

CORAL CAY
CONSERVATION



Expeditions

SOUTHERN LEYTE CORAL REEF CONSERVATION PROJECT

2002 - 2020

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Coral Cay Conservation
United Kingdom

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PROJECT INTRODUCTION

Coral Cay Conservation

Coral Cay Conservation is a renowned conservation specialist and expedition provider dedicated to developing resources for the protection, restoration and management of coral reefs and associated ecosystems. We are committed to creating real-time solutions to the many plights of the Oceans. Our mission is to:

“Provide resources to help sustain livelihoods and alleviate poverty through the protection, restoration and management of coral reefs and associated ecosystems”

Established in 1986, we have over 30 years of experience operating successful marine (and terrestrial) conservation projects. The Ocean, its inhabitants and the local communities that depend on valuable ecosystem services are at the centre of all our projects, acknowledging the necessity to give equal measure to scientific data collection, education and capacity building. Serving these three key themes, we operate under a citizen-science framework, providing crucial scientific, cultural and professional transfer scenarios that collectively protect biodiversity and increase ecosystem resilience whilst empowering local actors, resource managers and project participants. Those that join our projects contribute to our financing mechanism enabling the continual development of high-impact projects that

support capacity building and educational initiatives across local and national scales.

Since establishment, Coral Cay Conservation has operated in over 14 countries through the implementation of 17 mid to long-term projects. For all of our projects, we advocate best-practice through replicable and adaptable processes, operating under bottom-up frameworks with ecosystem-based and resilience-based practices.

Alongside working with local actors, we are continually active on both international and national platforms, collaborating with the global community and contributing to international agreements. This combination of local, national, and global action ensures the effective management of coral reefs, and associated ecosystems, for the prosperity of future generations.

The projects undertaken over our history have ranged from the Americas and Caribbean, through Europe and Africa to East Asia and the Pacific. Most recently, we have concluded projects in the Philippines, Montserrat (UKOT) and Cambodia with accomplishments including facilitating in the establishment of the UNESCO World Heritage Site Belize, the Danjungan Marine Reserve and Wildlife Sanctuary for Negros in the Philippines and multiple Marine Protected Areas (MPA) in Southern Leyte, Philippines (as reported hereforth).

The Southern Leyte Coral Reef Conservation Project

The Southern Leyte Coral Reef Conservation Project's (LRCP) inception in 2002 to secure the long-term benefits and services of coral reefs and associated ecosystems, saw Coral Cay Conservation protecting food-security and supporting livelihoods of the residents in the Southern Leyte province. The LRCP was established under a clear aim to:

“Enhance marine biodiversity and alleviate community poverty through the evaluation and restoration of coral reefs and associated ecosystems”

From 2002, the LRCP has instigated and concluded three phases, providing local

stakeholders, resource managers and project partners with valuable ecological data enabling decisive actions to challenge acute and chronic reef and coastal perturbations. The LRCP is built under a three-tiered framework, Resource Appraisal, Education & Outreach, and Capacity Building. These three key themes have actively built stakeholder capacity, provided the necessary tools and skills for autonomous management and raised awareness on the threats face by coral reefs to future generations of environmental stewards. Since establishment, Coral Cay Conservation has operated in over 14 countries through the implementation of 17 mid to long-term projects. For all of our projects, we advocate best-practice through replicable and adaptable processes, operating under bottom-up frameworks with ecosystem-based and resilience-based practices.



PROJECT PHASES

Phase I

The first phase of the LRCP was initiated in September 2002 following signed agreements between Coral Cay Conservation, the Philippines Reef and Rainforest Conservation Foundation Inc. (PRRCFI) and the provincial Government of Southern Leyte (PGSL). Under this agreement, the initial project time frame was expected to be three years. This time-frame saw multiple extensions with Phase I being concluded in 2012. Initially, the project was based in the municipality of Malitbog, west Sogod Bay, and subsequently re-located to Napantao, San Francisco (western coastline of Panaon Island). The key objectives of the project were:

We designed and refined our 'Baseline Survey Technique' that can be reviewed in greater detail [here](#). However, in summary, the protocol utilised a series of plot-less transects starting from a depth of 24m, perpendicular to the shoreline (Fig. 1). Systematically positioned every 500m along the coastline, the transects were surveyed by teams up to the reef crest (or shallow water). Each survey team recorded benthic composition and reef fish community composition from a pre-defined target list (composed of functionally and commercially important, and easily identifiable, organisms). Each species, coral lifeform and substrate category within each habitat type encountered



To undertake comprehensive assessments of coastal marine resources in Sogod Bay,



Collect quantitative information on ecologically and commercially important marine species,



Produce detailed coastal habitat maps for use as educational and planning tools for MPA designation,



To undertake community education and capacity building programmes in order to;

- Increase local awareness of marine environmental issues,
- Highlight the importance and economic benefits of MPAs,
- And to train PGSL employees in SCUBA and Marine surveying techniques,



And to undertake comprehensive assessments of coastal marine resources in Sogod Bay.

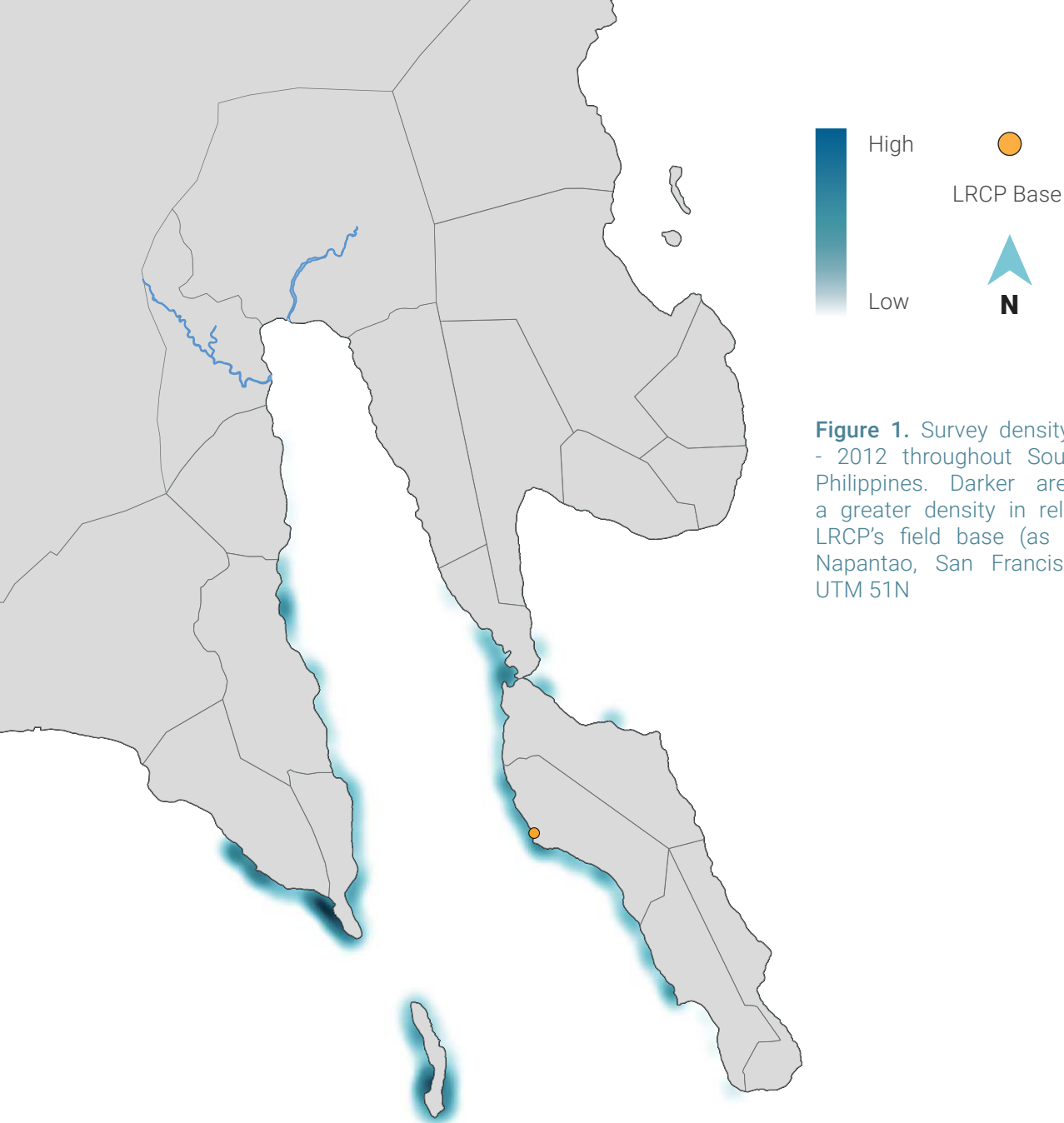


Figure 1. Survey density from 2002 - 2012 throughout Southern Leyte, Philippines. Darker areas indicate a greater density in relation to the LRCP's field base (as of 2008) in Napantao, San Francisco. WGS84: UTM 51N

was ultimately assigned an abundance rating from the DAFOR scale. In addition, Scleractinian hard corals were recorded as lifeforms and 36 target corals were identified to genus and/or species level. Reef fishes were generally identified to the family level (45 families) alongside 104 target species.

