
Capacity Building for Coastal Biodiversity Assessment

Mawtin Coast Partnership, Myanmar
Overview and Program Outcomes 2016 to 2020



The Capacity Building for Coastal Biodiversity Assessment Partnership is a collaboration between Fauna & Flora International and the marine science departments of Myanmar’s universities.

The Partnership aims to build the skills and knowledge of the Myanmar university marine science staff and students by training in coastal survey techniques, undertaking marine biodiversity baseline assessments, and managing and reporting on collected data. In addition, the universities are assisted in conducting independent research of the coastal and marine habitats of the Mawtin Coast, Ayeyarwady Region, Myanmar.

This publication showcases the capacity-building activities of the partnership from its inception in early 2016 (Phase I), through to completion of Phase II, and now in 2020, the commencement of Phase III. The biodiversity and habitat data collected are detailed in a separate technical report. This 2020 highlights brochure provides an overview and key outcomes of the partnership.

Cover:
Mangroves near Nga Yoke Kaung
(Grace Frank/FFI)

Inside cover:
Snorkelling training, Myeik
(Sue Murray-Jones/FFI)

ABOUT US



Established in 1903, Fauna & Flora International (FFI) is the world's longest established international conservation organisation.

Our mission is clear: to conserve threatened species and ecosystems worldwide, choosing solutions that are sustainable, based on sound science, and take into account human needs.

With over 140 projects in more than 40 countries, we work with local partners to ensure that biodiversity is conserved effectively by the people who live closest

to it, and is supported by the global community. We do this by working closely with local people to design strategies that are smart, sustainable and appropriate for communities.

Since 2006, we have proudly assisted Myanmar's communities to strengthen local participation in biodiversity conservation, establish scientific data collection and conservation projects (in both land and marine areas), and comprehensively assess key coastal habitats throughout the Myeik Archipelago.

We work alongside local communities and the Department of Fisheries to facilitate Myanmar's first Locally Managed Marine Areas (LMMAs).

By working closely with local communities, non-government organisations, governments, universities and industry, we have achieved large-scale conservation gains.

To learn more, visit www.fauna-flora.org



Countries in which FFI operates



Moken fishermen and children learning fish identification (Robert Howard/FFI)

OUR KEY PARTNERS

The Capacity Building for Coastal Biodiversity Assessment Partnership is a collaboration between FFI and all of the university marine science departments of Myanmar: Pathein (Ayeyarwady Region); Mawlamyine (Mon State); Myeik (Tanintharyi Region); and Sittway University (Rakhine State).

The Partnership has provided training and science equipment, as well as facilitated a small grants scheme to the four marine science departments to enable students and staff to increase their capacity and capability to quantify, document and conserve Myanmar's marine resources. The heads of the marine science departments play a pivotal role in supporting and developing the Partnership, outlining skill gaps, training and equipment needs, as well as supporting training and research efforts.

“As head of department, I'm pleased to see that the students and staff have improved in various fields of study in marine coastal resources after collaboration with FFI”.

- Professor Cherry Aung, Head of the Marine Science Department, Pathein University



Pathein University

The Marine Science Department of Pathein University was founded in 2002. Pathein has 24 staff members, with 16 master's students enrolled and 160 undergraduate students. Professor Cherry Aung has been Head of the Marine Science Department at Pathein University since 2015, and this partnership would not have been possible without her constant support and enthusiasm. U Htay Aung, retired Head of Department, has also been invaluable in assisting us with this project.



Professor Cherry Aung diving at White Sand Island, Chaung Tha (Ju Ko Ko Thet/Pathein University)



Myeik University

The Marine Science Department at Myeik University was established in 2002, and has 220 students, including seven master's students, with 23 staff. Professor Nyo Nyo Tun has been Head of Department since 2016. Prof. Nyo Nyo Tun is a collaborator with FFI's Tanintharyi Ridge-to-Reef project, as well as the Coastal Biodiversity Partnership. Myeik staff have been particularly enthusiastic about the training opportunities offered to them.



Professor Nyo Nyo Tun
(provided by Myeik University)



Sittway University

The Marine Science Department of Sittway University was established in December 2018, with Associate Professor Mya Kyawt Wai as head. The Department currently has 18 staff and 27 undergraduates. At this early stage there are no master's students. Most staff initially sent to set up the new department were from Patheingyi University, and nearly all had participated in training offered by the Coastal Biodiversity Partnership. Building on the capacity training staff received, the Partnership responded to a request for further support in the form of science equipment (laboratory and field), as well as the opportunity to participate in training courses held at Patheingyi and Myeik Universities.



Assoc. Professor Mya Kyawt Wai
(provided by Sittway University)



Mawlamyine University

The oldest and the largest Marine Science Department in Myanmar was founded at Mawlamyine University in 1986. Mawlamyine is the only university where students can undertake the coursework component of a marine science PhD. The department has around 400 students (350 undergraduates, 29 PhD candidates and 23 MSc students), with 27 academic staff. Professor San Tha Tun has been Head of Marine Science at Mawlamyine University since 2015.



Department of Fisheries

The Myanmar Department of Fisheries (DoF) is tasked with managing both marine and freshwater fisheries. FFI works with the DoF to conserve marine and freshwater species, ecosystems and environmental services. The DoF assists in obtaining the necessary permissions needed for our fieldwork. Over the duration of the partnership, fisheries officers have participated in much of the fieldwork and received field-based training in snorkelling, habitat mapping and many other field survey techniques.

“Training gives teachers and students fieldwork experience. Moreover, these experiences are effective in teaching and learning. After training, trainees share their experience and knowledge to teachers and students in the Marine Science Department... Thank you so much FFI for supporting our new Department”

- Associate Professor Mya Kyawt Wai, Head, Sittway University Marine Science Department

OUR GOALS

The Capacity Building for Coastal Biodiversity Assessment Partnership has two main goals:

1

to provide training and support for university staff and students of the marine science departments in Myanmar to conduct coastal and marine field research; and

2

to establish long-term monitoring sites and conduct the first baseline biodiversity assessments for the coral reefs, seagrass meadows and mangrove habitats of the Mawtin coast, Ayeyarwady Region, Myanmar, using international survey methods.

