IBEC Research Bulletin | Volume 7 | Issue 1 | June 2026

Documenting Endemic, Rare, and Red-Listed Species: Informing Conservation



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e-ISSN: XXXX-XXXX

https://online.fliphtml5.com/xxjdk/psyc/

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Editorial note

Warm greetings all readers

It is our pleasure to present the current edition of the Institute of Biodiversity and Environmental Conservation Bulletin, continuing the legacy established in previous volumes. The bulletin remains committed to serving as a platform for documenting biodiversity research, field observations, and conservation initiatives associated with the Institute and its research collaborators.

This edition introduces a renewed thematic focus, “Documenting Endemic, Rare, and Red-Listed Species - Informing Conservation”, reflecting our commitment to systematically documenting the Institute long-standing research contributions since the university’s establishment in the 1990s, particularly on species of significance conservation concern. Greater emphasis will be placed on endemic taxa, species listed under the International Union for Conservation of Nature (IUCN), and those protected under the Wild Life Protection Ordinance 1998, and species facing emerging ecological pressures. Each issue will present accounts of species ecology, distribution, conservation status, and prevailing threats, thereby strengthening both academic reference and conservation awareness.

Beginning this year, the publication schedule has been revised from four issues annually to two issues per year, to be published in June and November. This adjustment is intended to strengthen editorial focus, improve content depth, and enhance overall publication quality while maintaining continuity with past volumes. The bulletin is now presented in an interactive pdf flipbook format, offering readers a more engaging and visually accessible reading experience.



We would like to express our appreciation to the previous editorial team for their dedication, consistency, and commitment in shaping the bulletin into a valuable institutional record. Their efforts have laid a strong foundation upon which we now build. We are also grateful to Chien Lee for his generosity in sharing his photographs of Blyth's Hawk-Eagle and dragonflies for inclusion in this volume, which greatly enrich its visual appeal and educational value. We hope this renewed focus will strengthen the bulletin’s role as a scientific archive, an educational resource, and a platform for advancing biodiversity knowledge in Sarawak and beyond.

Message from the Deputy Vice Chancellor



It is a pleasure to extend my warmest greetings on the publication of the first issue of the IBEC Research Bulletin for 2026, themed "***Documenting Endemic, Rare, and Red-Listed Species: Informing Conservation***".

The Institute of Biodiversity and Environmental Conservation continues to play a pivotal role in advancing research excellence in biodiversity, environmental sustainability, and conservation science. The Research Bulletin stands as an important platform for showcasing the Institute's scholarly achievements, research innovations, and meaningful contributions to society.



I would like to commend the editorial leadership for their dedication in ensuring the quality and continuity of this publication. My appreciation also goes to all researchers, staff, and students whose work and commitment form the foundation of IBEC's growing impact.

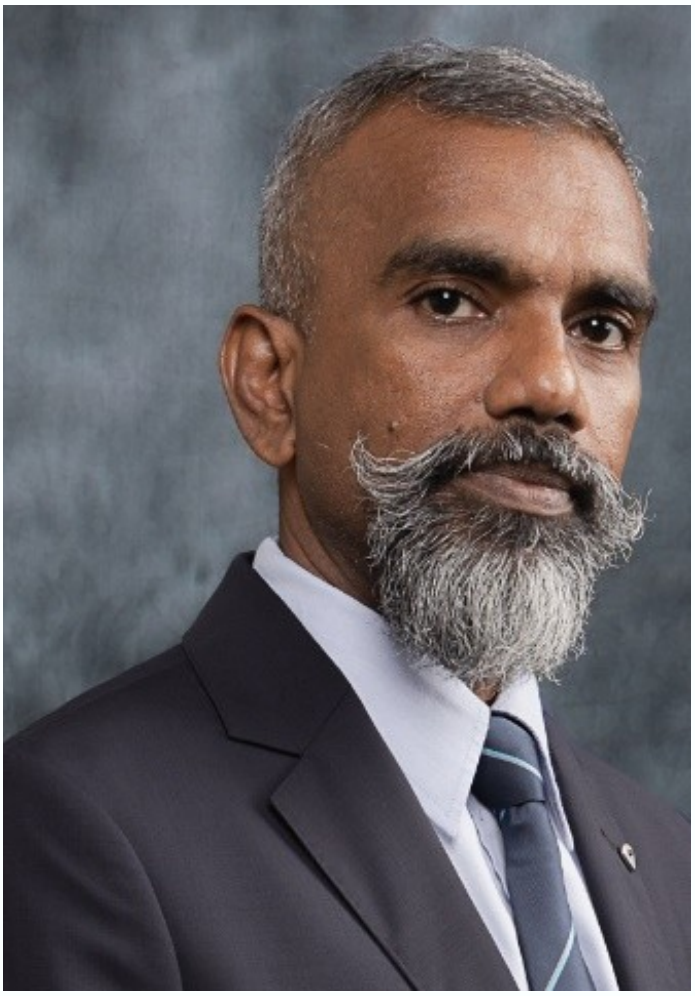
As UNIMAS advances under the Strategic Plan 2026–2030, the University remains committed to strengthening research visibility, enhancing interdisciplinary collaboration, and fostering impactful partnerships at national and international levels. IBEC's efforts strongly align with these aspirations, particularly in addressing global challenges related to biodiversity loss, environmental change, and sustainable development.