Throughout the Phase, 1,795 physical assessments were undertaken producing 2,061 habitat and species surveys. Overall, hard coral cover was higher towards the mouth of the bay, which was suspected to be a result of higher sediment input into the bay's head in the north. Coral diversity was very high in certain areas of the bay with a number of rare species recorded with 257 species identified overall.

A low abundance of commercially important fishes and invertebrate species indicated that there was severe overfishing of reef fish populations within Sogod Bay which followed the trend of fish stocks being considered to be both biologically and economically overfished in most areas of the Philippines.

The high diversity and abundance of reef-associated fishes and high live hard coral cover in existing fish sanctuaries, such as Napantao, and the four fish sanctuaries around Padre Burgos was highlighted as being encouraging but also extremely attractive to divers. The presence of Whale Sharks and other 'megafauna', such as turtles, sharks and marine mammals, indicated that there was

great potential for coastal and dive related tourism in the area, as well as the development of multiple MPA financing mechanisms, assuming it was managed in a sustainable manner.

Utilising five ecological indices, we were able to undertake intra-site comparisons to highlight key areas of ecological importance: the Conservation Management Value (CMV). The indices were used to produce CMVs were live hard coral cover, total number of benthic targets, total number of reef fishes, and the Shannon-Weiner Biodiversity index, for both benthic and reef targets. Review the results here.

In addition to the collection, and delivery, of baseline data, six MPAs were established from our recommendations and assessments in the barangays of Kawayan (Lbagon), Beunavista (Padre Burgos), Santa Sofia (Padre Burgos), Tangkaan (Padre Burgos), Lungsodaan (Padre Burgos) and Punta (San Francisco).

The conclusion of Phase 1 in 2012 demonstrated that it was highly successful and provided local stakeholders, project partners and resource managers with the vital data required to understand the ecological status of the coral reefs found within barangay and municipal waters. These crucial baseline data subsequently resulted in the establishment of Phase II.



Phase II

The second phase of the LRCP was undertaken between 2013 and 2018, following the successful completion of Phase I, and was founded under the objectives of developing local capacity and ensuring the long-term protection

and sustainable use of Southern Leyte's marine resources, through the establishment, and monitoring, of MPAs. Phase II was formulated with three core strategies;



conservation education for fisherfolk, schools, colleges and Local Government Units (LGU) of the Province



Capacity building of local stakeholders, LGU members and national citizens



Undertake biophysical surveys to provide spatial recommendations for the establishment of MPAs

From 2013 – 2018, teams of trained surveyors collected biophysical data from the reefs of Southern Leyte, at the request of the Provincial Government of Southern Leyte (PGSL) and the Provincial Environment and Natural Resources Management Offices (PENRMO). These data were utilised to provide recommendations for the establishment of small-scale MPAs, in support of Republic Act 8550 and Fisheries Code of 1998. Teams of surveyors were deployed from Coral Cay Conservation's field base to local barangays whose stakeholders, councils and/or LGUs had indicated a desire to instigate protection measures in their coastal waters. In contrast to Phase 1's systematic sampling protocol, Phase II was locally and spatially biased in nature. This removal of sampling framework enabled targeted assessments to guide highly-localised marine spatial management on much higher resolution scales. In addition to driving the establishment of MPAs, during Phase II, surveyors also implemented a long-term MPA monitoring sub-project focusing on the Napantao Fish Sanctuary. Data were collected from 2013 to 2020 from both inside and outside the MPA enabling a quantification of performance overtime.

The biophysical assessments of Southern Leyte during Phase II were conducted

utilising transect-based protocols through an amalgamated Reef Check method. Transects were laid parallel to the shoreline at depths ranging from 6 – 12m by trained volunteer survey teams (Fig. 2). Building on the Reef Check framework, additional target organisms and substrate categories were added that enabled the assessment of the following variables; fish density and diversity, commercially important fish abundance and biomass, invertebrate diversity and density, benthic impacts and substrate composition (including Scleractinian and reef building coral lifeforms).

Fish diversity and abundance data were collected using Underwater Visual Census (UVC) techniques and pre-defined fish families and species were recorded, recognised as being good indicators of fishing pressure, aquarium collection and reef health. The diversity and abundance of selected invertebrate families and species were also recorded along the same belt transect. Recorded species were typically targeted for food, collected as curios or important to the ecological balance of the reef. Two divers each recorded the abundance of target invertebrates 2.5m either side of the transect line while swimming in an S-shaped search pattern.

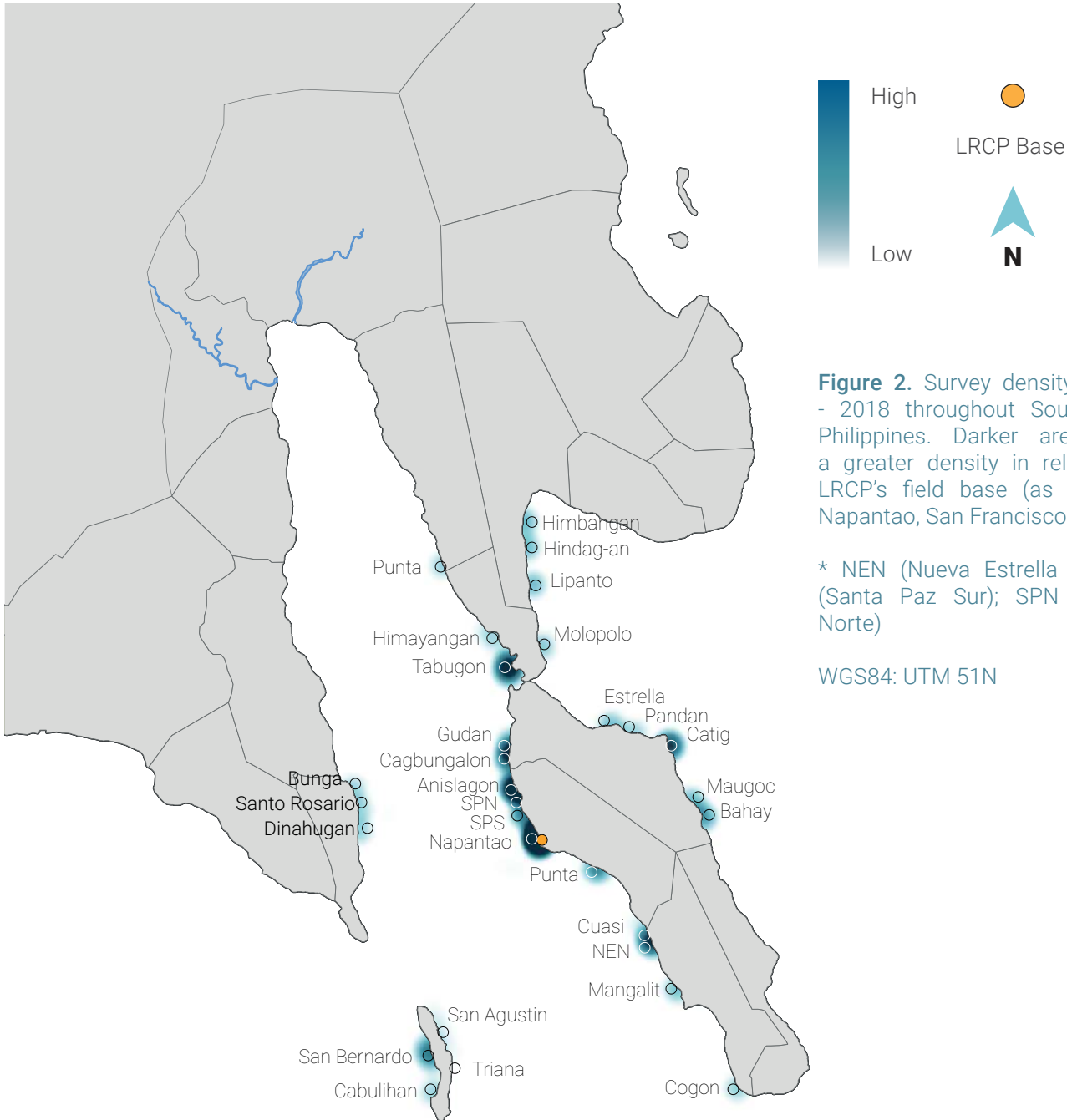


Figure 2. Survey density from 2012 - 2018 throughout Southern Leyte, Philippines. Darker areas indicate a greater density in relation to the LRCP's field base (as of 2008) in Napantao, San Francisco.

