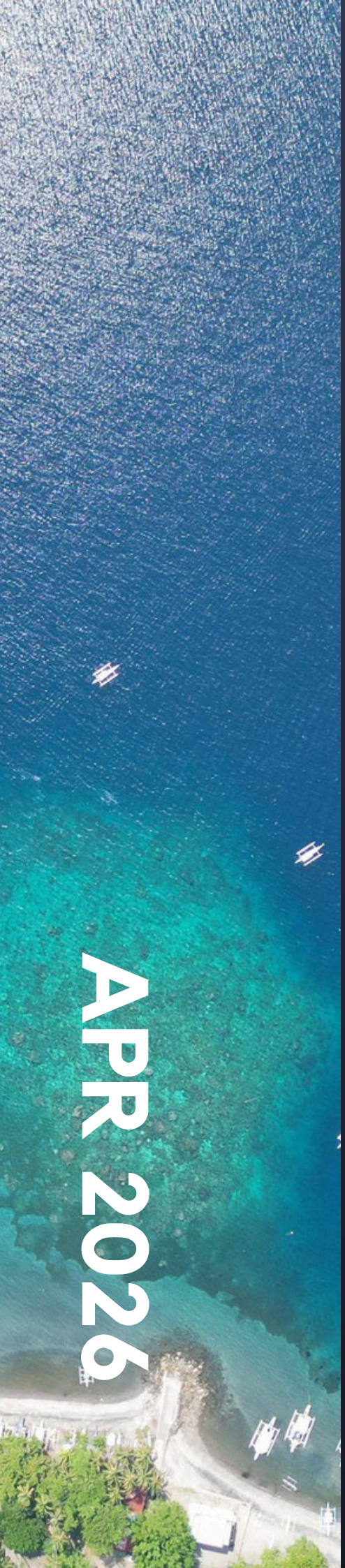


Marine Conservation Philippines

Semiannual Report

SANTA CATALINA

APR 2026

marineconservationphilippines.org

49

Surveys completed

25.6% Increase

43.5%

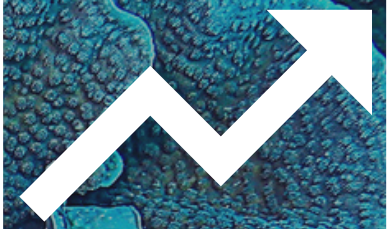
Hard Coral cover

59.3% Increase

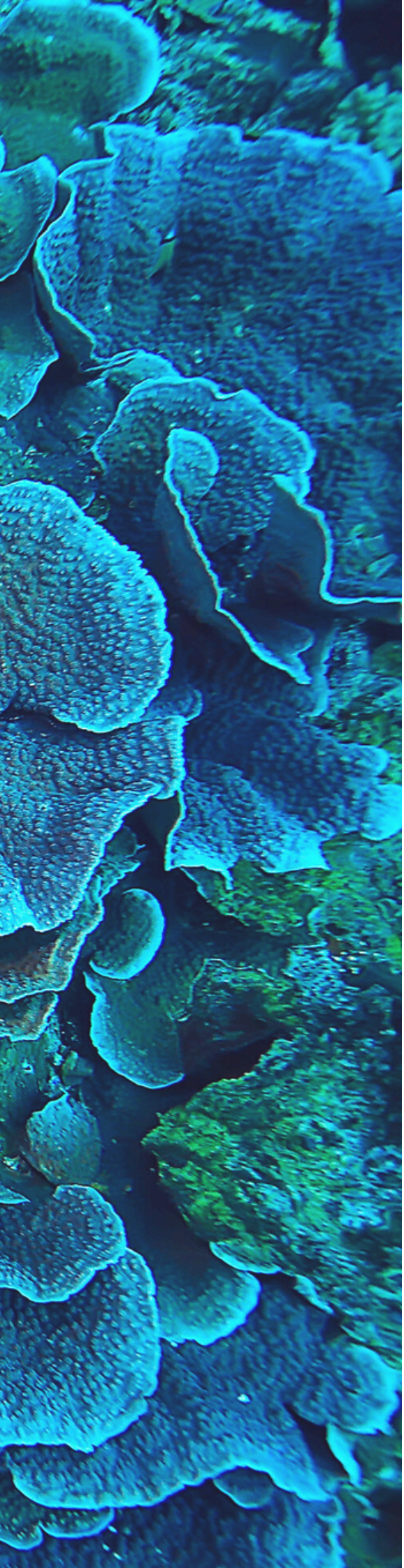
0.79 kg

Commercial Biomass

33.9% Increase



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 thehabagat 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 September 2025 - February 2026

- **International Coastal Clean-Up Day**

For International Coastal Clean-Up Day 2025, beach and dive cleans were conducted in Salag and Andulay, alongside Pro Ocean, Siaton Fisher Folk Association, members of the LGU and the local community, collecting 89 kgs of waste.

- **SCUBA Training**

Continuing our work in training members of LGU departments across Negros, in October, we hosted 22 people from BATASS, training them in a mixture of Open Water and Advanced Open Water.

- **Monitoring Dashboard**

Our new dashboard is now live on our website, giving communities instant access to the current and historical data for each MPA.

- **Dumaguete Youth Congress**

In December, MCP was invited to speak at the Youth Congress - Building a future for good Governance.

- **Immersion Program**

Ten science students from Basay National High School joined us for a 2-day immersion program in December. Taking part in presentations, fisher folk forums, seaweed surveying and a discovery dive.

- **White Gifts**

In 2025 we held a White Gift event in Olympia to help local communities that suffered due to the untreated molasses spill in Bias. We also held a White Gift event in Lutoban and Siaton.

