Final Report

A survey on freshwater turtles in Mangochi District, Malawi, with a focus on *Cycloderma frenatum* and *Pelomedusa subrufa*.

This project aimed to collect baseline data for freshwater turtles in Mangochi district, particularly assessing the occurrence, abundance, habitat use, and threats of freshwater turtles (TFTs), mainly focusing on *Cycloderma frenatum* and *Pelomedusa subrufa*. Data was mainly collected through surveys and community science. We also held several community awareness programs to raise awareness of the importance of turtles and tortoises to promote their conservation.

This is the outline of how the project outcomes:

a. Community sensitisation

We conducted community sensitisation meetings to acquire permission from local authorities, introduce the project and mobilise key informants. These meetings were done through Beach Village Committees (BVCs), which are a group of community members volunteering in managing and protecting fish resources. We visited 27 BVCs along the shores of Lake Malawi, Shire River and Lake Malombe (Fig 1).

Posters were distributed in these communities to inform them about our project and encouraged reporting of turtle sightings. Through these efforts, we built a network of key informants including local chiefs, fishermen, farmers and BVC members who we are engaging in reporting turtle sightings and providing ecological data.

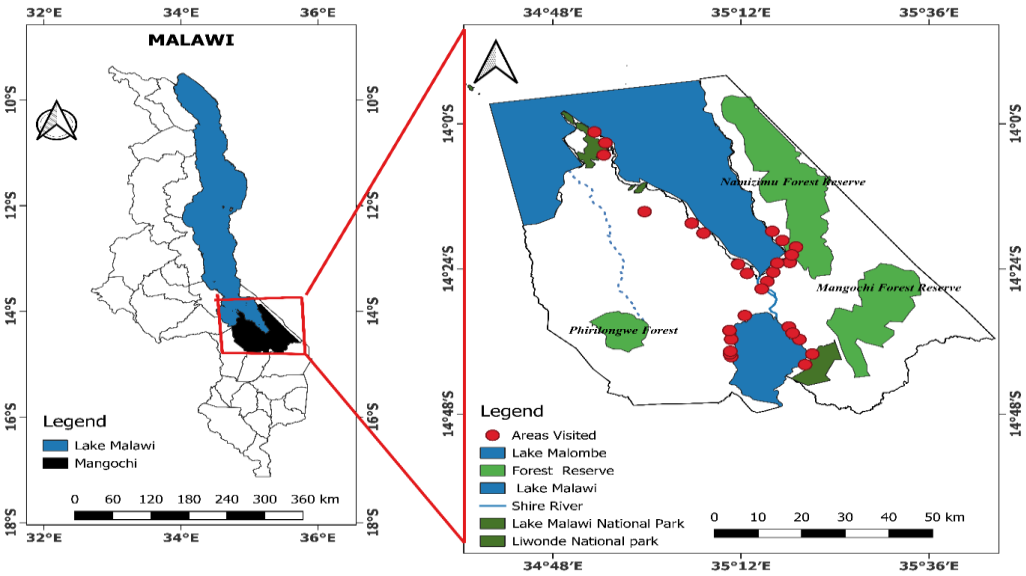


Figure 1: map showing the areas visited during community sensitization

b. Survey on the Zambezi Flapshell Turtle

We conducted an interview-based survey to gather local ecological knowledge about *Cycloderma frenatum*. A questionnaire was developed to collect data on species occurrence, abundance, habitat use, and threats. We interviewed a total of 163 respondents from 18 villages along the shore of Lake Malawi, Shire River and Lake Malombe.

Occurrence and abundance

Cycloderma frenatum was most frequently observed in Lake Malawi (76 sightings) and Lake Malombe (83), with few sightings in the Shire River (6) and Lake Chiuta (1) in Zomba district. Most respondents encountered turtles rarely (110, 67.7%), while occasional (31, 18.9%), frequent (13, 7.9%), or very frequent (7, 4.3%) sightings were less common. Based on this, the *Cycloderma frenatum* is mainly encountered rarely, suggesting relatively low local densities. This aligns with global trends in freshwater turtles, which have experienced severe population declines over recent decades due to overexploitation and habitat degradation. Fishermen (51.2%) reported population declines by fishermen support the view that local populations may be under pressure (fig 2). Accidental capture during fishing, reported by 91% of fishermen, represents an additional source of mortality that may exacerbate population declines, consistent with findings for other freshwater turtles in Africa.

