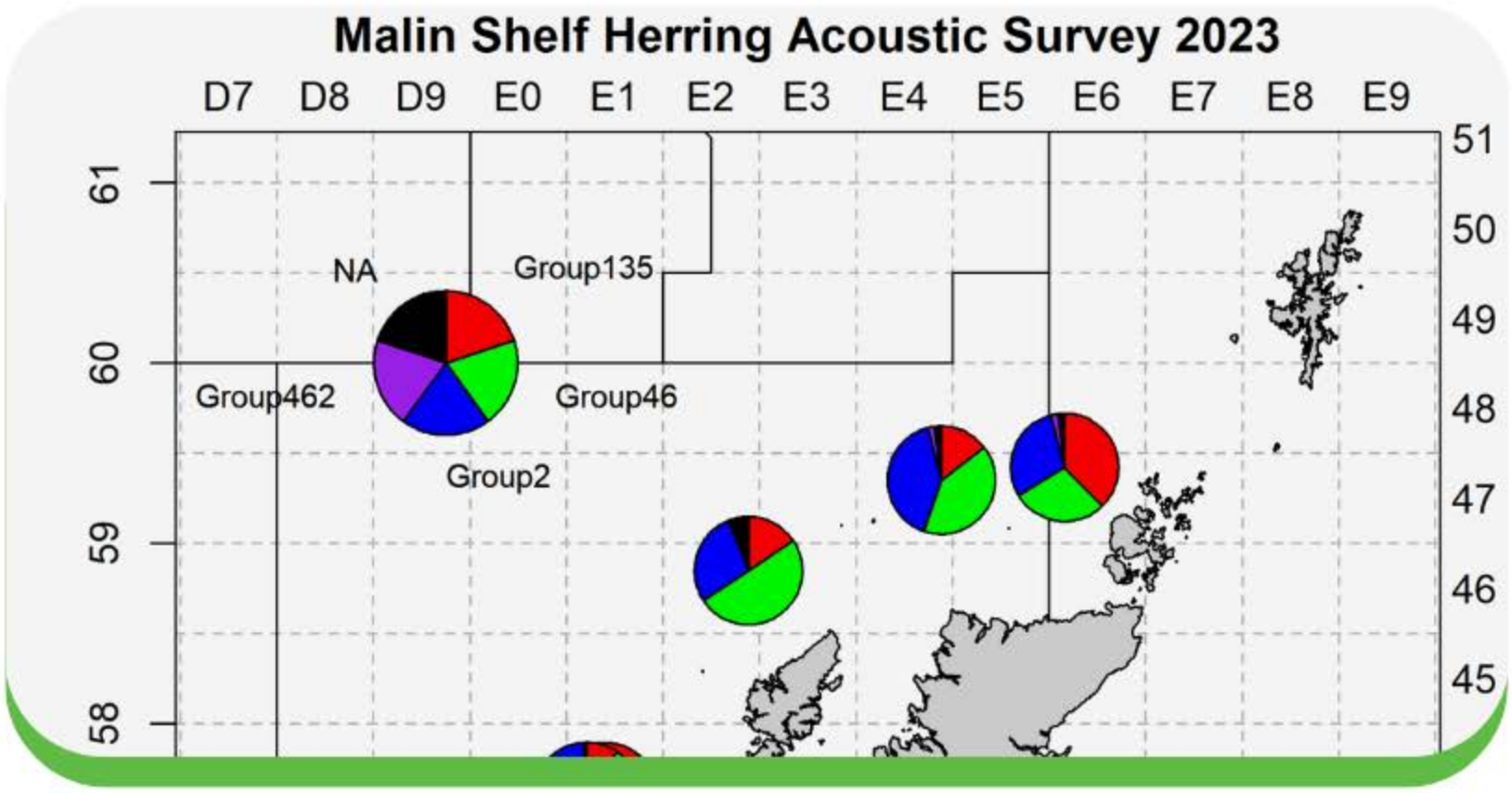
Through a collaborative research programme between the Marine Institute and its partners, a genetic stock identification method was developed and validated. It allows individual herring to be accurately assigned to their population of origin, using a panel of genetic markers and a machine-learning model.



Following the development of the new method, the Marine Institute integrated the results into its annual Malin Shelf Herring Acoustic Survey to split the biomass estimates by stock. In 2022, ICES benchmarked and accepted this innovation, enabling, for the first time, separate assessments for 6.a South and 6.a North.

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Following the adoption of the new science-based assessment approach, the herring fishery in ICES Division 6.a South (6.aS, 7.b-c) reopened after eight years of closure. This has had an important impact on the fishing industry, restoring access to a valuable resource for the Irish fleet.