* NEN (Nueva Estrella Norte); SPS (Santa Paz Sur); SPN (Santa Paz Norte)

WGS84: UTM 51N

Within the same area assessed for invertebrates, divers recorded the observed impacts on the reef. The total percentage of bleached coral cover was estimated together with the percentage of bleaching on each individual bleached coral colony; indicating severity. Coral diseases were identified, where present, and recorded as a percentage of the colony infected. Damage was recorded in three categories: boat/anchor, dynamite and other, on an ordinal scale from 0 to 3 (0=none, 1=low, 2=medium, 3=high). The impact of trash was also recorded on the same scale and separated into general and fishing nets/traps.

Benthic diversity was measured by recording living and non-living substrate categories along a 'point-intercept' transect. Benthic categories included: sand, rock, rubble, silt/mud, nutrient indicator algae, sponge, recently

killed coral, soft coral, hard coral and any other sessile organisms. Hard corals were further grouped and analysed for abundance in three conservation classes: disturbance adapted fast growing corals (i.e. *Acropora* spp.); competitor corals (i.e. foliose and encrusting); and stress tolerant corals (i.e. massive and sub-massive).

Between 2012 - 2018, 107,527 individual fishes were recorded, equating to approximately 82 fishes per 20m segment sampled throughout Southern Leyte (Fig. 3). The most abundance fishes were Fusiliers, Cardinalfish and Anemonefish.

Those considered commercially important, Parrotfish, Snapper and Grouper, were recorded in low abundances throughout Phase II. Of the three, Parrotfish were the most abundant but

Table 1. The municipality, barangay and year surveyed by Coral Cay Conservation from 2012 - 2018 during the LRCP's Phase II noting if the survey was a component of an MPA assessment or recommendation technical report.

* Napantao was continually surveyed throughout Phase II and Phase II with temporal studies provided

Municipality	Barangay	Year of Survey	Recommendation / Assessment
Libagon	Punta	2017	Assessment
Liloan	Bahay	2012	Recommendation
	Cagbungalón	2014	Recommendation
	Catig	2015	Recommendation
	Estrella	2016	Recommendation
	Gudan	2015	Recommendation
	Himayangan	2015	Recommendation
	Maugoc (President Quezon)	2017	Recommendation
	Molopoló	2014	Recommendation
	Pandan	2016	Recommendation
	Tabugon	2013	Assessment
Limasawa		2018	Assessment
	Cabulihan	2017	Recommendation
	San Bernardo	2017	Recommendation
	Triana	2016	Recommendation
Padre Burgos	San Agustin	2013	Assessment
	Bunga	2016	Recommendation
	Dinahugan	2016	Recommendation
Pintuyan	Santo Rosario	2017	Recommendation
	Cogon	2017	Recommendation
	Manglit	2019	Recommendation
San Bernardo	Neuva Estrella Norte	2014	Recommendation
	Himbangan	2017	Assessment
	Hindag-an	2017	Assessment
San Francisco	Lipanto	2017	Assessment
	Cuasi	2016	Recommendation
	Santa Paz Sur	2013	Assessment
		2017	Assessment
	Anislagon	2016	Recommendation
	Napantao	2013 - 2019 *	Assessment
	Punta	2015	Assessment
	Santa Paz Norte	2013	Recommendation
		2019	Recommendation

were dominated by small individuals (0-10cm & 11-20cm). Grouper and Snapper were also dominated by small individuals but were absent on most surveys. No individuals over 50cm were recorded for all three commercial families.

Surveyed sites hosted 26% live hard coral cover (Fig. 3), however, this varied between sites ranging from 0% to 95%. Of the hard coral colonies recorded, Non-Acropora Branching, Non-Acropora Massive and Submassive lifeforms were the most dominant. Acropora Branching species were also recorded in notable abundances. Less than <1% of all colonies observed showed signs of bleaching throughout the survey period.

The low abundance of commercially important fishes indicated that there was severe over-fishing of the reef fish populations within Sogod Bay, supporting observed trends throughout the region, and country. However, the dominance of Hard Coral throughout the bay, minimal bleaching, and the presence of rare fauna, alongside the recorded diversity of

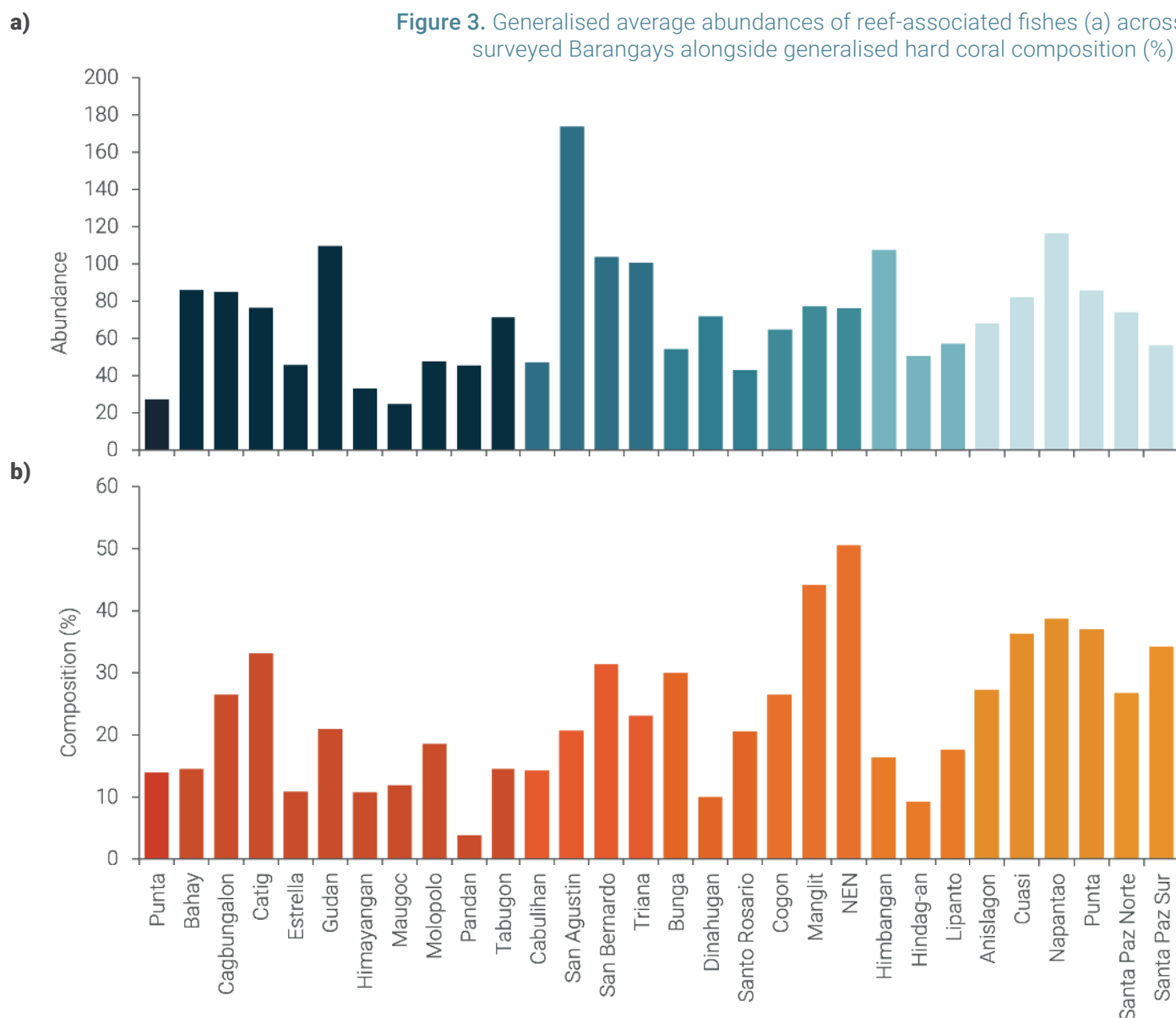
fish community assemblages, demonstrates that some reefs within Southern Leyte host a good ecological status.

A total of 5 sharks were observed throughout the 5 years of surveying, with 47 turtles, and 1 manta ray. No Bumphead Parrotfish were recorded however, 33 Humphead Wrasse were noted. Although not included in surveys, the presence of Whale Sharks was recorded. Their respective presence in the bay, alongside other rare fauna, such as turtles and Humphead Wrasse, indicated that there was great potential for coastal or dive related tourism in the area, assuming it is managed in a sustainable manner.

Throughout Phase II of the LRCP, a total of 30 independent Barangay coastal waters were surveyed, resulting in 21 recommendations for various marine spatial management actions being delivered to local governing units, regional government and local stakeholders (Table 1). Of those 21 recommendations, 52% were acted upon, leading to the generation of 10 protected areas being established within Sogod Bay.



Figure 3. Generalised average abundances of reef-associated fishes (a) across all surveyed Barangays alongside generalised hard coral composition (%) (b).



Phase III

Building on Phase II accomplishments, Phase III deployed a Before-After-Control-Impact (BACI) framework where previously surveyed barangays were re-sampled to understand the potential influence of MPA establishment on coral reef community assemblages.

