14.2.3. Using Evidence to Strengthen Fisheries Protection

Introduction

Protecting marine ecosystems and sustaining fisheries resources require reliable scientific information, effective conservation policies, and the active involvement of communities and institutions responsible for managing coastal waters. In southeastern Mindanao, where many coastal communities depend on fishing for food and livelihood, understanding changes in fish catches, evaluating the effectiveness of marine protected areas (MPAs), and monitoring habitat restoration are essential for informed resource management.

Davao Oriental State University (DOrSU) contributes to these efforts through fisheries research, marine conservation assessments, and partnerships that connect scientific findings with resource-management discussions. During Academic Year 2024–2025, university researchers produced studies examining the catch trends of small-scale fishers and the management effectiveness of marine protected areas. The university also facilitated the presentation of artificial reef monitoring results to the Pujada Bay Protected Landscape and Seascape (PBPLS) Special Protected Area Management Board (PAMB).

Together with earlier research on fisheries regulation in Davao Gulf, these initiatives demonstrate how scientific evidence can inform the protection of aquatic ecosystems. By documenting fishing pressures, identifying management challenges, and communicating ecological observations to decision-makers, DOrSU strengthens the knowledge base for conservation planning and sustainable fisheries management.

Documenting Catch Trends Around Marine Protected Areas

Small-scale fisheries provide food, employment, and income for many coastal communities in Davao Oriental. However, increasing fishing pressure, habitat degradation, illegal fishing, and changing environmental conditions can affect the availability of marine resources. Understanding these pressures requires systematic monitoring of fish catches and fishing activities, particularly in waters surrounding established marine protected areas.

Researchers Reyuof P. Manuel and Edison D. Macusi of DOrSU examined catch trends among small-scale fishers operating near MPAs in Mati, Mabini, San Isidro, and Lupon. Published in Marine and Fishery Sciences in May 2025, their study used participatory catch assessment and actual landed-catch surveys to document fishing activities, catch levels, and catch per unit effort across the study locations.

The researchers reported declining catch trends and differences in recorded catch quantities among the study areas. Reported catch ranges included 2.1–4.0 kg per trip in Mati and San Isidro, 10.1–20.0 kg per trip in Lupon, and 0.1–2.0 kg per trip in Mabini. These findings illustrate the importance of examining local fisheries conditions rather than assuming that fishing grounds experience the same pressures or produce similar yields.

The study emphasized the need for stricter enforcement of established no-fishing zones and accurate, consistent fisheries records. Reliable databases can help managers evaluate fishing pressure, monitor changes in catches, and assess the condition of resources surrounding protected areas. Participatory catch assessment also recognizes the important role of fishers in generating information relevant to resource management.

For DOrSU, this research demonstrates how field-based fisheries assessments can support science-informed conservation discussions. By translating catch observations into published evidence, the university provides local government units, fisheries managers, and coastal communities with

information that can guide monitoring priorities and strengthen the implementation of existing protection measures. Although the documented declines do not establish a single cause, they reinforce the importance of sustained observation, appropriate enforcement, and continued engagement with fishing communities (Manuel & Macusi, 2025).

