

CONSERVING FRESHWATER ECOSYSTEM IN KAIN RIVER, BALEH WATERSHED, SARAWAK



WORKING TOGETHER TO PROTECT FRESHWATER ECOSYSTEM IN SARAWAK



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ABSTRACT

The once abundant Semah and Empurau in Sarawak needs strategic management and conservation efforts to ensure their survival and sustainability. The upper Kain River has been identified as one of the only four river systems near to human settlement with wild *Tor* sp. Still thriving in the Baleh watershed. An ecological assessment was conducted in May 2018 at eleven stations located along this river stretch and a total of 809 individuals represented by 8 families and 24 species of fishes were caught. Most of these individuals were dominated by Cyprinidae (96.66%) and *Tor douronensis* (12.61%) a the top four dominant fish species. Fish composition was assessed through sampling using gill nets of different mesh sizes, cast net and electroshocking technique. Water quality measurement and habitat assessment was also conducted during sampling to obtain baseline data on the habitat to guide management actions. A community conservation based tagang system is recommended for the management of this river stretch to sustainably manage the *Tor* species and its freshwater ecosystem.

Keywords: high conservation value river, *Tor douronensis*, river conservation, fish composition

INTRODUCTION

WWF-Malaysia in Sarawak works to improve watershed management for the protection of freshwater ecosystems and its services in the Baleh watershed, a priority conservation area for Sarawak. Through collaborative efforts with Inland Fisheries Division (IFD) Sarawak, Kain river was identified as a potential High Conservation Value (HCV) river which is important for *Tor* species. Joint field assessments was then conducted to gather ecological information of the river to facilitate the development of management guides for the protection of the river and its habitat for *Tor*. Upstream of the Kain river, a large hydropower dam has been approved for development in this watershed. The data obtained is therefore also crucial to guide assessments of the extent of potential impacts, for example the change of flows which could potentially affect this tributary and ensure that mitigation and management actions are identified and put in place to protect the *Tor* species and reduce risks to its habitat. To date, no studies on fish fauna in the stretch of upper Kain River, has been carried out.



Figure 1. *Tor douronensis* caught from Kain River, Baleh

DISCUSSION

- *Tor douronensis* was found as the top four fish species caught from the study area. Most of them were found in the upper stream stations.
- It prefers cooler water (below 25 °C) and high dissolved oxygen (6.7 to 8.8 mg/L). Younger *Tor* sp. could be found in clean, cool and relatively fast flowing water while the adults could be found in slow running and slightly turbid water (Nyanti, 2013). Thus, the dissolved oxygen and temperature recorded in the present study were suitable and preferable for *Tor* environment.
- *Tor tambroides* (Empurau) and *Tor douronensis* (Semah) have declined and rarely caught over the years. The destruction of spawning ground due to overfishing, deforestation and changes of water quality due to agricultural activities could contribute to their decline (Nguyen, 2008). Hence, protection of their habitat here is needed and recommended.
- Most of the locals in Kain River fish for their own consumption. However, fishes that were caught and fetched good market prices will be sold as their source of income. Semah can command a market price up to RM 100 per kg and is therefore targeted by the fishermen.
- The communities with support and guidance from Inland Fisheries Division of the Department of Agriculture Sarawak will set up a tagang system for conservation and management of the freshwater ecosystem and the species, in particular the *Tor* species here.
- Tagang system is a community conservation based system of sustainable management of fisheries resources in its natural habitats.

CONCLUSION AND RECOMMENDATIONS

The once abundant *Semah* and *Empurau* needs strategic management and conservation efforts to ensure their survival and sustainability. There is a critical need to protect the upper Kain River as it is one of the only few river systems nearby the human settlement with wild *Tor* sp. still thriving. Community conservation via the Tagang system presents a positive opportunity to conserve this freshwater ecosystem and the *Tor* species while also promoting stewardship and support for their income and livelihood. Conservation of this river should be included in the Pilot Integrated Watershed Management Plan being pursued for Baleh.