Turtle Use

According to our respondents, turtle use is widespread but generally limited in scale: Consumption, trade, use as fishing bait, and medicinal applications were all reported (fig 4). However, exploitation was predominantly low in scale (63.4%), with moderate or large-scale use being rare. Acquisition most occurred through incidental by-catch or purchase from fishermen, indicating that human turtle interactions are largely opportunistic rather than deliberately targeted. These patterns are consistent with observations from other African freshwater turtle populations, where traditional and subsistence use persists but remains localized and is often regulated by cultural norms as also happens with tortoises and marine turtles as well. Nevertheless, opportunistic exploitations can rapidly transition into targeted harvesting when socioeconomic conditions change.

The practices persist mainly in areas with a significant presence of resettled tribes, such as the Lomwe and other groups (fig 5). By contrast, it has markedly declined or disappeared in communities that continue to be predominantly inhabited by the Yao. Where occasional use does occur, it is often practiced discreetly, suggesting the influence of cultural or social restrictions. DNPW operation of confiscating the 2013 illegal butchery helped to inform communities that *C. frenatum* is protected and trading is illegal hence also influenced in reducing the trends in some areas.

Perceived threats

Respondents identified a range of threats to *C. frenatum*, with anthropogenic factors such as persecution and consumption being the most frequently reported. By-catch and predation by Nile crocodiles (Crocodylus niloticus) were also mentioned, highlighting

interactions with other species and incidental capture as relevant concerns. Predation on turtles by Nile crocodiles is well documented especially with regard to juveniles.

Conservation implications

Overall, these findings have important conservation implications. First, the predominance of rare sightings and reported declines suggests that local populations may be vulnerable and require continued monitoring. Second, the use of traditional ecological knowledge (TEK) proved effective for collecting baseline information on this rare and cryptic species, supporting its integration into future surveys and conservation planning. Third, although current exploitation appears limited in scale, targeted education and awareness campaigns could further reduce anthropogenic pressures, particularly persecution and consumption, while promoting sustainable coexistence.