Data were collected from Bahay, Catig, Nueva Estrella Norte, Anislagon, Cagbungalón and Gudan in 2018 and 2019. Nueva Estrella Norte, Bahay, and Catig were considered 'Impact' sites due to an MPA being established, with the remainder being 'Control' sites; where no MPA had been established.

In addition to standard protocols deployed in Phase II to collect biophysical data, additional meta-data and management effectiveness data were collected to support findings whilst aiming to highlight prospective barriers to MPA efficacy.

The data collected throughout this period are currently being analysed and we are aiming to publish our findings in 2021. In addition to the BACI framework, Punta (San Francisco), Tabugon (Liloan) and Napantao (San Francisco) were assessed with data on the performance of each MPA delivered to PENRMO and PGSL.

ESTABLISHED MPAS

Phases I and II concluded with the establishment of 16 MPAs in Southern Leyte, each with varying overall sizes, No-Take Zones (NTZ) and surrounding, or adjacent, Marine Reserves (MR) (Fig. 4). Six of the established MPAs were an output of Phase I and protected a total aggregated area of 652.79ha. This aggregate included 81.27ha of NTZ, where strict ordinance was instigated and absolutely no extraction of fishes, or invertebrates, was permitted. NTZs ranged from 4.13ha (Kawayan) to 30ha (Beunavista), accounting for 12% of the total area protected from 2002 - 2012. Phase I contributed 16% of the overall protected area in province, as of 2020.

The remaining 10 MPAs were established as a result of efforts by survey teams and CCC field-staff in Phase II, from 2012 - 2018. In total, 908.56ha of coral reef were protected, composed of 256.15ha of NTZ (28%). Ranging from 10.13ha to 46.65ha, on average, the NTZs established from Phase II were smaller than those from Phase I. Despite this, Phase II MPAs protected a greater accumulative area, contributing to 22% of the overall protection within Southern Leyte (Table 2).

The combination of efforts between both phases saw the establishment of crucial areas of protection with two notable accomplishments.

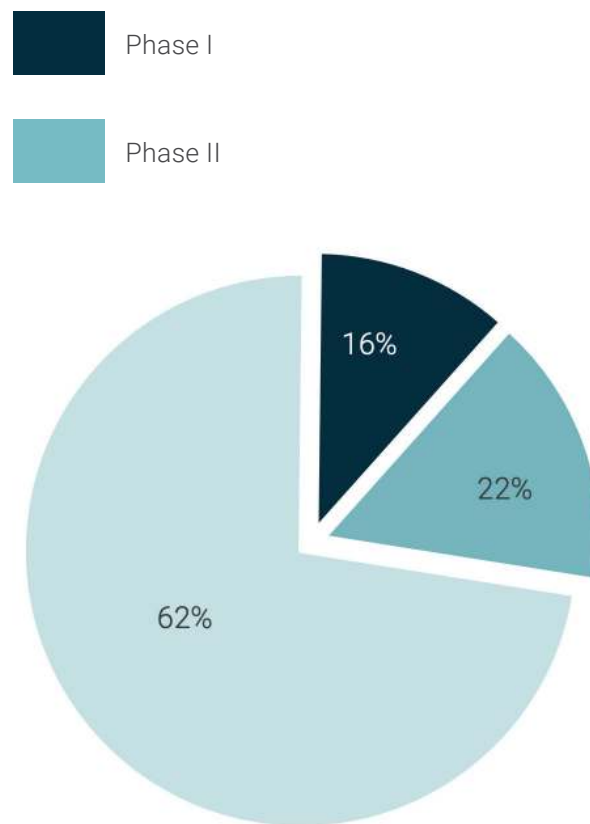
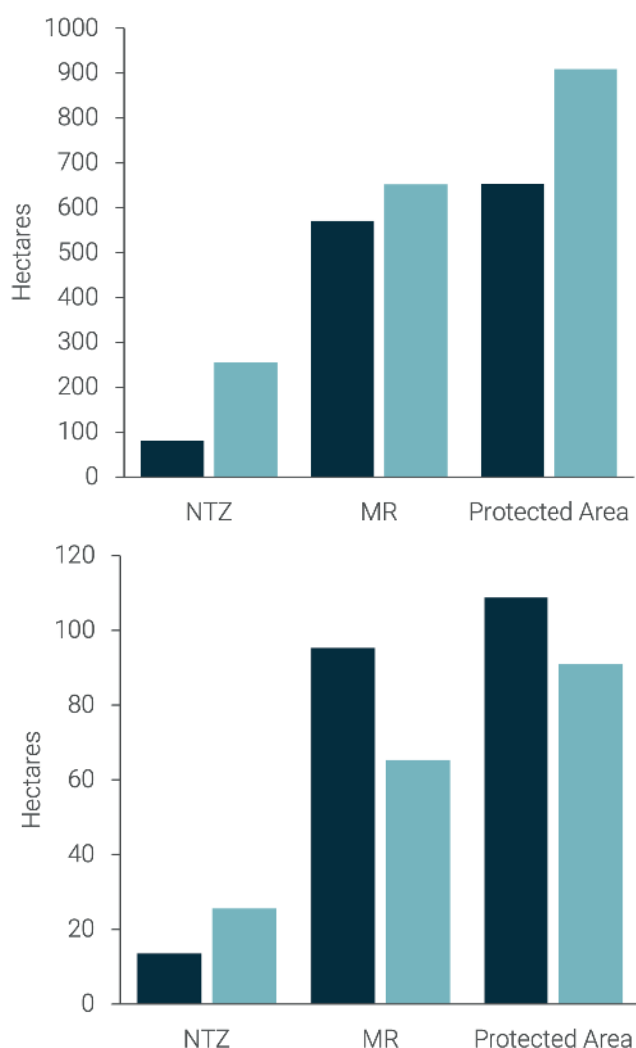
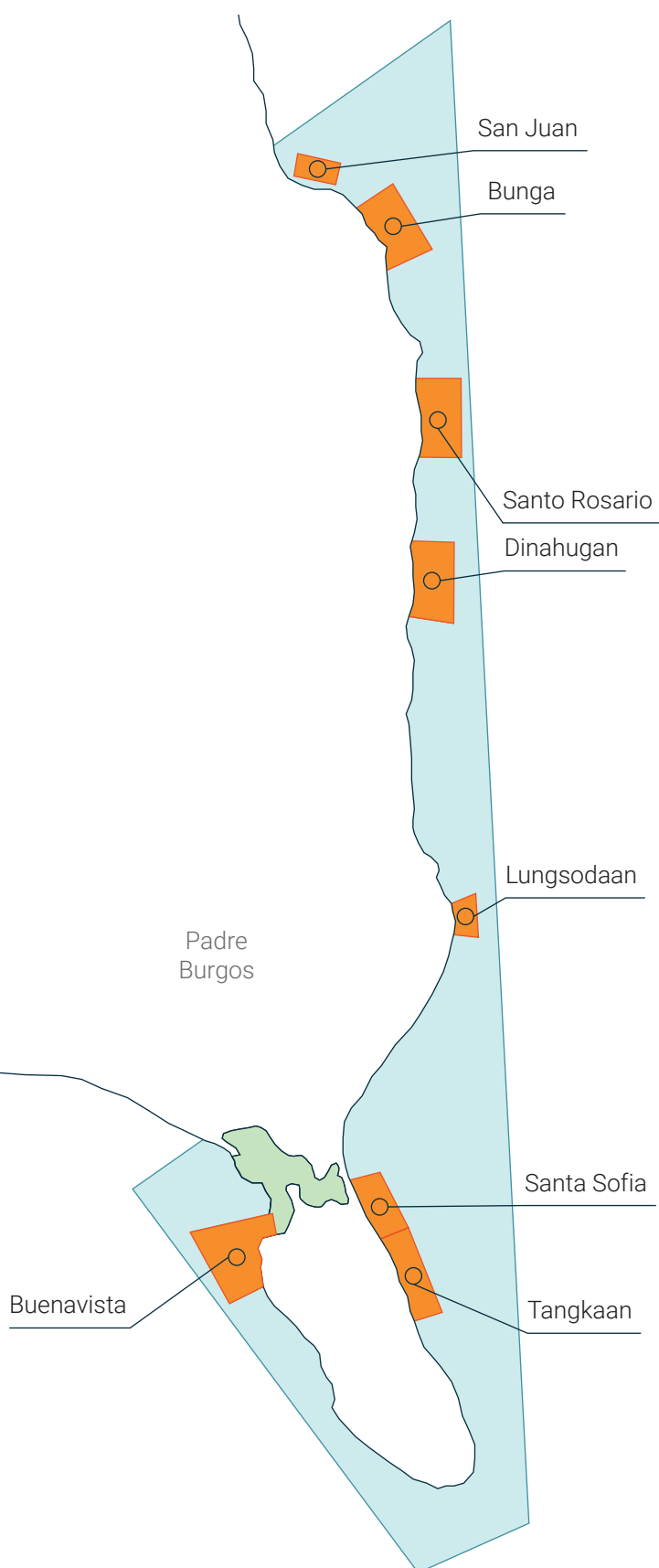


Figure 4. Phase I and II of the LRCP saw substitutional contributions to the overall protected area of Southern Leyte with varying total protected area within each Phase. Mean size (ha) of MPAs established in each Phases is given.