- **Mangrove Planting**

Togther with MENRO, Tourism officers and DNER we planted 200 mangrove seedlings at the Santa Catalina Mangrove Boardwalk.

EXECUTIVE SUMMARY

Marine Conservation Philippines Report Santa Catalina - September 2025 - February 2026

Marine Conservation Philippines (MCP) conducted a total of **1,728 surveys** across four survey methodologies (Fish, Substrate, Invertebrates, and Predation) across the three municipalities we monitor (Zamboanguita, Siaton and Santa Catalina) between September 2025 and Februrary 2026. With **808 surveys** conducted in the September - November 2025 season, and **920 surveys** conducted in the December - February season.

	Fish	Substrate	Invertebrates	Predation
Number of Surveys	13	12	12	12

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.

Due to Super Typhoon Nando, we had limited access to Santa Catalina in September.

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.

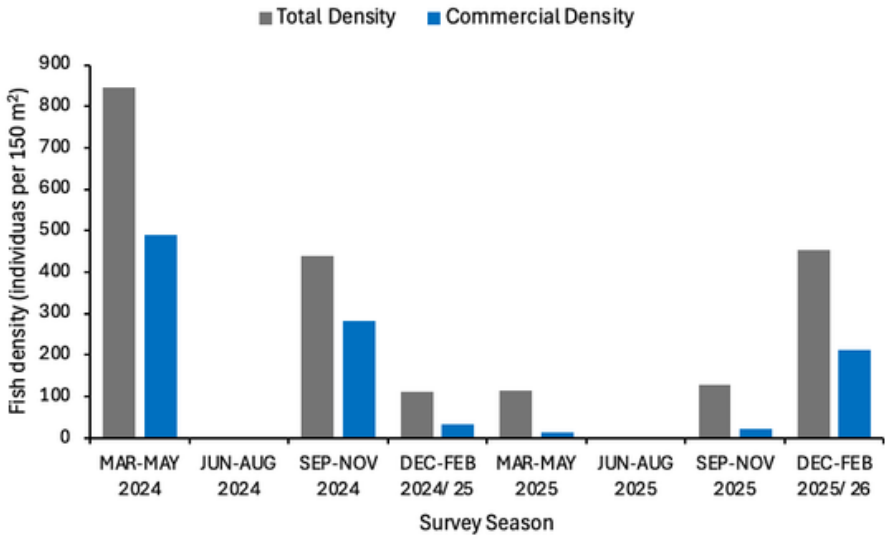


Figure 1. Temporal trends in total fish density and commercial fish density across the Santa Catalina Municipality (2024-2026). Values represent average individuals per 150 m^2 recorded during seasonal surveys.

Current status:

In September 2025 to February 2025, the fish community in Santa Catalina municipality recorded a **total density of ~290.4 individuals** per 150 m^2, with commercial species representing ~116 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 ~0.79 kg (Figure 2). The highest commercial biomass was recorded at Cawitan, at 1.51kg per 150 m^2 (Figure 3). Herbivores (~186.7 ind.) made up the largest group, followed by carnivores (~81.6 ind.), with detritivores (~10.7 ind.), omnivores (~6.3 ind.), and corallivores (~5.2 ind.) present in smaller numbers. This indicates that while overall fish density has increased, the fish community is still dominated by herbivores and carnivores, with other functional groups present in relatively low numbers.

Despite the increase in density, commercial biomass remains very low, indicating that most fish present are small-bodied individuals rather than large, mature fish that contribute significantly to fisheries productivity.

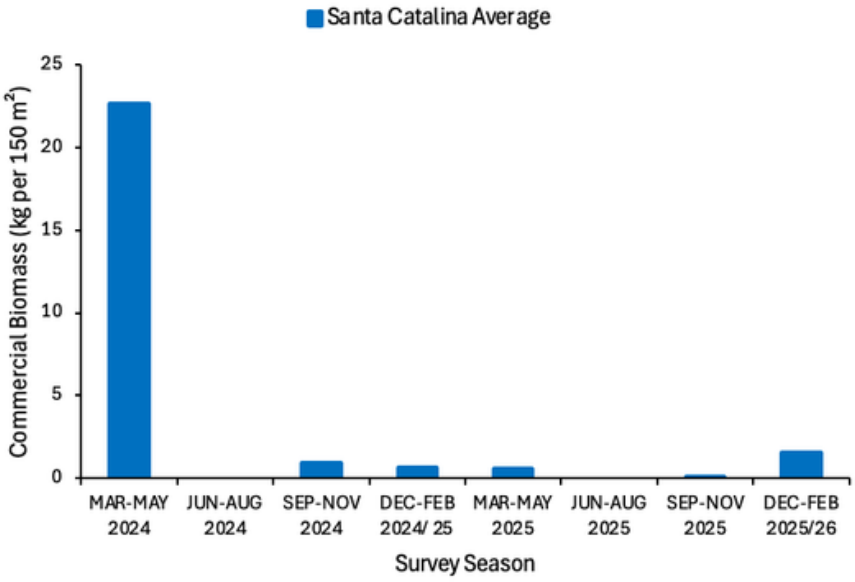


Figure 2. Temporal trends in commercial fish biomass (kg per 150m^2) across the Santa Catalina Municipality (2024-2026). Biomass values represent the estimated weight of commercially important reef fish, providing an indicator of food security potential and MPA effectiveness.

