



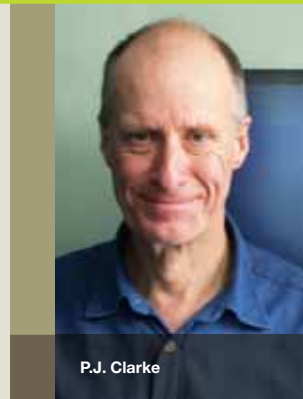
## Investigating the truth: a look inside MFish forensics

**“I like to think of myself as the Dr Watson to his Sherlock Holmes,” says P.J. Clarke, MFish fisheries investigator (forensic science), about his partnership with fisheries analyst Dr Graeme Bremner. The Dunedin duo use forensic methods to assist the MFish compliance team in the fight against poachers, illegal dumpers, and other plunderers of New Zealand’s marine resources.**

The word forensic is derived from a Latin term meaning ‘before the forum’. Today the term is used loosely, often meaning ‘forensic science.’ The MFish forensics team also includes staff with digital and financial expertise.

Much of P.J. and Graeme’s work involves analysing evidence from paua offenders. In some cases, science can be used to help identify where the paua came from.

“Sediment that washes off the land may become trapped in the crevices of a paua shell,” says P.J. “We can measure the proportions of different minerals in that sediment with an



P.J. Clarke



Dr Graeme Bremner

instrument called an x-ray diffractometer.” Geological differences between coastal areas account for variations in minerals found in the paua, and can support or contradict claims about where the paua was harvested.

Graeme Bremner says the most common cases they handle do involve paua. “We’re often trying to determine either where they came from or how big they were before the shell was removed,” he says.

One of his favourite cases was when he was asked to help police in Invercargill after they had taken over a case from MFish. “Eight hundred kilograms of paua shells was seized, and the offender’s initial story was that they were his amateur catch over several years from around Riverton,” he says. “He

later changed his story to say that he picked up all the shells as beach material between Greenhills and Bluff.”

Graeme noticed that older shells had significantly different characteristics than the newly harvested ones. “We also looked at where the shells came from,” he says. “Analysis on the sand grains embedded in the shells showed that they had been harvested from a much larger area than we were told – all the way from Fiordland to Otago.

“Some unusual maggots had also been developing in some shells, indicating that they were left in freshwater for some time. It turned out the shells had actually been stolen from a commercial paua diver, and the police were able to reunite them with their owner.”

### INVESTIGATING COMMERCIAL CATCHES

The team also assists with misreporting cases in the commercial sector. “We’ve been dealing with cases of trucking, meaning fishers are catching fish in one area but then reporting that it came from another,” P.J. says.

“There are measurable chemical differences in the same species of fish caught in different areas. By analysing the fish chemistry, it is possible to demonstrate where the fish are likely to have come from.”

Another team member who helps solve trucking cases (among others) is Mike Smith, a forensic investigating accountant based at the Petone MFish office.

“At the moment we’re assisting the Christchurch team with the investigation of a Ukrainian vessel suspected of trucking ling,” he says.

“We identify positional data, communications, spreadsheets, and other documents that may either contradict or support what they have reported to the Ministry.”

Mike stressed the importance of transparency and impartiality in conducting the investigations. “The evidence may actually



Above: A paua being examined to determine if it is from an undersized animal.

Previous page: Snapper with puncture wound thought to have been caused by a gaff.

support the fisher and show that there is some credence to their claims.”

One notable case is that of *Paloma V*, a vessel found to be supporting a known, and listed, illegal, unregulated, and unreported (IUU) vessel, the *Chilbo-San 33*. The *Paloma V* had been bunkering and transferring fuel and supplies to the *Chilbo-San 33*.

Although the computer hard drives were wiped clean, Mike was still able to recover data including photographs, email, and other documents proving the vessels’ association.

### DETECTING THE TRUTH

Although technology is always changing, much of the job comes down to old-fashioned detective work. In a recent paua poaching case, several bags of dumped paua were found. While the suspected offenders denied any involvement, flecks of paint that P.J. noticed in the dumped bags matched the paint on the deck of the offenders’ boat. “The good old Mark I Eyeball is sometimes the only tool that’s needed,” he says.

In a case where a trawler was suspected of illegal dumping, more than half of the dumped fish were found to have a single puncture wound. The team suspected the wounds were caused by a gaff – a nail on a piece of broomstick used for discarding fish.

Scientific imaging and analysis methods called scanning electron microscopy and electron density spectroscopy were used to identify and analyse metal fragments found in the wounds. The fragments matched gaffs found on the trawler. This is an example of Locard’s Principle, which states that ‘with contact between two items, there will be an exchange.’ Locard, a 20th Century forensic scientist, was nicknamed ‘the Sherlock Holmes of France.’

P.J. says that he isn’t an avid mystery reader and isn’t really interested in forensic television shows like *CSI*; “I did always enjoy the Sherlock Holmes stories though.”



A scanning electron microscopy image of a puncture wound.