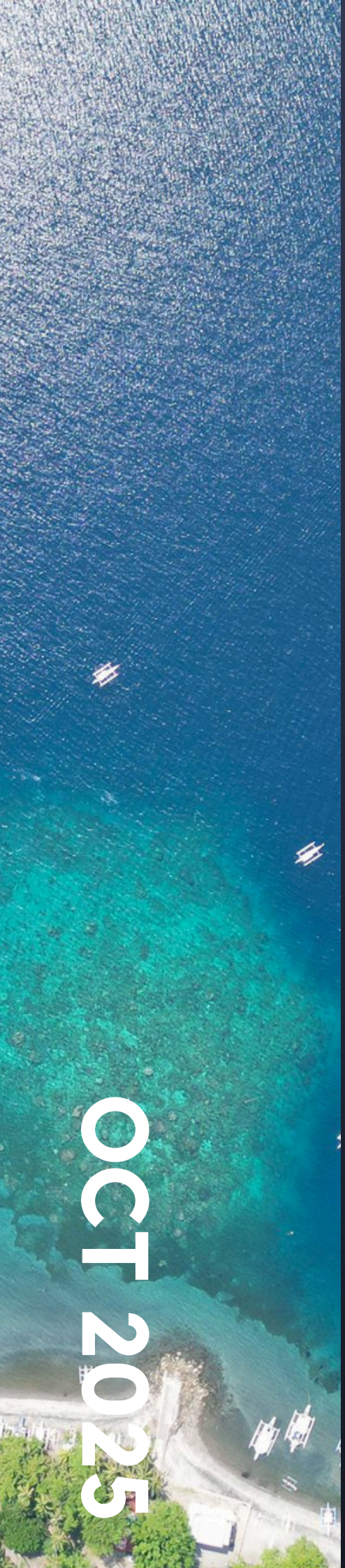


Marine Conservation Philippines

Semiannual Report

Santa Catalina

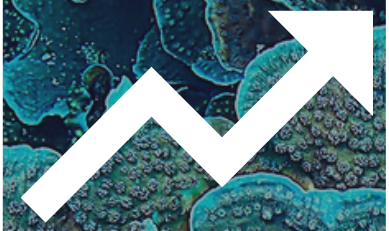
OCT 2025

marineconservationphilippines.org

39

Surveys completed

290% Increase



27.3%

Hard Coral cover

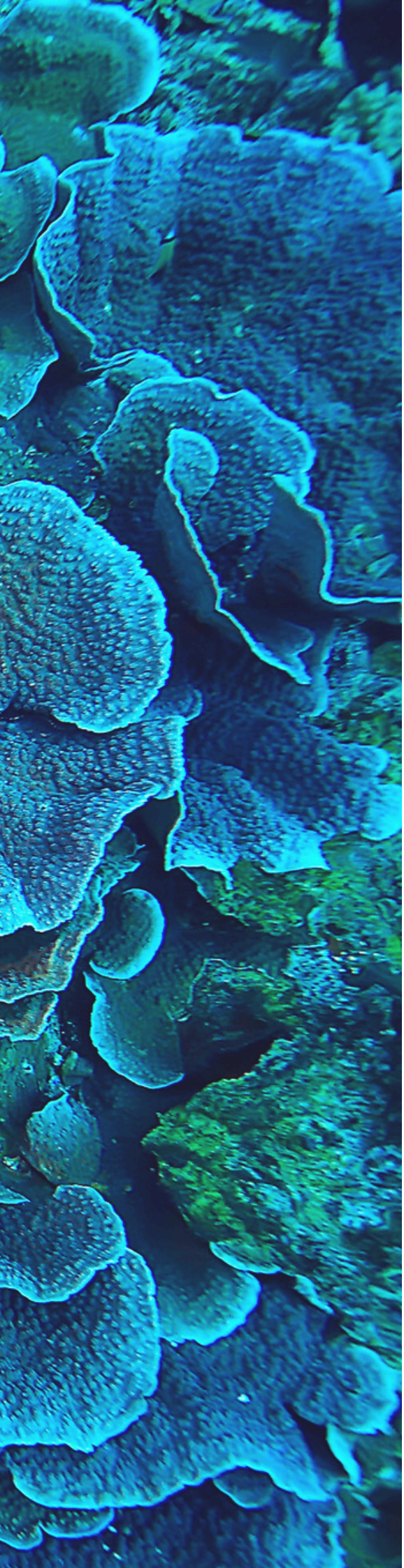
13.3% Decrease

0.59 kg

Commercial Biomass

2.5% Decrease

"Using science to understand how local and global pressures affect marine ecosystems, we empower, engage, and build local and national capacity to reduce and adapt to these pressures, aiming for a sustainable future for the Philippine people and environment."



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Monitoring and Science at MCP

The Philippines, situated in the heart of the Coral Triangle, boasts the highest number of Marine Protected Areas (MPAs) of any country in the world, with approximately 1,600-1,800 protected areas. Some of these, such as Tubbataha Reef, are managed at a national level under the NIPAS program and have been implemented to protect and enhance biodiversity. However, the majority are much smaller in scale and managed in combination by the LGU and local community. These MPAs have been created to promote food security and sustainability for the local community. The 1998 Fisheries Code legislation calls for 15% of coastal municipal waters to be protected within no-take MPAs.