The Partnership was established in 2016 and will continue into 2021. Implementation has been in two phases to date with a third commencing in the second half of 2020.

Phase I (2016 -2017)

We focussed on developing relationships with the marine science departments and various government organisations, as well as building capacity. We conducted preliminary explorations of the habitats of the Mawtin coast.



(Salai Mon Nyi Nyi Lin/FFI)

Phase II (2017-2020)

We built upon the groundwork laid down in Phase I. We focussed more on building capacity in marine science skills, providing training in swimming and snorkelling, English, computer skills, first aid, international habitat survey techniques and mapping, as well as ecological methods, data analysis and scientific writing.

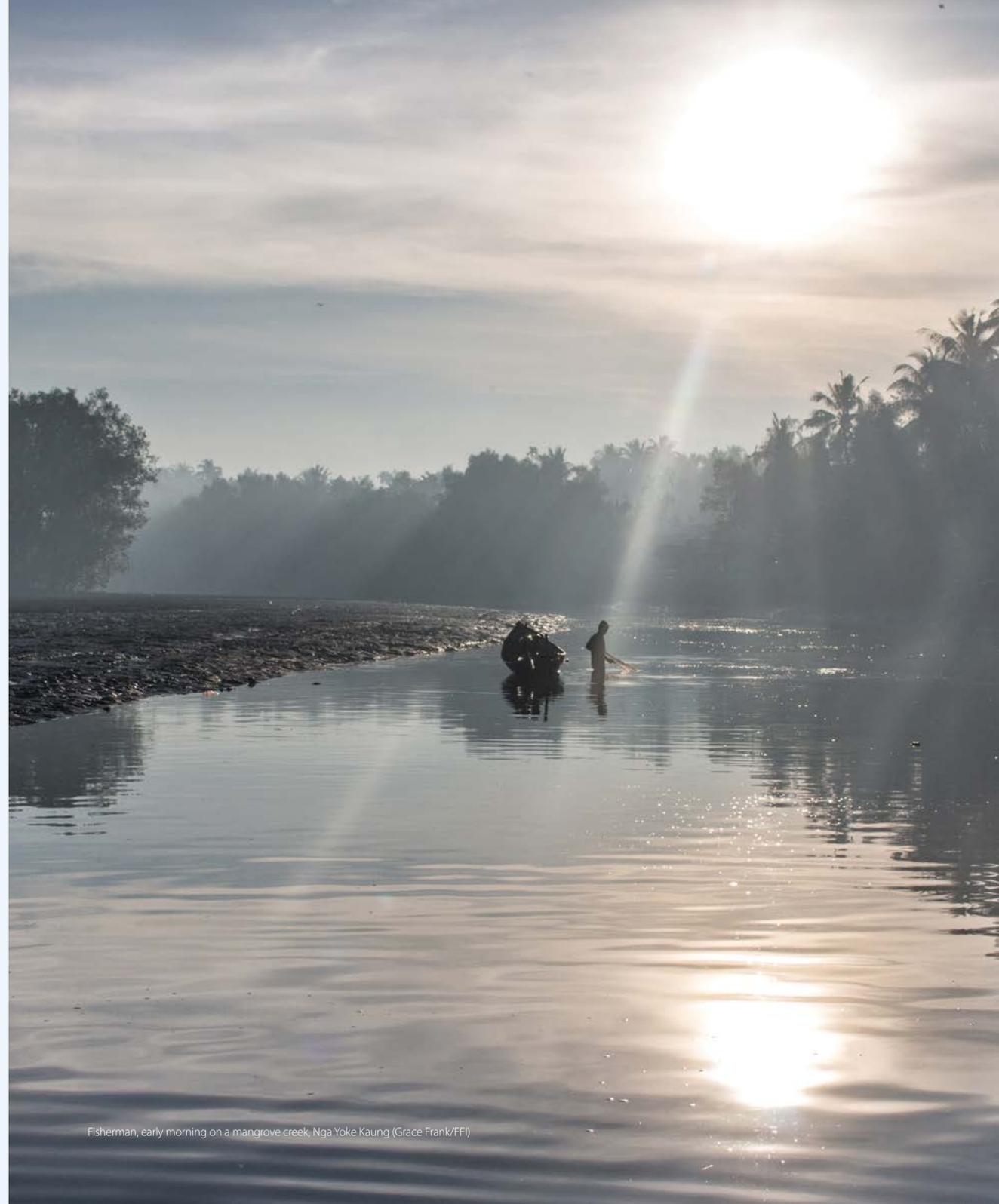
In Myanmar, staff are regularly rotated between the universities, which meant that, while we had trained a large cohort of staff at Patheingyi in 2016, there were few people with skills such as diving and habitat assessment methods available to do surveys. Hence, we extended training to all the universities with marine science departments to build capacity amongst a wider cohort of Myanmar marine science staff and students, and to ensure a core group of trained staff to pass on the knowledge and skills to students.

We also developed a small grants scheme, which allowed us to focus our research training towards supporting staff and students to conduct their own independent field-based research. The grants are specifically aimed towards fostering the next generation of national marine scientists. We provide targeted training for participants in field research, data collection methods, basic water safety and first aid, as well as scientific writing, budgeting, data management and analysis, alongside training and resources for specific projects.

Based on our preliminary field data, we established long-term monitoring sites for the areas we identified as having high ecological value. We continued to use national and overseas experts in conjunction with trained Myanmar personnel to provide training and collect data.

Phase III (2020-2021)

Phase III commenced in the second half of 2020, and will mainly focus on the Small Grants Scheme, offering opportunities for independent research by university staff and students. Some training, equipment and mentoring will be provided as needed.



