



USAID
FROM THE AMERICAN PEOPLE

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newsletter

Talking SEA

**Protecting Indonesia's Marine
Ecosystems for Future Generations**



**TOWARDS EFFECTIVELY
MANAGED MARINE
PROTECTED AREAS**

USAID SUSTAINABLE ECOSYSTEMS
ADVANCED (USAID SEA) PROJECT

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Photo: CTC

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Editorial

The USAID SEA Project, implemented in partnership with the Ministry of Marine Affairs and Fisheries and local government, is now in its third year of operations and deeply involved in addressing challenges facing fisheries management and marine biodiversity conservation in Indonesia. This issue of *Talking SEA* focuses on the need for, and challenges of, improving the implementation of marine protected areas (MPAs) in Indonesia.

We, in the SEA Project team, are working directly in 15 MPAs in eastern Indonesia and learning a great deal about the realities of MPA management at the provincial, district, and village levels. With our practical and scientific results of recent years, we know that well-managed MPAs contribute substantially to the maintenance of marine ecosystems, their productivity in terms of fisheries, and provide real economic and food security benefits to coastal communities. We also know that it is essential that a portion of any MPA needs to be totally protected from extraction and harm from human use, so that organisms can reproduce and the ecosystem can function normally.

However, an ongoing challenge for MPAs in Indonesia – and especially for fully-protected sites such as no-take zones within them – is that they are often seen as being incompatible with traditional-use patterns and as marginalizing the people dependent on them for food and income. Thus, the planning, implementation, and management of MPAs must consider the human communities and institutions that are usually the default decision-makers for resource utilization and protection. Experience from MPAs in Indonesia and other countries confirms that planning for MPAs needs to be sensitive to context (social, cultural, and environmental). Three interrelated factors are essential to improving the overall capacity and effectiveness of MPAs:

1. Well-designed and effectively-managed MPAs.

For MPAs to contribute to the long-term success of marine conservation and fisheries management, they must be carefully designed ecologically, contain enforced no-take zones of sufficient size, and be effectively managed. No-take zones should cover at least 20 percent of the critical habitat area and conform to sizes that are feasible within the local context. Key actions to improve effectiveness include: (a) identifying appropriate locations for no-take zones relative to critical habitats, spawning sites, essential ecological processes, and the most valuable resource areas within an MPA; (b)

developing an accepted and implementable management plan at each MPA; (c) ensuring that MPAs and their no-take zones have clear and accountable management bodies; and (d) developing and integrating professional management practices for law enforcement, visitor management, monitoring, and adaptive planning.

2. Monitoring, evaluation, and response-feedback systems.

A system to monitor MPAs and their no-take zones is needed, one that can detect changes in habitats and marine life parameters related to levels of protection and governance mechanisms. A management effectiveness assessment tool (E-KKP3K) is in place in Indonesia for improving MPAs, but needs to be fully adopted and implemented.

3. Integration of socioeconomic factors supporting MPAs.

Understanding the economic costs and benefits of MPAs is essential for making the case for MPAs, for financial planning and management, and for building sustainable capacity to manage MPAs. Socioeconomic and cultural considerations should be integrated into MPA planning, to promote activities that maximize the positive benefits derived from MPAs, and to counter local socioeconomic costs. While capacity in Indonesia for the meaningful integration of socioeconomic and cultural factors in planning is still weak, it is important to conduct socioeconomic and human perception surveys in every major MPA, and to factor the survey results into adaptive management processes and MPA management plans.

Finally – and highlighted in this issue – it is essential to include key stakeholders, from the start of establishing a new MPA through zoning and management planning. For while the national government is tracking overall coverage of ‘legally’ protected areas to achieve its national and international targets, these numbers mean little if local communities are not fully engaged and the legally protected areas are not under ‘effective’ management: this is the real challenge for us all.

**Please read
and enjoy our
Talking SEA
and we welcome
any feedback
or opinions you
may have!**



Alan White, Ph.D. Chief of Party

Introduction

By Stacey Tighe, USAID SEA Project.

The coastal and marine waters of Indonesia are some of the most valuable and fascinating natural places in the world.

