

FAUNAL ASSOCIATES OF *G. huttoni*

*Gobiomorphus huttoni* was found to be widely distributed in the Makara Stream. The only species with wider range than *G. huttoni* were the *Anguilla* spp. and *Salmo trutta*. Both *Anguilla* and *Salmo* were found from the estuary of the Makara Stream, well into the North Makara Tributary Stream. Range of *Galaxias attenuatus* also extended into the lower North Makara Stream, but greatest population density of this species occurred in the lowland reaches of the stream; other species present in the watershed (*Galaxias fasciatus*, *G. argenteus*, *Gobiomorphus basalis* and *Tripterygion varium* were the most important) had lowland distribution and thus overlapped the range of *Gobiomorphus huttoni* only in the lowland stream (see Fig. 2). Despite range overlap between *G. huttoni* and these species, habitat overlap or competition did not appear to be significant.

Apart from *G. huttoni*, the only fishes inhabiting the rapid water habitat in rocky streams were young trout, small eels, and the whitebait-like juveniles of *Galaxias fasciatus*. In comparison with the habitat type favoured by *Gobiomorphus huttoni*, the young trout were found to occupy more open water, sheltering behind rather than beneath the rocks. The small eels were found to conceal themselves beneath rocks the undersurfaces of which were very close to the stream bed, in contrast with the open substrate where *G. huttoni* was found. The juvenile *Galaxias fasciatus* were found to occupy much the same habitat as *Gobiomorphus huttoni* does, also tending to overlap with the habitat of the young trout.

In the sluggish lowland stream, where some adult *G. huttoni* were present, *Gobiomorphus basalis* was found to invade the Makara Stream in the spring and summer. In the lowland stream *G. basalis* was found to occur in similar habitat to *G. huttoni*. In the estuary there did not appear to be any marked differences in habitat between *G. huttoni* and *Tripterygion varium*. The other fishes in the Makara Stream (*Galaxias attenuatus*, large *G. fasciatus*, *G. argenteus*, large *Salmo trutta* and large *Anguilla* spp.) were mostly pool dwelling fish and occupied quite distinct habitat from that of *Gobiomorphus huttoni*.

In comparison with other streams on the west coast of the North Island, the Makara Stream is poor in fish species. The Waikanae River has more species of fish, although some of those present in the Makara Stream (e.g., *Galaxias argenteus* and *G. fasciatus*) were not found in the Waikanae River. In the Waikanae River, a series of samples of the species present was taken from four stations; one station was at each extreme of the range of *Gobiomorphus huttoni* in the river, with two intermediate stations. The uppermost station was about 13 miles from the sea at an altitude of about 650 feet, in the Maungakotukutuku Stream, a major tributary of the Waikanae River. The lowermost station was in the upper estuary of the Waikanae River. Samples were obtained by use of a pulsatory direct current electric fishing machine.

The only species which were found to have wider range than *G. huttoni* in the Waikanae River were the *Anguilla* spp. Apart from the presence of eels throughout the range of *G. huttoni*, faunal associates in the Waikanae River change with stream type, altitude and distance from the sea.

In the upper limits of its range, *G. huttoni* had almost exclusive hold on the fast water habitat. The only other species present in the stream in this region was *Galaxias postvectis*, which appeared to have habitat preferences quite different from those of the red-finned bully. Towards the upper limits of *Gobiomorphus huttoni*'s range, *Galaxias brevipinnis* was an abundant member of the rapid-water fish fauna and habitat overlap between the two species occurred. *G. huttoni* appeared to be the numerically dominant species here.