Fun Facts from One ASEAN Sea

Diving into the Reef with ASEAN ENMAPS

ASEAN ENMAPS
Connect. Conserve. Communicate. For Our One ASEAN Sea.

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Photo: Raiyani Muharramah

Foreword

The ocean is full of wonders. From the dazzling corals to the colourful schools of fish—these marine ecosystems are not just beautiful. They are essential to life as they provide food and support livelihoods for millions of people, while protecting the coastlines and providing cultural benefits to the people, especially in the ASEAN region.

Through the *Effectively Managing Networks of Marine Protected Areas in Large Marine Ecosystems in the ASEAN Region (ASEAN ENMAPS)* project, we are working to conserve these ecosystems across Southeast Asia by building networks of marine protected areas and by strengthening the governance of marine resources. One of these efforts is the publication of the *Fun Facts from One ASEAN Sea*, which brings the conservation mission to young readers, the future stewards of the ocean.

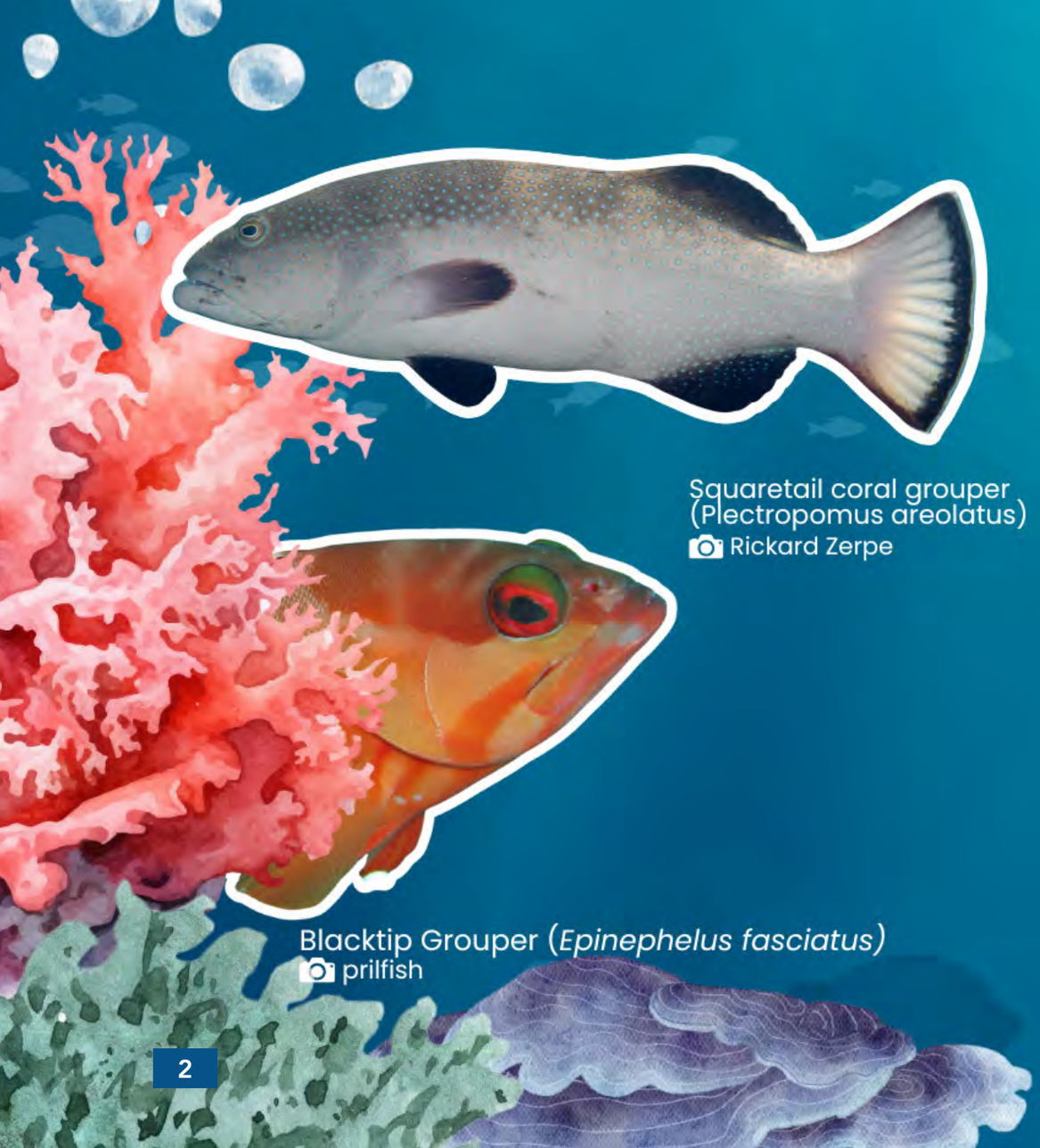
This book is more than just a collection of fun facts about our marine ecosystems. It is the gateway to curiosity, discovery, and the cultivation of enthusiasm toward protecting our shared marine heritage. Characterised by vibrant illustrations and amazing facts, this book provides our future stewards a way to explore the incredible life under the sea and understand why it is important to keep our waters and coastlines healthy. We hope that this would create a spark among the youth to love nature and to inspire them to become champions of the sea in their schools, families, and communities.

Thus, let's read on and dive in to protect the ocean together!

Jerome L. Montemayor, PhD
Executive Director
ASEAN Centre for Biodiversity

Photo: Daniel M. Ocampo

Let's dive in!