The sea here is host to the highest marine biodiversity on earth, with more than 600 of the world's coral reef species (76 percent), more than 1,300 of the world's coral reef fish species (37 percent), and with many other strange and wonderful marine plants and animals.¹ Indonesia is also home to many globally- and locally-important commercial fish species, as well as major populations of charismatic, endangered, and threatened species such as marine turtles, dolphins, dugongs, and great whales. Located in the global 'bull's-eye' of marine biodiversity, the seas of this nation provide a treasure trove for marine ecologists and underwater enthusiasts, and – more importantly – provide vital resources to sustain people's livelihoods and nutritional needs.

However, these marine assets are under threat, and at risk of disappearing. Illegal and unregulated fishing, overexploitation, coastal development and degradation, as well as climate change are just a few of the threats to this marine ecosystem. Over recent decades, the impact of these have been felt nationwide, and have put livelihoods and food security at risk, as well as threatening the future survival of marine species.

Therefore, in order to protect these marine ecosystems and maintain their productivity, it is essential to protect the habitats and key areas that marine species utilize at different stages of their life cycles, such as areas where they feed and breed. Establishing MPAs at strategic locations, and of sufficient number and scale, is one way to achieve this, and the Government of Indonesia has committed to establish 30 million hectares of effectively managed MPAs by 2030.²

What are Marine Protected Areas?

There are many definitions of MPAs, but the most commonly used is from the International Union for the Conservation of Nature (IUCN) which describes an MPA as:

'A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values'.³

An MPA is essentially an area in the ocean where human activities are more strictly regulated than the surrounding waters – thus similar to the parks we have on land. A well-managed MPA can provide benefits not only to the conservation of biodiversity in an area, but also to local economies and cultural heritage.

There are several types of MPAs globally, from small single areas, to larger 'zoned' MPAs, through to networks of multiple MPAs. Each is designed to meet the relevant management objectives of the area.

Different types of MPAs to achieve different management goals

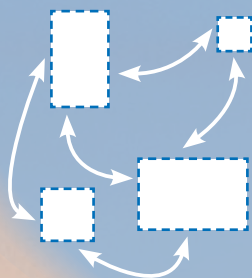
Single Small Area

An MPA established to protect a unique habitat, a site-specific life-cycle event (such as a spawning aggregation), or a unique cultural asset (e.g. a shipwreck, or spiritually-significant area).

Single Large Area

An MPA established to protect species nursery grounds and other important habitats from fishing pressures or wider destructive activities.

Network of MPAs



A network of multiple MPAs established to protect the diverse habitats needed for different life stages of marine species, and to ensure larvae transport occurs throughout an entire region.

In Indonesia, there are several classifications of MPAs, depending on their management goals and governance framework.

MPA classifications in Indonesia

Initiation through Ministry of Marine Affairs and Fisheries

Aquatic National Park
(*Taman Nasional Perairan*)

Aquatic Nature Reserve
(*Suaka Alam Perairan*)

Aquatic Tourism Park
(*Taman Wisata Perairan*)

Regional Aquatic Conservation Areas (including Coastal Parks)
(*Kawasan Konservasi Perairan Daerah, termasuk Taman Pesisir*)

Sub-national regions:

Fisheries Sanctuary
(*Suaka Perikanan*)

Protected Sea Area
(*Daerah Perlindungan Laut*)

Mangrove Protection Area
(*Daerah Perlindungan Mangrove*)

Initiation through Ministry of Forestry and Environment

Marine National Park
(*Taman Nasional Laut*)

Nature Marine Tourism Park
(*Taman Wisata Alam Laut*)

Marine Wildlife Sanctuary
(*Suaka Margasatwa Laut*)

Marine Nature Reserve
(*Cagar Alam Laut*)