METHODOLOGY

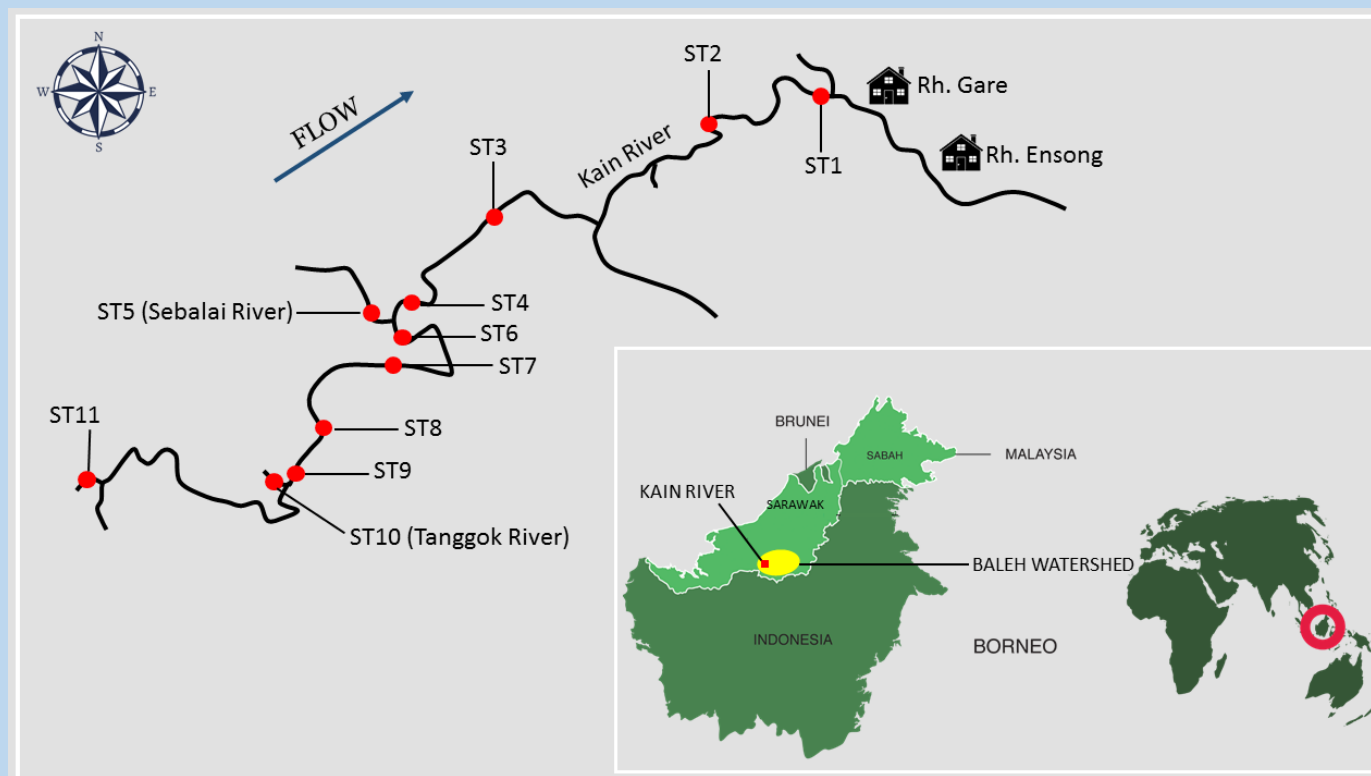
