PROGRESS REPORT

Project No. 42230-2

Unveiling the hidden amphibian and reptile diversity of a partially protected Mt. Busa Key Biodiversity Area, southern Philippines: conservation gaps, challenges, and priorities

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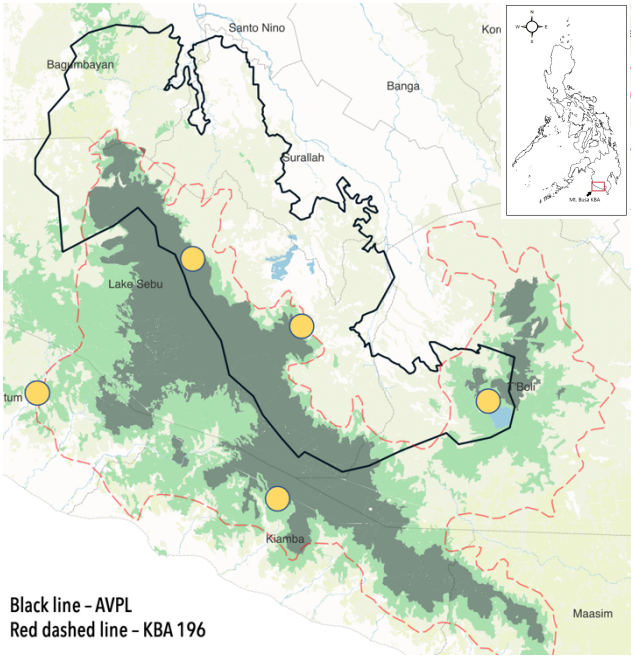
EXECUTIVE SUMMARY

Key biodiversity areas are critical for preserving biological integrity. However, many of the KBAs have partial or no levels of protection. Advocating for policies that provide full protection for these areas requires scientifically sound evidence. We will utilize field-based and phylogenomic approaches to unveil the unrecognized herpetological diversity of the partially protected Mt. Busa KBA (KBA 196), identify what portion of this diversity is protected and adequately managed, and use this information to identify conservation gaps, challenges, and priorities. The results contribute to the development of science-based management strategies for—and the holistic protection of—the whole of KBA 196.

This project builds on the scientific and conservation successes of my previous work in the Mt. Busa Key Biodiversity Area (KBA 196), funded by The Rufford Foundation. Our initial study revealed a high species diversity of herpetofauna in a single location within the unprotected portion of the KBA. Notably, we rediscovered Guttman's stream frog (*Hylarana guttmani*) outside its type locality, highlighting the urgent need for further survey efforts across this vast and vulnerable area. Building on these findings, the current project expanded our research to multiple localities, enabling us to secure wildlife specimens that may lead to the recognition and potential description of new species. The updated data will support the ongoing process of establishing area-based protection measures (e.g., Protected Area and Other Effective Area-based Conservation Measures) and enhance the effectiveness of existing management mechanisms. The project is being implemented in close cooperation with the Local Government Units governing the KBA 196, Philippine Department of Environment and Natural Resources Region XII (DENR RXII), and indigenous peoples and local communities (IPLCs).

1. Fieldwork and Specimen Collection

Fieldwork was conducted from June to August 2024 at five sites within the Mt. Busa Key Biodiversity Area (KBA 196): Mt. Busa, Dakeol Forest, Tudok Mgong, T'daankini Falls, and Mt. Melibengoy. We recorded approximately **74 species of herpetofauna**, comprising **27 amphibians**, **27 lizards**, and **18 snakes**. These numbers are subject to change pending molecular confirmation of specimens with uncertain species identification (see Appendix for photos of representative species).



A total of **225 wildlife specimens were collected under Wildlife Gratuitous Permit No. 337**, issued by the DENR Biodiversity Management Bureau (DENR-BMB) to the University of Kansas Biodiversity Institute (KU-BI), where I am currently affiliated. This permit is governed by a Memorandum of Agreement between DENR-BMB and KU-BI, as outlined in DENR Administrative Order No. 2022-10. Specimen collection and preparation adhered to protocols specified in Animal Use Statement No. 279-01, issued by the University of Kansas Institutional Animal Care and Use Committee (IACUC). The specimens were subsequently exported to KU-BI for further molecular analysis and indefinite storage and deposition, as approved by Wildlife Export Certification No. R12-2024-03, issued by DENR Region XII.