As a result of the high number of MPAs established in Municipality Padre Burgos (7), local government units alongside provincial government and stakeholders, adopted a municipal wide protected area (984.44ha) that enveloped the seven established NTZ, with an aggregated protected area of 138.87ha. In 2021, PENRMO are continuing consultations for other municipalities to adopt this approach throughout Southern Leyte utilising CCC's data.



Although not a municipal-wide instigation of protection, a collaborative approach to the conservation of coral reefs, and safeguarding ecosystem services, was exemplified between barangays President Quezon (Maugoc) and Bahay in 2018 following the agreement to join both pre-existing MPAs (est. 2016) with an extensive area (80.41ha) of Marine Reserve. This decision, coupled with Bahay's already large marine reserve (70.15ha), resulted in over 200ha of coral reef and important habitat protected.

President Quezon's NTZ is slightly smaller than Bahay's (27.31ha), at 22.64ha and is positioned to the south of Barangay. Both MPAs were established in 2016 following consultation processes utilising the data collected during spatial assessments.

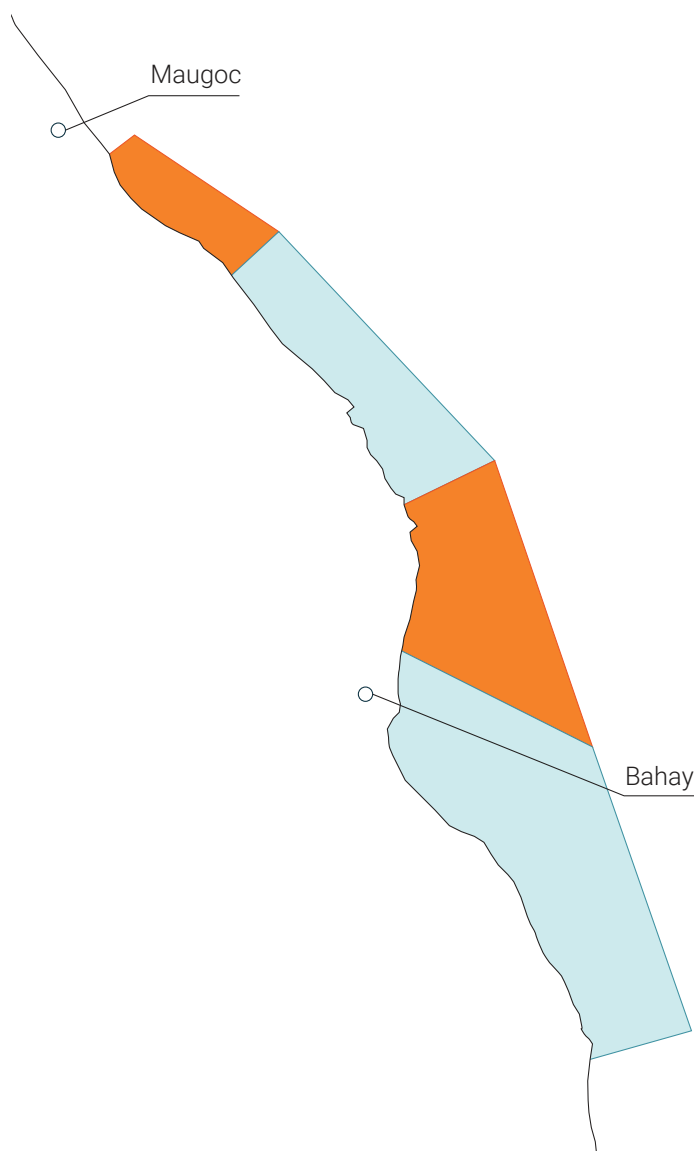
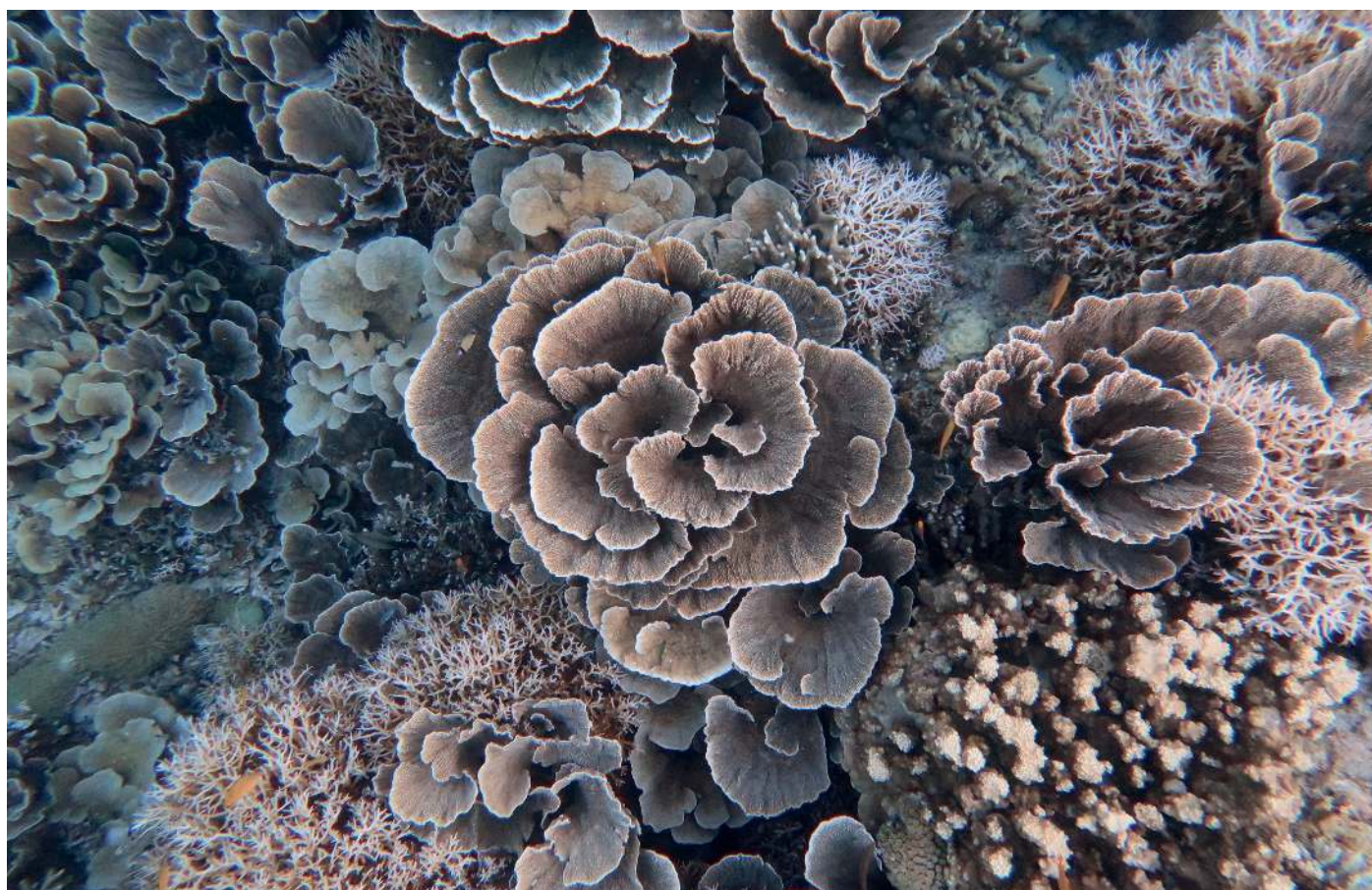


Table 2. Ordinance and spatial characteristics of all the MPAs that CCC assisted in establishment throughout Phase I ⁽¹⁾ and Phase II ⁽²⁾. * includes aggregated area from San Juan MPA that CCC did not facilitate in its instigation

Municipality	Barangay	Established	NTZ	MR	MPA
Libagon	Kawayan ¹	2015	4.13	3.52	7.65
Liloan	Bahay ²	2016	27.31	70.15	97.46
	Catig ²	2017	26.01	46.22	72.23
	Maugoc (President Quezon) ²	2016	22.64	80.41	103.05
Limasawa	Cabulihan ²	2019	46.65	9.05	55.70
	San Bernardo ²	2019	31.16	8.92	40.08
	Triana ²	2019	27.64	9.26	36.90
Padre Burgos	Bunga ²	2018	21.36	984.44 *	1122.81 *
	Dinahugan ²	2018	21.32		
	Santo Rosario ²	2018	21.93		
	Beunavista ¹	2005	30.00		
	Santa Sofia ¹	2005	13.99		
	Tangkaan ¹	2005	16.90		
	Lungsodaan ¹	2005	6.20		
Pintuyan	Neuva Estrella Norte ²	2016	10.13	6.50	16.63
San Francisco	Punta ¹	2009	10.05	5.46	15.51



CORAL REEF IMPACTS

At each survey site, alongside the collection of fish, invertebrate and substrate data, teams of trained surveyors also recorded site-level impacts. These ranged from biotic to abiotic including anthropogenic direct impacts such as discarded fishing gear and waste (plastic etc.). Five of the impacts recorded are ranked on an ordinal scale (0 - 3), enabling surveyors to grade each segment from transects positioned across the survey area. For example, where no incidences or 'pieces' (such as waste) were recorded, the surveyed section was awarded a '0' where as sections with 'High' levels of impact, presented >5 incidences or 'pieces' (Fig. 5).