Despite the encouraging number of MPAs in the Philippines, they need to be managed effectively if they are to succeed in their goal of enhancing food security. Three things are of fundamental importance to effective management.

- Engagement with, and support from, the local community
- Effective demarcation of the boundaries of the MPA
- Consistent and sustained support from the LGU to patrol and enforce the MPA.

Through a volunteer-based scientific diving program, Marine Conservation Philippines focuses on collecting and analysing biophysical data on the effectiveness & resilience of locally managed MPAs, and offers support to local and regional management units.

MCP's expertise is focused on utilising a wide range of commercial biomass and MPA effectiveness as primary indicators of progress in ensuring long-term food security. Substrate composition and resilience are considered indirect indicators, as they are essential for maintaining the commercial productivity of the ecosystem.



MCP's ecological monitoring program has been developed to provide a broad understanding of the regional health and abundance within the reef ecosystems. Its well-refined scope of data collection across all MPA sites, through all depth levels, ensures high coverage and accurate data input, with transparency and data quality remaining constant priorities.

The diversity, abundance, and fluctuations of commercial fish and invertebrates, as well as the composition & resilience of substrate lifeforms in the MPAs, are being monitored on a seasonal basis. By collecting the same representative dataset per season, change can be tracked, giving a much more detailed picture of change in the MPA over time. Seasons have been defined following PAGASA's (Philippines Atmospheric, Geophysical and Astronomical Services Administration) local recommendation ([December, January, February]; [March, April, May]; [June, July, August]; [September, October, November]).

The monitoring method employed uses 30m transects in a stratified random sampling strategy that recognises three depth ranges (3-7m, 9-13m, 15-19m). The depth ranges selected were chosen based on the spatial distribution of indicator life forms and the difference in indicator densities at different depths.

To collect a dataset representative of the ecosystem, it was necessary to identify these spatial differences and account for them to avoid bias. By observing each depth range and treating the results as an ecologically representative set, it is possible to generate an accurate model of the entire reef structure and community, determine its relative health, and track changes in the ecosystem over time.

The challenge in collecting an ecologically representative dataset lies in conducting a sufficient number of replicates to ensure that all present life forms are accounted for. For each of our sites, monitoring is therefore conducted across the three depth ranges and repeated a calculated number of times to ensure high validity. At least 12 replicates were conducted per site, per season, and for each ecological indicator group (invertebrates, substrate, and fish) to accurately represent the ecosystems of interest. These replicates were used to create a representative average of the ecosystem for each site and season.

Monitoring Sites

Santa Catalina Municipality

MCP has been conducting its Long-Term Monitoring Program since 2017, although monitoring at some sites began later. The complete list of survey sites, along with key details, is provided below.

Site Name	Status	Size (hectares)	Established	Monitored Since
Cawitan	MPA	101.7	2022	2024
Manalongon	MPA	22.4	2022	2024

Cawitan MPA, established in 2022, has an area of 101.7 hectares with less than 1 hectare of coral cover. The depth at which the corals are located ranges from 3 to 6 meters on high tide. The rest of the MPA is covered with sand and small patches of seagrass. The reef is often exposed to wind, longshore currents, and wave action, especially during the habagat season.

Manalongon MPA, established in 2022, has an area of 22.4 hectares of shallow reef, ranging from 1 to 5 meters in depth, with a maximum depth of 7 meters during high tide. The reef is composed of a variety of hard coral growth forms and a layer of macroalgae. However, it is heavily silted due to its proximity to a nearby river. The reef is often exposed to wind, longshore currents, and wave action, especially during habagat season.

SANTA CATALINA
Community Projects

Marine Conservation Philippines is pleased to continue our work for and with the local community. The following is a summary of the community projects we have undertaken in the last report period of March - August 2025

- **Turtle Monitoring**

Through MCP's ongoing Turtle monitoring program, assisted by DENR, Bantay Dagat, and local community members, we have successfully protected 5 nests in Turtle Island, Guinsuan, and Mojon. Over 300 turtle hatchlings safely made it to the water.

- **Ghost nets**

Our Tec-trained diving team has successfully removed a 10 m^2 ghost net from a depth of 45m-50m in Malatapay. MCP volunteers have also helped to remove ghost nets in Latason and Guinsuan.

- **Summer camp 2.0**

After the successful return of our summer camp program last year, MCP again hosted local youth leaders for a 3-day immersion program. Participants from previous years returned as facilitators and helped ensure a smooth running of all activities.

- **Ridge to Reef**

In MCP's first-ever partnership with Endangered Species International, we hosted a 2-day youth camp, highlighting the importance of forest biodiversity, native trees, and fish and coral conservation.

- **UNSDSN**

MCP was invited to join the United Nations Sustainable Development Solutions Network, which brought together over 100 participants for presentations and conservation activities.

- **Scholarships**

MCP is excited to welcome two new scholars who will undergo dive training from the Open Water Diver level to Divemaster level, as well as receive training to teach our science program.