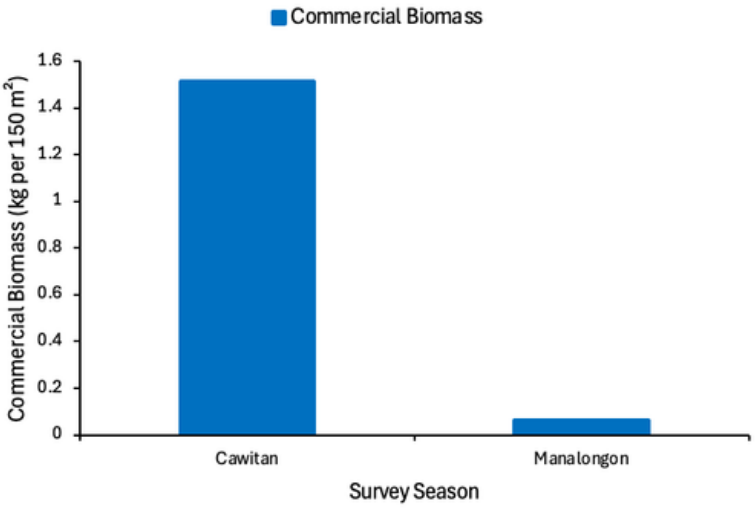


Figure 3. Average commercial fish biomass (kg per 150m^2) across the two survey sites in the Santa Catalina Municipality, September–February 2025/26. Biomass values represent the estimated weight of commercially important reef fish, providing an indicator of food security potential and MPA effectiveness.

Recent change:

Compared with the previous season, total fish density increased substantially (115.1 → 290.4 ind.) and commercial density rose sharply (13.9 → 116.2 individuals). Commercial biomass also increased (~0.6 → 0.8 kg) though it remains low overall (Figure 3). Herbivores showed the largest increase (55 → 186.7 ind.), while carnivores (34.5 → 81.6 ind.) also increased. Omnivores, corallivores, and detritivores all increased slightly. This pattern suggests a broad increase across functional groups, likely driven by recruitment or an increase in small individuals rather than recovery of large fish.

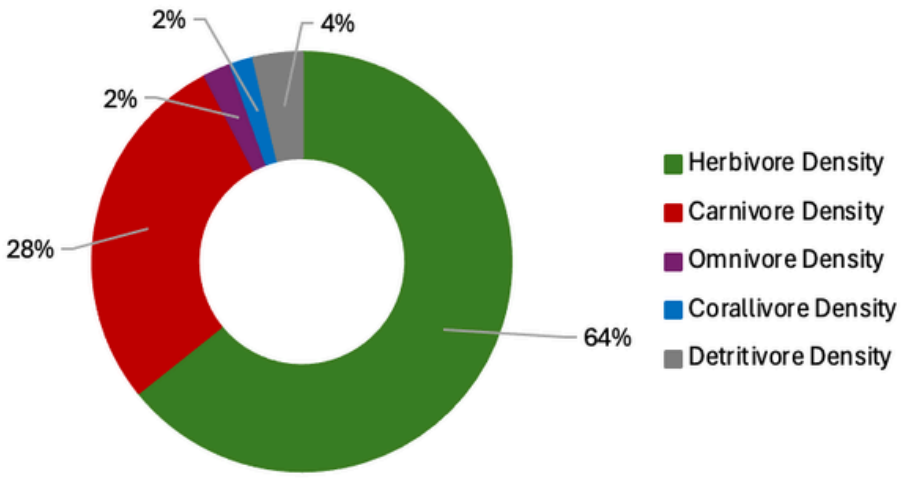


Figure 4. Proportional contribution (%) of dietary groups to total fish density for the Santa Catalina Municipality during September–February 2025/26. Data include both commercial and non-commercial species, highlighting the ecological importance of abundant herbivores in supporting algal–coral balance.

Dietary structure:
The community remains dominated by herbivores (~64%) and carnivores (~27%), with omnivores, corallivores, and detritivores making up the remaining (~7%) (Figure 4). This distribution reflects a functionally complete trophic structure, with herbivores maintaining a key role in grazing and reef resilience, although overall fish biomass remains low.

Long-term context:
Santa Catalina's fish densities declined dramatically from ~846 individuals per survey in Mar-May 2024 to ~111-127 individuals in 2025. The recent increase to ~453 individuals in the most recent survey period indicates a partial recovery; however, commercial biomass remains far below 2024 levels (~22.7 kg), showing that the fisheries value of the reef has not recovered. The fish community, therefore, appears to be recovering in numbers, but not yet in size or biomass.

Ecological interpretation:
The fish community in Santa Catalina shows signs of early recovery, particularly in total fish density and herbivore abundance. However, the continued low commercial biomass indicates that larger, reproductively mature fish are still absent, most likely due to ongoing fishing pressure. The increase in herbivores is positive for reef health, as they help control algal growth and support coral survival, but the lack of commercial-sized fish limits spillover benefits and fisheries productivity. Continued protection and enforcement within the MPAs will be important to allow fish to grow to larger sizes, rebuild biomass, and restore both ecosystem function and fisheries value over time.

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.