In addition to this ordinal system, biotic impacts were recorded on a proportional basis. Surveyors recorded the composition of Black

Band Disease and White Band Disease as a proportion of the colonies affected across each surveyed section. The level of bleaching on hard corals was recorded across two scales; proportion of the population that exhibited bleaching and, on average, the proportion of each colony that was bleached. These two metrics enabled the contextualisation of the amount, and severity, of bleaching within the surveyed area. On average, 2% of hard corals across a surveyed section were bleached with an average of 20% per colony (Fig. 5b & c). Incidences of disease were minimal (1 - 2%).

Reviewing the incidences and the severity of each impact across the project period, from 2013, provides an insight into the most prevalent impacts throughout the province.

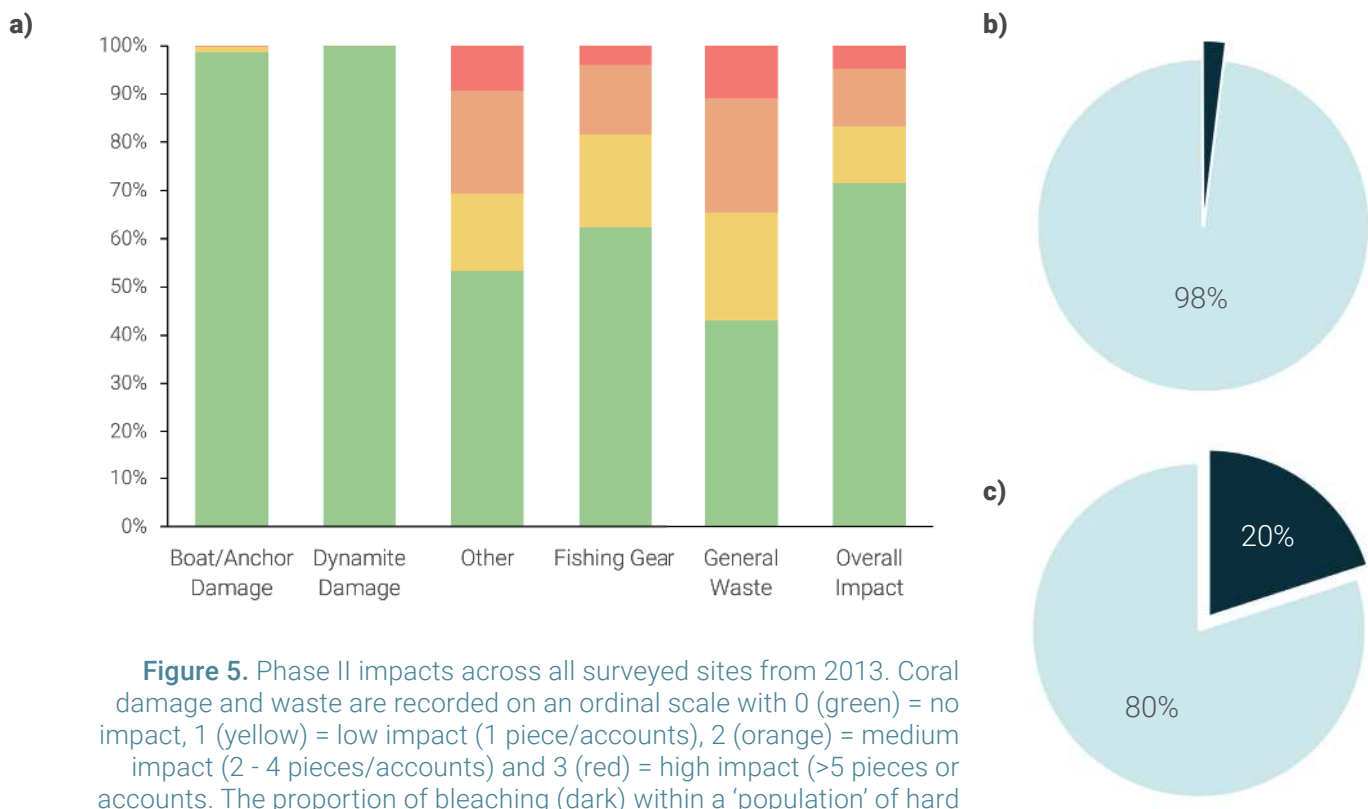


Figure 5. Phase II impacts across all surveyed sites from 2013. Coral damage and waste are recorded on an ordinal scale with 0 (green) = no impact, 1 (yellow) = low impact (1 piece/accounts), 2 (orange) = medium impact (2 - 4 pieces/accounts) and 3 (red) = high impact (>5 pieces or accounts). The proportion of bleaching (dark) within a 'population' of hard coral colonies (b) and as an average of each sampled colony (c) across each surveyed section was also recorded.



EDUCATION & CAPACITY BUILDING

We understand that successful conservation hinges on a holistic approach where equal measure is given to the collection of scientific data, education, and capacity building. And as such, it is our belief that marine conservation goes hand in hand with education and economic development.

Throughout the LRCP, great emphasis was placed into outreach efforts and engaging with stakeholders, students, and resource managers alike, aiming to inspire communities to challenge detrimental activities and adopt sustainable practices. Since the project's inception in 2002, thousands of children, students and adults have been provided with a better understanding of the marine environment, knowledge about resource management and sustainable practices.

Coral Cay Conservation aims to alter perceptions by raising awareness and inspiring future generations and as a result, hopes to overcome the often encountered social and traditional barriers to conservation success, incorporating sustainability and a sense of ownership for the marine environment.

Throughout the project's time frame, staff, volunteers and scholars have engaged with students and children through a range of initiatives, including our Sea Star Environmental Award Scheme (SEAS) for schools, Reef Rangers and Community Days (Fig. 6). In addition to these, Coral Cay Conservation were regularly invited to speak at events such as MPA planning and steering committees, community tree planting (hosted by the Mayor of San Francisco), and large-scale sports day events on Limasawa as well as Eco-Brick workshops (LEFT).

Utilising a range of events, environments and

initiatives, it enabled engagement with a wide range of audiences across an equally diverse set of topics, from marine ecology and coral reef management to plastic pollution mitigation and ecotourism best-practices (Fig 7 & 8).

SEAS

We developed the SEAS programme to provide a graded education initiative that would facilitate in the delivery of manageable topic components depending on student experience. The programme entailed staff and volunteers going into schools and supplying educational materials through a three-tiered framework that aimed to develop sustainable partnerships by building an environmentally aware culture among the young people of Southern Leyte. Throughout the programme, each school had to complete specific objectives in order to reach the next level (Bronze, Silver and Gold). The completion of the gold SEAS award depended on the school developing and establishing an Ecological Committee that carries on the CCC ethos of marine conservation.

Reef Rangers

Reef Rangers was designed to provide students with practical experiences where marine ecology theoretical lessons could be translated onto the reef. School students were welcomed to our project site for a day and would, in the morning, be introduced to coral reefs, their services and respective management alongside simple species identification of fish, corals and conspicuous invertebrates.

In the afternoon, and a plunge tank try breathing underwater with a SCUBA tank, the students were taken onto Napantao reef by our teams to put everything they had learnt that morning into practice!