Fisherman, early morning on a mangrove creek, Nga Yoke Kaung (Grace Frank/FFI)

PROGRAM HIGHLIGHTS: 2016-2020

4,337 TRAINING DAYS
ATTENDED BY
MYANMAR NATIONALS

25 SMALL GRANTS
TO SUPPORT **70** MYANMAR
RESEARCHERS

WE INVESTIGATED

52 SITES FOR
CORAL ACROSS **150** KILOMETRES
OF COAST AND
COMPLETED **87** CORAL
TRANSECTS



WE COUNTED **3,538** FISH ON **70** TRANSECTS



SYSTEMS
STUDIED



Coral



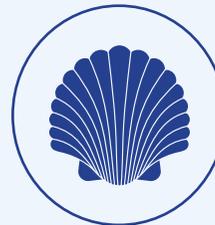
Seagrass



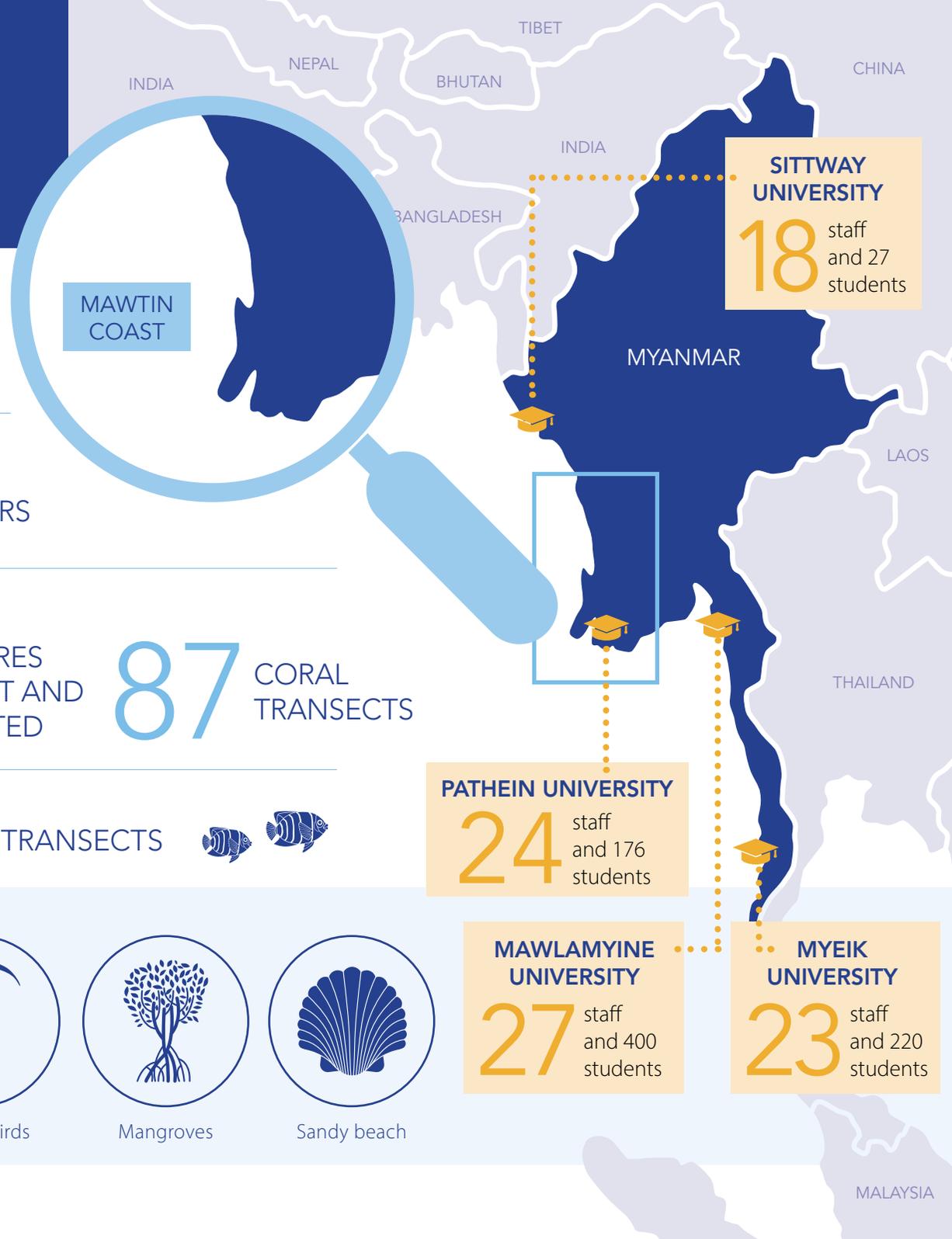
Coastal birds



Mangroves



Sandy beach



40 

PEOPLE COMPLETED FORMAL **ENGLISH IELTS¹ TRAINING**

55



WORKSHOPS AND TRAINING EVENTS HELD TO **BUILD CAPACITY**

124

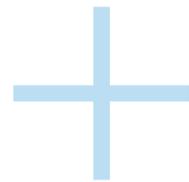
PEOPLE RECEIVED **SWIMMING AND SNORKELLING TRAINING**



WE IDENTIFIED

198

SPECIES OF **BIRDS**



11

SPECIES OF **SEAGRASS**

HABITAT MAPPING: **126** TRANSECTS USING TOWED VIDEO SYSTEM

19

MANGROVE TRANSECTS COMPLETED



WE INVESTIGATED

78

SITES FOR **SEAGRASS** ACROSS

200

KILOMETRES OF COAST



SKILLS TAUGHT



SCUBA diving



Habitat mapping



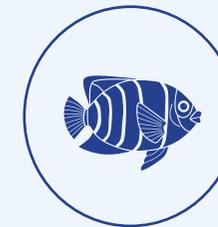
Swimming



Snorkelling



English



Underwater surveys



Bird surveys

1. International English Language Testing System

TRAINING

Working with national and international experts, we have provided the Myanmar marine science community with extensive and varied training in an assortment of foundation skills for field surveys and scientific writing, grant applications, independent field-based research and data collection, scientific analysis and reporting. Much of this training was also attended by officers from the Department of Fisheries. This section highlights some of the training we have completed.

