

ALTHOUGH eeling is part of the warmly-recalled childhood memories of large numbers of New Zealanders, eels have an image problem. For many people they conjure up a feeling of dislike, almost revulsion. This is largely because of their sliminess, their serpent-like form and their very unfish-like ability to move across land. Eels were the subject of both European and Maori legend. Aristotle argued that young eels came from decaying material deep within the earth. Maori regarded them as the progeny of supernatural beings. It was long thought that they gave birth to their young live.

Freshwater eels are only part of a large complement of eels in New Zealand

and wetlands and tends not to occur very far inland. The longfinned eel is found in both highland and lowland waters and is the most widespread fish in New Zealand.

The shortfinned eel grows to about a metre and 3.5 kg in weight and the female is larger than the male. The longfinned eel is bigger again, in fact one of the largest of all freshwater eels. There have been catches reported at up to two metres and 50 kg. The biggest eels are invariably old longfinned females, in some cases up to 60 years old.

Both species are very slow-growing. They mature in lakes and rivers and go to sea to spawn. Longfinned males are thought to migrate to the ocean at around an average age of 23 years (about 600 g)

access to the sea is stopped by a sand or gravel bar, eels will travel across it.

Freshwater eels have rarely been found at sea, and eel larvae are even rarer. What happens between the start of migration and the return of juvenile glass eels about 18 months later is still largely speculation. One of those who has done the most work on piecing together the puzzle of eel migrations is Dr Don Jellyman from the Ministry of Agriculture and Fisheries (MAF) in Christchurch.

As the eels begin their ocean journey their bodies which have already become more streamlined change even more. Their sexual organs develop at the expense of fat reserves, they cease feeding and their alimentary canals degenerate. Using the locations and size of the few eel

eels

*are we pushing them
to the edge?*

*Generally eels have had a bad press.
"Slippery as an eel" is a well-worn
and uncomplimentary figure of speech.
Yet the two New Zealand species of
freshwater eels are among the best
known fish in our lakes and
streams. Eels have a longevity approaching
that of humans and an extraordinary natural
history which is still only very imperfectly
understood. And, most importantly, New
Zealand's freshwater eels are under threat –
from habitat loss and from a major commercial fishery.
Ian Close looks at the past and present of freshwater
eels, and their future prospects.*



Longfinned eel.

waters – over a dozen families and 30 species. These include the well known moray and conger eels and also little-seen fish such as the deep-dwelling and bizarre gulper eel that has a huge head on a tiny body. But only two New Zealand species spend any part of their life cycle away from the ocean. These are the shortfinned freshwater eel (*Anguilla australis*) and the longfinned freshwater eel (*Anguilla dieffenbachii*) – two of about 16 species of freshwater eel worldwide. The shortfinned eel also occurs in south-eastern Australia and a number of Pacific islands while the longfin is endemic to New Zealand and the Chatham Islands.

While the distribution of the two species overlap, the shortfinned eel is the most common in lowland rivers, lakes

and females at about 34 years when they are around 4 kg. For shortfinned eels the migration age is around 14 for males and 22 for females.

WHILE the general life history of eels in our waterways is reasonably well known, what is still largely a mystery is the period of their lives spent at sea. Every autumn thousands of sexually maturing eels head to the ocean never to return. Migration downstream is heaviest when there is a rise in river level and during the last phase of the moon when the night light is at its lowest. The shortfins migrate first, and the males leave before the females. When, as in some coastal lakes,

larvae that have been found, knowledge of the ocean currents of the south-west Pacific, the arrival times of juvenile eels in New Zealand and the known life histories of northern-hemisphere eels, Jellyman has suggested that the likely spawning ground for shortfinned eels is north-east of Samoa, not in the Coral Sea as was once thought. Travelling at about 40 km a day, probably at great depth, the eels take about four months to make the 5,000-kilometre trip.

The information available on longfin migrations is even scantier. However, because they leave New Zealand later than shortfins and are more mature at departure Jellyman thinks that they breed closer to New Zealand, possibly east of Tonga. How either species survives such