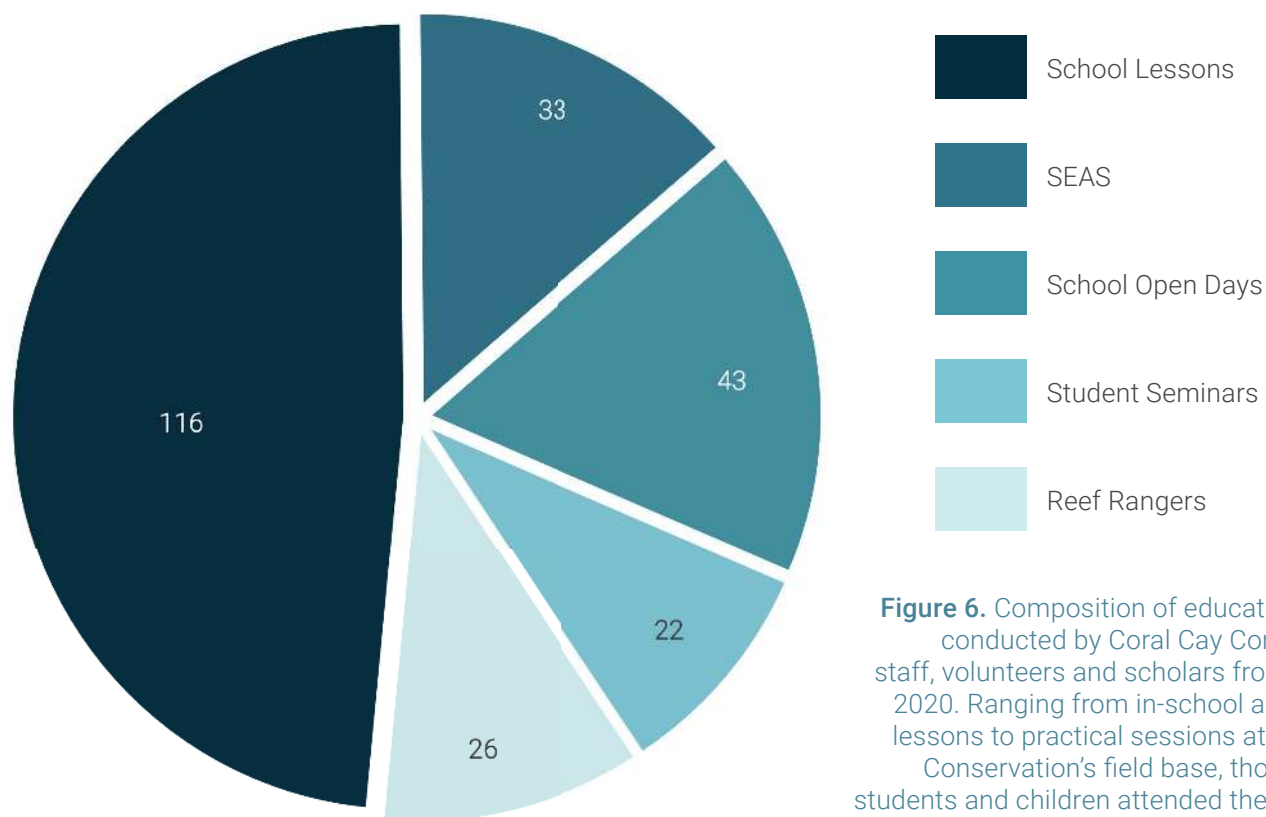


Figure 6. Composition of education events conducted by Coral Cay Conservation staff, volunteers and scholars from 2002 to 2020. Ranging from in-school and college lessons to practical sessions at Coral Cay Conservation's field base, thousands of students and children attended these events.

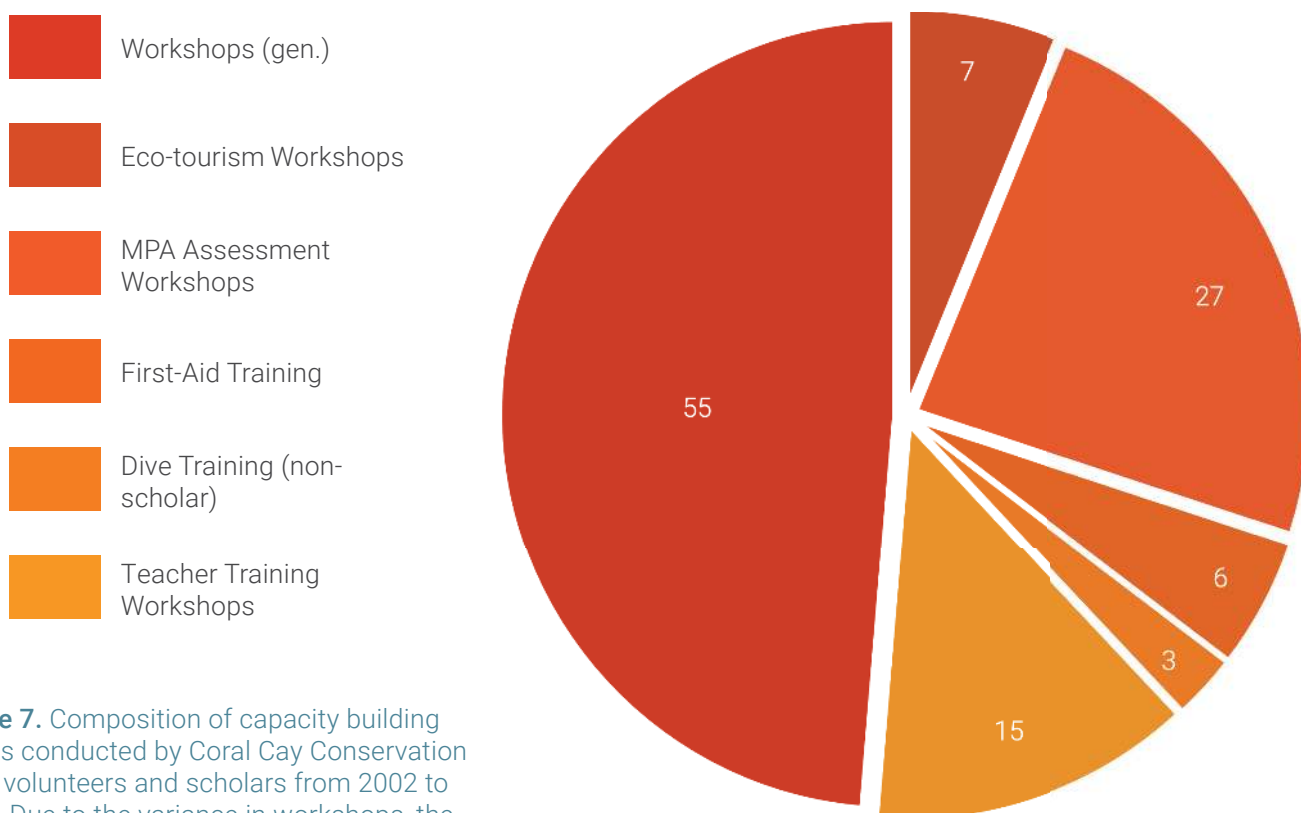


Figure 7. Composition of capacity building events conducted by Coral Cay Conservation staff, volunteers and scholars from 2002 to 2020. Due to the variance in workshops, the majority were amalgamated (Workshops (gen.)) to provide a clear summary. These included Thresher Shark Workshops, resource management and Bantay Dagat.

In addition to education and outreach activities, capacity building efforts were integral to the project. These capacity building initiatives were provided for community members, local and provincial government persons, MPA managers and teachers.

The aim was to build ample capacity within the project's focus area in resource management, MPA monitoring and environmental education that by the conclusion of the project our services would no longer be needed. One of the key formats to supply resources were Workshops. These were highly diverse and often we were driven by the requirements of the community. Most common workshops included the discussion and implementation of MPAs from collected data, alongside how to effectively manage MPAs and best-practices in ecotourism; specifically focusing on diving and whalesharks. There were even workshops delivered to fisherfolk on Limasawa to improve fisheries and mitigate detrimental impacts to Thresher Sharks.

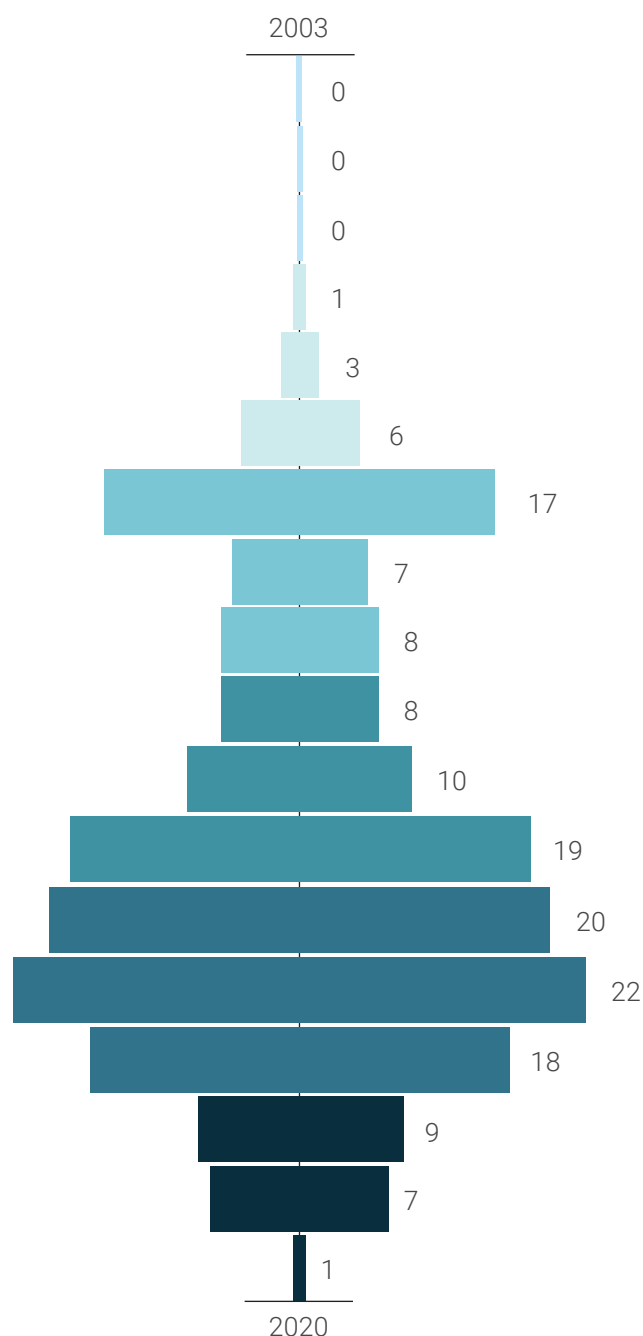
Teacher training workshops were essential and we conducted 15 in total over the project. Whilst education and outreach were critical actions by project personnel, it was essential that we supplied the necessary tools and resources for local teachers within the province to integrate an environmental ethos throughout their teaching curriculum. Whilst this enabled environmental-focused education to continue when Coral Cay Conservation staff were not available but cemented a permanent ethos within schools and amongst students.