2. Capacity-Building

During the course of fieldwork, the project **trained seven (7) individuals from diverse sectors in the science and practice of specimen collection for biodiversity research**. The trainees included: Aljohn Jay Saavedra, a biology graduate student from Mindanao State University General Santos (MSUGSC); John Faus Yata, a teacher and indigenous Tboli from Maitum; Mc Gabriel Fungan, an indigenous Tboli from Lake Sebu, affiliated with the DENR South Cotabato; Angelica Emit, an anthropology researcher from General Santos; John Michael Zante, a biology undergraduate student from MSUGSC; Rufilyn Dua, a biology undergraduate student from MSUGSC; Antonio Ugal, an indigenous Tboli affiliated with the Municipal Local Government Unit of Tboli. Additionally, **the project employed 25 Tboli guides during fieldwork, all members of Indigenous Peoples and Local Communities (IPLCs).** These guides provided crucial logistical support, such as coordinating with IPLC leaders at the field sites, identifying campsites, and assisting in wildlife specimen collection.

Various people were trained in the science and practice of specimen collection for research

The training covered various aspects of specimen collection in the field, including processing specimens according to approved IACUC protocols and preparing them for long-term storage and deposition in natural history museums. These skills are vital to advancing taxonomic, systematic, and conservation research, especially in the southern Mindanao region where such expertise remains limited. Beyond skill transfer, this initiative fosters transdisciplinary collaboration by involving individuals from academia, government, and IPLCs in the production of scientific knowledge. This shared knowledge is essential for biodiversity conservation and management. Furthermore, the project intends to translate scientific insights gained into actionable management interventions and policies.

3. Policy Advocacy

I have **forwarded a policy brief and public outreach materials** on the ecological significance of the Mt. Busa Key Biodiversity Area to Hon. Steve Solon, Congressman of Sarangani Province. These materials advocate for KBA 196's designation as a nationally legislated Protected Area under the National Integrated Protected Areas System (NIPAS). Hon. Solon requested these materials as he works on advancing House Bill No. 9270 in the 19th Congress of the Philippines. The bill, titled 'An Act Establishing the Mt. Busa Protected Landscape in the Province of Sarangani Under the Expanded National Integrated Protected Areas System (E-NIPAS), Providing for its Management, Funding, and Other Purposes,' seeks to ensure the long-term protection of Mt. Busa. We have agreed to hold a follow-up meeting to support the progress of this important legislation.

4. Remaining Activities

In the second half of 2024, exported specimens will be stored at the University of Kansas Natural History Museum (KUNHM) for detailed morphological examination, molecular sequencing, and taxonomic research. This laboratory work is generously supported by the University of Kansas Biodiversity Institute and the KU College of Arts and Sciences Research Excellence Initiative. Concurrently, I will work with Aljohn Jay Saavedra to develop the project's communication outputs. By December 2024, we aim to submit an expanded policy paper—based on the scientific findings of this project and other relevant literature—to concerned governing bodies, including DENR Region XII and local government units. The goal is to support the establishment of Protected Areas and Other Effective Area-Based Conservation Measures (OECMs) within Key Biodiversity Area (KBA) 196.

ACKNOWLEDGEMENT

I extend my heartfelt gratitude to the following institutions and individuals for their invaluable support in making the fieldwork component of my project possible: Department of Environment and Natural Resources - Biodiversity Management Bureau (DENR BMB), DENR Region XII, Provincial Environment and Natural Resources Office of South Cotabato, Protected Area Management Office of Allah Valley Protected Landscape; Municipal Local Government Units of Maitum, Kiamba, Lake Sebu, and Tboli; Association of Young Environmental Journalists (AYEJ), University of Kansas Biodiversity Institute, and the Indigenous Peoples and Local Communities across my field sites.