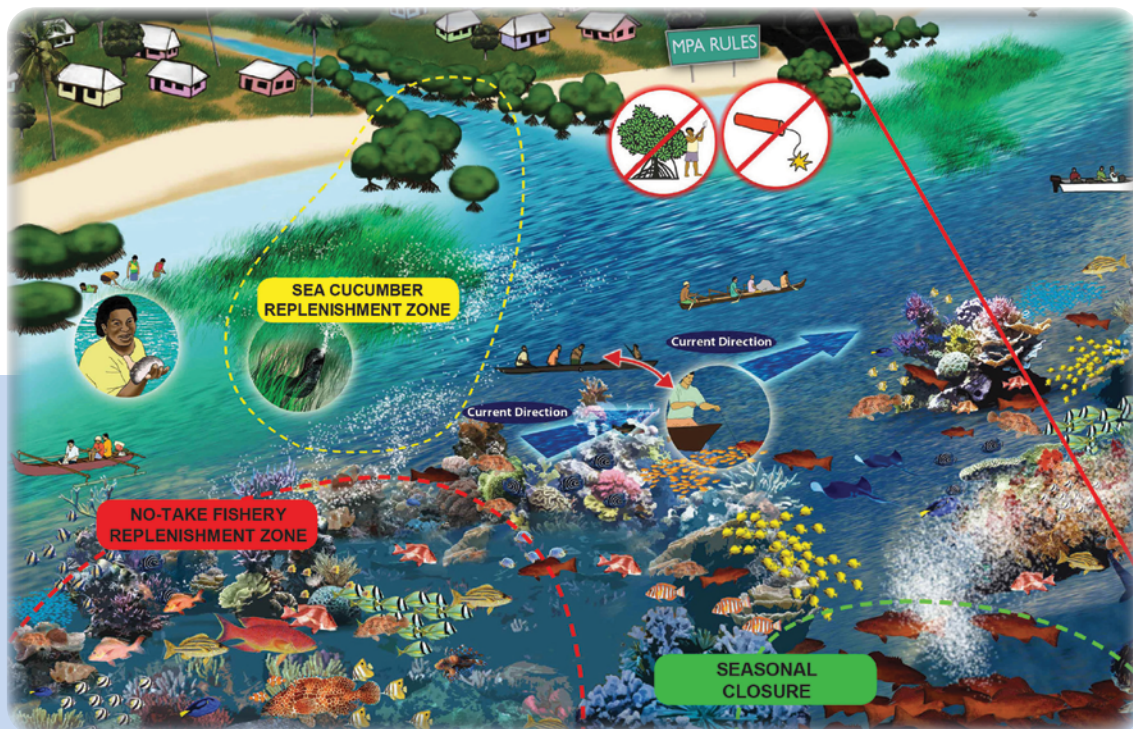
cont.

1 MMAF & USAID SEA Project (2018). *State of the Sea: Indonesia, Volume One: An Overview of Marine Resource Management for Small-Scale Fisheries and Critical Marine Habitats in Indonesia*. Jakarta, pp. 156.

2 Surat no. 1612/PRL.5/VIII/2017, KKP.

3 Day J et al. (2012) *Guidelines for applying the IUCN Protected Area Management Categories to Marine Protected Areas*. Gland, Switzerland: IUCN. pp. 36.

How do MPAs work?



Well-managed MPAs can protect a marine ecosystem so it is more resilient, and can better resist disturbance than a degraded system – a little bit like vitamins and good sleep help to heal a human body. For instance, a well-protected and resilient reef MPA can support corals to recover from ‘bleaching’ (caused by a period of extreme heat), or damage (caused by flooding and excess sedimentation). They also provide refuges for species, including endangered species, to ‘rest and recuperate’ from the various stresses faced in non-protected areas (e.g. through development, fishing pressure, and / or tourist activities).

Many MPAs include strict no-take zones, sometimes referred to as ‘fishery reserves’, which protect spawning sites and allow fish to reproduce and grow to their adult size, enhancing the overall productivity of the area. No-take zones (NTZs) have been proven to support higher quantities of fish and greater ecological diversity, and this increased abundance ‘spills over’ to re-stock neighboring fishing areas, making MPAs — and NTZs in particular — an important tool to support local fisheries and livelihoods.⁴

While NTZs are a common feature in MPAs, a wide range of other management features may also exist, tailored to the needs of the area. These might include, for example: seasonally limited-access areas, rehabilitation areas (with coral transplanting and cultivation to support the recovery of a site or to promote genetic diversity), or restrictions on fishing gears, or fish catch quotas or sizes. Indeed, every MPA is unique, and the choice of management actions needs to be based on the ecological needs of the area, the threats faced, the human context, as well as overall management objectives.

MPAs can also be established for cultural reasons, such as maintaining traditional practices, preserving the heritage of an area, or protecting local livelihoods dependent on marine resources. At the wider scale, networks of individual MPAs that are managed collaboratively are also important, particularly for migratory species (such as turtles and whales), and to spread the risk of ecosystem degradation.