I am confident that IBEC will continue to expand its research footprint and contribute significantly to knowledge generation, policy development, and community engagement.

Congratulations on the publication of this issue, and I wish IBEC continued success in the years ahead.

Research & Innovation
Universiti Malaysia Sarawak

Foreword from the Director



It is my pleasure to introduce the first issue of the IBEC Research Bulletin for 2026, focusing on groups of species of high conservation value.

At the outset, I wish to record our sincere appreciation to Professor Dr. Wong Sin Yeng for her dedicated service as Editor of the IBEC Research Bulletin. Her commitment and stewardship have ensured the consistency and quality of this publication. Under her guidance, the Bulletin has continued to serve as an important platform for communicating IBEC's research achievements, academic engagements, and conservation initiatives. The Institute is deeply grateful for her valuable contributions.

I am equally pleased to welcome Dr. Jongkar Grinang and Ms Heira Vanessa as the new Editor and Assistant Editor. With their fresh perspectives and scholarly dedication, I am confident that the Bulletin will continue to grow in impact and relevance. I look forward to working closely with the editorial team to further enhance the visibility and reach of IBEC's work.



Temurang Cave, Padawan

As we move forward in 2026, our focus remains on strengthening research excellence, fostering interdisciplinary collaboration, increasing high-quality publications, and expanding partnerships at both national and international levels, in alignment with UNIMAS's Strategic Plan 2026–2030. This issue themed "Documenting Endemic, Rare, and Red-Listed Species: Informing Conservation" reflects these priorities. The Research Bulletin plays a vital role in documenting our collective progress and celebrating the accomplishments of our researchers, staff, and students.

I encourage all members to continue contributing actively to future issues so that the Bulletin reflects our passion, thirst for knowledge, and dedication that define our Institute

Institute of Biodiversity and environmental Conservation
Universiti Malaysia Sarawak

Conservation Status of Miniature Freshwater Fish, *Paedocypris micromegethes* and Its Type Locality in Sarawak, Malaysian Borneo

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The conservation of miniature freshwater fish in Borneo has become an increasing concern because many species are highly restricted to fragile peat swamp habitats. These ecosystems have undergone extensive degradation since the 1960s due to logging activities, while current pressures arise primarily from oil palm plantation expansion and the development of road networks. Among the most remarkable species is *Paedocypris micromegethes*, one of the world's smallest freshwater vertebrates, with adults reaching only about 10–12 mm in total length. The species inhabits highly acidic blackwater peat swamp forests in Sarawak and is regarded as a stenotopic blackwater specialist capable of surviving only within a very narrow pH range. It was first described in 2006 from a peat swamp habitat in Gayau, Mukah, central Sarawak. Since its discovery, however, little information has been available regarding its population biology, habitat occupancy, or life history in the wild. In 2019, the species was assessed as Vulnerable on the IUCN Red List due to its restricted distribution and the continuing decline of peat swamp habitats throughout Borneo.



Studies on peat swamp fishes in Sarawak remain limited. Earlier surveys conducted in Maludam (2004), Loagan Bunut (2006), oxbows in lower Baram River (2016), and several peat swamp systems around Kuching primarily targeted medium- and large-bodied fishes using conventional fishing gears. Consequently, miniature species such as *P. micromegethes* were frequently overlooked because they could easily escape through coarse mesh nets.



Recent field observations suggest that the conservation status of *P. micromegethes* may be more critical than previously recognised. Surveys across several major freshwater swamp systems, including Samunsam, Lundu, Sematan, Kuching, Samarahan, Marudi, Serian, Maludam, and the Rejang Delta, have failed to record the species at any new localities.

Blackwater of a peat swamp forest in Marudi, northern Sarawak, revealing its pristine natural condition. Note the bluish patches on the water surface, possibly formed by biofilms or dissolved organic layers characteristic of blackwater peat swamp ecosystem.

Although suitable blackwater habitats still persist in some areas, the species has become increasingly difficult to detect, suggesting possible population declines and severe habitat fragmentation. The condition of the type locality in the Sg Gayau peat swamp complex is particularly alarming. The original peat swamp forest has been extensively degraded by oil palm plantation development, drainage activities, and road expansion. These land-use changes have substantially altered the hydrology and water chemistry of the habitat, potentially threatening the long-term survival of the species.



A live photograph of *Paedocypris micromegethes* showing its transparent body, with fin rays, vertebrae, and stomach clearly visible.



Maludam National Park, April 2012
Fish sampling in peat swamp forests is very challenging, as deep peat substrates slow movement and reduce sampling efficiency.

Conservation efforts for *P. micromegethes* should therefore prioritise the protection and restoration of the remaining peat swamp forest patches that continue to support surviving populations. Further studies, particularly on water quality tolerance, habitat requirements, and dietary ecology, are essential for understanding how the species persists in such specialised environments. Captive breeding programmes could also provide valuable insights into its reproductive biology and life cycle while supporting future conservation initiatives. Based on extensive current ecological observations, the provisional conservation status of *P. micromegethes* may warrant reassessment to a higher threat category in the near future.



Marudi Peat Swamp, January 2025
Road construction alters natural hydrological processes and can act as a barrier to fish movement, particularly during prolonged drought periods.

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