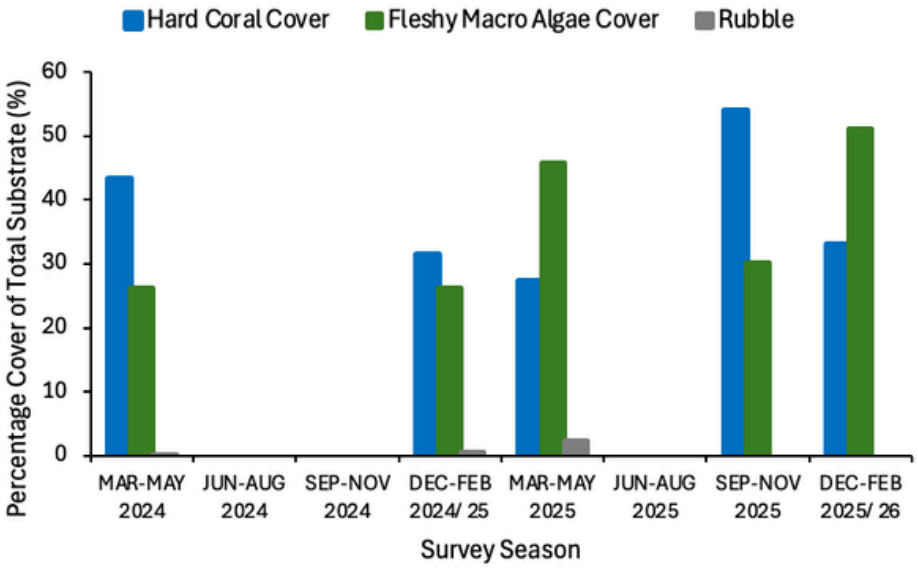


Figure 5. Temporal trends in average hard coral cover, fleshy macroalgae cover, and rubble across the Santa Catalina Municipality (2024–2026). Data is expressed as average percentage cover per survey season.

Current status:

During the September 2025 to February 2026 monitoring period, reefs in Santa Catalina municipality recorded an average **hard coral cover of ~43.5%**, **fleshy macroalgae at ~40.7%**, and **rubble at ~0%** (Figure 5). Hard coral cover in Santa Catalina indicates that the reefs remain coral-dominated systems with relatively intact reef structure. The absence of rubble across both sites suggests low recent physical disturbance and a stable reef framework.

However, fleshy macroalgae cover is also very high, nearly equal to hard coral cover on average from the last 6 months, indicating strong competition for space between coral and algae. This suggests that although coral cover is high, these reefs may be at risk of algal overgrowth if macroalgae continue to increase, particularly in the last season. Bleaching levels were low (~1.5%) during the current monitoring period, indicating low thermal stress at the time of survey (Figure 6).

Recent change:

Since the last reporting period, hard coral cover increased (27.3% → 43.5%), while fleshy macroalgae decreased slightly (45.8% → 40.7%). Rubble also decreased (2.4% → 0%). This represents a substantial increase in coral cover across the municipality, particularly driven by high coral cover recorded in Cawitan during September-November 2025 (Figure 7). The decrease in rubble to 0% suggests very stable substrate conditions, which are favourable for coral growth and recovery. However, macroalgae remains very high, which may limit future coral recruitment despite high adult coral cover. Overall, the municipality shows signs of coral recovery and stable reef structure, but macroalgae remains a key ecological pressure.

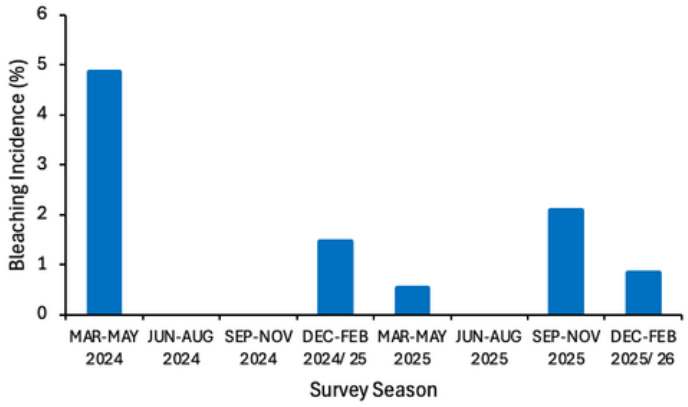


Figure 6. Seasonal bleaching incidence in the Santa Catalina Municipality (2024–2026), shown as average percentage of colonies observed with visible bleaching (either partially or fully bleached) per survey season.