Squaretail coral grouper
(Plectropomus areolatus)
Rickard Zerpe

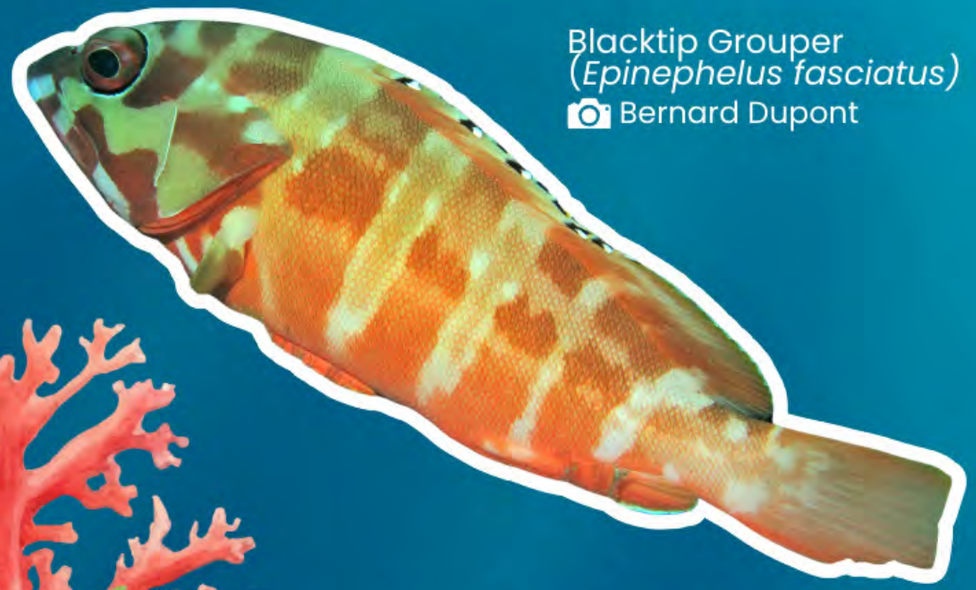
Blacktip Grouper (*Epinephelus fasciatus*)
prilfish

Groupers

DID YOU KNOW?

Many species from the grouper family (*Serranidae*) start life as females. But later in life, a few of them transform into males.

The fascinating sexual pattern is process known as protogynous hermaphroditism.



Blacktip Grouper
(*Epinephelus fasciatus*)
Bernard Dupont

Leopard coral grouper
(Plectropomus leopardus)
Frrancois Libert

Species of groupers from the genera *Epinephelus*, *Cephalopholis*, *Plectropomus*, and *Myctoperca*, to mention a few, are all protogynous hermaphrodites.

These newly minted males then take charge of a group of 8–12 female partners, ensuring the next generation swims on.

Targeting the larger, dominant males during fishing may seem like a good idea to fishers due to the size and value of these individuals. However, this practice **poses a significant risk to the reproductive success of grouper populations**.

Leopard coral grouper
(Plectropomus leopardus)
John Turnbull

In species where many individuals begin life as females and only a few transition to males, **removing the dominant males can disrupt the natural balance** necessary for successful breeding.

As a result, populations may experience a **decline in reproductive output**, ultimately threatening the sustainability of these valuable marine species.

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The marine conservation project "**Effectively Managing Networks of Marine Protected Areas in Large Marine Ecosystems in the ASEAN Region (ASEAN ENMAPS)**" of the **ASEAN Centre for Biodiversity (ACB)** is on a mission to spread the word and keep our marine resources swimming strong!

Seabass or Barramundi (*Lates calcarifer*)
Marre Patriam

Barramundi

DID YOU KNOW?

Barramundi start life as **males**, a sexual pattern opposite that for groupers!

As they grow, the biggest and baddest of the lot switches into a female, a trait known as ***protandry***, while the rest remain as males. The sex-reversed female then maintains a group of male partners, with a female-to-male ratio of 1:10.

Seabass (*Lates calcarifer*)
Charlene N. Simmons

Charlene N. Simmons

Male barramundis grow up to 6 kg, while sex-reversed **females** reach 8–15 kg, thus making them a **prime target** during fishing season.

Mitch Ames

Targeting these **hefty females** place at risk the reproductive success of this population as they will leave the dating pool one-sided, similar to the groupers discussed earlier.

Not enough females means trouble for reproduction, which could threaten our food supply.

Charlene N. Simmons

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Seabass (Barramundi)
Charlene N. Simmons

ASEAN ENMAPS steps in!