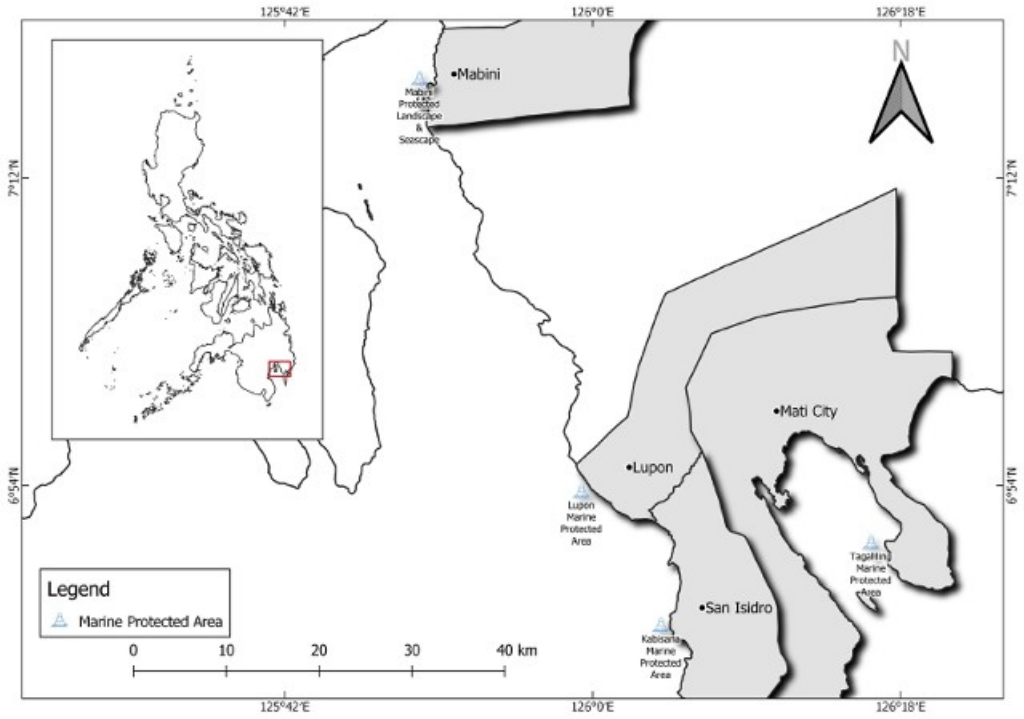


Figure 1. Locations of marine protected areas (blue tagged) in the study site are shown together with the name of the municipality (shaded in grey) in southeastern Philippines in the study "Catch Trends of Small-Scale Fishers Near Marine Protected Areas in Southeastern Philippines," published in Marine and Fishery Sciences, 38(3), 389–403 (2025)".

References

Manuel, R. P., & Macusi, E. D. (2025). Catch trends of small-scale fishers near marine protected areas in southeastern Philippines. Marine and Fishery Sciences, 38(3), 389–403. https://doi.org/10.47193/mafis.3832025010706

Evidence Base for Marine Protected Area Management

Marine protected areas are established to conserve marine biodiversity, safeguard important habitats, and support the long-term sustainability of fisheries resources. However, their effectiveness depends not only on legal designation but also on enforcement, adequate resources, community participation, monitoring, and the capacity of local institutions to implement management plans.

In a 2025 study published in Marine Policy, DOrSU researchers Maria C. Galveia and Edison D. Macusi assessed the management effectiveness of four MPAs in southeastern Mindanao. The assessment covered Mati, Mabini, San Isidro, and Lupon, involving 12 villages. Using the Marine Protected Area Management Effectiveness Assessment Tool (MEAT) and focus group discussions, the researchers examined institutional management conditions alongside the experiences and observations of local fishers.

The findings revealed that all four MPAs achieved excellent overall management scores. Nevertheless, none reached Level 3, the Sustained effectiveness classification. The study identified poor enforcement, limited financial resources, and inadequate training among the major challenges affecting long-term management effectiveness. These results demonstrate why favorable assessment scores should be considered alongside the operational difficulties experienced by protected-area managers and coastal communities.

Importantly, the research integrated community perspectives into the evaluation process. Focus group discussions enabled fishers to communicate management challenges and propose improvements, providing insights that might not be fully reflected in standardized assessment scores. This approach recognizes that effective marine conservation must consider both ecological objectives and the participation of people whose livelihoods depend on coastal resources.

The study provides a scientific basis for reviewing management priorities, identifying institutional needs, and strengthening conservation planning. Its findings can guide discussions on more consistent enforcement, improved financial support, sustained monitoring, and training for local stakeholders.

Through this research, DOrSU contributes to the evaluation of existing conservation arrangements and the development of evidence-informed management recommendations. The study documents strengths and limitations in MPA governance, although the implementation of its recommendations and subsequent ecological improvements require further monitoring and assessment (Galveia & Macusi, 2025).

Municipality	Mabini	Lupon	San Isidro	Mati
MPA	Mabini Protected Landscape and Seascape	Pangubaan Reef and Fish Sanctuary	Kabisanan Marine Protected Area	Tagaliling Marine Protected Area
Overall Score/84 (%)	79.3 94.4	67.3 80.2	69 82.1	72.5 86.3
Effectiveness level	2, Strengthened	1, Established	2, Strengthened	1, Established

Figure 2. Overview of the MEAT results (overall score and effectiveness level) for each MPA studied. On the study "Management Effectiveness of Marine Protected Areas (MPAs) in the Southeastern Mindanao, Philippines," published in Marine Policy, Volume 174, Article 106596 (2025).