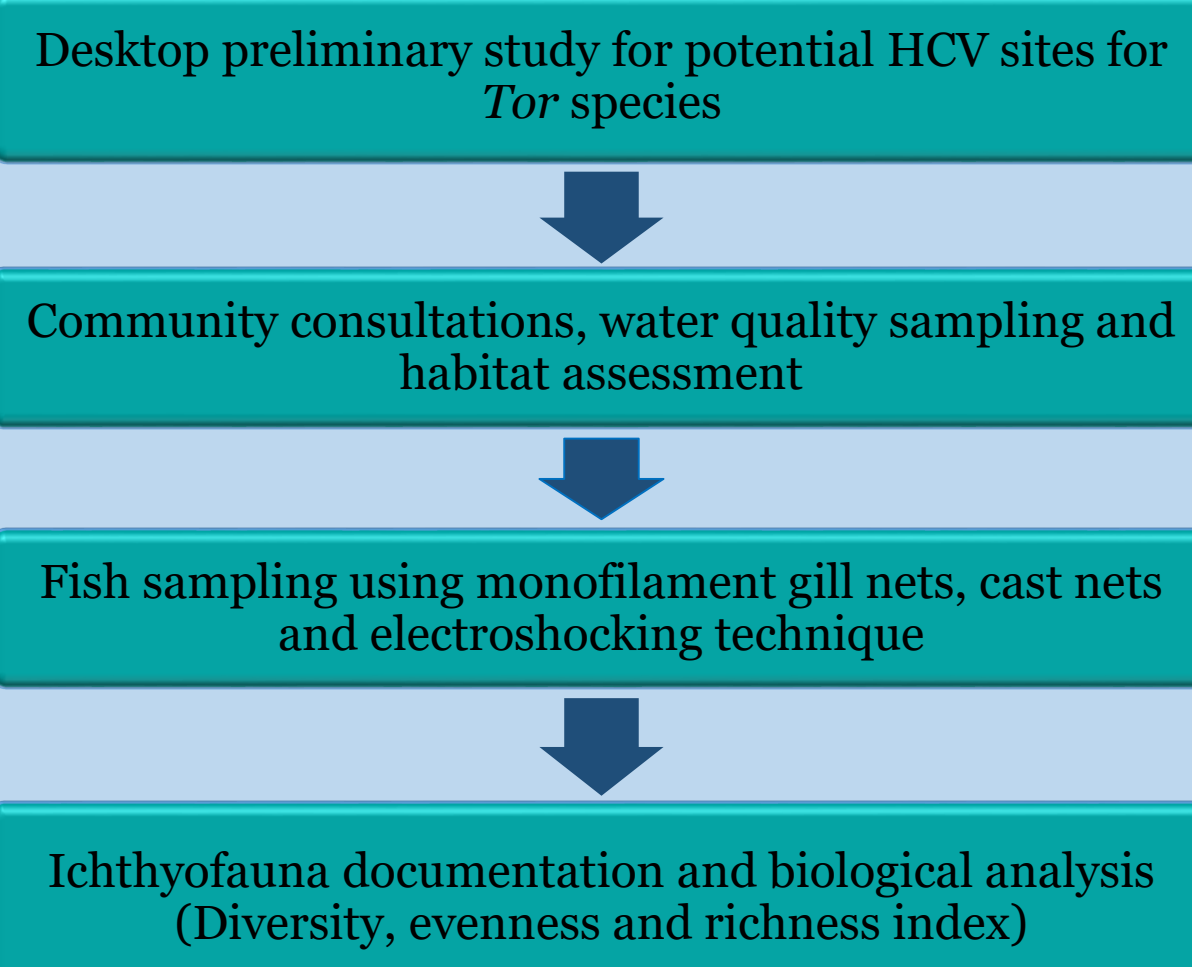