SUMMARY OF TRAINING

Year/Activity	2016	2017	2018	2019	2020	Total
Excel				42	24	66
1st Aid			31	20		51
Swimming, snorkelling	20	47	22	23	12	124
Diving	12		8			20
English	20	20				40
Writing grants				51		51
GPS				19		19
Statistics					14	14
Habitat mapping			21	23	48	92
Coral training	20			13		33
Mangrove training			22	34		56
Seagrass training	19	12	45		10	86
Impact assessment training		36				36
Bird training	44					44
Meiofauna training					11	11
Marine litter assessment training		50				50



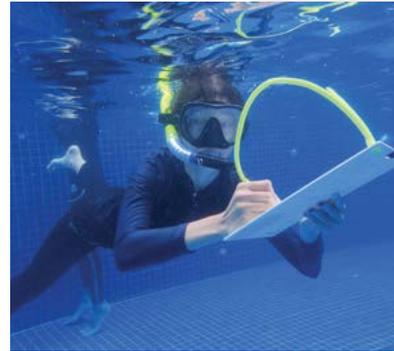
Water Skills Training

When we started the Capacity Building for Coastal Biodiversity Assessment Partnership, the majority of Myanmar's marine biologists could not swim. Marine research was restricted to habitats that could be reached on foot or by boat, such as mangroves and mudflats, or through the study of specimens brought back by local fishermen. For this reason, our first step in Phase II was to establish a water safety and swimming/snorkelling skills program.

We have now provided swimming and snorkelling lessons for 124 Myanmar nationals, and have trained 20 students and staff as SCUBA divers. We have trained six university staff as swimming instructors so that swimming and water skills training can continue. Snorkel training includes survey techniques such as laying out transect tapes, using quadrats and writing on slates to practice data collection, as well as underwater photography using underwater digital compact cameras.

Lecturer Daw Moe Lwin Lwin (now at Sittway University), who received snorkel training in Myeik, thinks the training has more benefits than just water skills. Students were initially nervous, as they have had little contact with foreigners, but after a while became more relaxed and appreciated the skills learned and the interaction with international marine scientists.

She said: "[students] gradually improved speaking and listening skills, created good competition and strengthened their minds. We cannot do this without support from this organisation. . . this training was very effective and a good opportunity for our staff and students."



(Sue Murray-Jones/FFI)



(Trainee/Myeik University)



(Salai Mon Nyi Nyi Linn/FFI)



(Trainee/Myeik University)



GPS and Mapping Training

Geospatial referencing of survey sites and habitats of ecological value is essential for baseline assessments and research projects. The Partnership provided all the marine science departments with a GPS unit. We ran training on using a handheld GPS, which included navigating to waypoints, entering waypoints in Google Earth and uploading them to the GPS, and downloading waypoints in Google Earth format and producing maps. We also trained a smaller number of students in habitat mapping using QGIS mapping software. The training has proved popular. One hundred and eleven people have had at least an introduction to the use of GPS units for basic mapping, with 48 of these receiving more advanced training in habitat mapping.



(Salai Mon Nyi Nyi Linn/FFI)



Microsoft Excel and Statistics Training

Access to and use of computers are now emerging in university settings, and department heads are keen to improve practical experience and increase training for both students and staff. We have provided training in data handling and management, and embarked on foundation courses in biological statistics to help address any knowledge gaps.

We were able to employ a young Myanmar national to conduct basic and advanced training in Microsoft Excel at three universities, covering many aspects of the software features for managing data, including use of pivot tables and chart creation, using templates, and applying advanced formatting and preparing reports. Feedback has been very positive.

We also ran a course in multivariate statistical analysis using the PRIMER statistical package for staff members of all four universities. Thanks to the generous discount and support given by the team at PRIMER-e, we were able to purchase a legal copy of the software for each university.



Excel training, Sittway University (Phone Nanda Min, Consultant)

FEEDBACK FROM PARTICIPATING STAFF AND STUDENTS

"This class was very good and I would like to learn more which would be useful for Marine Science"

"I hope you could teach another Excel training course at Marine Science (Sittway University)"

"Training times weren't enough for us. We need more skills in Excel!"

"This training is useful for us. We learned Excel and gained knowledge from this class"



CORAL TRAINING AND ASSESSMENT

The reefs of Myanmar's Mawtin coast are not true limestone coral reefs built up over thousands of years by living coral, but rather rocky reefs, where the hard coral colonies grow directly on rocky outcrops and individual boulders on the seabed. Prior to the Partnership, the marine scientists of Myanmar relied on fishermen to collect coral samples for them to study. Through providing training in underwater survey techniques, we can create more sustainable and thorough research on coral reefs, and study the ecology of living systems.

Coral reefs are extremely important. They provide a habitat for highly biodiverse marine life, protect coasts from storms, and sustain coastal economies by providing direct food and jobs through activities such as fishing. As coral reefs worldwide are extremely sensitive to environmental change, teaching the universities how to assess Myanmar's (unexplored) Mawtin coast was one of their, and our, highest priorities.

To date, 33 people have had some training in coral identification, with 14 receiving more intensive-based coral training.

In 2016, we looked at 48 sites across 150 km of the Mawtin coastline, and in 2019 we surveyed more sites. In all, we completed 87 transects on SCUBA, including an assessment of coral recruitment, threats and impacts for all sites visited.

Live coral cover varied from 15-85% across all survey sites, although live coral cover was generally patchy at all locations. In most communities, tabulate *Acropora* corals dominated the seascape.

