

Abstract of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfilment of the requirements for the degree of Master of Science

POPULATION STRUCTURE OF ADULT *Pangasius nasutus* (PATIN BUAH) IN THE PAHANG RIVER, MALAYSIA.

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Pangasius nasutus (locally referred to as Patin Buah) is among the most economically vital fish of the Pahang River. Currently, the population is considered at risk due to the rate of exploitation, threat of invasive alien species and habitat modification. This study was conducted to enrich the population parameters' information and understand their population status. Monthly samplings were conducted at eight sampling stations in Pahang River from May 2021 to April 2022. A total of 746 samples were collected. This study indicates that the smallest fork length sample collected was 287 mm, while the maximum size of the sample was 637 mm and mostly between 400 mm and 480 mm. The values of the exponent b from the LWR analysis for the sampling stations were between 2.2421 and 4.6245. The regression analysis results indicated that fish from Paloh Hinai, Kuala Krau, Jerantut Feri, and pooled station analyses displayed a negative allometric growth pattern, while fish from Kuala Wau, Kertau, Kg. Pangsenam, Kuala Tembeling, and Merting stations demonstrated positive allometric growth patterns. The length frequency data were incorporated into the FiSAT II software to analyse population parameters further. This study estimated that the asymptotic length (L_{∞}) 661.50 mm and growth coefficient (K) = 0.18 year⁻¹, growth performance index (Φ') = 4.90, maximum age (T_{max}) = 16.67, total

mortality (Z) = 0.61 year⁻¹, natural mortality (M) = 0.25 year⁻¹, fishing mortality (F) = 0.36 year⁻¹ and exploitation rate (E) = 0.59 year⁻¹. This study showed that *P. nasutus* in the Pahang River is a slow-growing species that would likely get overfished and undergo faster and more extensive population decreases. Although it was less than the value of E_{\max} (0.812), the estimated exploitation rate ($E=0.59$) was more than the ideal level of exploitation ($E=0.50$), which showed that the current level of exploitation of *P. nasutus* population in the Pahang River is acceptable. However, consideration should be taken to prevent overexploitation of the population. This means that regular monitoring programs should be implemented with a proper management plan that can be developed to ensure the future sustainability of this critical species.

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STRUKTUR POPULASI *Pangasius nasutus* (PATIN BUAH) DEWASA DI SUNGAI PAHANG, MALAYSIA

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Pangasius nasutus (dikenali secara tempatan sebagai Patin Buah) salah satu ikan yang paling penting dari segi ekonomi di Sungai Pahang. Pada masa ini, populasi ini dianggap berisiko disebabkan oleh kadar eksploitasi, ancaman spesies invasif asing dan pengubahsuaian habitat. Kajian ini dijalankan untuk memperkayakan maklumat tentang parameter populasi, seterusnya memahami status populasi ikan tersebut. Persampelan bulanan telah dijalankan di lapan stesen persampelan di Sungai Pahang dari Mei 2021 hingga April 2022. Sebanyak 746 sampel telah dikumpulkan. Kajian ini mendapati bahawa panjang cabang sampel terkecil yang dikumpul ialah 287 mm, manakala saiz maksimum sampel ialah 637 mm dan kebanyakannya di antara 400 mm hingga 480 mm. Nilai eksponen b daripada analisis LWR untuk semua stesen pensampelan adalah antara 2.2421 dan 4.6245. Keputusan analisis regresi menunjukkan bahawa ikan dari Paloh Hinai, Kuala Krau, Jerantut Feri, dan analisis stesen terkumpul telah menunjukkan corak tumbesaran alometrik negatif, manakala ikan dari Kuala Wau, Kertau, Kg. Pangsenam, Kuala Tembeling dan Merting menunjukkan corak tumbesaran alometrik positif. Data taburan panjang telah dimasukkan ke dalam perisian FiSAT II untuk menganalisis parameter populasi. Kajian ini menganggarkan panjang asimptotik (L_{∞}) 661.50 mm dan pekali tumbesaran (K) = 0.18 tahun^{cc}, indeks prestasi tumbesaran (\emptyset') = 4.90, umur maksimum (T_{maks}) =

16.67, jumlah kematian (Z) = 0.61 tahun⁻¹, kematian semula jadi (M) = 0.25 tahun⁻¹, kematian menangkap ikan (F) = 0.36 tahun⁻¹ dan kadar eksploitasi (E) = 0.59 tahun⁻¹. Kajian ini menunjukkan bahawa *P. nasutus* di Sungai Pahang adalah spesies lambat membesar yang berkemungkinan akan ditangkap berlebihan serta mengalami penurunan populasi yang lebih cepat dan lebih meluas. Walaupun ia kurang daripada nilai E_{\max} (0.812), anggaran kadar eksploitasi ($E=0.59$) adalah lebih daripada tahap eksploitasi ideal ($E=0.50$) yang menunjukkan bahawa tahap eksploitasi semasa populasi *P. nasutus* di Sungai Pahang boleh diterima, tetapi pertimbangan harus diambil untuk mengelakkan eksploitasi berlebihan populasi ini. Dengan cara ini, program pemantauan berkala harus dilaksanakan dengan pelan pengurusan yang sesuai yang boleh dibangunkan untuk kelestarian masa depan spesies penting ini.