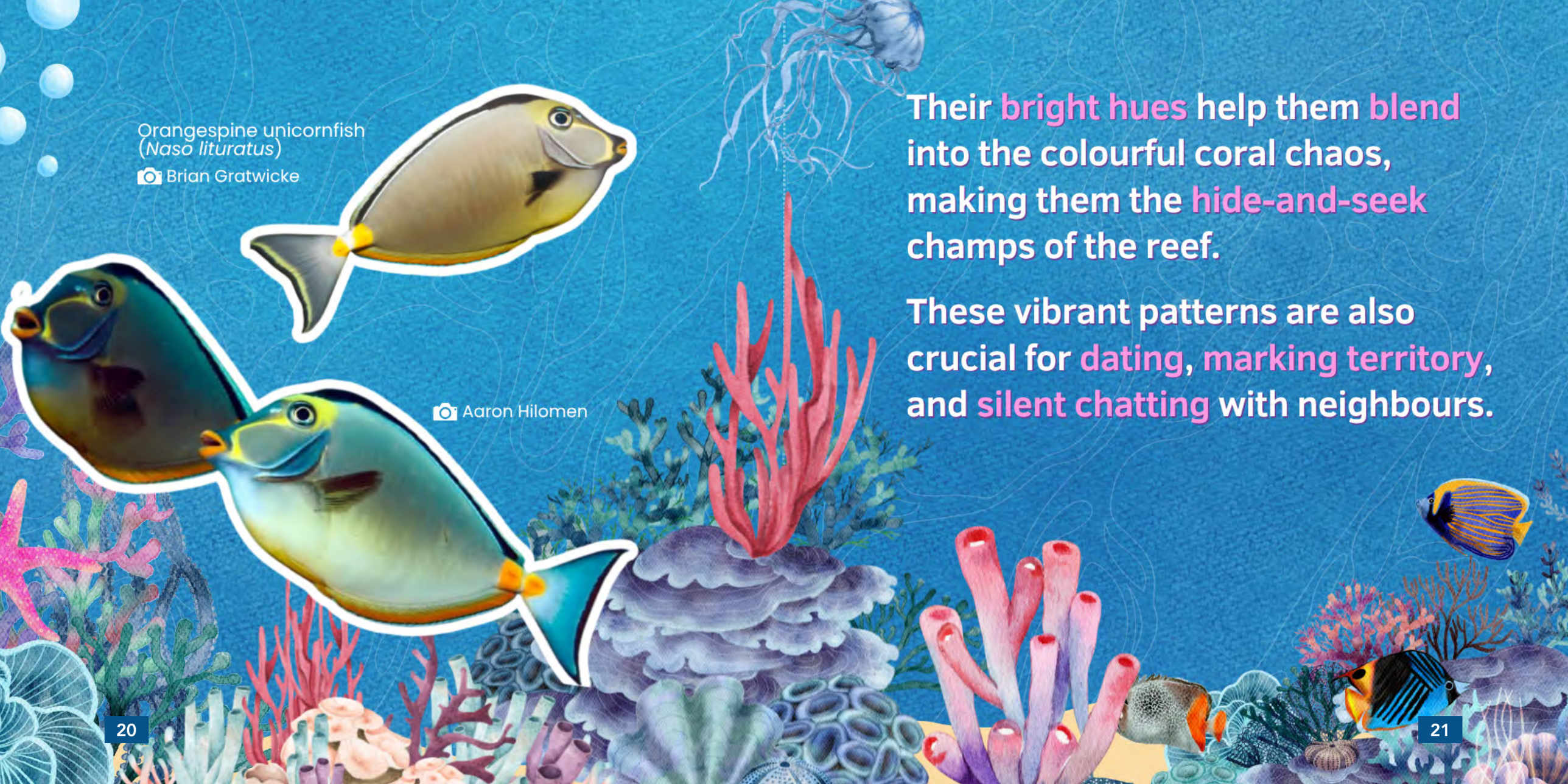
We're working through education and communication with fisherfolk and consumers to protect these fabulous fish so they can thrive in their habitats!

Neon damselfish
(*Pomacentrus coelestis*)
Badi R. Samaniego

Colourful Fish

DID YOU KNOW?

Ever wondered why herbivorous fish, like parrotfish and surgeonfish, sport dazzling colours? It's not just a fashion statement!

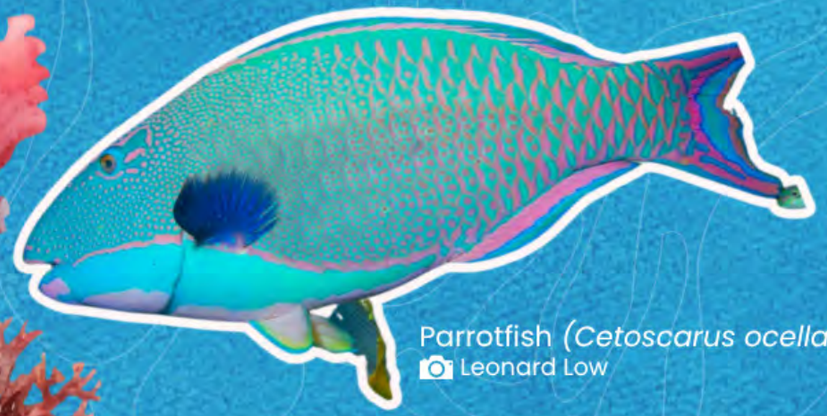


Orangespine unicornfish
(*Naso lituratus*)
Brian Gratwicke

Aaron Hilomen

Their bright hues help them blend into the colourful coral chaos, making them the hide-and-seek champs of the reef.

These vibrant patterns are also crucial for dating, marking territory, and silent chatting with neighbours.



Parrotfish *(Cetoscarus ocellatus)*
Leonard Low

Bignose unicornfish (*Naso vlamingii*)
Jiří Borový

In the bustling reef scene, their **hues** help fish **recognise** each other and pull off sneaky moves, like **mimicking dangerous species** or confusing predators. Their colours even match the algae and corals they munch on, making them **stealthy foodies**.

Golden damselfish (*Amblyglyphidodon aureus*)
Oswald Klingler

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And here's a splash of good news: ASEAN ENMAPS is on a mission to protect the habitats these colourful fish call home—reefs, seagrass beds, and mangroves. Thanks to their efforts, our oceans can keep rocking those rainbow vibes!