Inshore coral communities were generally richest and highest in live coral cover in shallower water (3-5 m). The highest coral cover and fish populations were found on reefs fringing the offshore islands in less turbid waters (6-8 m depth), furthest from the mainland and fishing communities. The sites closer to the coastal mainland are affected by high sediment levels, largely from the many rivers in the area. This makes mainland coastal areas more challenging for light-dependent hard corals to thrive in, and only the hardiest coral species survive.

For sites where tourism is becoming increasingly popular (such as Chaung Tha and the Bird Islands), we observed large amounts of physical damage from careless anchoring practices.

There were signs of high fishing pressure on all reefs surveyed. This is a significant threat to reef integrity.

Overall, we found the coral communities of the central Ayeyarwady coast are in moderately good condition but are facing multiple threats such as overfishing, discarded fishing gear and unmanaged tourism activities.



Bird Islands (Sue Murray-Jones/FFI)



Practicing transect techniques, Patheingyi (Sue Murray-Jones/FFI)



Coral gardens, North Bird Island (Sue Murray-Jones/FFI)



SEAGRASS TRAINING AND ASSESSMENT



Seagrass training, Shwethaungyan (U Soe Htun/FFI)



Trainee preparing for seagrass survey (Sue Murray-Jones/FFI)

Seagrasses are a vital ecosystem worldwide and play an important role in Myanmar's coastal ecology. These light-dependent habitats catch and retain sediment outputs from rivers during the monsoon season, protect the coast, provide feeding grounds for dugongs and sea turtles, and act as important nursery grounds for juvenile fish and many species of invertebrates.

Prior to 2016, there was sparse information about the seagrasses of the Mawtin coast, particularly the subtidal components with the global loss of seagrass habitats increasing due to coastal developments, extending the capacity of scientists to collect baseline data on Myanmar's seagrass meadows was (and remains) a high priority.

Eighty-four people have attended workshops run by Professor U Soe Htun (retired Head of the Marine Science Department at Mawlamyine University). A total of 57 of these staff and students further attended one of six additional intensive laboratory and field training events. Training included herbarium skills and seagrass identification, and how to measure density, biomass and abundance, with a strong emphasis on hands-on field training. Researchers now have the capacity to study the whole meadow, and not just the parts exposed at low tide.

We completed seven separate seagrass survey trips, investigating 78 sites along 200 km of the Mawtin coast, as well as six sites in Tanintharyi Region. We identified 11 species of seagrass.

Seagrass distribution was generally patchy, but the areas of seagrass appeared to be healthy. Cover varied from high to very sparse, with an average of 41% live seagrass cover across all sites. At sites such as Wetthe Bay, depressions amongst the seagrasses indicated dugong feeding areas.



Seagrass meadow (Grace Frank/FFI)



MANGROVE TRAINING AND ASSESSMENT

Myanmar possesses extensive mangrove systems which are highly diverse. The importance of mangroves is well known. They provide food, fuel, wood and other building resources, as well as shelter for juvenile fish and many crustaceans and molluscs. One of their most critical roles is in coastal protection, especially in low lying areas like the Ayeyarwady Delta. Myanmar's mangrove forests have been considerably degraded over the last few decades from charcoal production, firewood collection, illegal logging, agricultural expansion and conversion to fish and shrimp ponds.

There have been small scale assessments of mangroves by university staff and students in the past; however, lack of access to literature, analysis tools and computer training meant that much of the work was descriptive in nature. The universities highlighted the need for modern ecological training in mangrove identification and assessment. We brought in international trainers (A/Prof Stefano Cannicci, Universities of Hong Kong and Florence, Italy, 2018; and A/Prof Saravana Ayyappan and Dr Arumugam Muthuvel, Annamalai University, India, 2019).

Fifty-six people attended workshops on aspects of mangrove ecology and assessment, with 45 of these progressing to in-depth field-based training in survey methods and data collection.

Training covered mangrove ecology, botany, management and conservation, as well as survey techniques, along with mangrove management and conservation. Mangrove sites were generally highly biodiverse and greatly threatened in accessible areas.

Overall, we recorded 25 species of true mangroves, four of which are listed as Nearly Threatened, Endangered or Critically Endangered, and five mangrove-associated species, one of which is listed as Nearly Threatened (IUCN Red List).

In general, mangroves were highly impacted by human use, with almost all trees recorded represented by either young specimens or trees recovering from major cutting, often for firewood.



Mangrove restoration project, Shwethaungyan (Sue Murray-Jones/FFI)



Mangrove flower, *Sonneratia griffithii* (Stefano Cannicci/University of Hong Kong)



Mangrove fruit, *Sonneratia griffithii* (Stefano Cannicci/University of Hong Kong)



Trainees surveying lower tidal mangrove area, Nga Yoke Kaung (Stefano Cannicci/University of Hong Kong)



Fishing boats, mangrove creek, Nga Yoke Kaung (Stefano Cannicci/University of Hong Kong)



Mangrove aerial roots
(Grace Frank/FFI)



Trainees learning to identify mangrove species
(Grace Frank/FFI)



"Cannonball" mangrove seed pod (*Xylocarpus* sp.)
(Sue Murray-Jones/FFI)



Successful plantings of mangrove seedlings, Shwethaungyan (Sue Murray-Jones/FFI)



Training in field mangrove assessment skills, Nga Yoke Kaung (Grace Frank/FFI)



International mangrove trainer Stefano Cannicci surveying mangroves from a boat (Grace Frank/FFI)



Harvested timber in mangrove forest, Ngwe Saung (Grace Frank/FFI)



HABITAT MAPPING AND TRAINING

Due to the long wet season and the proximity to the Ayeyarwady River Delta, visibility in the coastal waters is often poor along the Mawtin Coast. The key habitats of interest, such as coral and seagrass generally occur in shallow waters (less than 8 m), but are not easy to survey by diving. The turbid conditions can reduce underwater visibility to centimetres, with considerable wave action often a factor. Only in completely calm weather or sheltered bays are dive-based surveys possible, hence we decided to trial remote survey methods, i.e., use of a towed underwater video camera system operated from a boat.