- **International Mangrove Day**

Joining the Siaton Coast Guard in Turtle Island to celebrate their 1st founding anniversary, we assisted in planting mangrove trees. We conducted a beach clean-up along with the local Bantay Dagat.

Approximately 200 million tons of trash are currently circulating in the global oceans, with around 11 million tons added annually. The Philippines is responsible for about 2.7 million tons of plastic waste alone being introduced into the oceans.

This trash can have devastating effects on marine and coastal ecosystems, from ghost nets killing animals that go to waste and large pieces physically smothering the reef, to microplastics being ingested and concentrated in animals that we ultimately eat, introducing potentially dangerous plastics into our own bodies.

Our partner NGO, Pro Ocean, conducts beach cleans 6 days a week along the coastline from Sibulan to Bayawan, playing a vital role in limiting the ecological damage that trash can cause. The following chart summarises the trash they've collected from March to August 2025 (Figure 9).

In addition, MCP conducted bi-weekly beach cleans throughout 2025, collecting a further 590 kg of trash, complementing Pro Ocean's ongoing efforts.

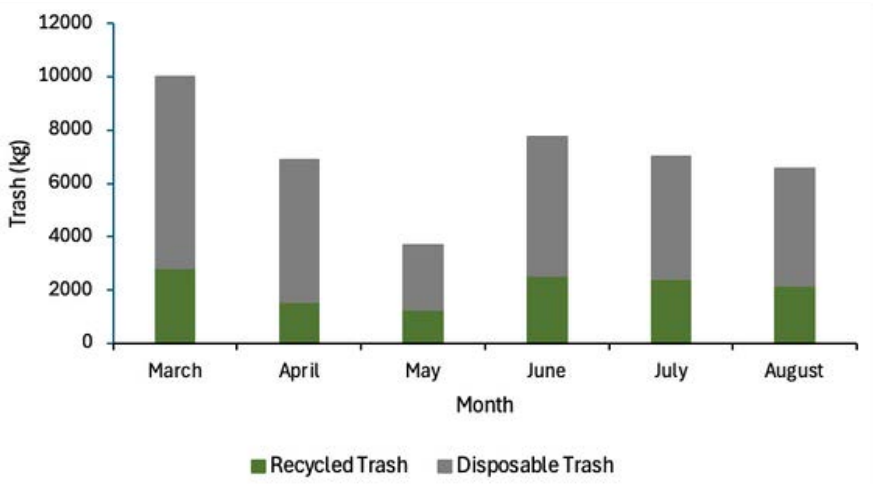


Figure 9. Monthly totals of recycled and disposable trash (kg) collected by Pro Ocean during beach cleans along the Sibulan–Bayawan coastline, March–August 2025. Regular clean-up efforts play a key role in reducing the ecological impacts of marine debris in a region where plastic pollution poses a major threat to coastal ecosystems.

EXECUTIVE SUMMARY

Marine Conservation Philippines Report
Santa Catalina - March-May 2025

Marine Conservation Philippines (MCP) conducted a total of **890 surveys** across four survey methodologies (Fish, Substrate, Invertebrates, and Predation) across the three municipalities we monitor (Zamboanguita, Siaton and Santa Catalina) between June and August 2025. With **871 surveys** conducted in the previous season (March-May 2025), this brings the total for this reporting period to **1,761 surveys. This represents a 23% increase in the number of surveys from the previous report.**

	Fish	Substrate	Invertebrates	Predation
Number of Surveys	12	6	12	9

Although MCP has been in operation for 10 years, Santa Catalina is a very recent addition to the programme, with monitoring commencing in March 2024. Due to habagat and passing typhoons, surveys were only possible for a limited time, therefore for this reporting period, surveys were only conducted during the March - May survey season. Therefore, there is no data for the latest survey season (June - August). During this period 39 surveys were carried out across 4 disciplines: Fish, Substrate, Invertebrates, and Predation. MCP aims to conduct more surveys here over the upcoming seasons to have more long-term representative data for the municipality. We are actively engaged with the relevant local Barangay, CoastGuard, Bantay Dagat, and LGU's to refine access, registration, and other factors to facilitate this.

As data is accumulated over coming seasons, it will be of interest to identify any trends and impacts from environmental conditions, breeding and aggregation patterns, and to observe any developments in the reef composition which will provide valuable insight into the overall ecology of the sites.

Food Security

Biomass of Commercial species

One fundamental measure of an MPA's success is the amount of fish biomass it produces. If there is higher fish biomass within an MPA, then more fish will be available for the community to harvest outside of the MPA. This is known as the 'spillover effect', and is one of the main ways in which an MPA can promote food security.

