Habitat Preferences of Brown Mudfish (*Neochanna apoda* Günther)

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"Ironically, it is often not the big and beautiful creatures but the ugly and less dramatic ones which we need the most"

- Douglas Adams, *Last Chance To See*

Abstract

Brown mudfish (*Neochanna apoda*) are one of five non-diadromous mudfish species endemic to New Zealand. They are considered a 'vulnerable' species under human induced gradual decline (Hitchmough et al., 2007; IUCN, 2009). Brown mudfish are the most widely distributed *Neochanna* species in NZ, however, their populations within this range are patchy. A lowland swamp fish species, brown mudfish are historically noted to be found in forested wetland areas, such as kahikatea (*Dacrycarpus dacrydioides*) swamp-forest. Clearance, drainage and modification of around 90% of lowland wetland areas in NZ (McGlone, 2009) has resulted in habitat loss, with populations now found in the widest range of habitat types of all the NZ *Neochanna* species.

Habitat suitability is hard to assess for brown mudfish as they subsist in such a wide range of habitats. Habitat preferences were investigated to determine which habitat characteristics were most influential for brown mudfish. Geographic Information Systems (GIS) data and nationwide records from the New Zealand Freshwater Fish Database (NZFFD) were used for this analysis. Substrate type, rainfall, shading and low slopes were important aspects for sites with brown mudfish present. Sites without mudfish had steep slopes, high elevation catchments, a large substrate size and warm temperatures. Historical land cover and shading were also important in determining brown mudfish distribution. A local study found some GIS variables to be useful for predicting brown mudfish presence, but on-site measures of ephemerality and flowing water were the most important habitat features for brown mudfish.

Brown mudfish are not often found with other fish species and are considered poor competitors (O'Brien and Dunn, 2007), suggesting that presence of other fish species influences brown mudfish presence. Continued wetland modification increases the probability of brown mudfish encountering other species. The ability of brown mudfish to detect shortfin eels (*Anguilla australis*; a natural predator), and the response made once detection occurred, was investigated. Mudfish were presented with a choice between eel odour or neutrally odoured water. The response made varied with mudfish size. The varying responses indicate that brown mudfish are able to detect shortfin eels, and that this is likely to be a learned behaviour.

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Approval for the trials undertaken as part of my research was gained from the Massey University Animal Ethics Committee (protocol number 08/83).

Top photo taken by Stella McQueen. All other photos taken by Natasha Petrove

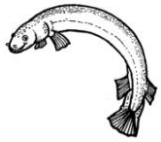

Table of Contents

List of Tables

List of Figures