

# Project Brief

Saving Critically Endangered Freshwater Snail *Tylomelania zeamais*  
in the Ancient Lake of Matano

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## Overview

Lake Matano is listed among ancient lakes of the world, with a depth of nearly 600 m. It is inhabited by numerous endemic biota that are evolutionary distinct but globally endangered. Among these endemics, mostly listed as critically endangered, is *Tylomelania zeamais* which has been reported to be potentially extinct in its range under IUCN Red List, following survey in 2017 and 2018 that failed to observe this species at sites where it was abundantly found two decades ago (IUCN, 2018; von Rintelen et al., 2007). Therefore, the project's goal was to conduct a survey to rediscover the existence of the species and map its distribution as well as to assess the habitat condition.

Through this project, my team and I have successfully surveyed all shallow parts of the lake, which allowed us to **rediscover** its existence and map the population distribution in the lake. Out of **32 stations** suggested by the project advisor, Dr. Thomas von Rintelen, to survey, only in **20 stations** *T. zeamais* can be observed. Major threats including thick algal bloom covering the rocks' surface and invasive alien species have been documented and been linked closely to the decline of *Tylomelania*. Educational campaign were also carried at **two elementary schools** in villages around the lake. Additionally, the team attempted to breed the snails and eventually succeeded in breeding them ex situ before releasing them back into the lake.

To sum up, apart from successfully confirming the existence of *T. zeamais*, major actions are undoubtedly required to solve the issue of habitat deterioration and invasive alien species in Lake Matano, which will ensure the survival of endemics for years to come.

## MBZ Fund Impact

**164 km<sup>2</sup>**

of total lake area covered

**32**

stations surveyed

**20**

stations monitored

**103**

pupils involved  
in campaign

**1**

**Youth-led Organisation**

officially established by the support of this grant





Photo panel 1

## Species Rediscovery.

Before carrying out the survey, 32 localities have been pre-determined following suggestion of the project advisor who has comprehensively sampled the lake. Out of the 32 localities, the team successfully observed and rediscovered the target species (photo panel 1. a) in **20 localities** (Fig. 1). In each locality, we randomly placed 1 x 1 m plot to count the number of snails and then repeated 3 times (photo panel 1. b). Number of individuals in each locality can be seen on the map (Fig. 1). These localities serve as benchmark for future monitoring to see changes in population over time. In addition to counting number of individuals, water quality such as Ph, conductivity, temperature and TDS were also measured.

Regardless the success of encountering the target species, it is important to note that the snail is restricted to a very narrow place at shallow water where the rock surfaces are still clean and not covered by thick algae layer (photo panel 1. c). Sometimes, they exist in a small pool which is encircled by plant roots.

Apart from algal blooming that can completely cover the rock surface and reduce suitable habitat, invasive alien species (photo panel 1.d) remains the major threat to the snail and overall endemic biodiversity of the lake. During the survey we can clearly see how the cichlid attacked the small juvenile of snails. Through the observation, it is also very visible that mostly "old" snail with degraded shell occurred, and not many juveniles are around, implying no recent recruitment.

Following the population and habitat survey, it is crucial to take a concrete action to address these issues to save the endemic snail from extinction.