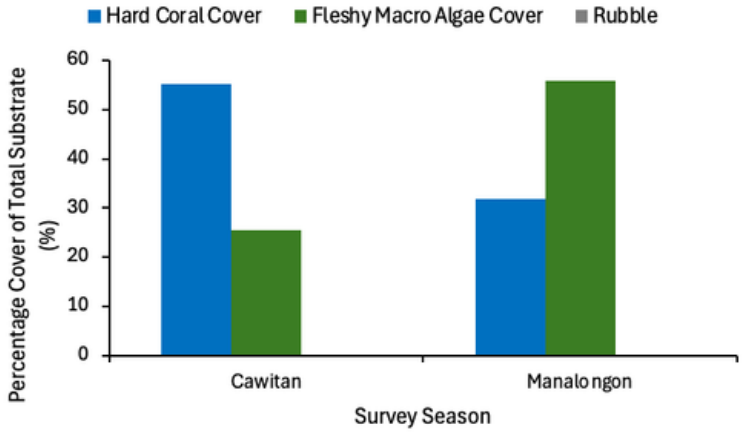


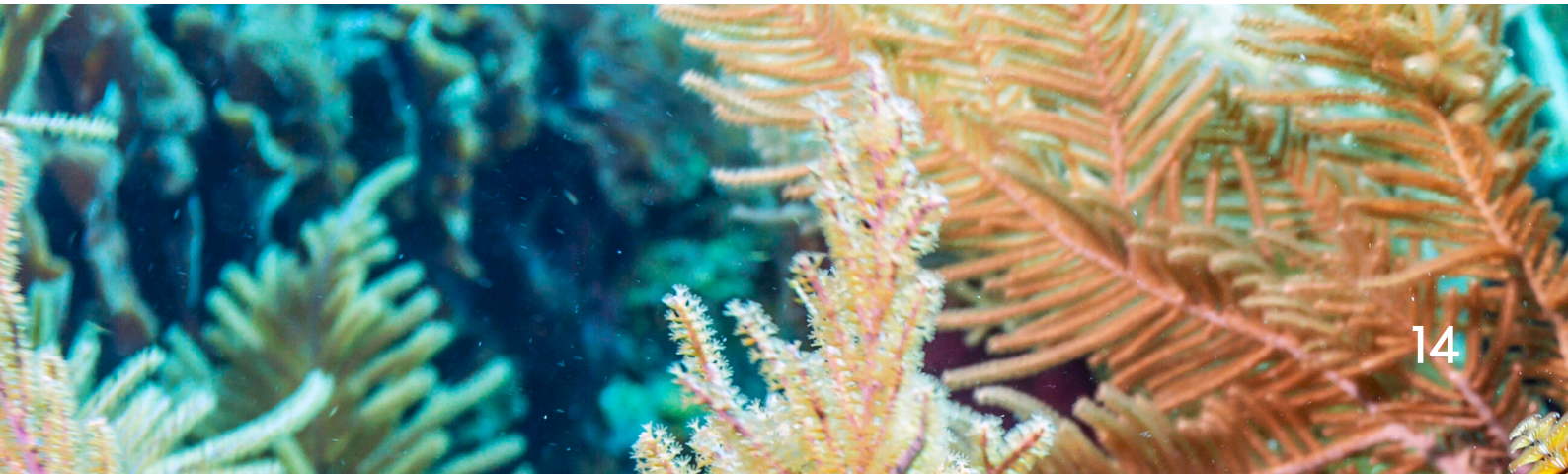
Figure 7. Average hard coral cover across survey sites in the Santa Catalina Municipality September-February 2025/26. Data is expressed as average percentage cover.

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:
From 2024 to 2026, Santa Catalina shows high variability in coral and macroagae cover. In 2024, there was very high coral (~43%) and high macroalgae ~(26%). In early 2025, coral declined and macroalgae increased significantly (~46%). In late 2025, coral increased dramatically (~54%), while in early 2026, coral decreased again, while macroalgae decreased slightly. This suggests the reef system is dynamic and fluctuating, likely influenced by seasonal changes, grazing pressure, nutrient input, and local disturbances. The key pattern is that when coral decreases, macroalgae increases, indicating competition for space between these groups.

Ecological interpretation:
Santa Catalina municipality currently has the highest coral cover among three municipalities, and reefs appear to be structurally intact with no rubble, which is a strong indicator of reef stability. However, the very high macroalgae cover (40-60%), particularly at Manalongon, indicates that these reefs are under ecological pressure from agal competition. If macroalgae continue to increase, these reefs could shift from coral-dominated to algae-dominated, particularly at Manalongon. The difference between the two sites suggests that local management, herbivory, or nutrient levels being in the same municipality. Overall, Santa Catalina reefs are high value coral reefs but at risk of macroalgal overgrowth, and management actions that support herbivorous fish populations and reduce nutrient input may be important to maintain coral dominance.

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.



Benthic Composition

Invertebrate Status

Across the Santa Catalina municipality, the average invertebrate density was ~13 individuals per survey, with a notable difference between the two MPAs. Cawitan recorded a much higher invertebrate density (22.5 individuals per survey) compared to Manalongon, which recorded a relatively low density (4.13 individuals per survey) (Figure 8). Despite this difference in density, species richness was relatively similar between the two sites, with Cawitan recording an average species richness of 2 species per survey and Manalongon recording 3 species per survey, giving a municipality average of 2.5 per survey (Figure 9). This suggests that while Manalongon has fewer individuals overall, the diversity of invertebrate species present is still relatively comparable to Cawitan.

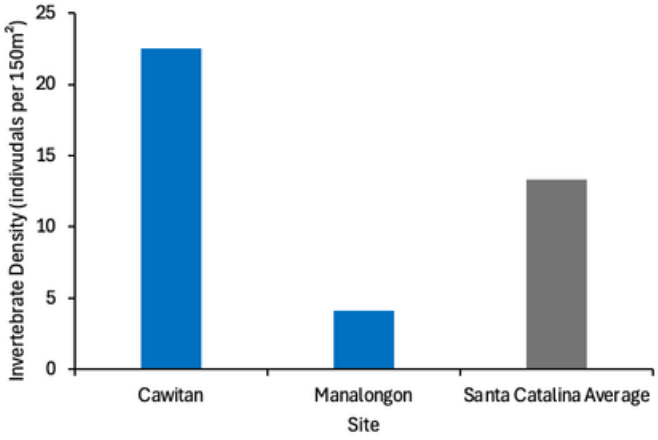
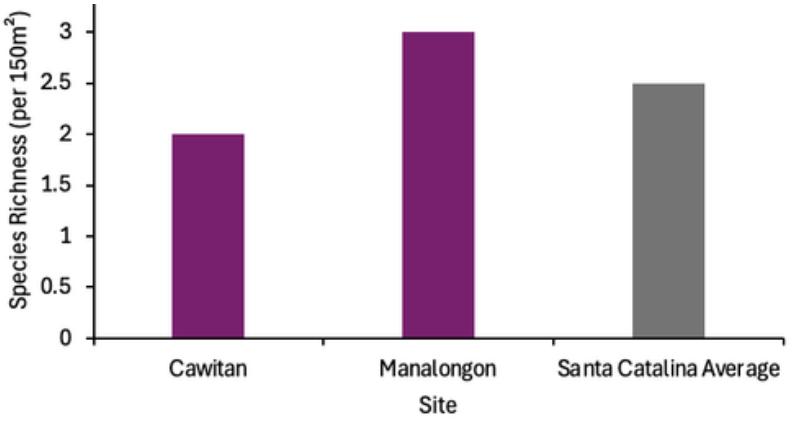


Figure 8. Invertebrate density across sites within the Santa Catalina Municipality during Sep–Feb 2025/26. Values represent average density per survey.

Figure 9. Species richness across sites within the Santa Catalina Municipality during Sep–Feb 2025/26. Values represent average species richness per survey.



