

## Fish Diversity and Water Quality during Flood Mitigation Works at Semariang Mangrove Area, Kuching, Sarawak, Malaysia

(Kepelbagaian Ikan dan Kualiti Air semasa Kerja Mitigasi Banjir di Kawasan Paya Bakau Semariang, Kuching, Sarawak, Malaysia)

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### ABSTRACT

*This study aimed to document the fish diversity and water quality at Semariang mangrove area, Kuching, Sarawak, which is located at the eastern part of Kuching Wetland National Park. Field samplings were carried out in 2009 during the construction of the flood mitigation channel at the eastern part of the park. A total of 21 families represented by 37 species of fish were caught from the area. The six dominant families in terms of the number of individuals caught were Mugilidae (16%), Leiognathidae (16%), Ambassidae (11%), Ariidae (9%), Lutjanidae (8%) and Plotosidae (6%). In terms of the percentage of six dominant genera based on the number of individuals caught, 16% was represented by Valamugil, 11% by Ambassis, 10% by Gazza, 9% by Arius, 8% by Lutjanus and 6% by Plotosus. The values of diversity and richness indices were lower at stations located close to the flood mitigation channel. Similarly, the concentrations of dissolved oxygen were lower and total suspended solids were significantly higher at stations close to the channel and sand mining area. Therefore, fish fauna and water quality at Semariang mangrove area were affected during the construction of the flood mitigation channel.*

*Keywords: Fish diversity; flood mitigation channel; Semariang mangroves; water quality*

### ABSTRAK

*Kajian ini bertujuan untuk mendokumentasi kepelbagaian ikan dan kualiti air di kawasan paya bakau Semariang, Kuching, Sarawak, yang terletak di bahagian timur Taman Negara Tanah Lembab Kuching. Kerja lapangan telah dijalankan pada tahun 2009 semasa kerja membina saluran mencegah banjir dilakukan di bahagian timur kawasan taman. Sebanyak 21 famili ikan yang mewakili 37 spesies ditangkap di kawasan ini. Enam famili ikan yang paling banyak daripada segi bilangan individu yang ditangkap ialah Mugilidae (16%), Leiognathidae (16%), Ambassidae (11%), Ariidae (9%), Lutjanidae (8%) dan Plotosidae (6%). Enam genus ikan yang paling banyak daripada segi bilangan individu yang ditangkap ialah Valamugil (16%), Ambassis (11%), Gazza (10%), Arius (9%), Lutjanus (8%) dan Plotosus (6%). Bagi stesen-stesen yang terletak berhampiran dengan saluran mencegah banjir, nilai indeks kepelbagaian dan kekayaan adalah lebih rendah, kandungan kepekatan oksigen terlarut juga lebih rendah dan pepejal terampai adalah lebih tinggi secara signifikan. Oleh itu, fauna ikan dan kualiti air di kawasan paya bakau Semariang telah dipengaruhi semasa kerja pembinaan saluran mencegah banjir.*

*Kata kunci: Kepelbagaian ikan; kualiti air; paya bakau Semariang; saluran mencegah banjir*

### INTRODUCTION

Mangroves are characteristic features of most tropical and subtropical estuaries. The low-energy intertidal zone encourages the development of this ecosystem (Twilley et al. 1996) and is commonly associated with soft and muddy substrate. Mangrove forests are highly productive and valuable ecosystems (Sasekumar et al. 1992). They are important detritus contributor for the ecosystem food webs, which also benefit the estuarine and near shore fisheries. They also act as nursery, feeding, breeding and shelter areas for many species of aquatic life. In Sarawak, mangrove forest covers an area of approximately 174,000 hectares and occupies about 60% of the 800 km length of its coastline. Mangrove forests are located mainly along the sheltered coastlines and estuaries within the major

bays of Kuching Division, Sri Aman Division, Rajang Delta and Limbang Division (Chai 1982). Over the past thirty years, the State of Sarawak had lost approximately 24% of its pristine mangrove forests (Anon 2008) due to conversion into various types of land use including oil palm plantation, aquaculture, housing estate and other development projects.

Traditionally, mangrove forests have been an essential resource for communities living in coastal areas and contribute high economic values in term of forest products, fisheries, aquaculture and eco-tourism. Bennett and Reynolds (1993) reported that the Sarawak Mangrove Forest Reserve, of which Kuching Wetland National Park is part of, contributed about US\$25 million to the State's revenue per annum from marine fisheries, timber