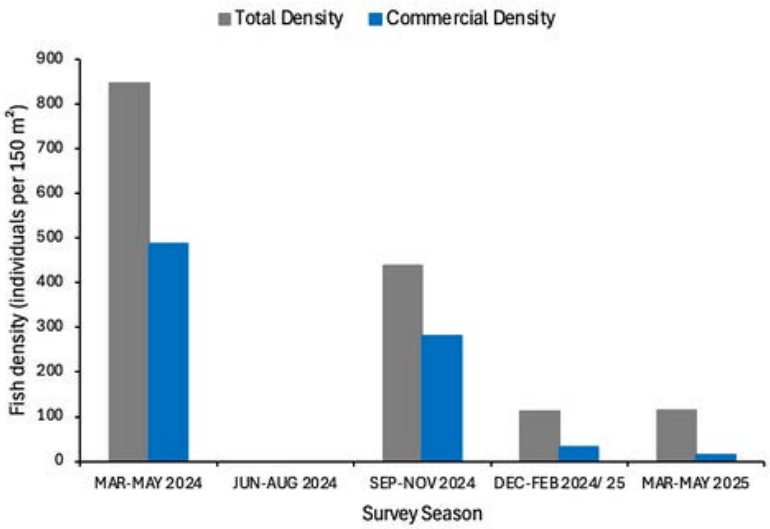


Figure 1. Temporal trends in total fish density and commercial fish density across the Santa Catalina Municipality (2024-2025). Values represent average individuals per 150m² recorded during seasonal surveys.

Current status:
In March to May 2025, the fish community in Santa Catalina municipality recorded a **total density of ~115 individuals** per 150 m², with commercial species representing only about 14 individuals (Figure 1).

We consider these data separately as we monitor some non-commercial fish that often occur in high numbers (particularly Damselfish), which would misrepresent the data if they were combined. The average fish density of the reefs in this municipality has remained relatively consistent, with minor seasonal fluctuations.

The average commercial biomass for Santa Catalina is very low at ~0.6 kg. The highest commercial biomass was recorded at Cawitan, at 0.64kg per 150 m² (Figure 2). Herbivores (~55 ind.) made up the largest group, followed by carnivores (~34.5 ind.), with omnivores (~4.4 ind.), corallivores (~2.8 ind.), and detritivores (~6.8 ind.) present in smaller numbers. These values indicate a low but still functionally diverse fish community, with commercial biomass particularly depleted. These values are low when compared to both Siaton and Zamboanguita. Local coastguards report that illegal fishing activities are a problem they are combating.

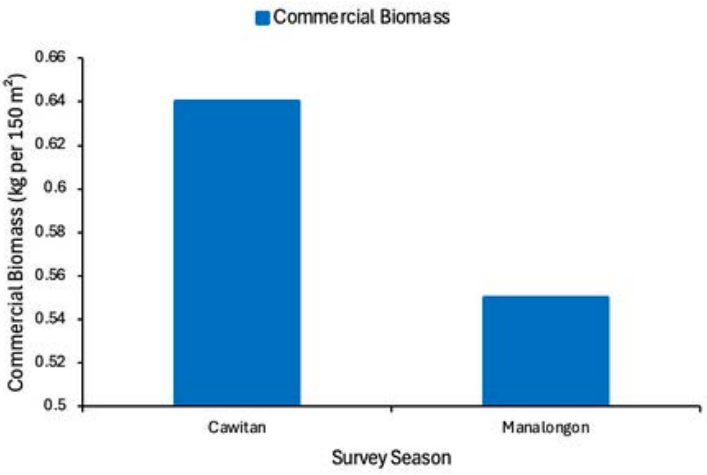


Figure 2. Commercial fish biomass (kg per 150m^2) across the two survey sites in the Santa Catalina Municipality, March–May 2025. Biomass values represent the estimated weight of commercially important reef fish, providing an indicator of food security potential and MPA effectiveness.

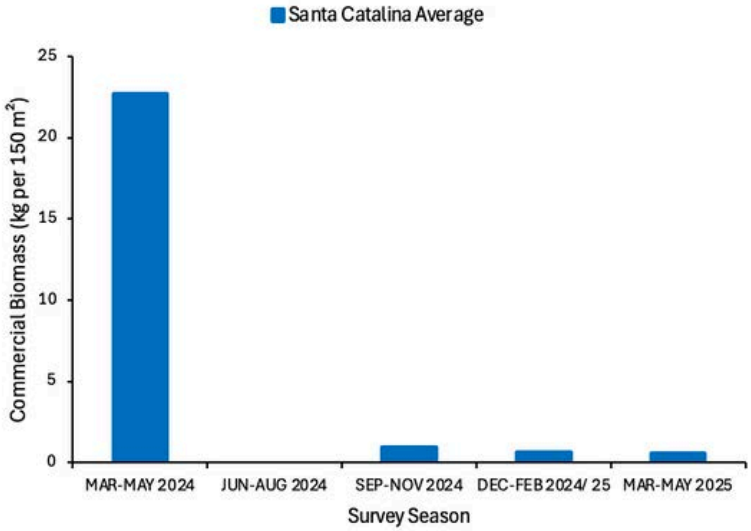


Figure 3. Temporal trends in commercial fish biomass (kg per 150m^2) across the Santa Catalina Municipality (2024-2025). Biomass values represent the estimated weight of commercially important reef fish, providing an indicator of food security potential and MPA effectiveness.