Bullethead parrotfish
(*Chlorurus sordidus*)
Rickard Zerpe

Juvenile Swarthy parrotfish
(*Scarus niger*)
Klaus Stiefel

Herbivorous Fish

DID YOU KNOW?

If a reef has mostly herbivorous fish, it might be a sign that predators have been overfished!

Carnivorous fish help keep the food web in balance. When they disappear, herbivores become the main catch for fisheries—even though they're usually not as delicious as meat-eating fish.

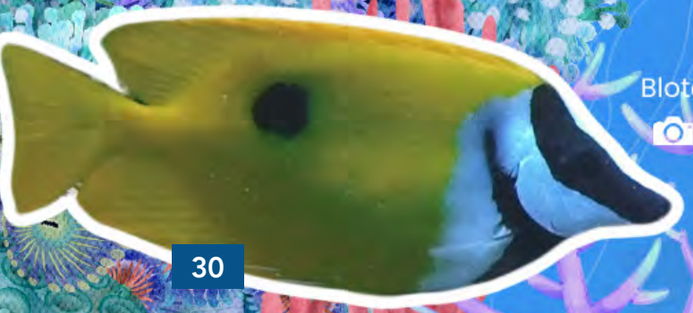
Bower's parrotfish (*Chlorurus bowersi*)
Rickard Zerpe

Orange-spotted spinefoot (*Siganus guttatus*)
Kary Mar

But herbivores, like parrotfish, surgeonfish, and rabbitfish, are not just side characters—they're the unsung heroes of the coral reef, munching on algae to make way for coral growth. Herbivores scraping algae off hard surfaces allow baby corals to settle and grow in the cleared areas.

Blue angelfish (*Pomacanthus semicirculatus*)
Badi R. Samaniego

Mimic surgeonfish (*Acanthurus pyroferus*)
Rickard Zerpe



Blotched foxface (*Siganus unimaculatus*)
Kary Mar

If herbivores get overfished next, algae can take over and smother the reefs, leaving marine life homeless.

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Bullethead parrotfish | *Chlorurus sordidus*
Rickard Zerpe

ASEAN ENMAPS is all about **keeping the balance** in its pilot marine protected area sites and expanding its efforts to other similar areas **to ensure both predators and herbivores** play their part in a thriving ocean.

Christmas Tree Worm (*Spirobranchus spp.*)
Mariuz Kasio

Christmas Tree Worm (*Spirobranchus spp.*)
Kary Mar

Christmas Tree Worms

Meet the **Christmas Tree Worms** (***Spirobranchus* spp.**)—tiny, festive decorators of tropical and subtropical coral reefs!

These colourful critters, with their dazzling spiral plumes in reds, greens, yellows, and blues, look like underwater ornaments straight out of a holiday magazine.

But these worms aren't just eye candy—they're reef superheroes!

Their spiral plumes act as filters, gobbling up plankton and organic particles. They also give corals a breather by fending off invasive sea stars, like the Crown of Thorns, and preventing algae from smothering their coral homes.

Bernard Dupont

Mariuz Jean-Marie Gradot

Did you know the **Christmas Tree Worms** can live for up to **30 years?** That's a long time to keep those colourful crowns waving!

Unfortunately, their tropical homes are under threat from **climate change**, **pollution**, and **destructive fishing**.

Mariuz Jean-Marie Gradot

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That's where initiatives like ASEAN ENMAPS step in!

By protecting coral reefs and supporting marine protected areas, we're ensuring that these festive worms and their coral neighbours stick around for future holidays.

Let's protect our reefs and celebrate biodiversity—365 days a year!

Clownfish
Nikolaj Potanin

Nemo the Clownfish

Move over, Nemo—here's a double plot twist!

DID YOU KNOW?

All Clownfish are born male (yes, even our favourite orange buddy), but the biggest, bossiest one gets a glow-up to female. That's right—Nemo could totally switch and become his mother, Coral!

Badi R. Samaniego

Badi R. Samaniego

But the surprises don't stop there. Clownfish and anemones are the ultimate ocean power couple.

The anemone protects the Clownfish from predators and tosses it food scraps, while the Clownfish lures prey fish for the anemone with its flashy colours.

Roy Chan

The anemone gets fertilised by Clownfish poop, which also provides nutrients like nitrogen and phosphorus to help the tiny algae (zooxanthellae) living in the anemone's tissues thrive.

These algae, in turn, supply the anemone with energy through photosynthesis.

David Clode

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A toxic bromance? More like a symbiotic success story!

That's why the ASEAN ENMAPS is working to protect reef habitats. By expanding marine protected areas and their networks, we're ensuring the Clownfish, their anemone BFFs, and the rest of their coral crew keep living their best underwater lives.