Our most successful capacity building programme, however, was our Scholarship Programme. The programme provided opportunities for any Filipino national to join the expedition team at our field base and receive training, with no expedition fees accrued, with the aim to build the necessary skills to undertake coral reef monitoring within regions of the Philippines outside of our remit.

A full four-week training course included the following:

- Introduction to coral reef ecology and biology
- Fish, coral and invertebrate species identification
- Ecological survey techniques
- Data handling skills
- Hands on conservation experience
- Reef Check Eco-diver certification

Scholars were invited from across the Philippines with priority given to residents of Southern Leyte. From 2003 to 2020, **155** scholars graduated from the programme:



- PADI dive training to Advanced Open Water

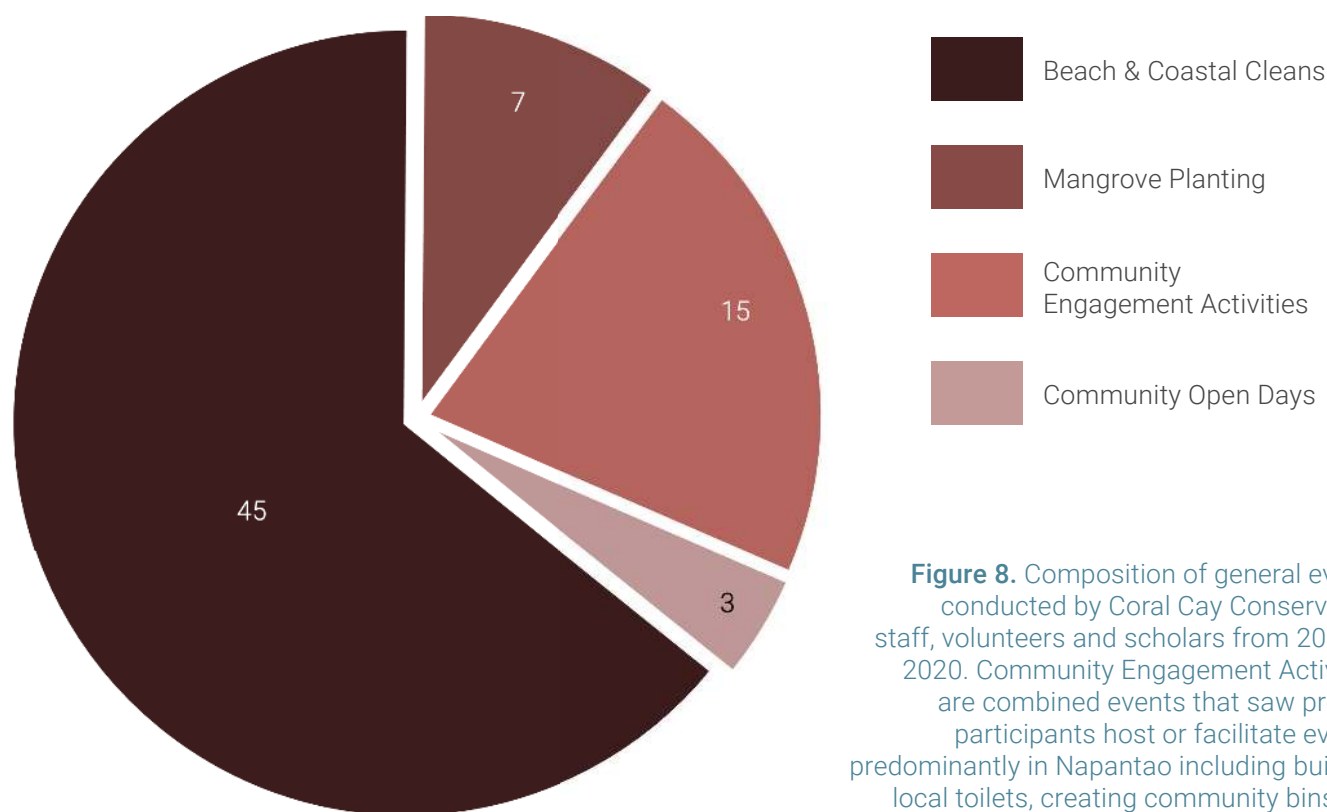


Figure 8. Composition of general events conducted by Coral Cay Conservation staff, volunteers and scholars from 2002 to 2020. Community Engagement Activities are combined events that saw protect participants host or facilitate events, predominantly in Napantao including building local toilets, creating community bins and school work.

Community engagement events, whether mangrove planting, large-scale beach cleans or opening our field site for local stakeholders, were the perfect opportunity to develop strong relationships with the local user group, fisherfolk and resource managers.

Establishing a strong presence within Southern Leyte was crucial in the project's success whilst fostering collective actions to protect and restore the natural resources of Southern Leyte. Coral Cay Conservation would regularly host and facilitate in beach and coastal cleans with large events held on significant days such as World Oceans Day or Earth Day, for example. Since 2003, 45 beach cleans were conducted with some collecting over 600kg of plastic, waste, discarded fishing gear in one day!

Community engagement activities include a diverse range of events from working with school children in Napantao to building relationships between local communities and international schools by building crucial infrastructure with communities such as outdoor toilets for

typhoon shelters.

In recent years, we welcomed international schools to our project base, in coordination with Adventure Lifesigns. In 2019, we welcomed two schools to the project; The Holt School & George Abbot.

The Holt School joined us in Summer 2019 and worked alongside our staff and community members to build much-needed infrastructure for our local barangay, Napantao. In an attempt to reduce the amount of plastic entering the Ocean, the team collected plastics from local beaches and spent many hours building Ecobricks. These Ecobricks were then utilised as the key building material for a communal toilet in the Barangay's hurricane shelter; an essential addition to ensure accessible sanitation for community members. Throughout its construction, The Holt School students engaged with local students and schools, assisting in lessons focused on the marine world and the mesmerizing fauna that habituate it.



PUBLICATIONS & TECHNICAL REPORTS

From 2002 to 2020, the following publications and technical reports were produced. All are available for download [here](#).

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DATA & COLLABORATIONS

All the data collected during the project are available upon request and we welcome further study. We provide support to university students, both undergraduate and post-graduate, alongside independent researchers as well as collaborative studies with other organisations. If you would like to request access or discuss a prospective project that utilise these data, then please email info@coralcay.org

At Coral Cay Conservation, we aim to be transparent in our data processes and feel that it is important to demonstrate, to project

participants, where the data that they worked so hard to collect are used. Beyond being utilised to develop recommendations for the establishment of MPAs or to monitor efficacy, over the years the data have been utilised to establish partnerships and facilitate other initiatives. These included supporting global initiatives, providing representation to Southern Leyte on global platforms or utilising data to help guide and promote international policy as well as new and emerging approaches in conservation. We've included a few logos of some data destinations.



ALLEN CORAL ATLAS



A BIG THANK-YOU

Coral Cay Conservation, and the Southern Leyte Coral Reef Conservation Project, could have only been successful in protecting coral reefs and supporting local communities through our devoted volunteer, scholar and staff network. This network of conservation advocates and multi-faceted collaborations within a local, national and international capacity that current, and future, stressors can be challenged, mitigated and remediated, taking actions to ensure the sustainability for current and future generations.

We would like to extend our gratitude to each staff member, volunteer, scholar, local partner, project partner, barangay council, local government unit, school teachers, student, and provincial partner for your support, guidance and work throughout this project. Without your involvement, the project would not have been able to achieve so much and impact so many within Southern Leyte.



CORAL CAY
CONSERVATION



Expeditions