PROJECT WORKFLOW and KEY DELIVERABLES

PHASE 1: Permitting, Coordination, & Planning	**PHASE 2:** Fieldwork (Data Gathering)	**PHASE 3:** Museum & Laboratory Work (Data Gathering & Analyses)	**PHASE 4:** Report Writing and Dissemination
Prior Informed Consent Documents from MLGU Lake Sebu, Tboli, Kiamba, Maitum Protected Area Management Board Clearance from AVPL (PAMB Resolution No. 2023-20) Inclusion of Mt Busa KBA in Wildlife Gratuitous Permit No. 337 from DENR-BMB Coordination Meeting with MLGUs and DENR	The updated herpetofauna record for KBA 196 includes 74 species: 27 amphibians, 27 lizards, and 18 frogs. Animal Use Statement from KU IACUC for specimen preparation (AUS No. 279-01) Exported 225 specimens (Wildlife Export Certification No. R12-2024-03 from DENR RXII) Wildlife Transport Permit Nos. 2024-03 and 2024-001 from DENR	Collected specimens stored at the KU Natural History Museum Specimens sorted for formal deposition and storage at KUNHM ***To be accomplished:*** *DNA barcoding of specimens for accurate species identification and facilitating further analyses in taxonomy and systematics.*	Policy brief and other public outreach materials ***To be accomplished:*** *Communication, education, and public awareness materials/deliverables* *Report for policymakers for submission to DENR and MLGUs* *Technical report about Mt Busa KBA with updated biodiversity information*

APPENDIX

Eutropis englei (male)

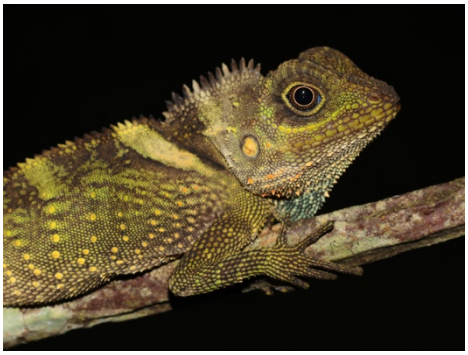
Eutropis multifasciata

Sphenomorphus fasciatus

Brachymeles tiboliorum

Tropidophorus sp.

Pelophryne brevipes



Gonocephalus sp.

Platymantis sp.

Limnonectes diuatus

Hylarana guttmani

Oreophryne annulata

Trimeresurus cf. *flavomaculatus*





Fenix 7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WIZARDS

POLICY BRIEF

Urgent Call for the Protection of the Mt. Busa Key Biodiversity Area (KBA 196)

Protecting KBA 196 is not just a conservation priority—it is a national imperative. It is recognized as one of the Philippines' most important biodiversity hotspots. Spanning the Busa mountain range and adjacent Mt. Melibengoy and Mt. Malibato, this KBA harbors an extraordinary concentration of biodiversity, necessitating immediate protection. Recent studies highlight KBA 196 as a stronghold for the critically endangered Philippine eagle (Senarillos et al., 2021; Pitogo et al., 2024) and the world's only known habitat of the rediscovered Guttman's stream frog (Pitogo & Saavedra, 2021, 2023).

The orchid diversity in KBA 196 is particularly remarkable, with over 250 species recorded, many of which are still undescribed (Saavedra & Pitogo, 2020; Pitogo & Saavedra, 2024). The discovery of *Pinalia campanulata* in 2023, the first orchid described from the region in decades, underscores the hidden diversity that remains to be uncovered (Saavedra et al., 2023). Additionally, KBA 196 serves as a critical habitat for numerous endemic and threatened birds, amphibians, and reptiles, emphasizing its vital role in Mindanao's conservation landscape (Brown et al., 2015; Senarillos et al., 2020; Pitogo, 2021; Pitogo et al., 2020, 2021a,b, 2024).

Despite its ecological significance, KBA 196 faces severe and escalating threats from mining, land conversion, unsustainable tourism, and illegal wildlife collection. These destructive activities not only jeopardize species survival but also undermine essential ecosystem services—clean water and air, typhoon protection, natural buffers against landslides and floods—that are crucial to the well-being of indigenous peoples and local communities.

The scientific evidence is overwhelming: ***KBA 196 is irreplaceable, and its protection is paramount***. We call on the Department of Environment and Natural Resources (DENR) and local government units (LGUs) to prioritize urgently the formal designation of Mt. Busa KBA as a Protected Area, securing the necessary legal framework to safeguard biodiversity, ensure the continued provision of ecosystem services, and protect a critical part of the Philippines' natural heritage. Failure to ***act now*** risks not only the extinction of irreplaceable species but also the collapse of ecosystem functions that safeguard the lives and livelihoods of present and future generations.

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