Figure 2. Study sites in the 11km stretch of Kain River, Baleh



RESULTS

Water quality

Table 1. Summary of water quality parameters from all sampling stations

Physicochemical parameters	Range
pH	5.84 – 7.86
Conductivity (µS/cm)	22.00 – 42.00
Turbidity (NTU)	1.90 – 19.80
Dissolved oxygen (mg/L)	7.97 – 11.58
Temperature (°C)	25.08 – 27.54

Fish composition

809 Individuals, 24 Species, 8 Family

- Live juvenile of *Tor* sp. caught in this study were segregated for brood stock programme by Sarawak Inland Fisheries
- At least two tributaries; ST 5 and ST 10 were found to be potential spawning area for *Tor* sp. – will be proposed for tagang system
- Species diversity index (2.26), species evenness index (0.71), species richness index (3.44)

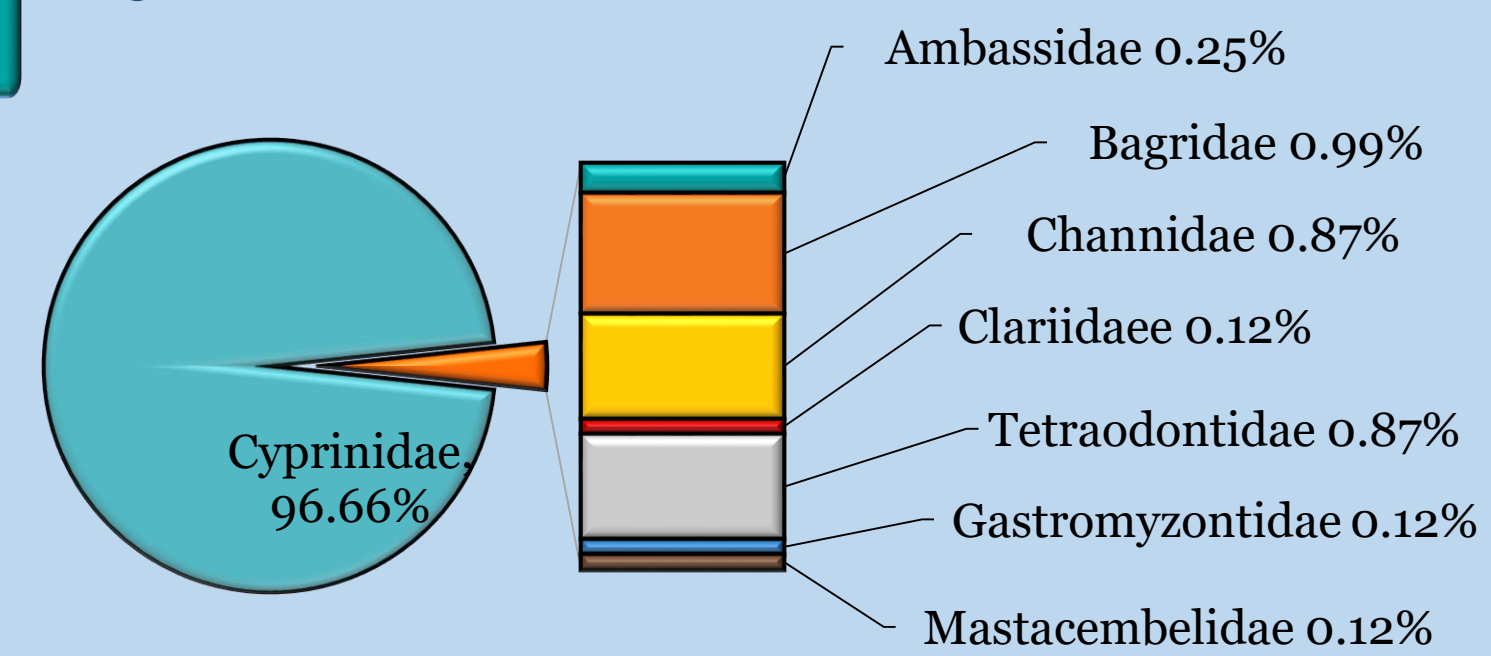


Figure 3. Percentage composition of fish families caught from Kain River, Baleh

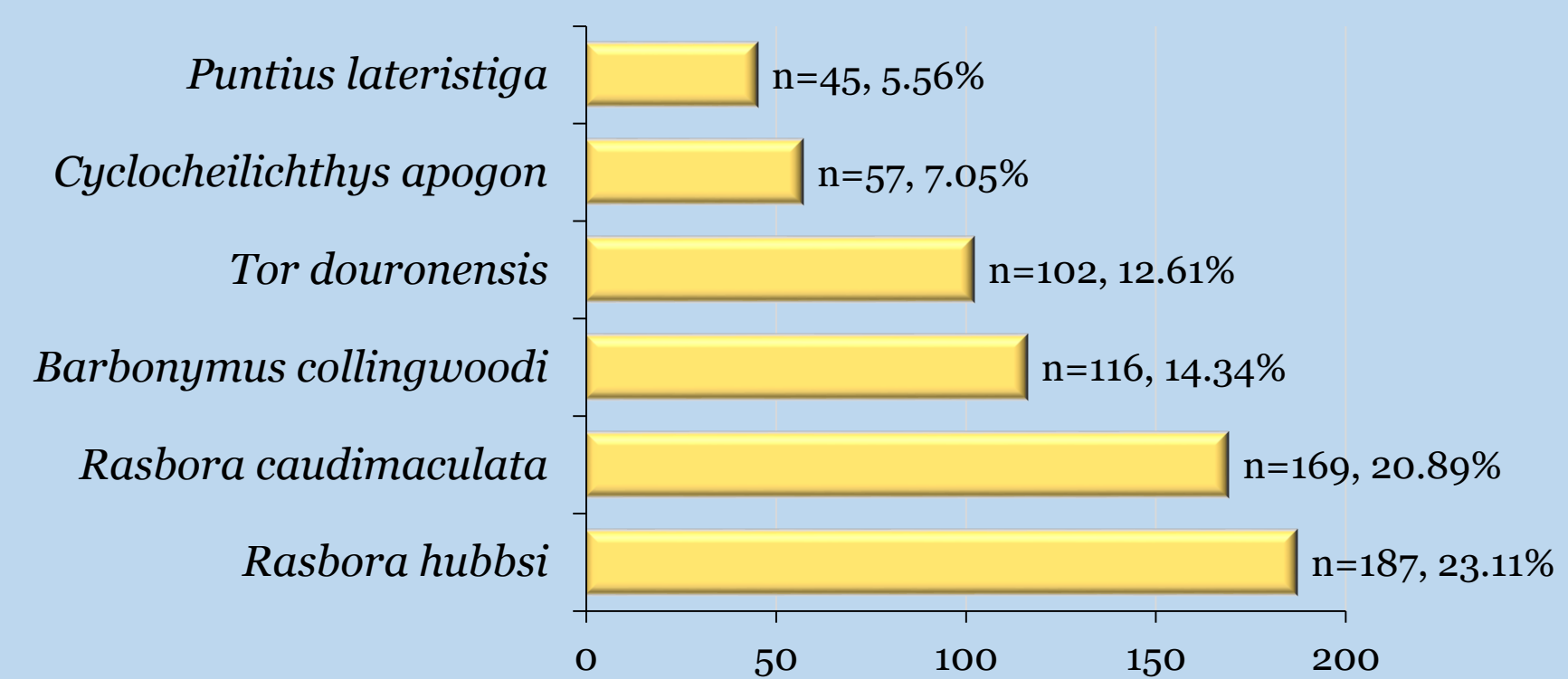
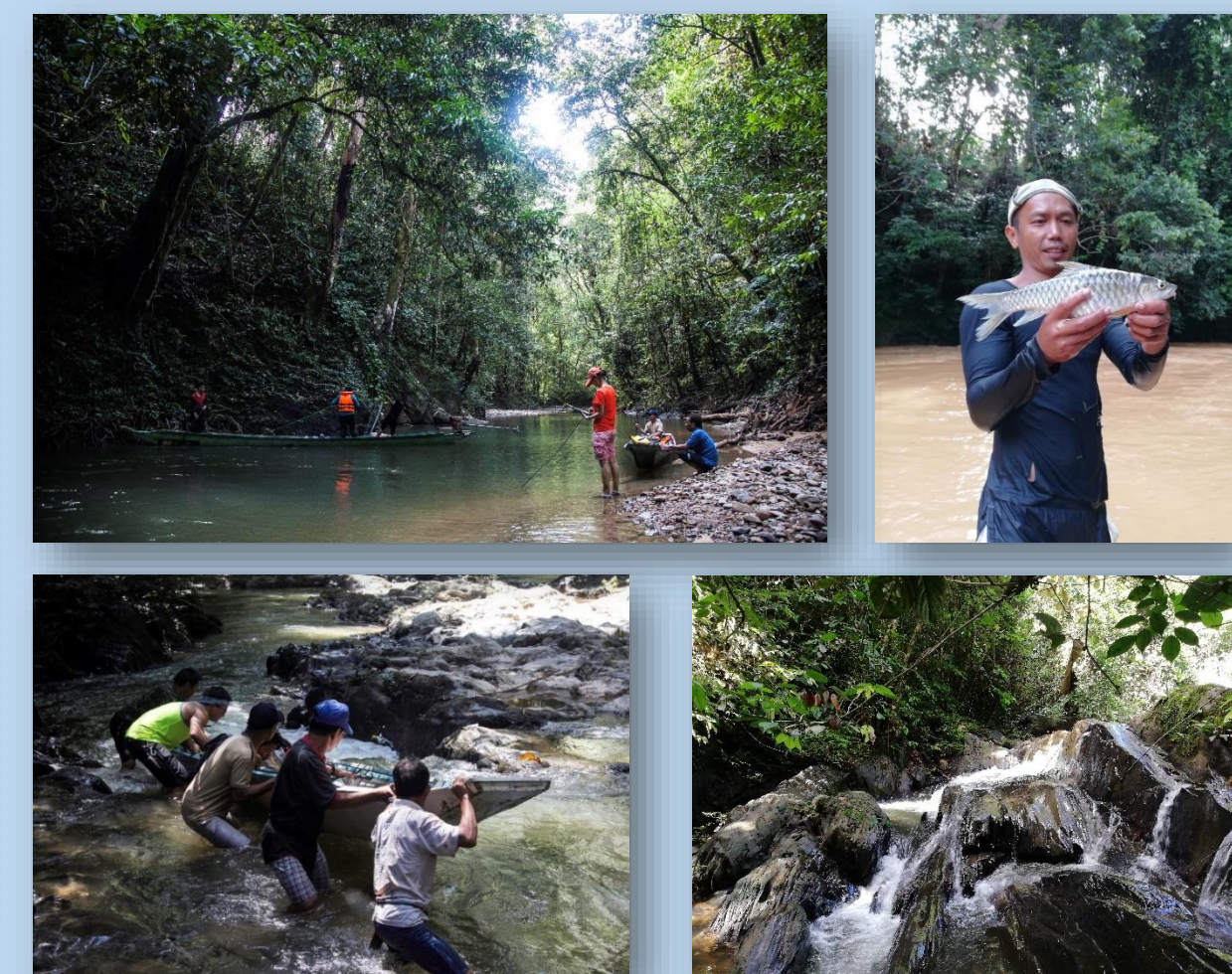


Figure 4. Six dominant species caught in the stretch of Kain River, Baleh



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