Recent change:

Compared with the previous season, total fish density remained very low (111.5 → 115.1 ind.), showing little improvement. Commercial density dropped markedly (33 → 13.9 individuals), and biomass remained relatively stable (~0.61 → 0.60 kg), reflecting ongoing pressure on the targeted species (Figure 3). Herbivores increased slightly (40.5 → 55 ind.), while carnivores (23 → 34.5 ind.) also rose, suggesting minor recovery in non-commercial groups. However, corallivores declined (11 → 2.8 ind.), and detritivores fell (16.5 → 6.8 ind.), indicating instability across functional groups.

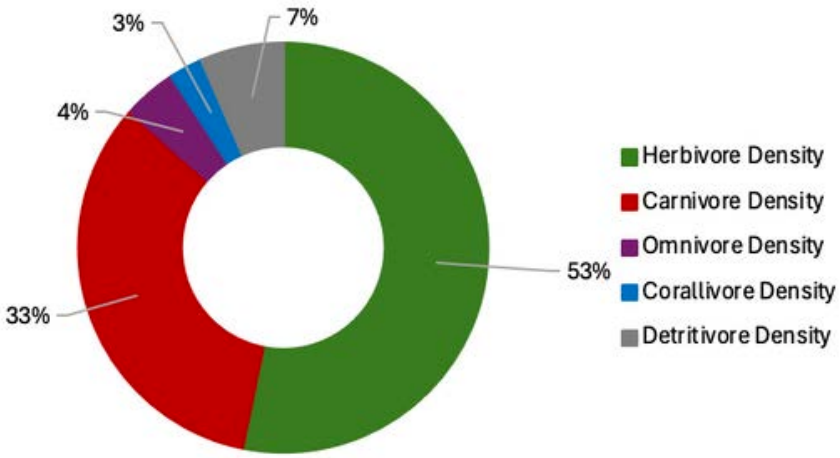


Figure 4. Proportional contribution (%) of dietary groups to total fish density for the Santa Catalina Municipality during March–May 2025. Data include both commercial and non-commercial species, highlighting the ecological importance of abundant herbivores in supporting algal–coral balance.

Dietary structure:
The community remains dominated by herbivores (~48%) and carnivores (~30%), with omnivores, corallivores, and detritivores together accounting for the remaining ~22% (Figure 4). This distribution reflects a balanced trophic spectrum but at very low absolute densities. The sharp decline in commercial species and biomass, alongside fluctuations in minor groups, highlights the fragility of the system.

Long-term context:
Santa Catalina's fish densities have collapsed since early 2024. Total density declined from ~846 ind. in Mar–May 2024 to just ~115 ind. in Dec–Feb 2024/25 — an 86% reduction in less than a year. Commercial biomass has dropped from ~22.7 kg to ~0.6 kg, showing a near-total loss of fisheries value. While herbivores and carnivores still make up the bulk of the community, their densities remain a fraction of earlier levels, and commercial groups in particular have been disproportionately reduced.

Ecological interpretation:
The current fish community reflects a reef under severe and ongoing pressure, likely due to overfishing. The loss of commercial species and biomass threatens both ecosystem resilience and the livelihoods of fisheries. The persistence of herbivores and carnivores at low levels indicates that their ecological roles are still present, albeit severely weakened. Without urgent management interventions—such as stricter enforcement of fishing restrictions, no-take zones, or active replenishment efforts—Santa Catalina's reef fish community risks long-term collapse, leaving the reef vulnerable to algal overgrowth and the loss of key ecological functions.

Reef Health and Resilience

Substrate Composition

The Philippines is situated in the Coral Triangle, an area of huge biodiversity that contains 30% of the world's reefs. Many factors determine the health of coral reefs, but two of the most important are Hard Coral Cover (HCC) and Algae Cover. Hard corals build the reef itself, providing habitat for thousands of other species, many of which are commercially important. Algae, particularly fleshy macroalgae, compete with coral for space. Too much algae can lead to algae dominating the reef. Without the coral and the living space it provides, much of the biodiversity of the reef is lost. Globally, hard coral cover has been decreasing since 2010.

Hard coral cover is an excellent indicator of the overall health of a coral reef, as it is this type of coral that builds the long-term physical structure of the reef. Algae are less biodiverse than corals and support fewer species of fish and invertebrates. A shift from hard corals to algae will result in lower climate change resilience, as well as significantly reduced commercial value.

