

Red moki, an easy target for spear fishers and set nets, have been decimated around New Zealand's coasts in recent years. This individual may be as old as 50 years.

Photo: Andy Belcher

Red moki are fish of the rocky reef. They are found all around New Zealand but are most numerous in the north.

In autumn the females, who live on the shallow reefs, swim down during the day to spawn with the males after dusk. Females prefer males holding territories with caves, so the older and bigger red moki attract many mates. Desirable territory also attracts rivals so the owner must drive off these challengers. If plain obstruction is not enough, the resident male will engage his rival in a joust, using his own superior weight to roll his opponent into the ground. If that fails he will bite the intruder. By the end of the breeding season an old male will have lost many scales and his tail fin will be tattered.

During the fighting the female may swim away so the male has to round her up, driving her back to his territory and biting her tail if she tries to escape. It is thought that spawning happens inside the cave. Nothing is known of the earliest stages of the red moki's life.

Their larvae presumably spend several months floating in the plankton. Between September and November juveniles 3 to 4 cm long appear in very shallow water or in rock pools. They can be recognised by their distinct bands, and are solitary and intensely territorial. Unlike the adults they feed diligently in the *Corallina* seaweed and grow rapidly to reach about 15cm after six months. They are approaching maturity at two years when the female is about 25cm long and the male about 30cm. Then they enter loose social groups on deeper reefs in 5 to 15 metres of water. From now on the red moki grow slowly and take several decades to double in size. Then territorial behaviour reappears and the oldest and largest males secure breeding territories on the reefs below 15 metres. They will defend their territories all year around.

Threats to the Red Moki

In many ways red moki are like our great flightless parrot, the kakapo. Like them, red moki are ponderous and non-aggressive. Their mating rites are akin to the "lek" behaviour of the kakapo, where the male defends a courting and mating arena. Again like the kakapo, before the coming of humans red moki had few enemies, and were unafraid and defenceless. Like the kakapo, this is their downfall.

Asleep a lot and seemingly half asleep even when awake, red moki are easy targets for spear fishers. A trigger-happy spear fisher can easily annihilate the large red moki around a reef, wiping out the breeding population. There is a pressing need to educate spear fishers. Some dive clubs already promote voluntary restraints. However, for red moki living on popular diving reefs, marine



reserves will be the only sanctuary.

Spear fishing is bad enough, but the wholesale slaughter of the set net is even worse. All the big red moki in an area can be caught in a single set net operation, killing the breeding fish and setting back the population for decades. Being sedentary and territorial, adults do not migrate quickly to the depleted reef, and the population must slowly re-establish from the growing juveniles.

And even the red moki's fondness for seeking shelter in caves may lead to disaster. Commercial fishers report that red moki are frequently trapped in crayfish pots, up to 30 in a single pot being recorded from the Hauraki Gulf.

Protection Measures

Outside New Zealand's two small marine reserves, red moki are fair game, with virtually no restrictions on their exploitation.

Red moki caught in set nets by commercial fishers are called "by catch". This means that the red moki were not the fishers' target but just an accidental catch. Although fishers are required to record their bycatch MAF has no statistics about the red moki catch, how many, how large, or where they are caught. This lack of basic data does not prevent the red moki being sold in fish shops.

The Wider Problem – Set Nets on Reefs

Red moki can be regarded as an indicator of the health of the reef system. Their decline is paralleled by that of other reef species – the coloured wrasse, the large grouper, porae and even the common and fearless leather jacket. Few accessible reefs now have natural

Red moki asleep – something this slow moving fish does more than half the time. Note the way in which the moki's stripes fade when it sleeps.

Photo: Kim Westerskov