



Metric 14.5

Saint Louis University

Maintaining a Local Ecosystem



14 LIFE
BELOW WATER





Indicator 14.5.5

Saint Louis University

Watershed Management Strategy



14 LIFE
BELOW WATER



SLU Architecture Students Lauded for Stormwater Park Design

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Saint Louis University (SLU) implemented a watershed management strategy by conducting comprehensive assessments of aquatic biodiversity to establish location-specific baselines for ecosystem health. By identifying and cataloging the diversity of aquatic species present in specific zones of the watershed, the university utilized these organisms as biological indicators to determine water quality levels and ecological stress points. This data-driven approach allowed SLU to tailor their conservation initiatives—such as community-based river cleanups and habitat restoration projects—to address the unique biological requirements and pollution challenges of different river sections, ensuring that management strategies were directly responsive to the living conditions of the local aquatic life.



SLU Participatory Approach for Riparian and Aquatic Biodiversity Assessment

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Saint Louis University (SLU) implemented a watershed management strategy in the Lower Agno Watershed Forest Reserve by adopting a participatory approach that engaged local stakeholders, including government units and indigenous communities, to conduct comprehensive biodiversity assessments tailored to specific locations like the Bued and Balog rivers. This strategy focused on generating scientific data based on the location-specific diversity of aquatic and riparian species—such as identifying distinct dominant vegetation families (e.g., Fabaceae in Bued River versus Lamiaceae in Balog River) and monitoring seasonal variations in phytoplankton, zooplankton, and macrobenthos abundance. By analyzing these biological indicators alongside physicochemical parameters across established sampling stations, SLU established a baseline for monitoring ecosystem health, thereby facilitating the creation of sustainable and resilient management plans grounded in the specific ecological realities of each river system.



Participatory approach for riparian and aquatic biodiversity assessment and monitoring: A case in Tuba, Benguet, Philippines

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ABSTRACT

Riparian and aquatic ecology within the mountainous portion of the Lower Agno Watershed Forest Reserve (LAWFR) were investigated to generate scientific data for a sustainable and resilient ecosystems in Tuba, Benguet, Philippines. Participatory approach was implemented with the collaborative support Department of Environment Natural Resources, local government units, private companies and local communities including indigenous peoples. The overall riparian plants identified were 69 species, 24 families of angiosperms, 1 gymnosperm, and 6 pteridophyte groups. Nine were reportedly known as invasive, indicating level of disturbance along rivers. Aquatic life forms in all five rivers comprised of 28 phytoplankton genera under 4 phyla (Bacillariophyta, Charophyta, Chlorophyta, and Cyanophyta), where Chlorophyta was found frequently occurring and highly dense. Zooplankton consisted of 12 taxa, with one new species listed onsite as *Brachionous angulifrons*. Seventeen periphyton taxa under 4 phyla (Bacillariophyta, Chlorophyta, Cyanophyta, and Xanthophyta) were recorded. Twenty-one macrobenthos species under 12 major taxa were identified. Higher number of phytoplankton species was generally found during dry season, while zooplankton was less abundant during dry season. Balog River was the only one with periphyton species across sites and sampling periods. Macrobenthos Ephemeroptera-Plecoptera-Trichoptera index was used to determine health status of the environment.

Keywords: Riparian, Aquatic, Endemic, Participatory, Lower Agno Watershed Forest Reserve, Benguet, Philippines

METHODOLOGY

The LAWFR area is around 393.04 km² covering portions of Pangasinan and Benguet. The sampling sites for the ecological study are found in barangays Ampucao and Camp 3 within the municipalities of Itogon and Tuba, Benguet, respectively. The sampling stations for the aquatic and riparian action researches were pinned in yellow (Figure 1).

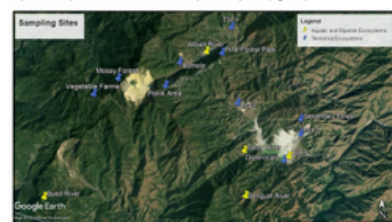


Figure 1. Riparian and aquatic sampling stations in Lower Agno Watershed Forest Reserve, Philippines

Participatory Biological Assessment and Monitoring

- For riparian vegetation: 50m transect were laid parallel to the river and streams.
- Species were identified in the field base on visual characteristics.
- Photographs & samples for herbarium were obtained.
- Phytoplankton and zooplankton were collected in runs & riffles using a plankton net with 25 microns mesh size and preserved using 70% ethanol.
- A triangular kick net was used to sample macrobenthic invertebrates in riffles or shallow portions of the fast-flowing streams.
- Representatives from the government, private company, schools, local community and indigenous people were trained during sampling collection.
- Density, diversity of species and EPT index were calculated.



Figure 2. Methodology and documentation during field sampling and bioassessments in LAWFR, Philippines

Plecoptera (P) and Trichoptera (T). EPT index indicated that Balog Creek, Benguet Creek and Bued River were moderately healthy while Alban Creek and TSF 3 had poor ecosystem health. The results are useful for prioritizing conservation and rehabilitation strategies.



Figure 3. Species of almost conservation concern recorded in LAWFR Philippines. ENDEMIC: (A) *Schefflera insularum*; (B) *Pogostemon velutius*; and (E) *Ficus pseudopalma*. NEAR THREATENED: (C) *Boerhaavia heterophylla*. VULNERABLE: (D) *Boerhaavia mutiflora*.



Figure 4. Phytoplankton, zooplankton and macrobenthic invertebrate taxa in LAWFR, Philippines

WAY FORWARD AND ACKNOWLEDGMENT

Biodiversity monitoring and capacity development of stakeholders should be prioritized to ensure conservation and sustainability. Partnerships formed during the project implementation can be strengthened by continuous updating and coordination. We would like to acknowledge the following: Phila Mining Corporation, Department of Environment and Natural Resources – Cordillera Administrative Region, Local Government Units of Barangays Ampucao, Itogon and Camp 3, Tuba, Benguet and the local communities.