

LiA reflection – Marine Conservation on Pom Pom Island

My primary objective on Pom Pom Island, Malaysia, was to work with the Tropical Research and Conservation Centre (TRACC) to help restore the marine ecosystem, which has been severely damaged by unsustainable fishing practices. The island is situated within the Coral Triangle, a global centre for marine biodiversity. It also serves as a nesting ground for endangered Green and critically endangered Hawksbill turtles. These factors underscore the critical importance of conservation efforts on the island to prevent irreparable damage to its fragile ecosystem. Recognising that corals grow a maximum of 15 cm per year, I understood that my impact would be a contribution to a long-term, cumulative conservation effort that will hopefully yield a flourishing marine ecosystem in the coming decades.

This project directly targets UN Sustainable Development Goal 14, Life Below Water. While TRACC's advocacy for sustainability also supports SDG 13 (Climate Action) and SDG 12 (Responsible Consumption and Production), I did not engage with these directly and will not claim to have contributed to them during my time there. This essay will explore the leadership themes within the community, my development of cultural humility, and the enhancement of my teamwork and perseverance as leadership skills.



The Socio-Political Context and Empathetic Leadership

One of the most significant threats to the island's ecosystem has been fish bombing. This practice has destroyed vast areas of coral, leaving behind a deep layer of coral rubble that makes it nearly impossible for new coral polyps to settle. Fish bombing in the region is predominantly practised by the nomadic Bajau people, but this method is a symptom of their struggle for survival. Traditional fishing methods may not yield sufficient catch to support their families; a single blast can yield up to 45 kg of fish, whereas a hook and line averages only 1.88 kg per hour. For a family of seven, this becomes an understandable, albeit destructive, choice.



Blast fishing aftermath, leaving a bed of coral rubble

The issue is compounded by their statelessness. During the post-colonial transition, the Bajau were not granted citizenship by Malaysia, the Philippines, or Indonesia, leaving them as a stateless people in the Celebes Sea. Consequently, they have no legal entitlement to healthcare, education, or housing and are often marginalised by the law. This presents a profound leadership challenge for the government of Semporna, the nearest town, where the growing Bajau settlement now constitutes a demographic majority. The local government struggles to address this reality while juggling resources allocated only for its citizens. A walk-through Semporna reveals this stark disparity, with high-end dive shops and tourist restaurants standing in sharp contrast to the homeless and child beggars.



Bajau people

This socio-political instability has direct environmental consequences, such as ineffective waste management, with much of the refuse being discarded into the sea and eventually washing up on Pom Pom's shores. Faced with this reality, I felt a sense of powerlessness; my small charitable act of giving noodles to two child beggars was merely addressing a symptom of a much larger political crisis. In a way, resolving the statelessness of the Bajau could be the most effective form of conservation for Pom Pom. It would not only reduce pollution but also provide the Bajau with access to education, carving a path towards professional careers beyond fishing.

This also comes with the crude assumption, potentially stemming from my western background, that the Bajau having lived as they do for centuries, would even want to integrate into modern society – it wouldn't be too far to think many prefer to keep with tradition and live and die as fisherman on the sea. This pondering allowed me to develop my empathetic leadership skills, where instead of directly blaming the Bajau for the destruction of coral ecosystem around the island, I could have the compassion to think past this and identify the unideal socio-political situation to be the root cause. This stood in contrast to some volunteers who would make comments like, "Do they not realise what they're doing to the ecosystem!". My empathy for the people was reinforced when I befriended one of the Bajau staff on the island, of the same age as me (21), and I realised he had only recently been given the opportunity to learn to read and write at a

vocational school in Semporna he visited monthly. For many locals, working at TRACC presented the opportunity to rise above the day-to-day struggle for survival and be comfortable, providing themselves with a better future.

Developing Technical and Practical Leadership Skills

Beyond this social context, I focused on improving conservation practices on the island, specifically turtle biometric re-identification. The existing method involved manually annotating turtle facial scutes and sifting through hundreds of potential matches in a software program. Staff could spend an entire working day processing just 40 turtles—a highly inefficient method for a database containing thousands of entries and a backlog to 2023. As a Laidlaw Scholar and an engineering student, I felt compelled to contribute more than just my efforts on work dives. I therefore initiated a project to develop an accurate, automated matching software using AI.

