FISH INTEL-Fish are intelligent, and we need intelligence to see what they do!

By Jean-Luc Solandt, Marine Conservation Society (MCS). November 2021.

You'll be aware that fish move. You may not be aware where they move to, when & why that happens. MCS has been working for 6 months with international scientists from UK, France and Belgium, and fisher groups for a common interest – to better understand movements and behaviour of some key species that share the waters of the English Channel and beyond.

At this time of the climate COP, we're particularly interested in spatial protection measures to help to re-build nature's solutions to climate change. And we're doing our bit in the ocean. Marine habitats such as seagrass and saltmarsh meadows, rich biogenic (living) reefs, and rich sediment seabeds are known as 'blue carbon' assets. We know that fish are carbon too, and have their own contribution to moving carbon around the ecosystem (from predation, natural mortality and defecation). The way we've exploited fish over the past 140 years hasn't taken ecosystem impacts into account; such as impacts on the carbon cycle and other 'ecosystem services' a healthy ocean provides for us. We're particularly interested in being involved in the project because of our history at MCS of pushing Marine Protected Areas to be considered in UK waters for wider ecosystem services, such as shoreline stabilisation, water filtration and fish habitat protection. Fish benefit from no-fishing and no-trawl zones both directly for the species themselves, and also for protecting areas of 'essential fish habitats' where rich complex seabeds act as nurseries, feeding grounds - generally making fish more abundant in the wider population. We've started seeing this in 'rich' seafloor MPAs in Scotland, Devon, & Cornwall. The regulator protecting Sussex waters has also protected nearshore habitats from trawling in order to support the regeneration of 'essential fish habitat'.

We need more of this spatial management to support healthier and more secure fish populations. We believe FISH INTEL will help us convince managers of the need to better protect fish in areas like estuaries, in artificial reefs and around shipwrecks and other artificial structures (such as around rope-grown mussel farms).

The FISH INTEL project uses sophisticated scientific tools – acoustic tagging. All animals we are investigating are caught, tagged (with small acoustic transmitters), and released in the ocean as soon as possible. We're looking at the movements of crawfish (a type of lobster); bluefin tuna (a monster of a fish growing to over 700kg); Seabass (a favourite for your dinner plate) and pollack (a large cod-life reef fish). Listening devices are placed at locations where we believe the animals are likely to move (either at depth zones, on rocky reefs, close to and within estuaries, wrecks, offshore structures and windfarms). These devices are set up to allow 'triangulation' of sound – whereby more than one device will receive 'signals' from tagged animals – allowing the specific location of animals to be positioned.

We're working on crawfish – the spiny lobster. A species that has seen a rise in population numbers since 2005 in the southwest of England and Ireland. This species lives in rocky habitats surrounded by kelps, corals, and other colourful marine life. Historically targeted by small-scale net fishing and divers, the populations were targeted and collected without regulation up to the late 1980s. Now there are minimum landing sizes, and marine protected areas where landings are banned. We're looking at populations in the Mer D'Iroise (a rocky archipelago off the west of Brittany) and Isles of Scilly. These locations – although in different countries – really resemble each other. In the Scillies, 36 animals have already been tagged in a location near to the northeast of the archipelago. Our 'listening devices' devices in the Scillies are close together – about 300m apart and are in a 1.2 x 1.5km grid. We'll know when and where the animals move. We'll also be able to record when they move offshore for their annual migration into deeper waters.

Pollack – pollack are a species found all along the English channel (*La Manche*), and come together in offshore reefs (wrecks, rocky areas, around windfarms) in the winter months. They are thought to aggregate in these areas before spawning. Our work will tag the animals near to these offshore structures to find out the 'residency' related to them. Do they like to hang out on them permanently? Do they move from them after spawning? These questions will help to be revealed by our offshore listening devices.

Seabass – seabass are the anglers favourite fish for 2 reasons. It puts up a good 'fight', and it tastes delicious. Recent decades have seen catastrophic declines in numbers of the species, largely because of 'pair trawling' whereby huge vessels sweep up all animals from huge schools before they can spawn. This fishing technique has also been detrimental to cetaceans which are incidentally caught in the nets. Large vessels were operating in the Channel up until a moratorium on the fishing in 2004 within 12nm of the UK coast. Since then there has been some recovery. Global warming has coincided with an element of change to the species behaviour. In winter, the species migrates southwest, and enters our estuaries. Both adult, subadult and juveniles are then found in places like the Dart, Severn and Falmouth in large densities. We're working with Plymouth University scientist Dr Thomas Stamp who has been tracking them for years using acoustic tags. He's found 'residency' within estuaries by subadult fish. He's found that the odd fish moves further afield (with one individual migrating to southern Welsh waters). Further fish will be tagged to understand

movements within the British Isles, but also across the channel into northern French waters – to be recorded by our French partners at IFREMER in Brittany and Normandy.

Bluefin Tuna – We are seeing a recent increase in bluefin numbers largely related to a significant reduction in commercial fishing across the North Atlantic, and possible impact of climate change. The species remains on the IUCN redlist of threatened and endangered species. Yet, the recent rise in numbers of animals coming into UK southwest and French waters has led some to want to start fishing for them again, both recreational and commercial anglers and professional fishers are interested in exploiting them. Currently a license is needed to even catch, tag and release the species by scientists. Our partners from the University of Exeter (Drs Matt Witt and Lucy Hawkes whit whom we've worked for a number of years on habitat protection, jellyfish, basking shark, shark and turtle projects) have already tagged 30 animals in late summer/autumn 2021. We anticipate these animals will not only make county-wide movements within the channel, but also are likely to cross into French waters on a continuous basis. Once again, the collaboration with partners in Brittany, Normandy and in Belgium will allow listening devices installed on the other side of the channel to reveal if 'our' fish turn up in their waters.

People – we're not 'tracking' people, but the fishers, recreational anglers, regulators and governments involved in these species are important to their long-term survival. A major part of the project is to both map these groups, understand their relations to the species, and get any of their recommendations for management for the species (e.g. MLS, seasonality, habitat protection). In turn, we will be cataloguing the various different regulatory bodies and government structures involved in managing the species and providing scientific recommendations at the end of the project based on our findings.

Further information and updates on the project are available on https://www.mcsuk.org/ocean-emergency/marine-protected-areas/fish-intel-project/ and at the Plymouth University website https://www.plymouth.ac.uk/research/marine-conservation-research-group/fish-intel-interreg