In terms of functional groups, indicator (sensitive) species made up a large proportion of the invertebrate community in Santa Catalina, particularly in the second survey period, where indicator species density was notably high (Figure 10). Other benthic-associated species were also relatively abundant, while commercially important species and ecosystem engineers were present at lower densities. Charismatic species were recorded at low to moderate densities, and the average abundance of sea cucumbers, sea urchins, and giant clams per survey remained low overall across the municipality. The relatively high density of indicator species may suggest that reef conditions at these protected sites are supporting species associated with healthier reef environments.

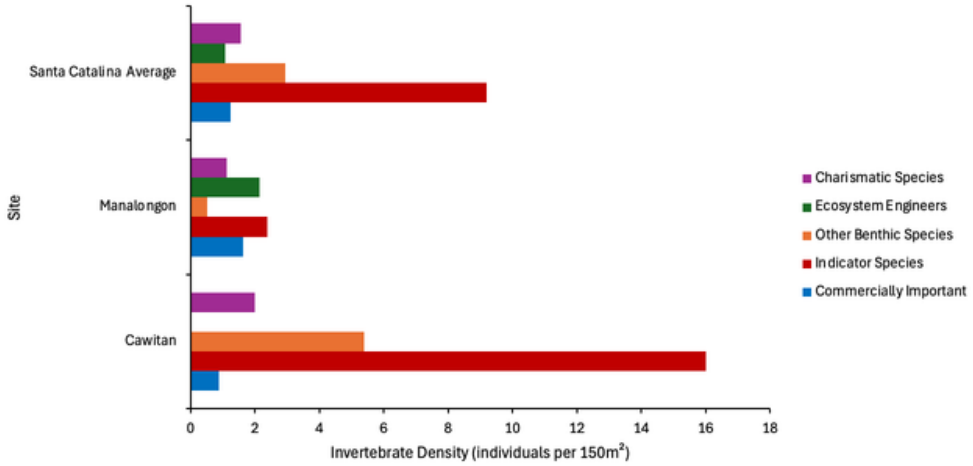


Figure 10. Composition of invertebrate functional group density at Santa Catalina reef sites (September - February 2025/2026).

Analysis of commercially important invertebrates showed that the most abundant commercial species in Santa Catalina were gastropods, particularly cone shells, followed by several species recorded at low densities, including thorny oysters, turban shells, nilo top shells, cowries, other shells, giant clams, rock boring sea urchins, Diadema sea urchins, and lobster (Table 1). Santa Catalina has a lower density of commercially important invertebrates overall, and the community is less dominated by sea urchins and more evenly distributed among gastropods and bivalves. The presence of lobster and giant clams, even at low densities, is ecologically important as these species are often targeted by fishing, and can benefit from protection within MPAs.

Gastropods - Cone	0.50	**Bivalves - Thorny Oyster**	0.06
Sea Urchins - Diadema	0.20	**Gastropods - Other Turban**	0.06
Sea Urchins - Rock Boring	0.06	**Gastropods - Nilo Top**	0.06
Bivalves - Giant Clam	0.06	**Gastropods - Other Cowrie**	0.06
Bivalves - Other	0.06	**Gastropods - Other Shell**	0.06
Lobster	0.06		

Table 1. Most abundant commercial invertebrates in the Santa Catalina Municipality during Sep–Feb 2025/26. Values represent average density per survey and highlight the dominant contributors to the commercial benthic community.

Overall, the invertebrate communities in the Santa Catalina municipality show clear differences between the two MPAs, with Cawitan supporting higher invertebrate diversity than Manalongon. However, both sites support indicator species and a range of commercially important invertebrates, suggesting that these protected areas are providing important habitat for reef invertebrates. The relatively low densities of some commercially valuable species may indicate past fishing pressure, slow population recovery, or naturally low population densities, but continued protection within these MPAs should support population recovery over time.

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	13.64	0	6.82
Cephalopods	9.09	5.56	7.32
Cowries	9.09	0	4.55
Eels and Snakes	69.32	36.11	52.72
Frogfish	0	0	0
Giant Clams	0	5.56	2.78
Porcupinefish and Pufferfish	81.82	69.45	75.63
Scorpaenidae	55.68	36.11	45.90
Sharks	0	0	0
Shrimps	22.73	11.11	16.92
Slugs	30.68	36.11	33.40
Stingrays	0	0	0
Syngnathidae/ Pegasidae	9.09	0	4.55
Turtles	4.55	5.56	5.05

Table 2- Average percentage frequency of sightings for key charismatic species across MPAs in the Santa Catalina Municipality between September and February 2025/26.

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 September 2025 and February 2026. 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 porcupinefish/pufferfish (75.6%) and eels and snakes (52.7%) contribute the most to tourism value, ensuring consistent attractions for divers seeking charismatic and photogenic reef fish (Table 2, Figure 11). Scorpaenidae (45.9%) and slugs (33.4%) also contribute strongly. In contrast, encounters with megafauna are notably scarce. There were no encounters with sharks, stingrays, and very limited turtle sightings (5.1%) 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.