References

Galveia, M. C., & Macusi, E. D. (2025). Management effectiveness of marine protected areas (MPAs) in the southeastern Mindanao, Philippines. Marine Policy, 174, Article 106596. https://doi.org/10.1016/j.marpol.2025.106596

Taking Reef Evidence to the People Who Manage the Bay

Marine restoration initiatives become more relevant to conservation planning when ecological observations are communicated directly to the institutions responsible for managing protected ecosystems. In Pujada Bay, DOrSU has supported this connection through its collaboration with rrreefs and other partners involved in artificial clay reef restoration and monitoring.

On July 23, 2025, the PBPLS Special PAMB convened at the DOrSU Boardroom, where rrreefs co-founder Hanna Kuhfuss presented monitoring findings from the artificial clay reef initiative. The presentation provided protected-area managers with information on coral recruitment, fish abundance, and ecological developments observed following the installation of artificial reef structures.

According to the findings reported during the meeting, coral recruitment increased from 13 to 34 recruits per square meter within five months. After approximately one year, an estimated 4,000 coral recruits had colonized the 100-square-meter artificial reef structure. The presentation also reported substantial increases in fish abundance and biomass around the artificial structures. These observations provided encouraging early indications of habitat colonization, while continued monitoring remains necessary to evaluate long-term ecological performance.

Hanna Kuhfuss, co-founder of rrreefs, presents findings and conservation challenges associated with the Pujada Bay artificial reef initiative during the PBPLS Special PAMB meeting on July 23, 2025. Photo credit: DOrSU–Public Information Office.



Figure 3. Hanna Kuhfuss presenting marine conservation findings during the PBPLS Special PAMB meeting at DOrSU.

The meeting also provided a venue to discuss proposed expansion areas for artificial reef restoration, updates on the existing structures, and opportunities for greater community participation. Initial insights from a consultation workshop in Barangay Tamisan were presented, highlighting the importance of incorporating social and community considerations into restoration planning.

Following the discussions, participants visited DOrSU's 3D Clay Bricks Fabrication Facility and the Regional Integrated Coastal Resource Management Center XI (RIC-XI). These visits provided an

opportunity to examine the university's production facilities, technical capabilities, and research support for coastal restoration.

The engagement demonstrated how scientific monitoring can be linked with protected-area governance. By presenting ecological observations to the PAMB, DOrSU and its partners made research findings available for conservation discussions, site evaluation, and future restoration planning.

The initiative also illustrates the importance of sustained partnerships among research institutions, government agencies, conservation organizations, and coastal communities. While the meeting documented encouraging monitoring findings and proposed restoration directions, future deployments and long-term ecological outcomes remain subject to subsequent implementation and assessment (DOrSU PIO, 2025; Oblianda, 2025).

References

Davao Oriental State University, Public Information Office. (2025, July 23). Marine life booms in Pujada Bay after artificial reef installation. Retrieved from https://dorsu.edu.ph/marine-life-booms-in-pujada-bay-after-artificial-reef-installation/

Oblianda, A. S. (2025, July 29). The promise of eco-engineered reefs in coral restorations. Philippine Information Agency. Retrieved from https://pia.gov.ph/features/the-promise-of-eco-engineered-reefs-in-coral-restorations/

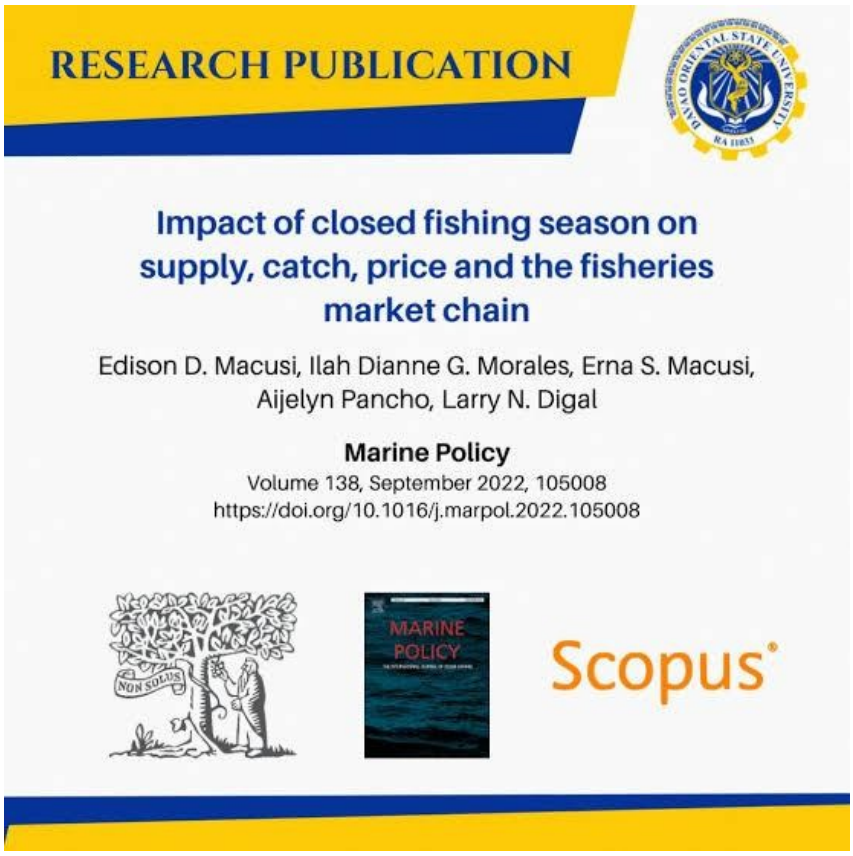
Research Context for Managing Fishing Pressure