To date, we have held three dedicated training and field-based activities for subtidal habitat mapping. Ninety-three people attended workshops, and 28 received intensive field-based training. The participants were taught to use the towed underwater camera in the field (recording video imagery of the seabed from a vessel), as well as the post-survey processes of decoding, categorising and mapping data using QGIS (a public access GIS software package). This also included developing skills in managing large data sets. We now have categorised and mapped data for 128 transects. These are from many areas of the Mawtin coast,

including those we identified as important biodiversity areas (Chaung Tha, Shwethaungyan, Pho Htaung, Nga Yoke Kaung and the Bird Islands off Ngwe Saung), with a small number of sites in the Myeik Archipelago.

Training has been received with enthusiasm, with Myanmar scientists quick to see the potential of the remote survey equipment and techniques. The camera system is now held and maintained by FFI Myanmar for use in-country, and we have received a number of expressions of interest for specific projects under the Small Grants Scheme.



"This training is very useful for us. It gave us a lot of skills about the mapping of habitats. It can be useful not only in coral surveys, but also in mangroves, seagrasses, and also inland forest surveys, etc. If we can use it in these areas of Myanmar, it will be very effective for the sustainable development of resources in the future. In Myanmar, there may be little research on habitat mapping. By learning with international experts like Maylene, we can learn every single step of habitat mapping clearly. She is very patient, active, and energetic. So we can learn habitat mapping well."

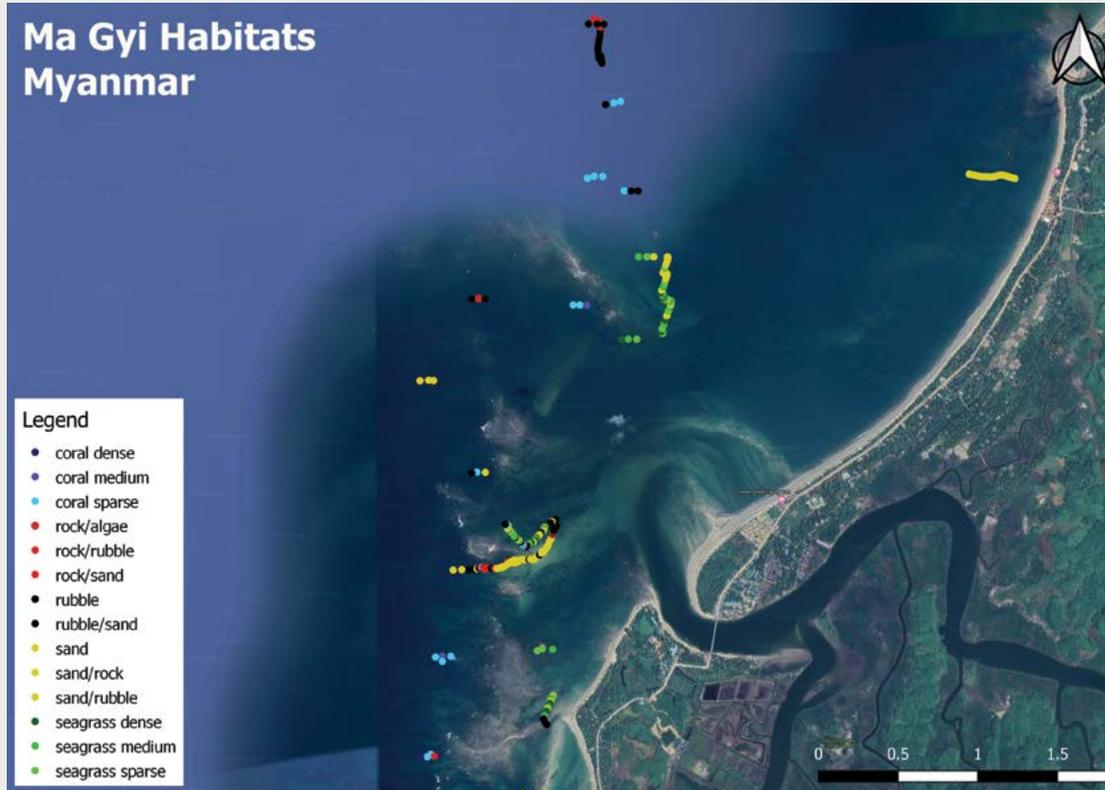
Daw Tin Yin Kyu, marine science lecturer at Myeik University



Habitat mapping around Ngwe Saung (David Miller, SA Marine Parks)



Habitat mapping boat, Nga Yoke Kaung area (Salai Mon Nyi Nyi Lin/FFI)



Mapped transects around University of Patheingyi's Ma Gyi field station, Shwethaungyan (QGIS map)



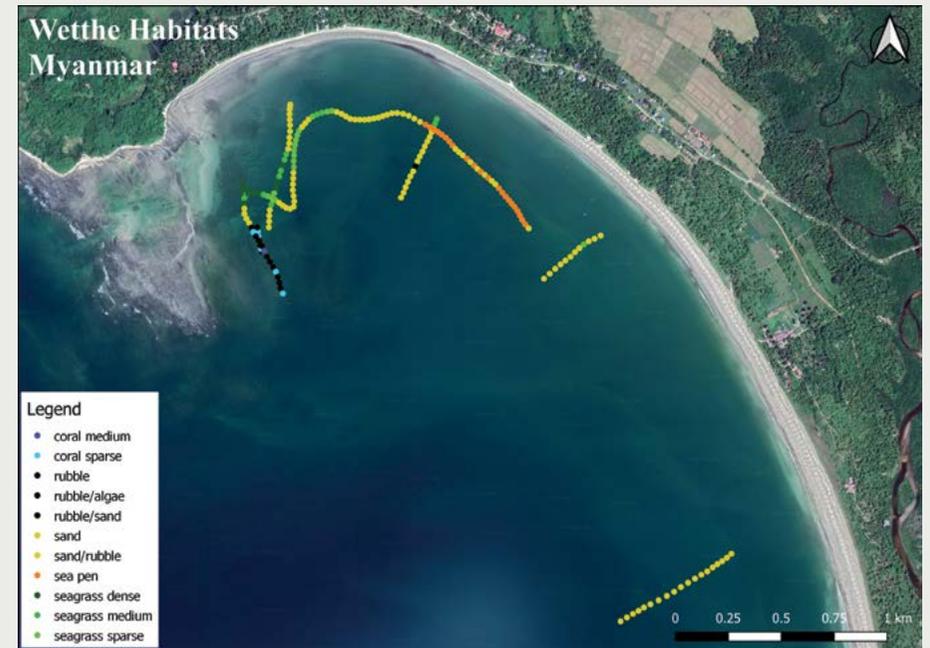
Transects around Pho Htaung Gyang (Bay) (QGIS map)