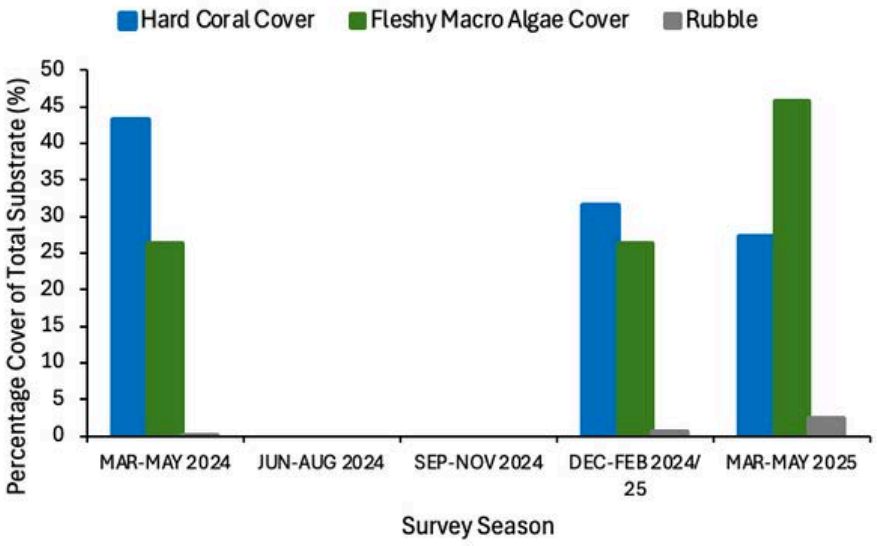


Figure 5. Temporal trends in average hard coral cover, fleshy macroalgae cover, and rubble across the Santa Catalina Municipality (2024–2025). Data is expressed as average percentage cover per survey season.

Current status:

In Mar–May 2025, the benthic community of Santa Catalina municipality was characterised by **hard coral cover of ~27.3%**, **fleshy macroalgae at ~45.8%**, and **rubble at ~2.4%** (Figure 5). This indicates a reef dominated by macroalgal overgrowth, with hard coral representing a secondary but still significant component of the benthos. Rubble remains low, suggesting limited recent physical disturbance. Bleaching was minimal (~0.5%), indicating very little visible stress during the survey period.

Recent change:
Since the last reporting period, hard coral cover declined (31.5% → 27.3%), while fleshy macroalgae expanded sharply (26.3% → 45.8%). Rubble also increased slightly (0.6% → 2.4%), suggesting some instability in the substrate. Manalongon has a higher percentage of macroalgal cover at 50.4% compared to 41% at Cawitan (Figure 6). Bleaching fell from 1.5% to 0.5%, continuing a downward trend in visible bleaching stress (Figure 7). Manalongon showed a lower level of bleaching at 0.2%, whereas Cawitan showed a slightly higher level of bleaching at 0.8%, though this is still very low. The shift in benthic cover highlights an intensification of algal dominance at the expense of corals.

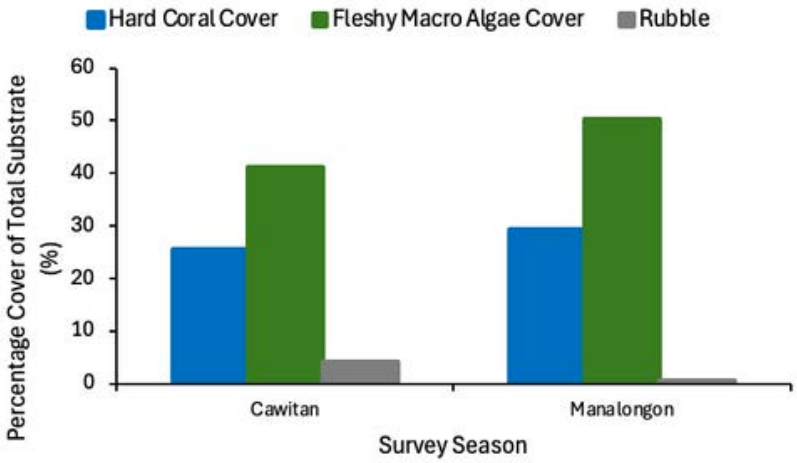
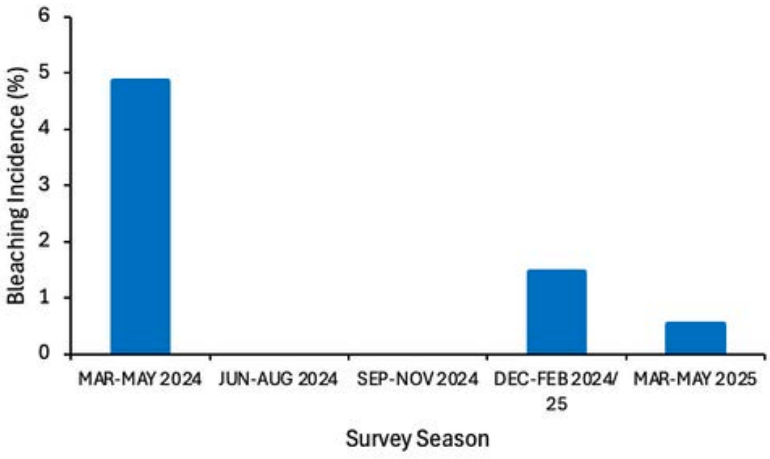


Figure 6. Average hard coral cover across survey sites in the Santa Catalina Municipality March-May 2025. Data is expressed as average percentage cover.

Figure 7. Seasonal bleaching incidence in the Santa Catalina Municipality (2024–2025), shown as average percentage of colonies observed with visible bleaching (either partially or fully bleached) per survey season.