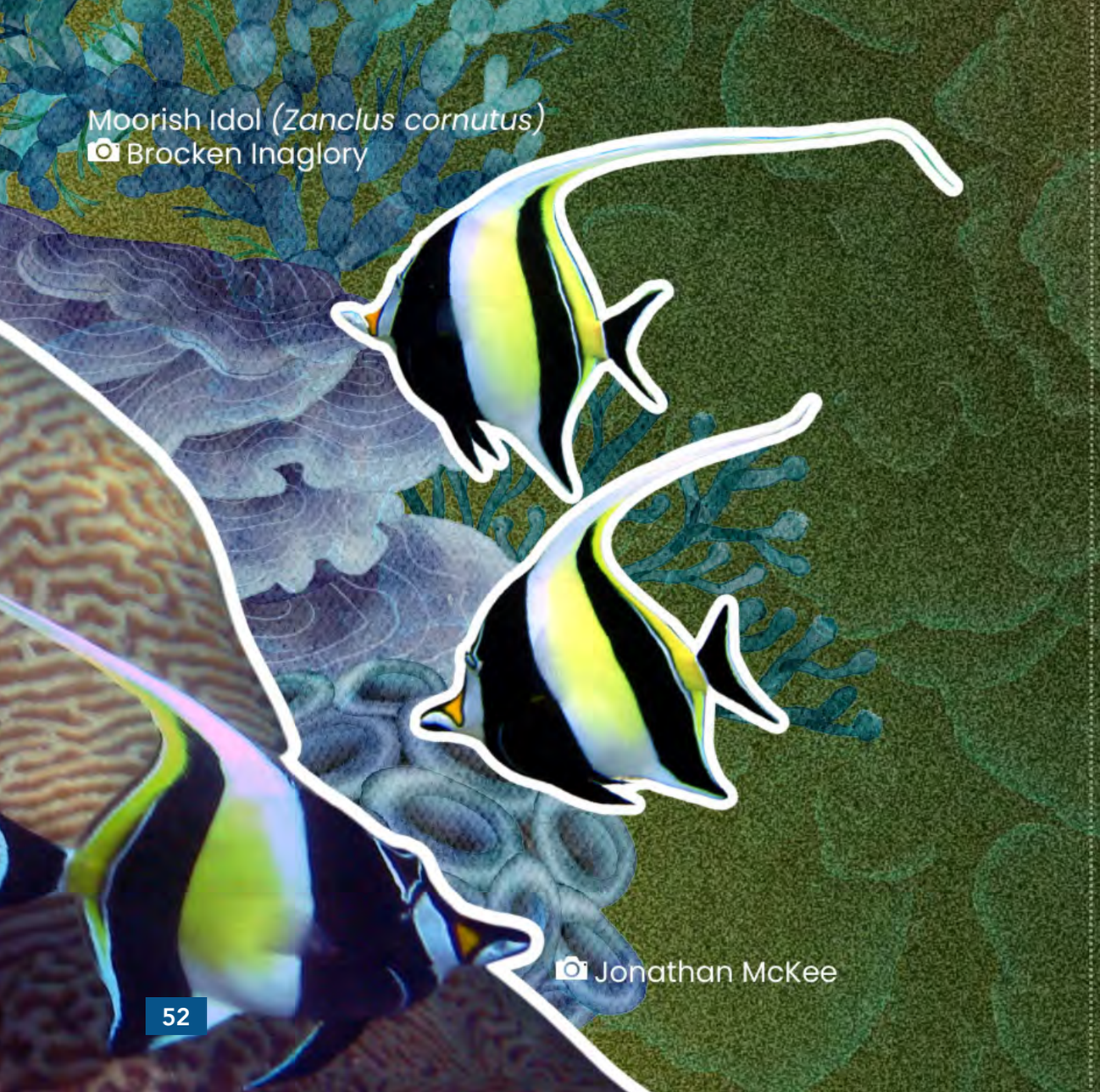
Moorish Idol (*Zanclus cornutus*)
Andy Blackledge

John Stevenson

Gill the Moorish Idol

DID YOU KNOW?

Recognisable as "**Gill**" from *Finding Nemo*, the **Moorish Idol** is not just a movie star—it's been gracing the oceans for **over 50 million years**, making it one of the most ancient fish species alive!