Habitat mapping camera being deployed (U Soe Htun/FFI)



Learning to habitat map at the University of Patheingyi (Salai Mon Nyi Nyi Lin/FFI)



Transects around Wetthe, a well-known dugong feeding area (QGIS map)

SMALL GRANTS

As part of Phase II, the Mawtin Coast Small Grants Scheme was set up to encourage research into marine habitats. Students and staff of all universities were invited to apply for these grants (with the initial proviso that at least 50% of the fieldwork was to be conducted in the Mawtin coastal region). We encouraged comparative studies, rare in Myanmar due to resource limitations. In 2019, we relaxed the requirement for half the work to be done on the Mawtin coast, as the difficulty of travelling created barriers. Academics in Myanmar rotate to different universities in order to gain promotion, so we extended the scheme to include all the marine science departments.

The Small Grants Scheme has been highly successful, offering us a chance to mentor students and staff in developing research proposals, estimating costs of the project and managing budgets. We provide appropriate training and equipment when needed, including making sure all participants have first aid and swimming/snorkelling training. We are providing feedback on outputs.

Professor Cherry Aung credits this scheme with the increase in the number of master's students in Patheingyi. She said: "The greatest improvement from the small grants scheme from FFI is the increased number of master's students and the increase in research by staff. This year (2020), there are 16 students doing Masters degrees. This is the highest number we have seen in the Marine Science Department in Patheingyi University."

To date, we have awarded 25 small grants, with 70 people participating. Uptake has been from both post-graduate students and staff, covering everything from assessing seagrass, seagrass fish and invertebrates, mangrove and mudflat communities, coral, plankton and bird surveys.

Year/Activity	2017	2018	2019	Total
Small Grants projects	11	6	8	25
Small Grants participants	17	24	29	70



Learning to estimate the distribution and abundance of organisms living in mudflats (Cherry Aung/Patheingyi University)



Learning seagrass identification and herbarium skills at the University of Patheingyi's Field Station at Ma Gyi (U Soe Htun, FFI)

CASE STUDIES

CASE STUDY ONE

Three Pathein master's students were awarded small grants in the first round of funding for projects on seagrass. One of these was Thu Rein, who had participated in our seagrass assessment, swimming, snorkelling and diving, English, first aid, Microsoft Excel and GPS training modules. He received a small grant to complete the fieldwork for his master's degree at Pathein University. His thesis was titled "Study on the Systematics and Ecology of Seagrasses in Shwe Thaug Yan Coastal Area", and he shared fieldwork with two other grant recipients (Maung Maung Wai Phyo: "Study on the Composition and Distribution of Benthos from Seagrass Beds in Shwe Thaug Yan Coastal Areas" and Min Khant San: "A Preliminary Description of the Seagrass Fish Communities Around Ma Gyi Coastal Area"). Conducting fieldwork together allowed them to support each other in the planning and implementation of their data collection, and keep their costs down.

Thu Rein examined seagrass percent cover and biomass from Pho Htaung Gyaing, Kyauk Nagar and Inn Din Gyi on the Mawtin coast. He found eight of the seagrass species known to occur in the region during his study, and a distinct seasonal effect in seagrass cover. Total coverage of seagrass was far higher in the dry season than in the monsoon (wet) season.

Since graduating, Thu Rein has gained a job with the Wildlife Conservation Society in Myanmar. He uses many of the skills we taught him in his new job, which includes carrying out marine biodiversity surveys.

"I think snorkelling and seagrass survey methods training, SCUBA-diving training, water safety and swimming programme training, environment impacts assessment training and SCUBA-diving equipment are very useful for marine biodiversity conservation. Many thanks to Small Grant for supporting my research. It's great for conservation and supporting new scientists and biologists."

- Thu Rein, Pathein master's student



Seagrass training, Pho Htaung Gyaing, Thu Rein on right (Sue Murray-Jones/FFI)



Moe Lwin Lwin during snorkelling training, Myeik (Moe Lwin Win, Myeik University)

CASE STUDY TWO

In 2018, Daw Moe Lwin Lwin with two other staff members and two master's students from Myeik University submitted a proposal entitled, "Seagrass Training and Set Up Permanent Transect at Seagrass Sites Around Lampi". Myeik University had been asking for some time for a round of seagrass training to be held in Myeik. FFI funded the project under the Small Grants Scheme, and a workshop for 23 people was held at Myeik University, followed by intensive training and field-based surveys with the five grant recipients. They produced a very professional report, which has now been published in an international journal¹. Daw Moe Lwin Lwin had attended a number of training courses with FFI prior to applying for the small grant, such as GPS skills and mapping, first aid, swimming and snorkelling training.

After publishing her research, Moe Lwin Lwin was promoted to a lecturer position and is now teaching at Sittway University in the north of Myanmar. She credits the training and funding supplied by FFI as instrumental in her achieving her new university position. She said: "After finishing the training, seagrass paper was published in an international journal. So it supported...our promotion. Thank you so much "Woodside!"

