



### **Cautious optimism for Kaikoura paua fishery's recovery**

Earthquakes and storms have hammered our country in recent times and the marine environment has copped it as well.

But there are at least encouraging signs of a recovery in the hard hit paua habitat along the Kaikoura coastline.

Around 130km of highly productive coastline from north Canterbury to Marlborough was impacted by the 2016 earthquake measuring 7.8 that resulted in widespread mortality of paua and other marine animals.

Platforms as large as a square kilometre were thrust out of the ocean.

A paua harvesting ban along large sections of the affected coast was put in place, with the full support of the industry, which has been extended to November this year.

This affects half the PAU3 (Canterbury) fishery.

Paua are a species of snail, an ancient lifeform that has survived for millions of years, yet there is much that remains unknown about their ability to repopulate locally depleted areas.

Dr Tom McCowan, a Paua Industry Council (PIC) scientist, is among those trying to fill in some of the gaps.

In the Kaikoura fishery he is drawing on data loggers, small electronic boxes attached to divers' wetsuits, that record effort – number of dives, number and weight of paua taken, location, water temperature.

This is cross referenced with current surveys, using electronic callipers to measure every paua seen on a dive in a measured area.

The research is warranted – the highly prized delicacy has a Total Allowable

Commercial Catch of 919 tonnes and returns around \$36 million in exports.

“In terms of the adult biomass it’s going to be looking pretty good in quite a few areas after the closures,” McCowan said.

“But there are some areas that came up a long way and there was high mortality and it is definitely looking a bit patchy.

“Estimating biomass is notoriously difficult to do with paua but we’ve come up with a new set of methodologies using the data loggers.”

Canterbury University’s Marine Ecology Research Group has also been conducting intensive paua research along the same stretch of coast, centred on juvenile biomass surveys, with both projects funded by the Ministry for Primary Industries.

The Canterbury team have studied a variety of sites, drawn on 20 years of previous data sampling and assessed what remained of the inter-tidal paua population. How successful post-earthquake reproduction and recruitment have been and what habitats are remaining have also been quantified.

“The good news is that we are seeing clear signs of post-earthquake recruitment in the form of tiny paua from last year’s spawnings, some just a few millimetres in length,” according to marine ecologist Dr Tommaso Alestra.

“There are also many larger juveniles in these habitats from previous years’ spawnings.

“Although these will take several years to grow into harvestable sizes, there are encouraging signs that juveniles are surviving and recruiting in some places.”

In a separate PIC research project co-funded by Seafood Innovations Limited, methods to improve the significant rates that paua can grow at are being investigated in a translocation project.

Paua growth can be highly variable and some populations do not reach the minimum legal size of 125mm.

On the Chathams, the country’s most productive paua fishery where a third of the total annual catch is made, McCowan and local divers have relocated one tonne from an area where their growth is stunted to a more productive area that has been fished out.

Differences in growth rates are being measured. Translocation could become a regular practice, another tool in managing the paua population.

The beauty of the various research projects is that they benefit everyone, with paua highly sought after by recreational and customary sectors as well.



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## News

*The NZ Herald* reports Conservation Minister Eugenie Sage would like the decline in New Zealand sea lions halted, although this year's pup count shows the population has stabilised. At the main breeding site in the Auckland Islands, an estimated 1792 pups were born this season, slightly fewer than last year (1965), while 734 pups were counted at Campbell Island, more than the last pup count in 2015 (696). Sage said fishing was the biggest man-made threat to the sea lion population. "We need to reduce human-related impacts on sea lions; including being caught in fishing trawl nets," she said. Deepwater Group chief executive George Clement said captures were at an all-time low and pointed out drowning or becoming stuck in holes and starving were bigger threats to the population.

Five hundred pāua have been seized at a central North Island beach, *Hawkes Bay Today* reports. The Ministry for Primary Industries was informed by police about the catch at Blackhead Beach, an hour south of Hastings. A spokesperson for MPI said fishery officers took possession of 485 pāua. Only two were of legal size.

A fishery broker in Christchurch who took \$387,225 from seven fishing companies and lost it all through online gambling has been sentenced in the Christchurch District Court, *Stuff* reports. Michele Susan Chapman, 46, a director of Pipeline Consultants Ltd, admitted six charges of dishonestly using documents and one charge of obtaining money by deception. Chapman was a quota broker who took large payments, some in excess of \$100,000, for ACE, but never transferred it to the companies. She was sentenced to 10 months home detention, 200 hours community service and ordered to pay back \$35,200 – less than 10 percent of what she took. The seven companies - not

named in the report - were based in Wellington, Hawke's Bay, Nelson, Timaru, Warkworth, and Blenheim.



### **News - Scientists send snapper to boot camp**

At a laboratory just outside Whangarei, scientists are putting very young snapper through comprehensive physical testing - including a full medical check-up involving smell, hearing, vision, and even anxiety testing.

NIWA's Northland Marine Research Centre at Bream Bay is the site for this experiment which aims to understand the effects of ocean acidification and warmer sea temperatures on snapper larvae.

"Most work in this area overseas is conducted on small, tropical reef fish. To be able to look at the effects of climate change on such a highly valued

commercial, customary and recreational species as snapper in New Zealand is a first for us and very exciting,” said NIWA marine ecologist Dr Darren Parsons.

The snapper experiment began last month when adult broodstock were spawned at Bream Bay and the eggs placed in tanks under four different conditions. The eggs and larvae were used for the experiment because, compared to adult fish, they are the most vulnerable to environmental change.

In one set of tanks the temperature is 18°C, which matches normal conditions at the time of spawning. In other tanks the temperature is 22°C, closer to sea surface temperatures reached this summer due to a marine heatwave.

Carbon dioxide levels are being kept at present oceanic levels in the third set of tanks, and then raised in the fourth set of tanks to match those expected at the end of this century. Each tank was stocked with thousands of eggs.

During the first 35 days, after the eggs hatched into larvae but before they became juvenile fish, scientists monitored how fast they grew, photographed them, and counted how many died.

The scientists are also watching changes in the behaviour of the fish as they regulate the pH in their systems.

In a flume tank the larvae are tested for “swimmability” with increasing water flows.

“The flume tank is like a treadmill for fish. We ramp up the speed of the treadmill until the fish can’t swim forward anymore to give us an idea of their aerobic performance and how this differs for larvae from the different experimental conditions.”

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