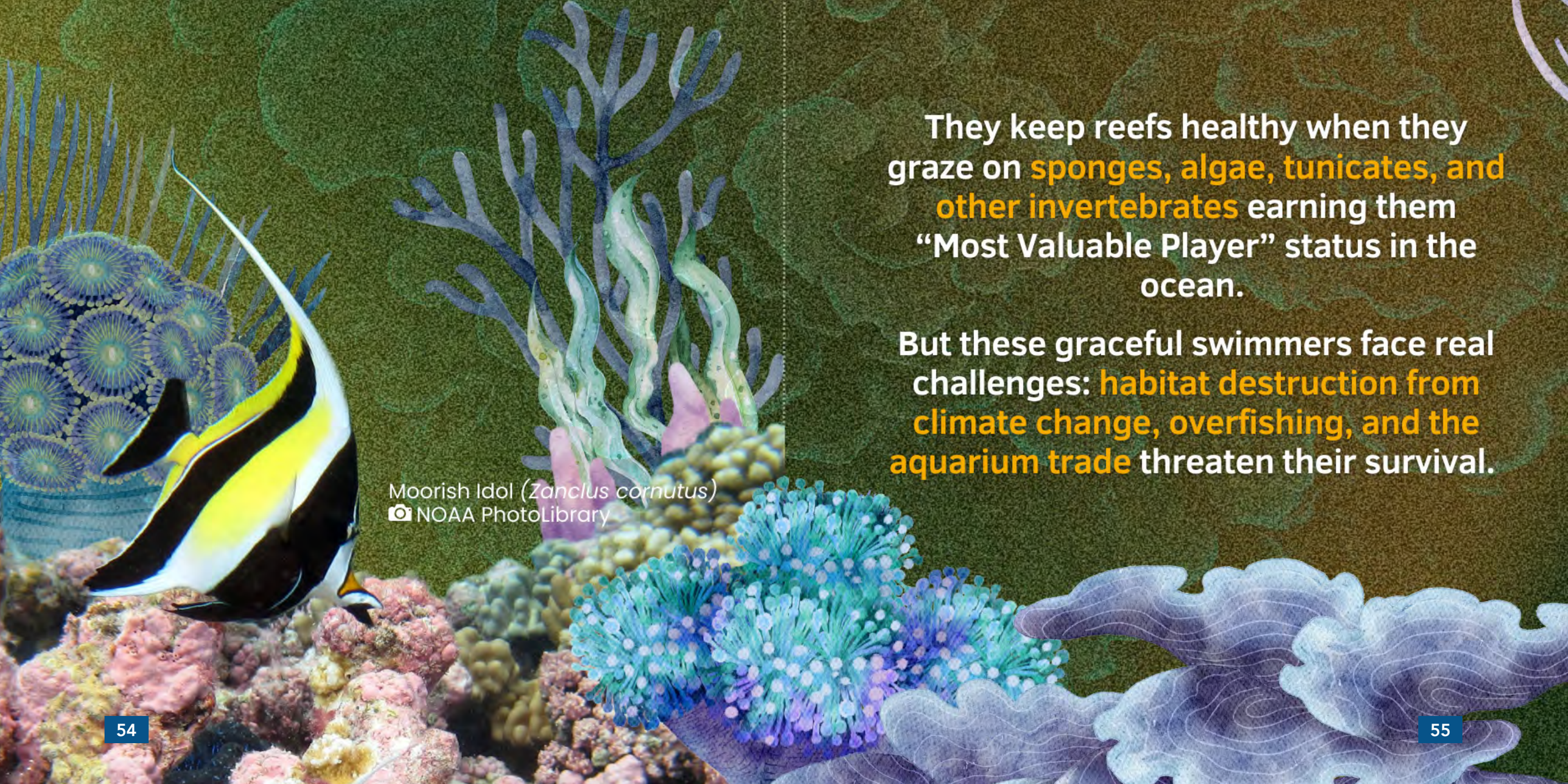


Moorish Idol *(Zanclus cornutus)*
Brocken Inaglory

Jonathan McKee

Found in **Indo-Pacific coral reefs**, it is named by the Moors of Africa as a symbol of good fortune.

This one-of-a-kind beauty belongs to its own family, ***Zanclidae***. Juveniles keep a low profile with shorter fins and muted colours, while **adults sport bold stripes** and an elegant dorsal fin "banner."



Moorish Idol *(Zanclus cornutus)*
NOAA PhotoLibrary

They keep reefs healthy when they graze on **sponges, algae, tunicates, and other invertebrates** earning them "Most Valuable Player" status in the ocean.

But these graceful swimmers face real challenges: **habitat destruction from climate change, overfishing, and the aquarium trade** threaten their survival.

Moorish Idol *(Zanclus cornutus)*
Doug Finney

Moorish Idol *(Zanclus cornutus)*
MacCavity

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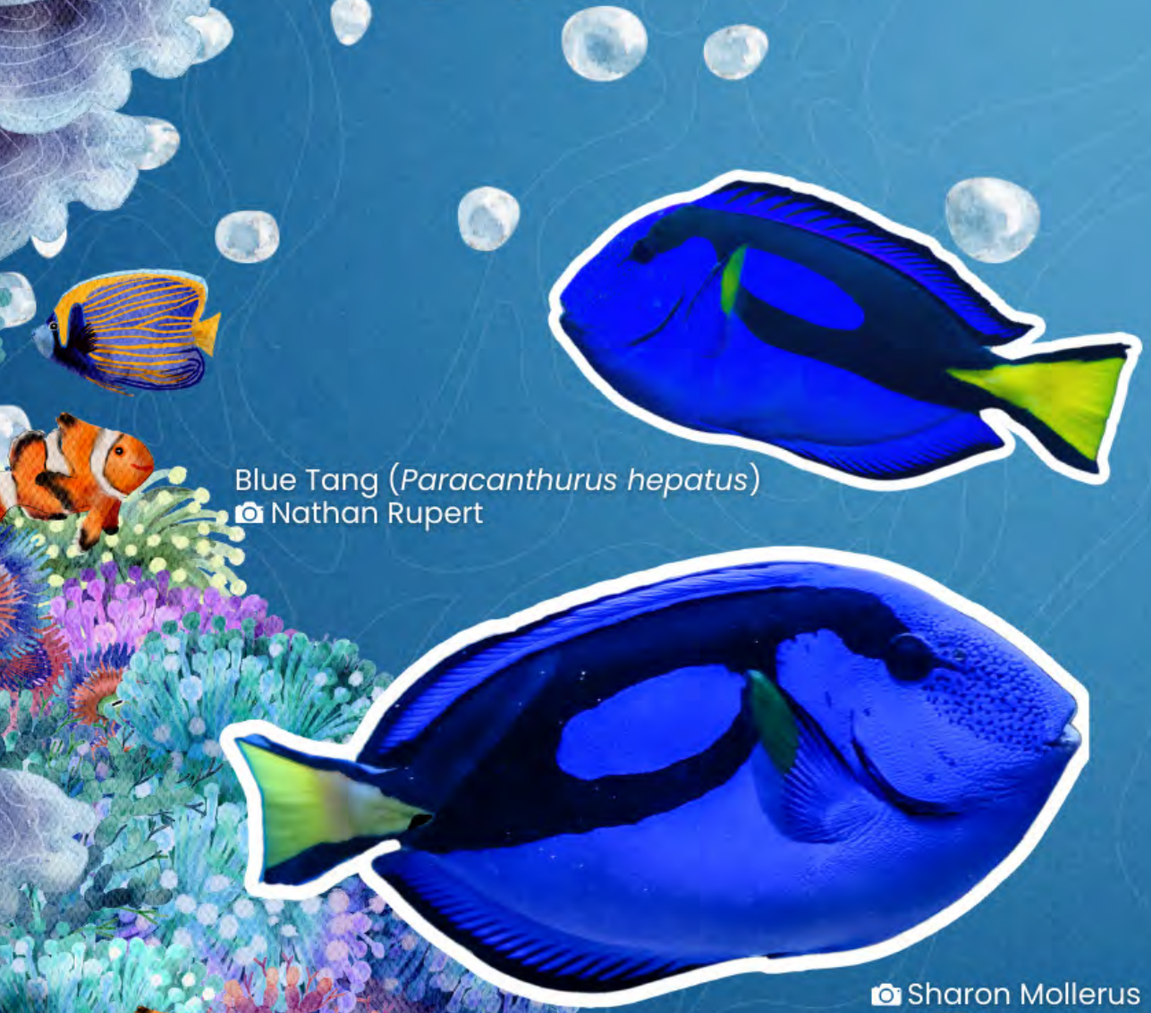
Thus, projects like **ASEAN ENMAPS** are vital for protecting coral reefs and ensuring Moorish Idols and their ecosystems thrive.

