

INVESTIGATION OF THE STATUS OF THE FISHERY OF EXOTICS IN POLGOLLA RESERVOIR, SRI LANKA

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Polgolla reservoir is a small reservoir (117.4 ha, at full supply) situated at Kandy district (elevation of 441 m above sea level) in Sri Lanka where a small-scale fishery exists. The fish landings are dominated by three exotic fish species *Oreochromis mossambicus*, *O. niloticus* and *Pterygoplichthys multiradiatus*. *P. multiradiatus*, an accidentally introduced ornamental fish, makes gillnets less effective for catching cichlids. Therefore it is important to investigate the possibility of reducing the biomass of *P. multiradiatus* in the reservoir while sustaining the existing small-scale fishery in the reservoir based on exotic cichlids.

In the present study, catch statistics were obtained from commercial gillnet catches of Polgolla reservoir from May to October 2004. Species-wise catch and effort data and length frequency data of each fish were recorded. Monthly length frequency samples of three dominant exotic fish species in the landings were analyzed by the length-based stock assessment software FISAT II (Version 1.1.3) package.

Estimated mean annual fish yield in Polgolla reservoir is about 17.3 kg ha⁻¹ yr⁻¹. *P. multiradiatus* is effectively caught in night catches so that most fishers operate gillnets during day-time to avoid catching the nuisance species. However, from May to October, when the wind action was strong during day-time fishers fished at night. Estimated growth parameters (asymptotic total length, growth constant per year) for *O. mossambicus* (30 cm, 0.56) *O. niloticus* (48.7 cm, 0.39) and *P. multiradiatus* (41.2 cm, 0.36) were biologically reasonable. Mortality estimates were also within reasonable ranges because of heavy predation.

Relative yield per-recruit analysis indicated that the optimal fishing strategies for the three exotic species could not be achieved simultaneously because all three species are exploited by the same gear. On the other hand, two cichlids are important constituent species to support livelihoods of fishers where *P. multiradiatus* is a nuisance species. As such, management of the fishery of Polgolla reservoir should be aimed at optimizing yield-per-recruit of two cichlid species for long term sustainability while adjusting fishing strategy to reduce the biomass level of *P. multiradiatus* to a low level. To achieve these exploitation levels, sizes at first capture (L_c) of two cichlid species should be increased while maintaining the exploitation rates (E) at the present levels. For *P. multiradiatus* on the other hand, L_c should be maintained at the present level while E should be doubled. As such increase of minimum permissible mesh size (stretched) of gillnets to 8.5-10.0 cm for day time fishing at the present level of fishing mortality for *O. mossambicus* and *O. niloticus* and the use of smaller mesh (6.9-7.5 cm) gillnets at higher fishing intensities during night to maintain higher levels of exploitation of *P. multiradiatus* can be considered as a feasible management strategy for the fishery of Polgolla reservoir.