Netherlands report in the current issue of the Proceedings of the Royal Society B (published online) the first ever survey of freshly spawned fish eggs to cover the whole of the North Sea.

The team highlight the former significance and current concern about cod stocks. "Rebuilding these stocks remains a key policy aim in Europe, the USA and Canada," they argue.

"Historically, the North Sea contained one of the most productive cod stocks but the present abundance of mature fish is the lowest on record," they write. And the population has been considered as a single entity, which may mask the presence of sub-groups within the North Sea. "In these assessments, data are aggregated over large areas but this can mask local trends caused by differences in population dynamics, exploitation, and environment."

Key to the assessment of North Sea cod stocks is the determination of their breeding sites. But this presents many problems: freshly released and fertilised eggs need to be identified quickly to locate key spawning grounds but this has traditionally been hard because cod eggs are difficult to distinguish from the eggs of related species such as haddock and whiting in the earliest stages. But the team report that this problem has been overcome by the use of molecular techniques to distinguish the cod eggs.

The researchers report the first survey of the whole of the North Sea to use genetic probes to identify unambiguously cod eggs within the plankton samples trawled from varying depths by vessels involved in the research project over the late-winter spawning season.

Alongside the trawl for egg-containing plankton, the researchers compared their results with trawls for mature fish, to help estimate egg production.

In total, the researchers carried out 502 plankton trawls and nearly 9,000 cod-like eggs were identified using genetic probes. Analysis of hatchery-spawned cod and haddock eggs revealed that 95 per cent of the plankton eggs were correctly identified.

The researchers studied cod eggs up to the end of stage 1 of development, which represents approximately three days' growth. Identification of these eggs gives a good indication of where they were spawned.

The survey revealed hot spots of cod spawning. Eggs were found around the southern and eastern edges of the Dogger bank in the central North Sea with another concentration in the German Bight. Significant numbers of eggs were also found off the Moray Firth in Scotland and to the east of the Shetland Isles.

The researchers found that the spawning sites they discovered matched the presence of mature fish found in other trawling surveys. The one discrepancy was that of mature fish found off the UK's Yorkshire coast at Flamborough Head, but no evidence of spawning in this area from the fish egg survey.

"The application of modern molecular methods holds the promise of rapid, unambiguous identification of cryptic species or life stages. However, applications to large-scale distribution mapping of marine plankton have been hampered by the need to analyse very large numbers of specimens, by the relatively high per-sample cost of molecular identification and by the time and specialist skills needed," the researchers write.

"The application of modern molecular techniques combined with traditional plankton survey methods allowed us to map the occurrence of early-stage cod eggs across the whole of the North Sea for the first time."

The researchers believe their results show that the severely depleted North Sea cod are still spawning in most areas where mature fish were found. But the situation is difficult. Recent studies found slightly increased numbers of cod in the North Sea last year and the EU has increased the fishing quota for 2008 by 11 per cent. But last year's catch of 20,000 tonnes is a shadow of the 170,000 tonnes caught 20 years ago.

"Some localised populations may now have been reduced to levels where it is difficult to find cod eggs in the plankton. These populations could be at particular risk of severe depletion and may require targeted conservation measures," the researchers write.

Q & A

Ray Guillery

Ray Guillery is a professor in the department of Anatomy at Marmara University in Istanbul. He is a neuroanatomist who entered University College London as a medical student in 1948 and taught there for 11 years, moving in 1964 to Madison, Wisconsin, where he helped to establish a new graduate neuroscience programme. He moved to the University of Chicago in 1977, to lead another new graduate neuroscience programme. In 1984 he returned to England, to the Oxford Anatomy chair. He helped establish yet another graduate neuroscience programme there, retired in 1996 and moved back to Madison to a small research programme and some teaching. In 2006 he moved to Istanbul. He has studied the hypothalamus, the visual pathways and, most recently, the thalamus. He was the founding editor of the European Journal of Neuroscience*.*

What turned you on to biology in the first place? The teachers during my pre-clinical years at University College included J.Z. Young, B. Katz, H. Gruneberg and M. Abercrombie. They created a wonderfully challenging environment. The opportunity to study the brain under J.Z. Young's free-wheeling supervision provided an entrance to what I saw (correctly) as an exciting career. It was also an escape from the medical career planned for me by my mother.

Do you have a favourite paper? Yes, though my choice has changed as my focus has changed. When I started in research, it was a 1946 paper by W.J.H. Nauta, who showed that hypothalamic lesions in rats produced changes in sleep patterns. The research was carried out in singularly unfavorable conditions in Holland during and immediately after World War II. He described the degenerating myelinated axons damaged by his lesions and then worked for the next decade to develop a new method to reveal the unmyelinated axons as well. This method, new in 1954, helped start my career as a neuroanatomist.

