**STATEMENT OF GRANT PURPOSE**

**Sophie Wulfing, Indonesia, Biology**

**The effects of mangrove restoration on marine biodiversity Tanakeke Island, Indonesia**

Mangroves provide a key serviceto the surrounding environment such as flood and tsunami protection, carbon sequestration, and foster biodiversity in their habitats. They are also essential to fisheries as they act as a refuge for many species of juvenile fish due to abundance of feeding resources and reduced predation. About 55% of total fish catch biomass in Indonesia is made up of species dependent on mangrove habitats.However, coastal communities across the globe are experiencing mangrove degradation due to anthropogenic activity at an alarming rate. To address this issue, the Indonesian government has committed to restoring 600,000 hectares of mangroves in the country by 2024, the most ambitious mangrove rehabilitation program in the world. Since these efforts began in 2020, communities the areas targeted have seen not only the economic benefits of flood prevention and ecotourism, but also increased fish catch. However, very little research has been done to assess the improvements in marine biodiversity of species that have benefitted from this restoration project. In this study, I propose to work on Tanakeke Island in the Takalar Regency, South Sulawesi. There, mangrove restoration has been continuously occurring since 2015 and has been organized and conducted by the local community.I aim to understand how mangrove restoration is affecting the local marine biodiversity, namely rabbitfishes, emperor breams, snappers, jack fish, and barracudas, all of which are commercially fished species that have experienced stock declines in recent years. I will conduct this work with Dr. Rohani Ambo-Rappe from the Universitas Hasanuddin in Makassar. I will deciminate this research in the form of peer-reviewed scientific articles as well as to local communities to help them make informed decisions about the benefits of mangrove restoration both ecologically and economically.

I plan to conduct my research in Tanakeke Island, where the community, particularly women, have been restoring their coastline and changing community dialogues around the value of mangroves. As a result, there have been reports of higher fish yield. However, no study has been conducted in this region on the effect role of mangrove restoration on this increased catch. I will collect data through Baited Remote Underwater Videos (BRUVs), a non-invasive, cheap camera contraption. I will deploy these BRUVs in this site and analyze these videos to assess what species are living in the area, create a local food web of the species, and assess the biodiversity of the area. Then, with the help of Dr. Ambo-Rappe, I will share my findings with the local community, both conservationists and fishers alike, to help inform how effective this mangrove conservation is and commercially fished stocks are benefitting from these restoration efforts.

My timeline for the project

* September – November 2023: Focus on Bahasa Indonesia language learning in Java (this part is contingent upon me receiving the CLEA award).
* December 2023 – May 2024: Data collection in Tanakeke Island. This will involve moving to South Sulawesi and beginning to work with local people in the area.
* June 2024: Data analysis, model food web creation and biodiversity assessment.
* July – August 2024: I will present results to Dr. Ambo Rappe, write up our findings, and begin developing conclusions on the benefits of mangrove restoration to present to stakeholders.

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Dr. Rohani Ambo-Rappe is a seagrass ecologist that has worked extensively in the areas surrounding South Sulawesi with both fisheries researchers and the local community in the region. She can provide expertise in the area, connect me with local fish venders, and provide key advice for conducting science in tropical marine areas. I will also be applying for the Critical Language Enhancement Award (CLEA), which will be a key component of my communication skills with local stakeholders.

Dr. Ambo-Rappe has also helped me identify ways I can help support the local community. In order to engage with the students at Makassar, I plan on teaching workshops in the statistical programming language R, a common analysis tool in ecology. I have run similar workshops during my master’s program and am familiar with the challenges new students face when learning to code. I would gain so much from a Fulbright Grant in Indonesia, and I hope to use this course to foster a mutual exchange of experience and knowledge.

I have conducted fisheries research both in the field and through data analysis. In 2017, I interned for the National Oceanic and Atmospheric Administration where I aided in a research project updating population models of Pacific fishes. Further, I participated in their bottom trawl survey, learning how to identify species in the Eastern Pacific and how fisheries are managed and regulated. I am familiar with coastal restoration research through my time at Louisiana Universities Marine Consortium, where I worked in a lab studying coastal erosion in Louisiana’s marshland. Currently, I am getting my master’s degree at UNH’s Quantitative Marine Ecology lab where I study mathematical applications in biology. My thesis is in studying small-scale fisheries in Madagascar and I hope to continue this line of research during my Fulbright year.

Further, in order to understand small-scale fisheries, having an understanding of their culture is key which is why I will also be applying for the CLEA in order to be able to communicate effectively with my peers and colleagues. Before leaving for the country, I also plan on mastering the basics of Bahasa Indonesia through independent study using resources such as Duolingo. On top of that, I am already pursuing a formal Bahasa Indonesia course through the language course website Babel. Further, I have connected with members of a local group called Indonesia Community Connect that focuses on connecting Indonesian culture with the region and promotes Indonesian heritage in New Hampshire. Through this, and an online exchange program, I will meet weekly with a native speaker willing for a language exchange…

After my master’s degree, I plan to apply for jobs at an NGO or government agency to better understand and quantify the status of our world’s small-scale fisheries. This project will aid me in that goal as it will help me gain a better understanding of how diverse subsistence fishing can be and how to incorporate ecological needs with the culture of the people fishing it. Despite the growing threats ocean environments face, Indonesia is still home to precious marine resources that require better understanding in order to protect them.

For linguistic preparation, I would also be sure to highlight that you have picked up languages previously to work in other countries.