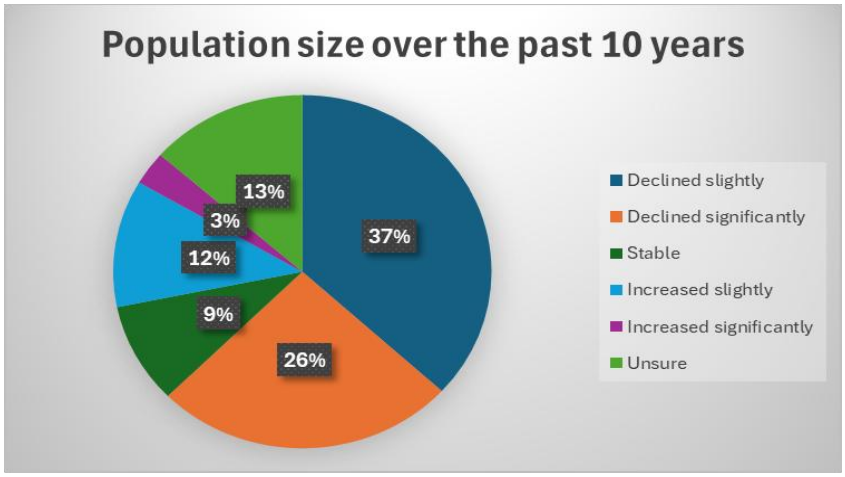


Figure 2: Perceived population status by fishermen

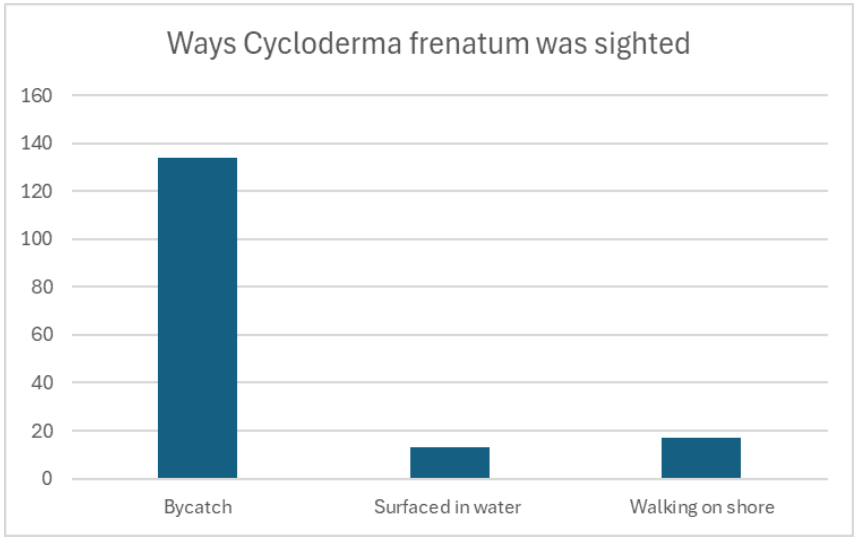


Figure 3: Ways Cycloderma frenatum is sighted by the community

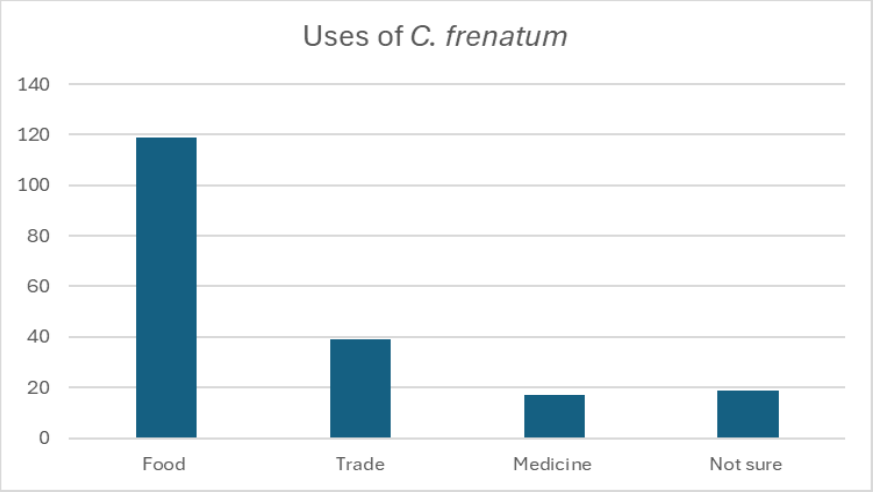


Figure 4: Use of C. frenatum among communities

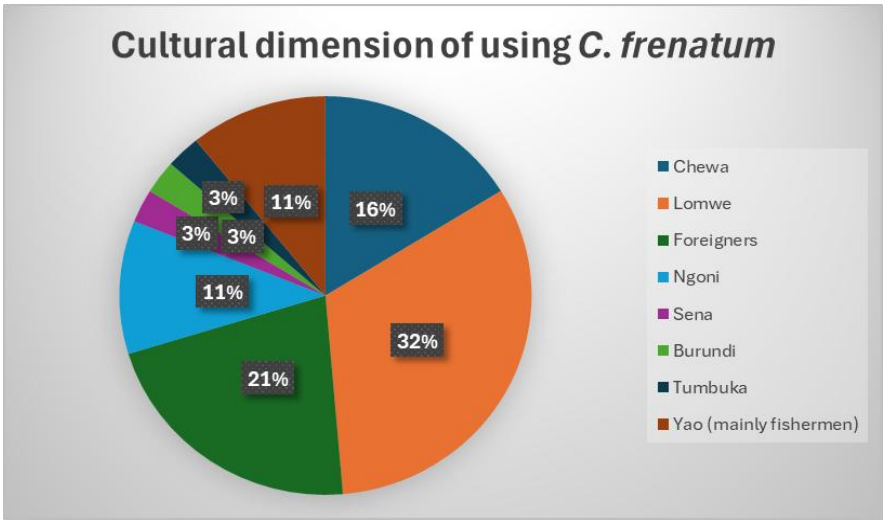


Figure 5: Cultural dimension to the use of C. frenatum

c. Turtle sighting results

We have been recording and tracking turtle sighting around the district through community science by engaging with BVCs, National Park officers, fishermen and local community members. This research was focusing on *Cycloderma frenatum* and *Pelomedusa subfra* but through community science we have able to identify other tortoise and freshwater turtle species namely: *Kinixys belliana, Stigmochelys pardalis, Pelusios sinuatus and Pelusios castanoides*. During the survey period, we were unable to find *P. subfra*. We received a total of 45 sightings from ten sites in the district. Most of sightings were through bycatch, we encouraged our key informants to safely release the turtles back in water. A video was recorded and sent to us as proof of safe release.