Globally, ocean temperatures are rising in response to human-caused climate change, and incidences of bleaching are becoming increasingly widespread and severe. However, it is interesting to note that the waters off the eastern and southern coasts of Southern Negros can be as much as 1 degree Celsius cooler than the waters of the Sulu Sea to the west, which does afford the area some natural protection against bleaching events. As ocean temperatures continue to rise, bleaching events will likely become more frequent and severe. This will be important to monitor through the upcoming seasons.

Long-term context:
Santa Catalina's substrate composition has shifted notably over the past year. Hard coral cover has fallen from ~43% in Mar–May 2024 to ~27% by Mar–May 2025, while macroalgae has nearly doubled (26% → 46%). Rubble levels have risen only slightly, suggesting that direct physical disturbance has been less important than biological competition in driving this shift. Bleaching has remained low throughout the monitoring period (≤5%), indicating that thermal stress is not the immediate driver of coral decline. Instead, algal proliferation appears to be the dominant process shaping the substrate.

Ecological interpretation:
The substrate dynamics in Santa Catalina reflect a reef undergoing a phase shift towards macroalgal dominance. While bleaching stress is currently minimal, the rapid decline in coral and surge in macroalgae suggest that ecological balance is being lost, most likely due to reduced herbivory, fishing pressure on key grazing species, or nutrient enrichment. Without sufficient grazing control, macroalgae may continue to expand, further limiting coral recruitment and compromising the resilience of reefs. This trajectory poses risks for biodiversity, fisheries productivity, and coastal protection. Strengthened management to support herbivore populations, reduce nutrient inputs, and promote coral recruitment will be essential to reverse the trend and stabilise the reef system.

Touristic Value

Iconic and Charismatic Species

Southern Negros not only hosts some beautiful coral reefs, but is world famous for the abundance of small, rare animals found in its waters. This is a significant draw for divers and contributes substantially to the local tourism industry.

Tourism has an increasingly important role to play in the success of Marine Protected Areas, provided it is managed in a thoughtful and conservation-minded manner. The effective ticketing of recreational diving activities will generate income for the communities around an MPA, as well as help to cover ongoing maintenance costs. This will enhance the MPA's ability to provide food security.

	Cawitan	Managalanon	Municipal Average
Barracudas	0	0	0
Cephalopods	11.11	5.26	8.185
Cowries	22.22	21.05	21.635
Eels and Snakes	100	42.11	71.055
Frogfish	0	0	0
Giant Clams	0	0	0
Porcupinefish and Pufferfish	77.78	68.42	73.1
Scorpaenidae	66.67	26.32	46.495
Sharks	0	0	0
Shrimps	55.56	47.37	51.465
Slugs	55.56	63.16	59.36
Stingrays	0	0	0
Syngnathidae/ Pegasidae	0	0	0
Turtles	0	0	0

Table 1- Average percentage frequency of sightings for key charismatic species across MPAs in the Santa Catalina Municipality between March and May 2025.

The table above summarises a wide range of animals with high potential tourism value that divers and snorkellers would be interested in seeing. The figures represent the percentage of times an indicator was observed during dives between March and May 2025. Giving a representation of how likely divers would be to see these creatures and aid dive operations in selecting sites to suit customers.

The Santa Catalina municipality offers a more limited but still valuable marine tourism portfolio, with its strengths lying in the reliability of encounters with certain reef-associated groups. On average, sightings of eels and snakes (71.1%) and porcupinefish/pufferfish (73.1%) contribute the most to tourism value, ensuring consistent attractions for divers seeking charismatic and photogenic reef fish (Table 1, Figure 8). Macrofauna also contribute strongly, with slugs (59.4%), shrimps (51.5%), and cowries (21.6%) providing dependable sightings that support macro-focused tourism. Scorpionfish (46.5%) add further interest, particularly at Cawitan, where they peak at 67%, appealing to both macro divers and underwater photographers. In contrast, encounters with megafauna are notably scarce. This sets Santa Catalina apart from municipalities like Siaton, where such taxa add breadth to the tourism portfolio.

Overall, Santa Catalina's tourism value currently lies in its high reliability of encounters with eels, snakes, porcupinefish, and macro-invertebrates, which create a solid base for macro-oriented diving experiences. However, the absence of larger charismatic species limits its appeal to visitors seeking megafauna, suggesting that its niche strength lies in being a dependable destination for small to medium-sized reef fauna rather than big-animal diving.

