

This little frog is the rarest of our three tiny native frogs. It is present only on two islands in the Cook Strait area remote from the two other members of the genus, *L. hochstetteri* and *L. archeyi* who live in the Northern half of the North Island.

These three frogs are as unique in the class of amphibia as the tuatara is in the class of reptilia. Charles Darwin opined that frogs were absent from oceanic islands but that New Zealand was apparently an exception to this rule. Their presence in New Zealand is therefore a pointer not only to the geological history of New Zealand, but because of their rarity — the changes that have occurred to the country since the European colonisation.

Our frogs simply could not have survived a long sea passage, and so migration from elsewhere to New Zealand would have been impossible. They must therefore have been living on the chunk of Gondwanaland which broke away some 80 million years ago and together with the ancestors of the tuatara they were carried away on the land which was to become the isolated New Zealand of today. So together with tuatara they represent the most archaic of our fauna.

They are quite unique with primitive bone structures and many features not shared by the other frogs of the world. Thus they represent the most ancient of the branches of the frog family tree.

They are tiny, only 40–47 mm long. They lack the vocal sacs responsible for the croaking of other frogs and the best they can manage is a high pitched squeak. They lack important parts of the ears and have no external ear drums so obvious in other frogs. But they do have large bulbous eyes which aid in night vision.

Only *L. hochstetteri* is found close to streams but it also shares the high ridges and areas right away from open water where *L. Archeyi* and our subject *L. Hamiltoni* are found. As if to underline this *L. Hochstetteri* has webs between its hind toes, but its two cousins have no webs — after all they're no use when there's no water to swim in, and its no use having free swimming tadpoles. So these little frogs have modified the procreation method. They lay their eggs on the ground in clusters, each egg surrounded by a gelatinous watery capsule within which the embryos go through all the development. Froglets complete with legs and a tail emerge and the tail drops off after a few weeks leaving two well developed but useless tail wagging muscles which they carry on through life.

Hamilton's frog was found 350 metres up on Stephens Island in Cook Strait in 1915, this was in a small rock patch with deep voids between the rocks providing a microclimate some 40 cm down, where Hamilton's frog was living quite unsuspected on spiders, millipedes, beetles, slugs, etc that occurred in the damp habitat beneath the stones.

The rock patch was sheltered by high forest with the rocks covered by moss, and it is near the high top of Stephens Island, which often sports a cloud cap which

became most important to the later survival of the frog.

Several were dug up subsequently but by 1927 the forest shelter had disappeared and the windswept summit with its now bare rock patch was a very changed habitat, apparently not conducive to our frog's survival. However the microclimate below the rocks coupled with the moist cloud cap combined to preserve the frogs in a minimal habitat.

In 1951 the Wildlife Service planted taupata trees as shelter round the rock patch and muehlenbeckia and grasses over the rocks and better conditions for these little frogs now exist. Indeed their position is now extending and secure and some frogs have been seen venturing out into the grassy surrounds.

In 1958 Hamilton's frogs were discovered on Maud Island living in a sloping forested area from 150 metres and upwards containing some rock falls and providing a most suitable habitat. Close research has gained much information and established that some hundreds of frogs inhabit the shady forest floor.

When Forest and Bird assisted the purchase of Maud Island as a sanctuary for bird life in 1976 it was as much to protect Hamilton's frog in this its second habitat as to provide for kakapo and saddlebacks.

The reader must be asking why if there are *Leiopelma* frogs in Coromandel and the Northern half of the North Island and others in the Cook Strait region, when there must be dozens of suitable habitats remaining in the lower half of the North Island and in the Northern South Island, why no native frogs? It is faintly possible, of course, that they live their secret hidden lives quite unsuspected in other areas (after all the Maoris were apparently quite unaware of the frogs), so one cannot be sure that they have been wiped out by our modifications to the land.

I for one, hope that perhaps other colonies will be discovered in time. They hide themselves so well in inextricable places that predators would be hard put to get at them. Moreover I suspect that they taste 'terrible' to stoats, rats, etc — if this is the case, then there's hope. After all they were unaffected apparently by the recent stoat invasion of Maud Island and continue their expansion of range. Perhaps that is a pointer!

Probably the rarest frog in the world, Hamilton's frog is also one of the most archaic. Surely, these two factors make it essential that we protect this unique endemic little amphibian which is even rarer than the tuatara.

A word of warning, if you should be lucky enough to find native frogs. They should not be handled or taken and their hiding place must not be disturbed, they are absolutely protected. Record or photograph their presence if possible and inform the Wildlife Service.

HAMILTON'S FROG

Reference and further reading

- Richard Sharrell. 'The Tuatara Lizards and Frogs of New Zealand', Collins 1966.
I. G. Crook. *New Zealand's Nature Heritage* pp 259–262.
Ben D. Bell. *Forest and Bird* No 204, May 1977, pp 12–17.

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DAVID G. COLLINGWOOD