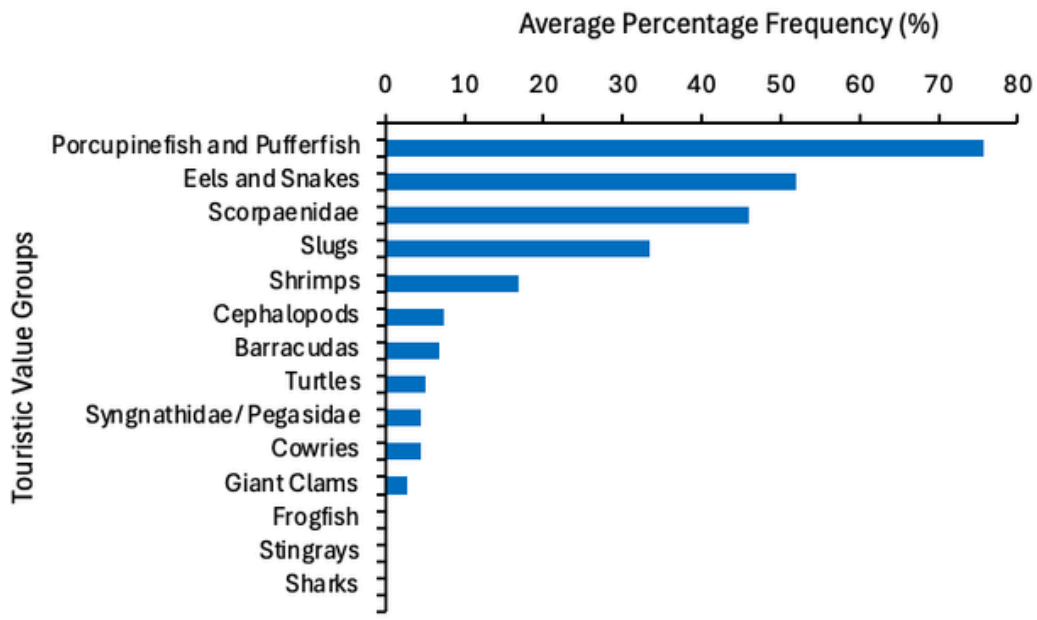
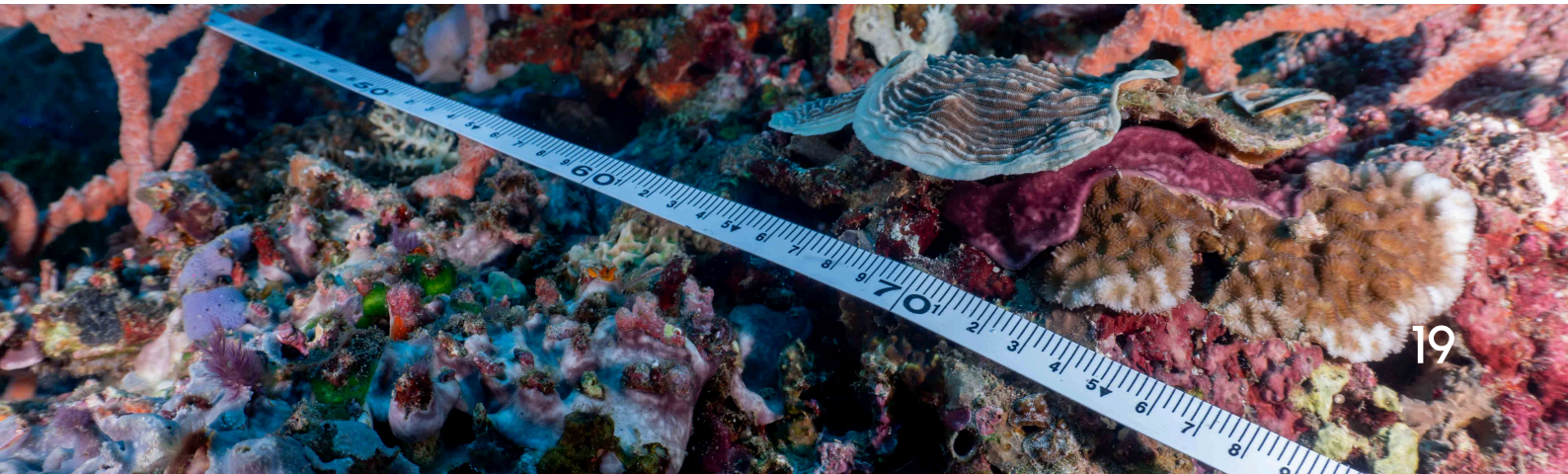


Figure 11. Sightings of high-value touristic species across the Santa Catalina Municipality during September–February 2025/26. Data is presented as the percentage of dives in which each group was recorded.

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

Management Suggestions

- Strengthen MPA establishment and demarcation
- Prioritise the expansion of MPAs in sites showing declining coral cover and low fish biomass
- Ensure clear boundary markings (buoys, signage) to improve compliance and awareness
- Increase patrol frequency (e.g. Bantay Dagat), particularly in areas with low commercial biomass and predator abundance
- Implement herbivore protection measures
- Consideration of temporary fishing restriction on herbivorous fish in sites of algal domination
- Protect key grazing species (e.g. surgeonfish, parrotfish) to support coral recovery and prevent algal growth
- Promote sediment and nutrient control measures (e.g., mangrove protection, improved drainage systems)
- Strengthen management of runoff from coastal development and river inputs, particularly where macroalgae is high, and coral cover is low
- Introduce or strengthen size limits and gear restrictions to allow fish to reach maturity and increase biomass
- Conduct regular beach and dive cleans
- Continue and exapnd monitoring
- Enhance community engagement and education
- Increase awareness of the importance of herbivores, MPAs, and reef health.
- Encourage alternative livelihoods to reduce fishing pressure on reef systems.
- Use of safe materials in artificial reefs: https://www.marineconservationphilippines.org/wp-content/uploads/2018/02/factors-and-principles-artificial-reef-creation.pdf
- Improve tourism management and focus on the collection of ticketing revenue for recreational water activities
- Reinvest revenue into enforcement, monitoring, and reef restoration.



Approximately 200 million tons of trash are currently circulating in our global oceans, with around 11 million tons added each year. The Philippines is responsible for approximately 2.7 million tons of plastic waste alone that is introduced into the sea.