She hopes to obtain more funding through the Small Grants Scheme. The two master's students who attended the seagrass field training both subsequently applied for and received small grants.

Daw Moe Lwin Lwin was enthusiastic about the seagrass training, saying that: "...staff got (1) methodology, (2) good and valuable experience and (3) invaluable knowledge from this training. Moreover, these are very effective for us in teaching, especially knowledge sharing in the classroom."

1. Moe Lwin Lwin, Yin Yin Htay, Nay Nan Nandar New, Phyu Phyu Thin, Thin Lei Lei Wai, Sue Murray-Jones and U Soe Htun 2019. Seagrass surveys in the Eastern part of Lampi Island, in Myanmar, *Journal of Aquaculture & Marine Biology* 8(2):47-53.

PHASE III

Phase III of the Capacity Building for Coastal Biodiversity Assessment Partnership will expand upon Phase I and II, and provide further technical and educational support to Myanmar's four university marine science departments. We will work closely with them to improve skills and support them in surveying marine and terrestrial biodiversity.

Delivery for Phase III will be primarily via the competitive Small Grants Scheme—the first such scheme for marine science in Myanmar. The scheme helps applicants develop strong research questions; conduct and manage field data collection, analysis and reporting; and encourages (with assistance if required) publication of their work.

OUR TEAM



Dr Sue Murray-Jones
FFI Programme Coordinator/
Consultant 2016-2020



Filippo Carli
FFI Marine Programme Manager
2019-20



Soe Tint Aung
FFI Dive team



Dr James True (Coral expert)
Lecturer, King Mongkut's Institute
of Technology, Thailand



U Soe Htun (Seagrass expert)
FFI Marine and Freshwater
Programme Manager 2019-20



Salai Mon Nyi Nyi Lin
FFI Dive team





U Htay Aung
Project Support (retired Professor, Patheingyi University)



Dr Maylene Loo
(Habitat Mapping)
Maytrix Solutions



Prof Anthony Cheshire
(Impact Assessment training)
Science to Manage Uncertainty



A/Prof Saravana Ayyappan
(Mangrove training)
Annamalai University, India



Dr Arumugam Muthuvel
(Mangrove training)
Annamalai University, India



Phone Nanda Min
(Excel Training)
Consultant



Christoph Zöckler
(Bird surveys)
Consultant



David Miller
(Habitat Mapping)
South Australian Dept of Environment



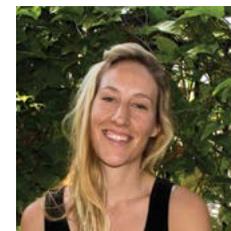
A/Prof Stefano Cannicci
(Mangrove training)
University of Hong Kong and
Department of Biology, University
of Florence, Italy



U Zau Lunn
FFI Marine and Freshwater
Programme Manager 2016-2018



Robert Howard
FFI Marine Programme Manager
2016-2019



Grace Frank
FFI Field Coordinator 2017



ACKNOWLEDGEMENTS



"Woodside is an environmentally responsible operator, and our continued support of the FFI program demonstrates how we collaborate with science-based organisations to build capacity and environmental knowledge in Myanmar. Woodside is delighted the program now includes Sittway University and will continue until the end of 2021. This long-term partnership and sharing of the knowledge it generates contribute to our sustained relationships with governments and communities in Myanmar."

- Woodside Myanmar Country Manager – Michelle Grady, July 2020

The Capacity Building for Coastal Biodiversity Assessment Partnership is supported by Woodside Energy (Myanmar) Pte Ltd.

Woodside is Australia's largest independent oil and gas company with a global portfolio, recognised for their world-class capabilities as an explorer, developer, producer and supplier of energy.

The Woodside approach:

- » robust environmental risk management;
- » credible science to underpin decision making;
- » strong partnerships with local researchers; and
- » transparency of environmental knowledge.

Woodside's partnerships

Woodside's activities are often situated in unique and remote locations. As such, Woodside has chosen to collaborate with some of the world's leading research and conservation organisations to better understand these local environments. This allows the company to sustainably conduct exploration and development activities based on the best scientific knowledge.

The FFI-Woodside partnership is an NGO–Industry science-based partnership. The partnership aims to assist Myanmar's marine scientists to conduct research to support the understanding and management of coastal biodiversity.

Trainees entering data after a day of mangrove surveys, Ngwe Saung (Grace Frank/FFI)





Fauna & Flora International

The David Attenborough Building Pembroke Street,
Cambridge, CB2 3QZ, United Kingdom

T +44 (0)1223 571000
F +44 (0)1223 461481
E info@fauna-flora.org
W www.fauna-flora.org

Registered Charity Number 1011102
A Company Limited by Guarantee, Registered in England Number 2677068

Full technical reports from this partnership are available
by request from FFI Myanmar (email info@fauna-flora.org)

1. Murray-Jones, S., True, J.D., Soe Htun, and Zöckler, C. (2016). Capacity Building for Coastal Biodiversity Assessment: Mawtin Coast Partnership, Myanmar. Final Report Phase 1: 2016.
 2. Murray-Jones, S., Cannicci, S., Cheshire, A., Miller, D. Soe Htun, Howard, R. and Frank, G. (2018). Capacity Building for Coastal Biodiversity Assessment Partnership, MCAP Report 06, Myanmar. Report Phase II: 2018. Fauna & Flora International.
 3. Murray-Jones, S., Howard, R., Loo, M., Saravanakumar, A., Arumugam, M. and True, J. (2019). Capacity Building for Coastal Biodiversity Assessment Partnership, Myanmar. End of Year Report Phase II: 2019. Fauna & Flora International.
 4. Murray-Jones, S. (Editor) (2020). Marine and Coastal Biodiversity of the Mawtin Coast. Survey Results and Conservation Recommendations 2016-2020.
-

Proudly supported by



Produced in October 2020