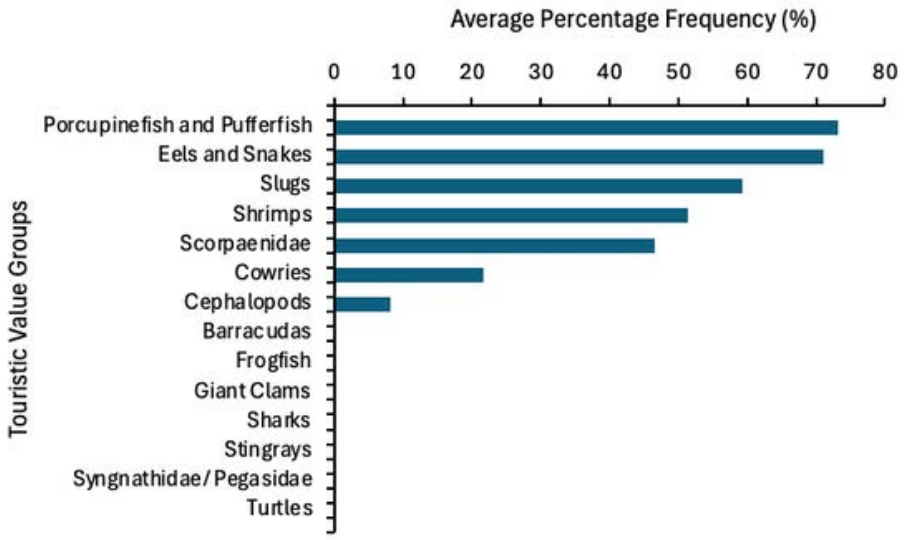


Figure 8. Sightings of high-value tourist species across the Santa Catalina Municipality during the Mar–May 2025 survey season. Data is presented as the percentage of dives in which each group was recorded.

In this context, Scorpaenidae refers to lionfish, scorpionfish, and stonefish, while Syngnathidae and Pegasidae includes seahorses, pipefish, sea moths, and sea dragons.

Management Suggestions

- Demarcation is ongoing for sites in Santa Catalina
- Develop enforcement strategies
- **Consideration of temporary restriction on herbivorous fish in sites of algal domination**
- Community engagement
- Conduct regular beach and dive cleans
- Continue monitoring
- Consider MPAs in coastal activities that could lead to runoff, especially sites in the vicinity of river mouths.
- Use of safe materials in artificial reefs: https://www.marineconservationphilippines.org/wp-content/uploads/2018/02/factors-and-principles-artificial-reef-creation.pdf
- Increased focus on the collection of ticketing revenue for recreational water activities.

Fish Monitoring

Our fish surveys are conducted using a visual census method based on a 30-meter by 5-meter belt transect. This yields an area of 150 square meters per survey. All target fish that enter the survey zone, from the seafloor to the surface, are counted and sized. The transect is left undisturbed for 15 minutes after it has been laid out, allowing fish to return to the survey area. Surveys are timed to last 10 minutes.

The following is our complete fish indicator list (commercial in bold):

- Angelfish - Bicolor
- Angelfish - Keyhole
- Angelfish - Midnight
- Angelfish - Pearl-Scale
- Angelfish - Other
- Anthias
- **Barracuda**
- **Big Eye**
- **Bream**
- Bristletooth
- Brushtail Tang
- Butterflyfish
- Cornetfish
- Damselfish - Other
- Damselfish - Sergeant
- **Emperorfish - Other**
- **Emperorfish - Long Face**
- **Fusilier**
- **Goatfish**
- **Grouper - Barramundi**
- **Grouper - Brown-Marbled**
- **Grouper - Other**
- Long-Jawed Mackerel
- Moorish Idol
- Needlefish
- **Rabbitfish**
- **Parrotfish - Other**
- **Parrotfish - Bumphead**
- **Parrotfish - Raggedtooth**
- **Parrotfish - Stareye**
- **Pufferfish - Other**
- **Pufferfish - White-Spotted**
- Scad
- Sea Rays
- Sea Snakes
- Sharks
- **Snapper**
- **Soldierfish**
- Squid
- Spadefish
- **Surgeonfish - Other**
- **Surgeonfish - Whitetail**
- **Surgeonfish - Yellow Mask**
- **Sweetlips**
- **Trevally - Other**
- **Trevally - Scad**
- **Triggerfish - Other**
- **Triggerfish - Redtooth**
- **Triggerfish - Titan**
- **Tuna**
- Turtles - Green
- Turtles - Hawksbill
- **Unicornfish - Blue-Spine**
- **Uniccornfish - Orangespine**
- **Unicornfish - Other**
- Wrasse - Cleaner
- Wrasse - Humphead
- Wrasse - Other

Substrate Monitoring

Our substrate surveys utilise a Point Intercept Method, based around a transect length of 30 meters. The substrate directly below every 25 cm increment on the line is identified and recorded. This yields a total of 120 data points per survey.

The following is our comprehensive list of substrate indicators.

Hard Coral
- Branching
- Tabulate
- Plate-like
- Encrusting
- Submassive
- Columnar
- Massive
- Solitary

Soft Coral
- Other Soft Coral
- Gorgonian
- Organ Pipe

Other Cnidarians
- Anemone
- Corallimorph
- Hydroid
- Zoanthid

Sessile Invertebrates
- Sponge - Barrel
- Sponge - Encrusting
- Sponge - Irregular
- Ascidian - Regular
- Ascidian - Encrusting
- Bryozoan

Algae
- Coralline
- Halimeda
- Filamentous
- Macro
- Turf

Health and Vulnerability
- Bleaching
- Disease
- Infestation
- Predation - Coralliophila
- Predation - Crown of Thorns
- Predation - Drupella
- Silt

Substrate
- Giant Clam
- Live Coral Fragment
- Rock
- Rubble
- Sand

Marine Conservation Philippines

Thank You

Please contact us if you would like any additional information, or require assistance with any conservation activities

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