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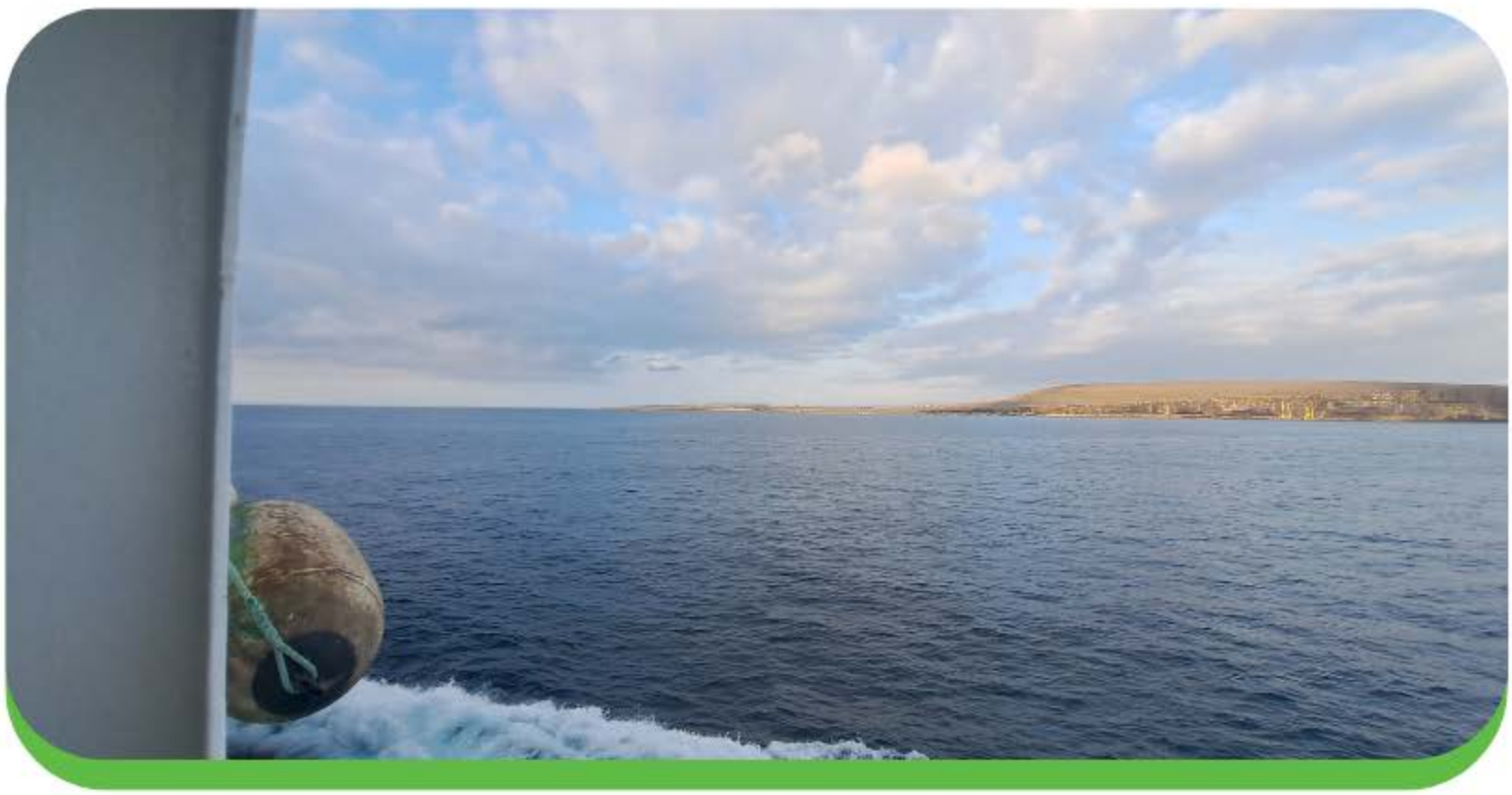

In addition to the economic benefits, the new approach has improved sustainability by reducing uncertainty in stock assessments, ensuring that exploitation rates are appropriate for each population.

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The project demonstrates the power of industry-science collaboration in delivering practical, evidence-based solutions that support both Ireland's Blue Economy and sustainable fisheries. It also serves as an excellent example of international marine science leadership in applying genomics to fisheries assessment.

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"The scientific advances that led to the reopening of the northwest herring fishery were only possible due to strong industry-science collaboration, which the KFO has long recognised as being vital for sustainable fisheries management. The pioneering genetic methods developed are now being widely applied in a range of species and improving how we assess many stocks."

— Dr Edward Farrell, Chief Scientific & Sustainability Officer, Killybegs Fishermen's Organisation

Want to learn more about the impact of this innovation?

Read the Marine Institute's **Annual Impact Report** to see how scientific stock assessments are empowering sustainable fisheries.

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