UNIVERSITI TEKNOLOGI MARA

# SUSTAINABLE HARVESTING OF *TENUALOSA TOLI* IN SARAWAK

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Thesis submitted in fulfillment
of the requirements for the degree of
**Master of Science**

**Faculty of Computer & Mathematical Sciences**

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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is my original work except for quotations and citations which have been used duly acknowledged as referenced work. I also declare that it has been previously, and is not concurrently, submitted for any other degree at Universiti Teknologi MARA or at any institution.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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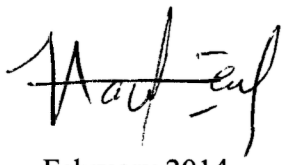
| Signature of Student | : |  |
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## ABSTRACT

This research concerns the sustainable harvesting of the *Tenualosa toli* (*T. toli*) fish in Sarawak. *T. toli* is already on the brink of extinction due to unlimited fishing of the species in all of Sarawak's rivers. Modern technology has increased fishing capacity year by year. This has resulted in the decline of the landings of *T. toli* fish. Hence, fishing activities have become less profitable due to over harvesting of *T. toli* in Sarawak's rivers. Therefore, it is essential to estimate harvesting at maximum sustainable yield, $H_{MSY}$ in order to ensure that *T. toli* can be continuously harvested and to protect the fish from becoming extinct. This research will attempt to determine the effort at maximum sustainable yield, $E_{MSY}$ of *T. toli* using the Schaefer model and the Fox model. These models are surplus production model which are useful when limited data are available. The Schaefer model incorporates the logistic growth model to capture the population dynamics whereas the Fox model incorporates the Gompertz growth model to capture the population dynamics. The intrinsic growth rate, the carrying capacity and the catchability coefficient are estimated from the catch and effort data. These values are needed to estimate $H_{MSY}$ and $E_{MSY}$. This research will add to the body of knowledge regarding sustainable harvesting policies that will ensure a continuous sufficient supply of *T. toli*. The appropriate level of fishing effort and the corresponding sustainable biomass growth can be suggested to the regulating body that oversees fishing operations. If this species can be replenished, the abundance of *T. toli* may spur other related fish products such as fish oil from *T. toli* which is rich in omega-3 and omega-6.

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