MPAs are, however, only one tool in the toolbox of natural resource management and they will

“The SEA Project, with its partners WWF and CTC, have provided extraordinary assistance and support [for MPAs in Maluku], from helping the initiation of MPAs, to providing back up support. Our hope is that activities to foster public awareness about the MPA can continue, to improve MPA management through direct and active community involvement; as well as training for the Maluku Marine and Fisheries Agency who act as the regional management institution.”



Fatma S. Rumagia,
S.Pi, M.Si (Mrs.).
Section Head, Marine
Conservation and Biodiversity,
Fisheries and Marine Agency
of Maluku Province

How MPAs work: effective MPA zoning and enforcement will support the health and abundance of marine resources within an MPA.⁵

not solve all marine problems. MPAs cannot stop the rising of seawater caused by the melting of glaciers, nor the acidification of the ocean caused by increased carbon dioxide in the atmosphere, and other climate measures are needed globally to tackle these threats. MPAs generally can also not address marine pollution, as this threat moves across the ocean, and can only be solved by improved land-based waste management. But, MPAs can include adjacent shoreline areas to help stop localized land-based threats and pollution.

Management activities in MPAs are confined by their boundaries, and complementary measures are needed outside of MPAs to achieve sustainable change, including: effective wider-scale marine spatial planning (such as shipping lanes, restricted zones etc.), an ecosystem approach to fisheries management throughout national waters, and integrated coastal management among others.

As such, the USAID SEA Project is implementing a five-year initiative (2016-2021) to improve fisheries productivity, food security, and sustainable livelihoods in eastern Indonesia through four key pillars: advancing an ecosystem approach to fisheries management, marine spatial planning, law enforcement, and MPAs. This integrated approach is essential to combat the multifaceted threats facing the marine environment.

The project aims to support the development and effective management of six existing MPAs and nine new MPAs, covering a combined area of more than one million hectares in three target provinces in east Indonesia. In addition to this, the project is supporting the establishment of MPA networks. Support includes helping to identify

and assess priority areas for conservation and fisheries enhancement, strengthening scientific approaches to MPA design, engaging communities at the site to support collaborative management of the area, and providing training and capacity building amongst MPA managers and wider stakeholders for effective management.

Ultimately more – and better managed – MPAs are needed, in the right places, and at the right time (now), particularly in areas where conservation is urgent both in Indonesia and globally. #

MPAs in the USAID SEA Project Portfolio

NORTH MALUKU	Morotai (new)	58,011 ha
	Guraici	95,086 ha
	Makian (new)	42,799 ha
	Mare	7,611 ha
	Widi	7,690 ha
	Sula (new)	123,436 ha
MALUKU	Buano (new)	33,989 ha
	Lease	81,573 ha
	Sawai (new)	106,249 ha
	Ay-Rhun	47,969 ha
	Koon-Neiden	9,901 ha
WEST PAPUA	South Sorong (new)	338,324 ha
	Bintuni Bay (new)	66,921 ha
	Berau Bay (new)	99,018 ha
	Nusalasi (new)	248,272 ha

4 Sala, E. & Glakoumi, S. (2018). 'No-take marine reserves are the most effective protected areas in the ocean', in *ICES Journal of Marine Science*, Volume 75, Issue 3, 1 May 2018, pp 1166-1168

5 Gombos, M., et al. (2013). *Designing Effective Locally Managed Areas in Tropical Marine Environments: A Booklet to Help Sustain Community Benefits through Management for Fisheries, Ecosystems, and Climate Change*. Jakarta, Indonesia: USAID Coral Triangle Support Partnership.

A Brief History of MPAs in Indonesia

By Rudyanto and Alan White, USAID SEA Project.

Conserving and managing the marine and coastal environment of Indonesia has been a way of life for coastal people for hundreds of years, dating back to a time before Indonesia existed as a country.

Traditional management systems were present in a range of forms, based on customary custodianship, and strong traditional knowledge of fishing communities (see page 16). However, with rapid population growth, migration of people and cultures, and an intensifying demand for fish and marine resources, traditional frameworks began to fade in many regions by the early 20th century.

After Indonesia's independence in 1945, marine conservation was not a priority until a government agency (the Directorate of Nature Protection and Conservation) was established in 1971. This agency focused predominantly on land-based conservation until 1990, when the first criteria for establishing MPAs was developed (Act no. 5/1990). By 1997 Indonesia had established 24 MPAs covering around two million hectares.

