

An atlas of New Zealand freshwater fish distributions

by
R. M. McDowall
and
J. Richardson

Fisheries Research Division
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Introduction

The distributions of fish species in New Zealand's fresh waters have never been mapped comprehensively or in detail. With the development of a New Zealand freshwater fish survey data base over the past 6 years (McDowall 1979, McDowall and Richardson 1983) there was initially a consolidation of much older historical information on fish distribution already held by Fisheries Research Division and subsequently the systematic recording of newly acquired information. Various agencies have contributed data on fish species recorded in field collections, so that at the end of 1984 there were about 6000 data points in the survey computer file. And though there remain substantial gaps in knowledge owing to limited field collection, the overall coverage of the country is now good enough for the presentation of an atlas of freshwater fish distributions.

Maps for all 27 indigenous species and 16 introduced species are presented in the pages that follow. These are based primarily on recent (post 1960) data from the survey computer file, but additional points, derived from recent taxonomic reviews of families in the fauna (see McDowall 1978), are also included where appropriate. Thus most, but not all points will be found in the survey computer file. Full maps of New Zealand are included for species with only localised distributions to provide a clear perspective of the species' ranges. Where there are very limited or highly disjunct distributions these have been accentuated by the addition of arrows.

The temptation to add localities where species are "known", but have not been formally recorded in some form, has been resisted. Thus the illustrated ranges of some of the more common and widespread species is significantly less than their actual known ranges. This is particularly evident for species like the inanga (*Galaxias maculatus*) and black flounder (*Rhombosolea retiaria*), which are almost universally present in fresh waters close to the sea, and for the brown trout (*Salmo trutta*) and long-finned eel (*Anguilla dieffenbachii*), which are extremely widespread from the sea to the high country in most river systems. With time, the extent of the distribution of these and other less well-known fishes will be more fully represented in the files and thus on the maps. In the meantime existing data provide a valuable and helpful representation of species' distributions and, in particular, enable interested persons or agencies to ascertain general ranges and distribution patterns. The data also enable the identification of major areas where species are present or absent. For example, the three mudfishes (*Neochanna diversus*, *N. apoda*, and *N. burrowsius*) can be seen to be restricted to northern New Zealand, central New Zealand, and Canterbury, respectively. The upland bully (*Gobiomorphus breviceps*) can be seen to occur spasmodically in the southern North Island, and widely in northern and eastern South Island, but to be absent from northern North Island and from southern Westland and Fiordland. Some species are widespread, but largely lowland and coastal in range, e.g., red-finned bully (*Gobiomorphus huttoni*) and inanga (*Galaxias maculatus*).

Possibly the only species for which the data are an utterly inadequate representation of distribution are the black flounder (*Rhombosolea retiaria*) and giant bully (*Gobiomorphus gobioides*). In spite of being known very widely at low elevations and occasionally being recorded many kilometres inland, the black flounder appears in few records and is shown very sparsely on the map. The giant bully appears to occur largely in tidal and supra-tidal waters. As much of the collecting on which records are based is by electric fishing machine, and because these operate very inefficiently in brackish water, the giant bully is seldom collected. However, some recent collecting by fyke net and seine net in

estuarine waters has shown this species to be quite common in certain rivers. Its sparse distribution as shown on the map is a likely product of limitations of suitable collection techniques in the right habitats.

The maps were prepared by transposition of points from map printouts from the computer, based on co-ordinates on the NZMS1 Topographical Map series. The points illustrated should not be seen as highly accurate representations of location - the dots themselves being large enough to cover a substantial area - and persons wishing to clarify any particular distributional point should seek site-specific data from the original computer file.

Information on the use of the New Zealand freshwater fish survey data base can be obtained from McDowall and Richardson (1983). Data from the file can be obtained by legitimate users by contacting Fisheries Research Division, P.O. Box 297, Wellington. Information on the natural history of New Zealand freshwater fishes is to be found in McDowall (1978).

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