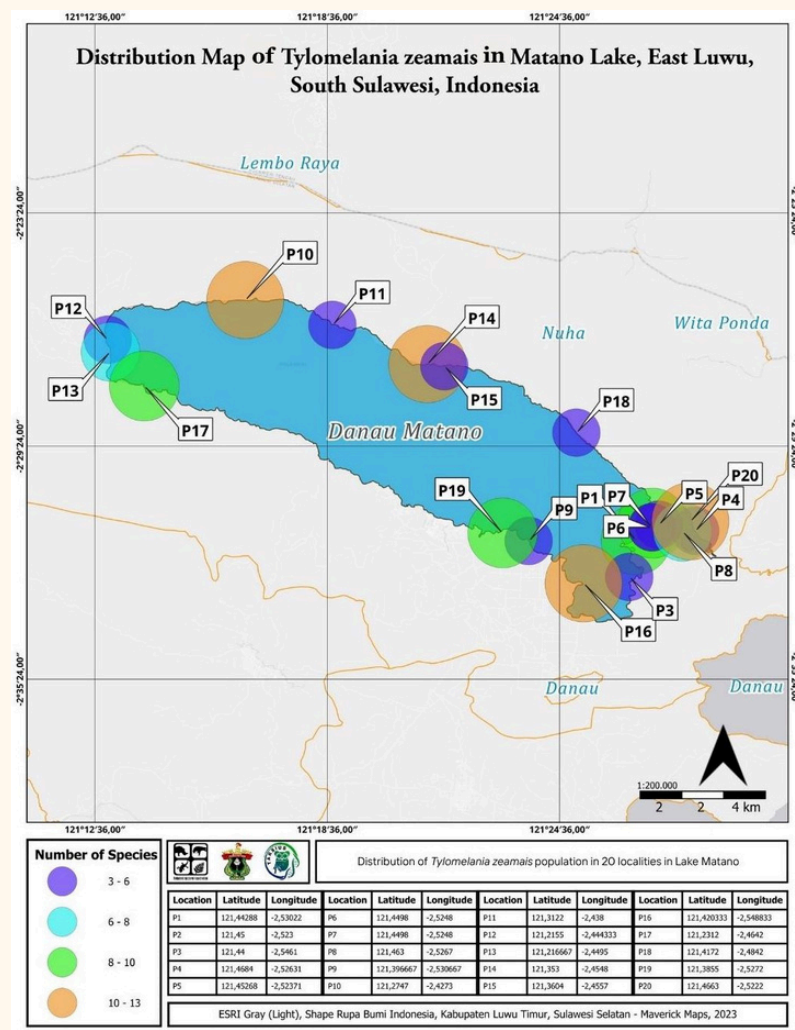


Figure 1. Map of population distribution *Tylomelania zeamais* in Lake Matano





## Protecting through storytelling

Within this project, an educational campaign was carried out to foster a sense of responsibility and to build a foundational understanding of the importance of protecting biodiversity. Two elementary schools in two different villages around the lake were visited. An interactive comic reflecting the current condition of Tylomelania was created, and the team conducted a storytelling session to deliver the message contained in the comic. Over 100 pupils participated enthusiastically, engaging with the fascinating story of the snail. This effort may not directly improve the deteriorating condition of the population and its habitat, it is however expected to inspire the pupils to develop personal awareness and a sense of stewardship toward unique endemic biodiversity of Lake Matano.

This activity is planned as an initial step in raising awareness about biodiversity conservation. My team and I at TARSIOUS has planned to develop an environmental curriculum for students and incorporate it into the local curriculum.





## Looking Ahead

The project has not only supported the implementation of planned activities but has also facilitated the establishment of a youth-led organisation called *Tapak Diversitas Hayati Nusantara* (TARSIUS). With this team, we have committed to take actions beyond this project to collaboratively save endemics of Sulawesi, particularly in Malili Lake System, through biodiversity conservation. Hence, there are some follow up activities that we expect to see in the near future.

- **Incorporate environmental curriculum at school**, after triggering pupils to care more about their environment, one that is important is the continuity of this kind of exposure. Therefore, we plan to incorporate the biodiversity conservation into school curriculum, which will allow a prolonged program to cultivate “love for nature” from early age.
- **Continuous population monitoring**, following a baseline data, series of monitoring are essential to see the change of population and habitat condition over time.
- **Eradication of invasive alien species** (on-going) has been one of concrete actions to reduce the intensity of threats faced by endemic biota in Lake Matano. Funded by another donor, TARSIUS is now leading an eradication program in the lake by combining science and community based action to give pressure on invasive species population while hoping that the endemics will recover.