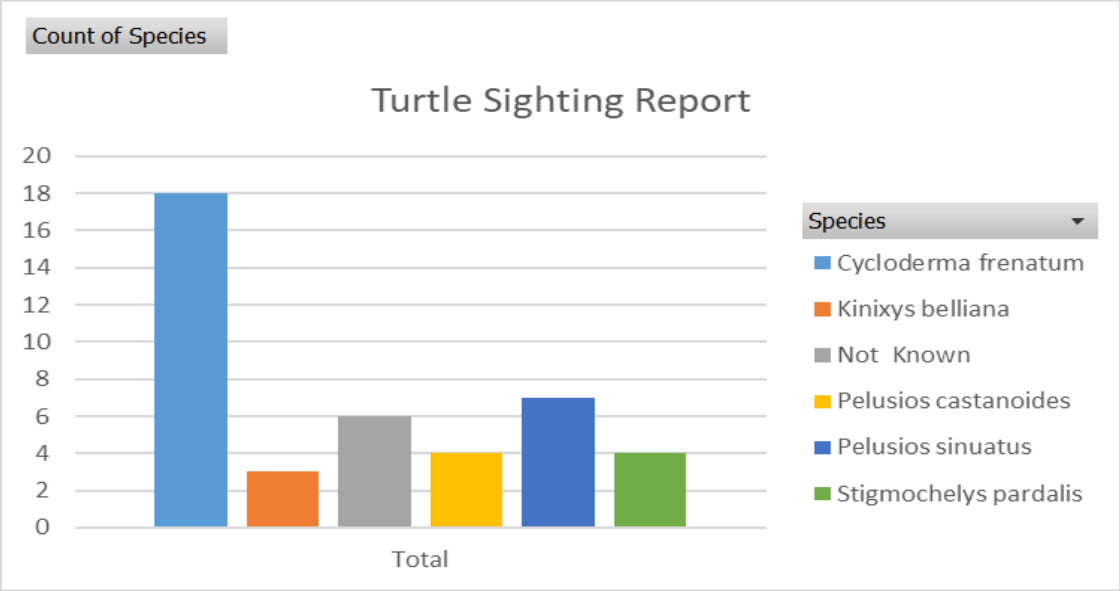


Figure 6: The total number of sightings recorded

d. Community awareness

As a part of community awareness, we conducted wildlife talks on the basics and importance of turtles to eight school wildlife clubs in areas with high sighting of the Zambezi flap shell turtle.



Figure 7: Students drawing a turtle

e. Project exit meeting

We had a wrap-up meeting with all the stakeholders involved in the project to report the final outcomes. Main stakeholders involved were ten BVCs, the Lake Malawi National Park (LMNP) research team and local chiefs. We encouraged the stakeholders to continue promoting the safe release of turtles during bycatch and sending reports of new turtle sightings.



Figure 8: Stakeholders involved in the project exit meeting



Figure 9: Cycloderma frenatum



Figure 10: Pelusios sinuatus



Figure 11: Pelusios castanoides



Figure 12: Stigmochelys pardalis



Figure 13: Kinixys belliana

Participants:

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4. Sellina Dyeratu