Investigation of the status of the fishery of exotics in Polgolla reservoir, Sri Lanka

By

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Abstract

Polgolla reservoir is a small reservoir (117.4 ha at full supply) in Sri Lanka, situated at the elevation of 441 m above mean sea level. there is a small scale fishery in this reservoir and three exotic species, *Oreochromis mossambicus*, *O. niloticus* and *Pterygoplichthys multiradiatus* form over 96% of the landings. Of these three species, *P. multiradiatus* is an accidental introduced species through ornamental fish industry and it is considered a nuisance species as this species makes gillnets less effective for catching cichlids.

The present study was carried out from May to October 2004 to investigate the status of the fishery of Polgolla reservoir with particular reference to the three exotic species. As *P. multiradiatus* (Suckermouth catfish) is effectively caught in gillnets during night, this species is now abundance in the landings during September-October where the fishers tend to engaged in night fishing to avoid windy hours during day time. On the other hand, during calm months, fishers are mainly engaged in day- time fishing in order to avoid catching suckermouth catfish. As such, it appears that there is a possibility of differential exploitation of the two exotics cichlid species during day time and suckermouth catfish during night.

Monthly length frequency data of the three exotic species are analysed using FiSAT II (version 1.1.3) software package to determine asymptotic length (L_∞) and growth constant (K). Estimated growth parameters (L_∞, K) for *O. massambicus*

(30 cm, 0.56 $year^{-1}$), *O. niloticus* (48.7 cm, 0.39 $year^{-1}$) and *P. multiradiatus* (41.2 cm, 0.36 $year^{-1}$) were biologically reasonable. Mortality estimates were also within reasonable range because of heavy predation.

Relative yield per-recruit analysis indicated that the optimal fishing strategies for the three exotic species cannot 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 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 option for the fishery of Polgolla reservoir.