

New means of safeguarding world fish stocks proven

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Powerful and versatile new genetic tools that will assist in safeguarding both European fish stocks and European consumers is reported in *Nature Communications*. The paper reports on the first system proven to identify populations of fish species to a forensic level of validation.

With up to 25% of fish catches being caught illegally across the world, and with an estimated cost to Europe of up to €10 billion by 2020, the EU were eager to address the problems facing the European fishing industry. One major initiative was to fund the EU project behind the latest development: a three year, four million Euro pan-European project, called "FishPopTrace" led by Bangor University, UK.

The EU has already introduced a law requiring any fish sold in the EU to be identified with the species and region of origin on the label from 2011. The same regulation explicitly requires EU Member States to undertake pilot studies of novel traceability tools by 2013 to test the authenticity of this labelling. Furthermore, awareness and take up of the product is already in hand. In the UK, DEFRA have recently announced that they are to begin a pilot project to introduce the tools and train their own staff and the UK fishing industry to collect, manage and store the samples to forensic standards. .

Minister for the Natural Environment and Fisheries, Richard Benyon said: "Illegal fishing is not just theft from responsible fishermen and fishing communities it has a devastating impact on the fish in our seas and oceans. I'm delighted to see a project as innovative and revolutionary

as FishPopTrace come to fruition. Protecting our seas and our honest fishermen from this abuse would be a remarkable achievement and I am confident that this technology will prove highly valuable in efforts to achieve sustainable fisheries globally."

Prof Gary Carvalho who headed the FishPopTrace EU consortium behind the new validation tools explains:

"A major existing problem is that it has not previously been possible to prove the exact origin of any particular fish, and in some circumstances, particularly with processed or cooked fish, it can be quite difficult even to identify the species, let alone its source of origin.

"We set out to develop a method that could be used throughout the food supply chain and across the fish industry, and have shown its effectiveness in four common European species, Atlantic Cod, Atlantic Herring, Common Sole and European Hake: each threatened by overfishing and illegal, unreported and unregulated (IUU) fishing. The tools can be used to identify or compare a set of pre-identified genetic markers within fish samples at any point in the consumer chain from net to plate, and to trace the fish back to their region of origin or breeding group. Such DNA-based tools can be used in tandem with existing technologies such as conventional labels, but importantly provides an independent and robust method for ad hoc tests of authenticity".

"This tool is also highly flexible. We have already identified the markers to separate populations of fish at large geographic scales, but the new methodology is powerful enough to identify fish from much smaller spatial scales, such as North Sea and Baltic cod. Moreover the system can be further developed for any [fish species](#) as required.

Far from being a punitive measure, the ethos behind the use of such tools is to assist the fishing industry, providing greater assurance of the

population of origin and conservation status of the catch. The tool has application in validating various eco-certification and eco-labelling systems currently in use, but which are typically un-validated. Those charged with ensuring conservation and sustainability of our fish stocks will have a far greater ability not only to identify populations at risk or thriving but also a forensically validated system that can be used to test authenticity at any point in the supply chain to enforce the relevant legislation.

Last but not least, consumers will be able to purchase fish, confident in the knowledge that they are buying or eating the product described on the label or the menu and that their purchases are from sustainable fish stocks.

With the results validated, once rolled out, we can expect a greater number of cases to be brought before European courts, with the forensic evidence to support them, in much the same way that forensics is used as evidence in human crimes.

Carvalho concludes: "Illegal, unreported and unregulated fishing has had a major role in the overexploitation of global fish populations.

Improving this technology and spearheading its application in [Europe](#), these new tools provide a new way forward for managing global [fish](#) resources, will revolutionise origin assignment and become highly valuable tools for fighting illegal fishing and mislabelling worldwide.

More information: [DOI:10.1038/ncomms1845](https://doi.org/10.1038/ncomms1845) 22/05/12

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