

EFFECTS OF LAND USE ON FISH ASSEMBLAGES IN INUNDATED AREA OF PLEIRAN RIVER AND DANUM RIVER SECTIONS OF MURUM RESERVOIR, BELAGA, SARAWAK

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ABSTRACT

Land use changes and degradation of riparian zone had been proven to have effects on water quality and eventually affecting fish communities of newly impounded tropical reservoirs. For the case of newly impounded Murum reservoir in Sarawak, Pleiran and Danum catchments showed a significant disturbance due to logging, plantation and subsistence farming. A drastic change of land use is observed in Pleiran catchment, whereas Danum catchment is relatively less disturbed. This study aims to investigate fish assemblages at inundated areas of both catchments for one year. A total of 5,367 individuals of fish representing 36 species and eight families were caught. Results of multivariate analysis showed significant land use changes in both catchments, which contribute to significant differences in water quality. Pleiran catchment had significantly higher water temperature and TSS, but lower concentrations of Chl-*a* and DO. While Danum catchment showed otherwise. In this relatively good aquatic environment, the fish assemblage comprising the intolerant species: *Tor douronensis* and *Osteochilus* spp. The results imply that conversion of forested area at riparian corridor to open area led to changes in physicochemical characteristics, and subsequently resulted in habitat partitioning by fish species according to their environmental tolerance limit.

Key words: Malaysian reservoir, fish composition, land use change, riparian zone

INTRODUCTION

The impoundment of river by dam construction in the highland area has opened ways for exploitation and conversion of forested areas into agriculture area or other land use purposes. Construction of dam has not only provided roads for various economic activities, but also facilitated deterioration of the natural environment as large area of forest is being cleared, often followed by anthropogenic activities. This environmental degradation influenced the distribution and composition of fish communities in the natural river and newly inundated habitats. Murum reservoir is a man-made lake that receives water source from two major rivers, the Pleiran and Danum. The Pleiran and Danum catchments have been disturbed at different magnitude by logging, plantation and subsistence farming. Nislow and Lowe (2006) reported that streams with more

riparian vegetation or forest density have the tendency to host higher abundance of aquatic life. The impoundment of the river directly affected stream ecosystems and communities through alteration of hydrological regimes and water quality, and acted as barrier to the movement of fish towards upstream and thus influence and change the fish assemblages and compositions. The effects of land use changes and forest conversion on fish assemblages in inundated area of the Pleiran and Danum rivers are of great concern. Penczak (2004) reported changes in fish assemblages are often associated with stream habitat characteristics. The habitat characteristics, on the other hand, are affected by the land use in the adjacent river or within the catchment. Although the impacts of impoundments on land use changes in the watershed that influences fish assemblages has received detailed investigation in the other region of the world and West Malaysia, the information on the effects of dam impoundments and land use changes

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