Let's **secure their future**—because the ocean wouldn't be the same without its timeless beauties!



Blue Tang (*Paracanthurus hepatus*)
Nathan Rupert

Sharon Mollerus

Dory the Blue Tang

DID YOU KNOW?

The Blue Tangs (*Paracanthurus hepatus*) play a crucial role as keystone species—those organisms that hold a habitat together—as they feed on algae. By doing so, they prevent algae overgrowth that could smother corals and cause imbalance in reef ecosystems.

Blue Tang (*Paracanthurus hepatus*)
Bill Gracey

Sharon Mollerus

Without herbivores like **Blue Tangs**, algae could rule the reefs, threatening the biodiversity of these underwater havens.

But they aren't just reef nurses—they're also **reef health monitors**. A signficant decline in their population often signals trouble like habitat degradation.

Blue Tang (*Paracanthurus hepatus*)
Nathan Rupert

Kelly Verdeck

If the number of herbivores like Blue Tangs drops way down, **one single event of coral bleaching** could turn a coralline community into an algal one.

Unfortunately, Blue Tangs are under threat: **overfishing** for aquarium trade; **habitat loss**; and **unsustainable tourism**, where handling these fish damages their protective mucus coating and makes them vulnerable to diseases.

Blue Tang (*Paracanthurus hepatus*)
Nathan Rupert

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Blue Tang
Bill Gracey

Thankfully, **ASEAN ENMAPS** is doing its best to strengthen the management of **marine protected areas (MPAs)** through **establishing MPA networks.** Moreover, combining conservation with community engagement ensures that **Blue Tangs** can continue their role in maintaining healthy coral reefs.

Let's protect Dory's cousins!

