



**CONSERVATION
TE PAPA ATAWHAI**

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No. 19

MONITORING AND SURVEY METHODOLOGY FOR BLACK MUDDFISH

(Short Answers in Conservation Science)

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Advice Sought: Monitoring and survey methodology for black mudfish

Restrictions on Use of Information: Nil

MONITORING AND SURVEY METHODOLOGY FOR BLACK MUDFISH

Background

At present there is no standard methodology for sampling or monitoring black mudfish in lakes such as Lake Ohia. This is because very few studies have been carried out on this species.

Strickland (1981) surveyed the fishery resources of the Whangamarino Swamp, and in the process sampled black mudfish. Fry were readily caught in small streams with slowly flowing water using electric fishing. However, adults were difficult to sample, only one being caught during the entire survey despite attempts to catch them with a variety of methods. This is probably because adults are nocturnal and seek shelter in places where they are inaccessible to conventional sampling methods.

Thompson (1987) also found it easier to sample fry than adults. He readily caught fry in the small slow-flowing streams in wetlands, but only had success with adult fish when using dip nets to sample freshly inundated swamp margins at night in autumn.

Eldon (1979) has made an intensive study of the brown and Canterbury mudfish, which are closely related to the black mudfish. He noted the diversity of habitats in which adults occurred. Black mudfish adults probably inhabit a similar range of aquatic habitats, as well as some artificial, or constructed ones. For example, they occur in farm drains (McPhail, pers. comm.), and observations by several ex-MAF Fisheries staff have shown that the holes excavated by collectors of kauri gum are useful places to catch black mudfish adults. The accumulated overlying vegetation needs to be removed first, exposing the open water. On return several hours later such holes are good collecting places for adult mudfish. It is not known whether the mudfish are present in these holes to begin with, or move into them after they are partially cleared. Baited G-minnow traps proved successful for catching adult black mudfish in farm drains, but were not used by Strickland (1981), or Thompson (1987), and therefore have not been evaluated in swamp/wetland environments such as Lake Ohia.

Development of a sampling/survey methodology

Because efficient sampling of black mudfish is currently limited to the capture of fry in the slowly-flowing streams leading out from wetland/swamp areas, it is not possible to map distributions, nor determine densities of these fish in such environments. The relative abundance of fry in streams could provide a guide to differences in the abundance of adults in various regions of swamp/wetland areas, however, this approach assumes that factors influencing egg survival and fry mortality are much the same in all areas.

Winter months would probably be the best time for sampling fry. Thompson (1987) studied the reproduction of black mudfish. Based on the date of capture of small (FL 10-11mm) fry, he concluded that they can spawn from April to at least September. He noted that spawning did not occur when water temperatures were below 7°C, and when there was no flow, but did occur when rain raised the water temperature to 9-10°C. However, the indicator for spawning was the presence of fry in small streams, and their sudden appearance may have been due as much to the increased

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flow from the recent rain as to a recent spawning. Although the environmental conditions which stimulate spawning are unknown, it is apparent that black mudfish can spawn over an extended winter period, and that a survey to monitor fry would be feasible during the period late autumn to early spring.

There are only 2 records of fish for the Lake Ohia catchment in the Freshwater Fisheries data base, and black mudfish are not recorded in either. Information on the habitats of black mudfish adults in wetlands such as Lake Ohia is urgently needed for their conservation, however, reliable sampling methods need to be found for adults in order to identify black mudfish habitats in wetlands.

Recommendation

A single winter survey could be usefully designed at this stage to:

- (a) determine the presence/absence and/or relative density of fry in small streams (inlet and outlet) around the perimeter of Lake Ohia. A preliminary site inspection would be needed to locate suitable sampling areas.
- (b) determine the feasibility of using baited G-minnow traps for sampling adults and juveniles in various habitats in the lakes, particularly gum diggers holes.

References

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