

The oldest of our fish is the humble orange roughy, which can live for 150 years. The prize for fastest fish goes to the critically endangered southern bluefin tuna – which grows up to 2.2 metres and 180 kilograms and can reach speeds of up to 90 kilometres per hour.

All five of the Pacific's endangered marine turtle species occur in New Zealand waters. The largest is the leatherback which ventures as far south as Foveaux Strait; it can reach three metres in length and weigh up to 700 kilograms.

Marine biologists have only recently started to unravel the deep secrets of 'Blue Zealand' and what they're finding is changing the way we view the ocean depths. According to Peter Batson, author of the recently published *Deep New Zealand*, new species from our deepest waters are being discovered at a rate of about one per fortnight, many around underwater seamounts. (See *Forest & Bird*, November 2003.)

Seamounts are submerged volcanic mountains, ridges and hills that rise from the sea floor but do not break the surface. They can reach several kilometres in height from the sea floor and can have particularly lush fauna because of the nutrient-rich 'upwellings' in the water around them.

These 'oases of life' allow some species to grow to unusual sizes. One species of black coral reaches two storeys high. Hard coral trees of one bright pink *Paragorgia* species can grow even taller. Some of these coral 'forests of the deep' can live for centuries.

We have all heard about the diversity of life in tropical rainforests and around tropical coral reefs. Studies now indicate there is even

more biodiversity amongst deep cold-water coral forests. The top predator here is the sperm whale, which dives down over a kilometre to feed on giant squid and fish species including orange roughy.

It is here the environmental cost of seafood begins its impact. Most of us assume that if a fish is commercially caught it must come from a well-managed, healthy and abundant fishery. But sadly this is not necessarily the case. The fishing methods used and the intensity of exploitation have hidden costs for the marine environment which are affecting the abundance and diversity of all marine life. Sadly, some species could be wiped out before they are even described by scientists.

The seas around New Zealand are being industrialised. Every year more than 2000 local and foreign commercial vessels catch over 600,000 tonnes of fish in our waters. They do this by setting 50 million hooks and 10,000 kilometres of nets, making over 100,000 trawls and 90,000 dredge tows. This adds up to industrial-scale pressures on marine fish and the wider marine environment. As a result, destructive fishing methods such as bottom trawling and the sheer intensity of exploitation have taken their toll on 'Blue Zealand's' marine environment, reducing the abundance and diversity of life, particularly in deeper waters.

It is the orange roughy fishery that has helped New Zealand become the deep water fishing capital of the world. Despite the use of 'high-tech' fishing gear and the complex quota management system, almost all orange roughy fisheries are down to below 20

percent of their original unfished population — in the worst case below three percent. Two fisheries, Challenger and Puysegur, are now closed.

After orange roughy was commercially 'discovered' in the late 1970s, quotas and catches shot up from a few thousand tonnes in the 1979-80 fishing season to a peak of 56,000 tonnes in 1988-89. By 1995-96, orange roughy had been so badly overfished that the catch had to be reduced to below 17,000 tonnes, with about 70 percent coming from bottom trawls of seamounts. Bottom-trawling nets are often weighted across the bottom with large steel rollers that crash, crush and drag corals, swallowing all in their path.

Industrial-scale clear-felling of indigenous forest habitats on Crown land ended nearly 10 years ago, but the marine equivalent continues in our deep water fisheries.

Seamounts may also play a role in determining where seabirds such as albatrosses feed on the high seas. The same nutrient-rich upwellings and waters that seabirds feed in are sometimes targeted by fishing vessels. It's not surprising then that trawling and long-lining over some seamounts kills seabirds. Some seabirds collide with and are killed by the heavy trawl-net cables or 'warp lines'; others are caught and drowned on baited long-line hooks as they are set.

Sadly, the orange roughy fishery is not an isolated 'bad apple'. Many of our commercially fished species are being exploited to their lowest population levels ever, especially deep water species. As with orange roughy, Forest and Bird research shows hoki and oreos stocks have been poorly managed and overfished — and there are problems with the high level of non-target fish also being caught.

Hoki is one of our most destructive fisheries. It is also a fishery which relies heavily on the bottom-trawling methods that bulldoze fragile deep-water habitats and kill a range of by-catch species including New Zealand fur seals, albatrosses and petrels. Hoki fishers also catch a variety of deep-water, non-target fish species including long-lived sharks. Hoki are heavily overfished and the western fish stock is nearing collapse.

In 2001, when the hoki fishery was awarded a form of environmental certification by the UK-based Marine Stewardship Council, the annual allowable catch was 250,000 tonnes. Last year the allowable catch had to be cut to 180,000 tonnes, but the stocks are in such bad shape that the industry was unable to catch this much. The 2004 assessment of hoki stocks by the Ministry of Fisheries shows the quota needs to be cut to around 100,000



Northern giant petrel, a circumpolar species, seen here with a chick on subantarctic Antipodes Island. Like albatrosses, petrels too are vulnerable because of unsustainable fishing practices.

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