However, the dilemma I encountered was that I had minimal exposure to AI, having only taken an introductory course, as well as only possessing at most intermediate programming skills. After conducting some research, I found a paper providing an open-source general animal reidentification toolset alongside a pre-trained AI model. Combining these tools, and a publicly available green turtle facial dataset, I was able to achieve a 97% match accuracy. I presented to the TRACC team, and helped push towards the adoption of this newer, faster technique – I was glad to hear afterwards that a former volunteer and software engineer would be hired to complete implementation. With this challenge, I was able to develop my perseverance and problem-solving leadership skills, pushing through a mental barrier of self-doubt to provide the ‘TRACCoons’ with some valuable insight. This self-doubt was particularly strong on days when code wouldn't work, but my commitment to the task saw it through to completion.

Result for Query 87 - CORRECT
(Score: 0.823)

Query Image
True ID: t163



Best Match
Predicted ID: t163



AI model outputting a correct match

Teamwork and communication were vital during conservation dives. For instance, during coral planting, divers work in pairs to fragment and glue coral onto artificial reef structures. One diver would fragment and place the coral, while the other applied glue and cleared algae. A well-defined workflow was essential for efficiency, especially under the time pressure of a depleting air tank. Strong currents and venomous animals added further layers of difficulty. This required clear communication on the surface to develop a strategy with my buddy, followed by concise underwater sign language to execute our plan efficiently. Observing the divemaster also offered valuable leadership lessons, from making critical decisions about currents to coordinating the group and ensuring every diver's safety and air supply.

My rescue diver course was a true test of grit and focus. The two-day course was gruelling, with the most challenging part being the final rescue scenario. I had to simulate rescue breaths on an unconscious, non-breathing diver every five seconds while towing them 50 metres to shore, sometimes against a current. Simultaneously, I had to remove my equipment and the victims at five-second intervals to be ready for CPR on the beach, all against the clock. Repeating this exercise pushed me to my physical and mental limits. It was also a humbling experience to see another trainee, a woman significantly smaller than me, complete the task with much more swiftness and grace than I could ever hope for.

Cultural Humility and Personal Growth

My time in Malaysia, a predominantly Muslim country, was an important lesson in cultural humility. The conservative customs regarding clothing and behaviour sometimes clashed with the Western norms of volunteers. For example, female volunteers had previously been approached by armed local police for wearing crop tops and asked to dress more conservatively. Considering most local Sabahan women wear hijabs, it became clear why crop tops could be seen as inappropriate. This experience prompted me to reassess my own cultural norms. I realised it would be hypocritical to claim that Western culture unconditionally allows "women to wear what they please" when, for example, a woman exposing her torso in public in England would be arrested. It challenged my perspective on what defines modesty, for who is to deem what is 'naked' or 'not naked'?

I also had to challenge my preconceived notions about the local TRACC workers. Initially, it seemed counter-productive that local staff at a conservation centre would engage in fishing. This view, however, was ignorant. They used traditional hook-and-line methods, and as descendants of a people with a deep fishing heritage, it was a natural pastime. It became apparent that many were working at TRACC not out of a specific

passion for conservation, but because it offered a stable livelihood and the potential for professional diving qualifications—a path to a life beyond subsistence fishing.

Conclusion

During my time at TRACC, I developed my empathetic leadership skills, learning to look past the surface-level problem of fish bombing to understand the deeper socio-political inequalities driving it. I hope to apply this empathy in the future, treating others with fairness and seeking a full understanding of situations before drawing conclusions. This empathy is closely tied to cultural humility and the ability to look past cultural differences to build genuine connections.

I also strengthened my perseverance and problem-solving abilities, pushing through the technical hurdles of my AI project and the physical demands of the rescue course to achieve my goals. This is a leadership skill that is universally applicable to future challenges. Finally, completing approximately 50 work dives significantly enhanced my teamwork and collaboration skills, which will be invaluable in my future engineering projects. Overall, volunteering at TRACC was a deeply fulfilling and formative experience that I would recommend to anyone, especially those with expertise to share in the underfunded world of conservation.

Acknowledgments

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