Later, I studied the visual pathways and Walls' 1953 book '*The Lateral Geniculate Nucleus and Visual*

Histophysiology' provided a concise and entertaining guide to the puzzles of this strange nucleus. Currently I am focused on the thalamus and sensory mechanisms; Lord Adrian's short book '*The Basis of Sensation*' on sensory mechanisms, published in 1928, says nothing about the thalamus, but is a wonderful example of clear thought about, and a lucid presentation of, a difficult subject.

What is the best advice you've been given? On completing my thesis I was expected — by family, friends, teachers — to complete the clinical part of my medical training. J.Z. Young advised me to continue with my research. He said that the next three years would be my most productive; I should not waste them learning skills I would not be using later. I was 24 at the time. He was right.

If you knew earlier on what you know now, would you still pursue the same career/research path? 'Yes' to career, obviously 'no' to the research path because I would know the answers I had to work for so hard earlier. How wonderful to be able to start at 24 with the knowledge and techniques, produced by others, available now!

What has been your biggest research mistake? Thinking I had found a syncytial stage in electron micrographs of the developing chick brain and preparing a letter to *Nature* before concluding that, in spite of appearances, there was something wrong with my method of fixation.

Do you have a scientific hero? Any neuroanatomist who did not have Cajal at the top of the list would be suspect. Cajal can still inspire enthusiasm about the mysteries of the brain. He had a depth of knowledge that has not been rivalled since. But there are others, such as Kölliker, who are not far behind, and I myself carry a torch for Otto Deiters, my greatgrandfather's younger brother, who had, before he died at 29, published on muscles and the inner ear, had demonstrated axons and dendrites connected to nerve cells, and had revealed the structure of astrocytes. Cajal had a strong negative view of Deiters' position on the neuron doctrine, which was almost certainly based on a misunderstanding of what Deiters had written. This is an issue I would still like to explore further.

What is your greatest research ambition? Just now it is to understand how to interpret the functional significance of the branching axons that carry messages to the thalamus for transmission to the cortex. One branch represents classical sensory pathways, or corticothalamocortical messages, the other innervates motor circuitry. What does this 'motor' branch tell us about the nature of sensory perception? Views of perception as 'embodied' will become interesting when we know how the neural connections produce the embodiment. Thalamocortical pathways are likely to provide a key.

Any strong views on journals and peer review? Moving to Istanbul has given me a striking view of doing research with limited funding, poor infrastructure, and inadequate library facilities. On journals: the current economics of journal publication are funding publishing houses and academic societies, depriving those without funds of needed access to the current literature. Universities, through their library budgets are paying millions into the publishers' pockets. NIH insistence on inclusion in PubMed central may help, but only if there is no significant delay between publication and access. On peer review: the level of arrogant and incompetent reviewing I have seen for papers submitted by colleagues has increased significantly since I moved from Madison to Istanbul. Dear referee (and editor), please don't assume that papers written by authors with funny sounding names working in Universities about which you know nothing can be dismissed with minimal attention. These are people working with limited funds under extremely difficult conditions, writing in what is to them a strange foreign language. Their work may not be up to your standards, but read the paper, explain what is wrong, and try to be helpful.

Why did you move to Turkey? I ran out of research funds in Madison, and was getting old far from family. I have a daughter and three grandchildren who live in Istanbul close to Marmara University, where I found wonderful colleagues interested in the thalamus and the thalamic reticular nucleus.

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Thames delight

Conservationists have revealed for the first time a two-year-old secret: seahorses have been discovered in seagrass beds in the estuary of the River Thames in London. Researchers kept quiet until the announcement last month that the rare short-snouted seahorse, found in the Thames, and its relative the spiny seahorse had been added to the list of species legally protected under the British Wildlife and Countryside Act.

Scientists from the Zoological Society of London (ZSL) have discovered five seahorses during routine surveys of the river estuary at three separate sites. The short-snouted seahorse is a rare species, more usually found in the Mediterranean and around the Canary Islands, but it has also been found off the south coast of England.

The ZSL scientists say the presence of the species in the Thames estuary is a good indicator that the quality of the water is improving. Alison Shaw, manager of London Zoo's marine and freshwater conservation programme said: "These amazing creatures have been found in the Thames on a number of occasions in the last 18 months during our wildlife monitoring work."

"It demonstrates that the Thames is becoming a sustainable biodiverse habitat for aquatic life. Now they are protected, conservationists are more relaxed about telling the world they are there."

Seahorses worldwide are threatened by exploitation for traditional medicines, aquariums and curiosities, as well as accidental capture by fishing fleets, and degradation of their habitats.

But their apparent establishment in the Thames estuary also remains precarious. The river, which flows through one of the densest regions of human population in the developed world, was also once one of the dirtiest. The once rich freshwater and marine life associated with the river was all but wiped out during the nineteenth