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 September 2025 to February 2026 (Figure 12).

In addition, MCP conducted 8 beach and 9 dive cleans between September 2025 and February 2026, collecting a further 304.44 kg of trash, complementing Pro Ocean's ongoing efforts.

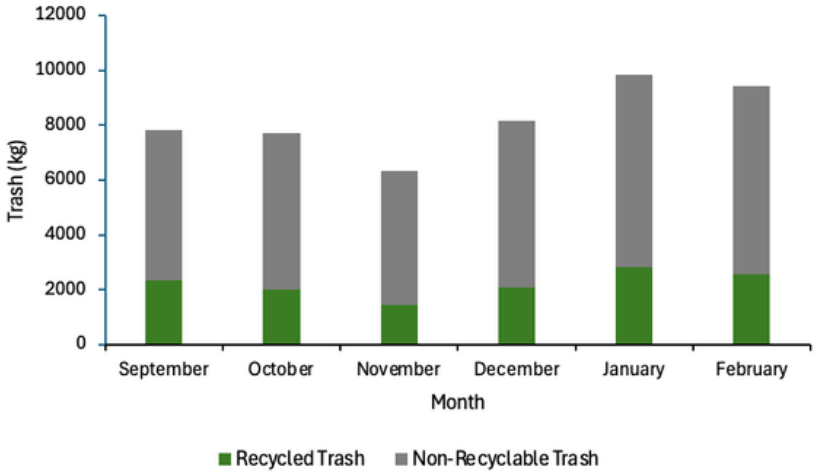


Figure 12. Monthly totals of recycled and non-recyclable trash (kg) collected by Pro Ocean during beach cleans along the Sibulan–Bayawan coastline, Sep–Feb 2025/26. Regular clean-up efforts play a key role in reducing the ecological impacts of marine debris in a region where plastic pollution poses a major threat to coastal ecosystems.

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

Invertebrate Monitoring

Our invertebrate surveys are conducted using a visual census method based on a 30-meter x 5-meter belt transect. All target invertebrates present or that enter the survey zone are identified, counted and sized.

The following is our complete invertebrate indicator list.

Echinoderms

- Sea Star
- Cushion Star
- Urchin
  - *Diadema*
  - *Rock Boring*
  - *Collector*
  - *Other*
- Sea Cucumber
  - *Black Spotted*
  - *Leopard*
  - *Pinkfish*
  - *Sandfish*
  - *Volcano*
  - *Amberfish*
  - *Magnum*
  - *Other*

Arthropods

- Cleaner Shrimp
  - *Banded Coral*
  - *Other*
- Harlequin Shrimp
- Other Shrimp
- Mantis Shrimp
- Lobster
- Crab

Gastropods

- Conch
  - *Scorpion Spider*
  - *Other*
- Turban
  - *Giant*
  - *Other*
- Top
  - Nilo
  - Other
- Triton's Trumpet
- Horned Helmet
- Cone Shell
- Cowrie
  - *Tiger*
  - *Common Egg*
  - *Other*
- Other Shell

Bivalves

- Giant Clam
- Giant Boring Clam
- Thorny Oyster
- Pearl Oyster
- Pen Oyster
- Honeycomb Oyster
- Scallop
- Other Bivalve

Slugs

- Nudibranch
- Headshield Slug
- Sapsucking Slug
- Flatworm

Cephalopods

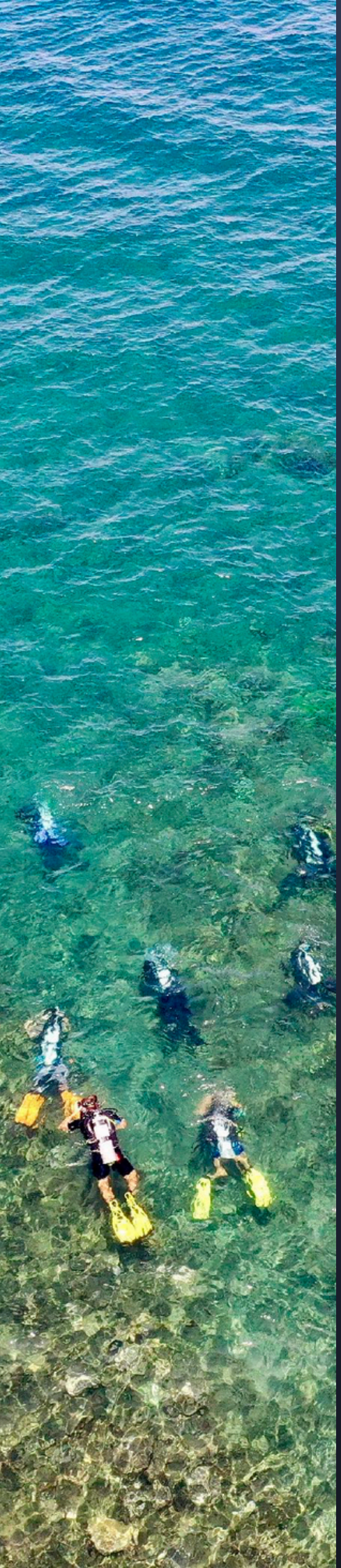
- Blue-ringed Octopus
- Other Octopus
- Cuttlefish
- Flamboyant Cuttlefish

Benthic Fish(Ish)

- Eel
- Ribbon Eel
- Pipefish
- Seahorse
- Frogfish
- Lionfish
- Scorpionfish
- Porcupinefish
- Blue Spotted Singray
- Blue Spotted Ribbontail Ray

Key:

- **Commercially Important Species**
- **Ecosystem Engineers**
- **Indicator Species (Reef Health & Diversity)**
- **Other Benthic Species**
- **Charismatic Species**



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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