The protection of marine resources also requires an understanding of how fisheries regulations affect fish catches, markets, and the livelihoods of people involved in the fishing industry. Measures such as seasonal fishing closures are intended to reduce harvesting pressure and provide opportunities for fish stocks to recover, but their implementation must also consider the economic and social conditions of fishing communities.

Earlier research involving DOrSU researchers examined the effects of the closed fishing season policy in Davao Gulf. Published in Marine Policy in 2022, the study by Edison D. Macusi and colleagues investigated relationships among fish supply, catch volumes, prices, and the fisheries market chain.

The researchers used questionnaires, interviews, and fisheries production data to examine the policy and its implications for market participants. The study reported differences in municipal and commercial fisheries catches following the implementation of the seasonal closure, as well as changes in fish prices. It also documented substantial support for the policy among surveyed fisheries-sector participants, although the findings should not be interpreted as establishing that the policy alone caused all observed changes.

The research recommended retaining the closed fishing season alongside complementary fisheries management measures, including vessel and gear regulation, enforcement, marine sanctuaries, and livelihood support for affected fishers.



Although the study predates Academic Year 2024–2025, it remains relevant as scientific background for interpreting more recent research on catch trends and MPA management in southeastern Mindanao. Together, these studies demonstrate that fisheries protection must address both ecological pressures and the social and economic conditions influencing resource use.

For DOrSU, this body of research provides a broader evidence base for evaluating conservation measures. It reinforces the importance of integrating fisheries monitoring, regulatory enforcement, stakeholder participation, and livelihood considerations into resource-management discussions. The earlier publication supports continuity in the university's research contributions but is not presented as a new closed-season intervention during the reporting period (Macusi et al., 2022).

Figure 4. "Impact of Closed Fishing Season on Supply, Catch, Price and the Fisheries Market Chain," published in Marine Policy, Volume 138, Article 105008 (2022).

References

Macusi, E. D., Morales, I. D. G., Macusi, E. S., Pancho, A., & Digal, L. N. (2022). Impact of closed fishing season on supply, catch, price and the fisheries market chain. Marine Policy, 138, Article 105008. https://doi.org/10.1016/j.marpol.2022.105008

Conclusion

Davao Oriental State University's contribution demonstrate the importance of using scientific research and institutional collaboration to support the protection and sustainable management of fisheries resources. Through participatory catch assessments, evaluations of marine protected area management, and the presentation of reef-monitoring findings to protected-area decision-makers, the university has helped strengthen the evidence available for understanding fisheries pressures and improving conservation planning.

The research on small-scale fisheries highlights the need for reliable catch records and enforcement of protected-area regulations, while the assessment of MPA effectiveness identifies institutional challenges that must be addressed to sustain conservation efforts. Meanwhile, the presentation of artificial reef monitoring results to the PBPLS Special PAMB demonstrates a practical connection between ecological research and protected-area governance.

Together with earlier studies examining fisheries regulations and their socioeconomic implications, these efforts contribute to a more informed and integrated approach to marine resource management. The university's documented contribution lies in generating scientific knowledge, communicating findings to stakeholders, and identifying management priorities rather than demonstrating completed improvements in fish stocks or enforcement outcomes.

By maintaining its commitment to research, monitoring, and cooperation with conservation partners, DOrSU strengthens the foundation for protecting marine habitats, supporting sustainable fisheries, and promoting the long-term resilience of coastal ecosystems and communities.