Manta Ray
Nathan Rupert

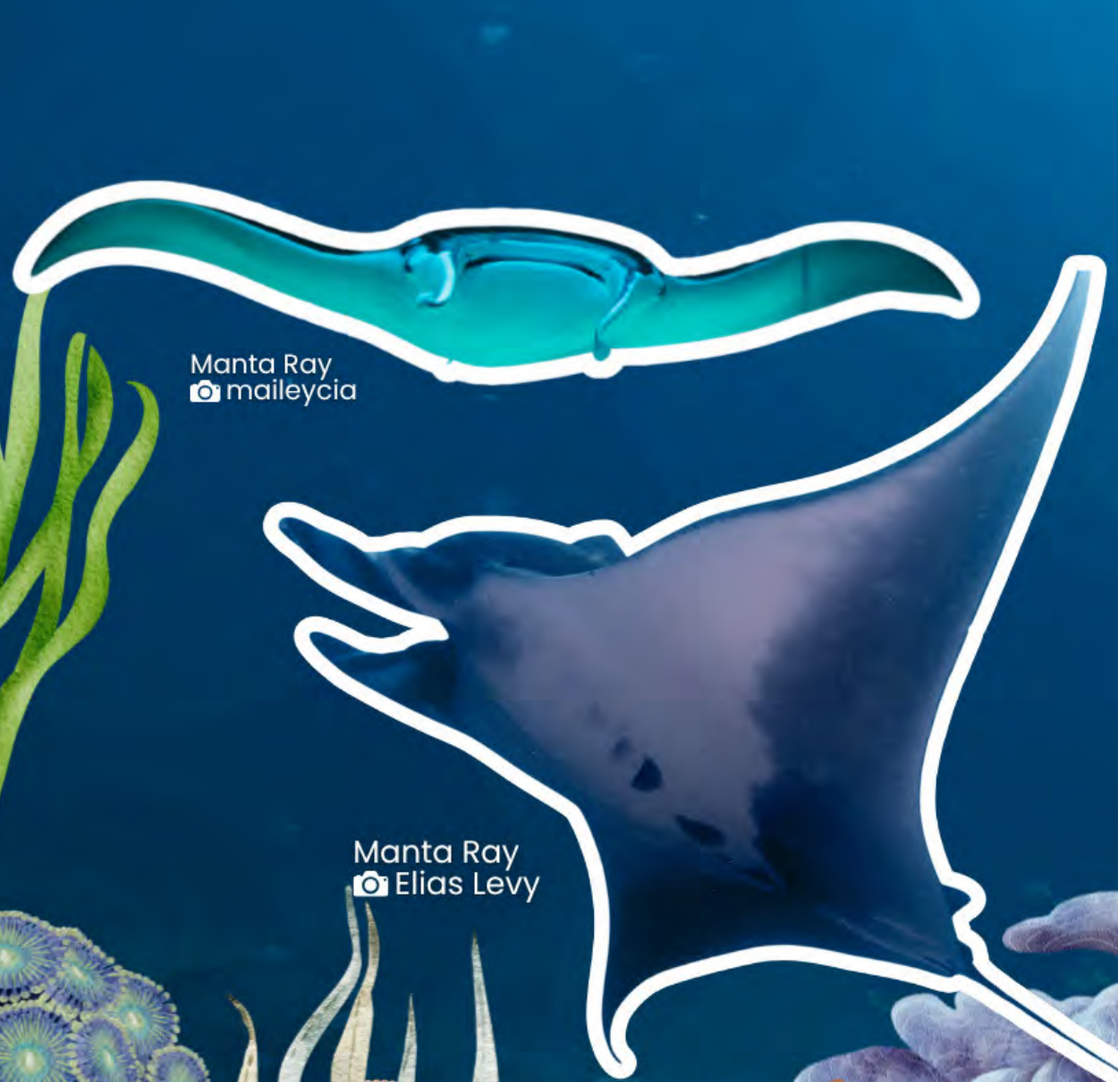
Mr. Ray the Manta Ray

DID YOU KNOW?

Class is in session with the ocean's brainiest balancers! Manta Rays have the biggest brain-to-body ratio of any fish. No wonder they're the ocean's brainiacs, teaching us humans about keeping the seas healthy.

These brainy giants are also **nature's filters, slurping up plankton** to keep their numbers in check and help coral reefs thrive.

They also play the role of **underwater couriers, transporting nutrients** through their, well, No. 2 business, as they shuttle between the ocean's surface and the deep sea, keeping ecosystems balanced and thriving.



But life's not all smooth swimming. **Manta Rays** face fishing nets, habitat destruction, and **illegal trade of their gill plates**, prized in traditional Asian medicine. Even their **fins** aren't safe, often harvested for soup. These brainy giants need protection to keep gliding and filtering the seas.

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Enter **ASEAN ENMAPS**, the marine defenders, championing protected areas to save not just mantas but entire marine ecosystems. It's a master plan for inclusive **marine conservation**, protecting nature while **empowering local communities**. Let's protect these gentle geniuses— without them, the ocean's classroom would be incomplete!

Editorial board

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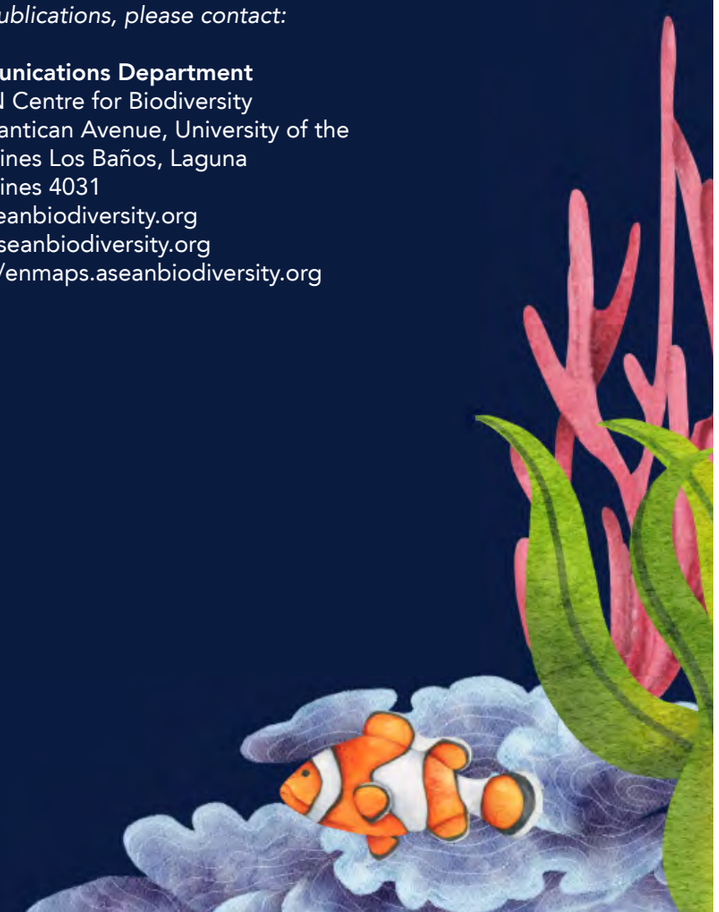

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The project ***Effectively Managing Networks of Marine Protected Areas in Large Marine Ecosystems in the ASEAN region (ASEAN ENMAPS)*** project aims to improve marine protected area (MPA) and MPA network management in key Large Marine Ecosystems across Indonesia, the Philippines, and Thailand. It applies science-based strategies to conserve biodiversity and sustain fisheries. The project also aims to strengthen governance, build the capacity of stakeholders, promote knowledge sharing, and advance sustainable financing for long-term conservation. ASEAN ENMAPS is implemented by the United Nations Development Programme through the funding of the Global Environment Facility, and with the ASEAN Centre for Biodiversity as the executing agency.