While this was an important step forward, it was by no means sufficient for a nation with the second largest coastline in the world (stretching more than 95,000 km),⁵ and by 1999 the need for dedicated marine and coastal management was recognized through the formation of another agency, known as the Department of Marine

Exploration and Fisheries (which evolved into today's Ministry of Marine Affairs and Fisheries). Under this agency, the momentum for sustainably managing the nations' marine and coastal resources began to grow considerably.

In 2009, the President of Indonesia (at the time), H.E. Dr. Susilo Bambang Yudhoyono, announced the nations' commitment to expand MPA coverage to 20 million hectares by 2020, as part of Indonesia's contribution to a six-nation agreement known as the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security. This further spurred a rapid expansion of MPAs, and by 2017, 165 MPAs had been established across the country. The establishment of these MPAs contributes to Indonesia's commitment to the international Convention on Biological Diversity, which requires all signatory nations to protect at least 10 percent of their marine environment. In 2017, the government of Indonesia announced plans to expand MPA coverage to 30 million hectares by 2030.⁶

The 21st century has seen a rapid growth in MPAs being formally established in Indonesia.

However, establishing an MPA on paper, and effectively managing it on the ground, are two very different things. So how do you not only establish, but also effectively manage, an MPA? #



How to Establish an MPA and effectively manage

Indonesia is equipped with a range of laws, regulations, and guidelines for establishing and managing MPAs.

Firstly, an MPA is 'initiated' by identifying an area of interest, and undertaking biophysical and socioeconomic studies assessing its suitability for protection. If deemed appropriate, the site is officially 'reserved' as an MPA. For coastal areas up to 12 nautical miles from shore, the designation, development, and management of an MPA is the responsibility of the provincial government (areas beyond 12 nautical miles are managed by the national government). Exceptions to this rule, are areas designated as 'National Marine Parks', which are managed by the Ministry of Environment and Forestry in coordination with provincial and district governments.

Once a site is reserved, a management unit is set up, and a management plan prepared for the site. This plan includes mapping the area, and identifying different types of zones for different activities (including 'no-take zones' which are set aside as 'refuges', where no fishing or extractive activities are allowed). The plan also documents the objectives of the MPA, which should include conservation and preservation of the marine environment, support for sustainable fisheries, and processes to ensure that local communities in and around the MPA benefit from its existence. The development of this

By Rudyanto and Alan White, USAID SEA Project.
plan, therefore, requires a lot of consultation with local communities, as well as wider organizations and industries that might be affected by the area becoming protected. Once finalized, it requires approval from the provincial Governor, at which point the MPA is considered 'established'.

That, however, is only the beginning of the story. Turning the management plan into management action requires a lot more work. The management unit responsible for the MPA needs to be fully staffed, trained, and equipped. Management practices and operational procedures need to be put in place. And in order for the MPA to be officially recognized as part of the nation's protected areas system, a ministerial decree needs to be acquired. Once the MPA is recognized at the national level, it can be demarcated (e.g. boundary markers can be installed so that fishers at sea know where the MPA is located). At this point, work can be scaled up to start management plan implementation. This generally requires strong community engagement, involvement, and support, as well as sufficient funding to ensure management activities – including patrol, surveillance, and enforcement – can be conducted on a regular basis.

So, how do you know if your MPA is being effectively managed... ?

cont.



Meet *Chrysiptera uswanasi* – a new species of damselfish discovered by Conservation International Researchers in the waters of Fakfak in West Papua.

This vibrant little fish is an important reminder of how much we have to learn about our marine environment. Scientists estimate that up to two thirds of species living under the water are undescribed, and as marine ecosystems continue to diminish globally due to human activities, we wonder how many species may disappear before we even know of their existence ...? Named after the Bupati of Fakfak, Bapak Mohammed Uswanas, in recognition of his commitment to establishing MPAs to preserve the rich marine heritage of the area, this small fish has now joined the legions of documented species!



Photo: Gerald R. Allen

* Reference: Allen et al. (2018). '*Chrysiptera uswanasi*, a new microendemic species of damselfish (Teleostei: Pomacentridae) from West Papua Province, Indonesia,' in *Journal of the Ocean Science Foundation*, Vol. 31, pp. 74-86.

To measure management effectiveness, Indonesia currently uses an evaluation system known as E-KKP3K.⁷

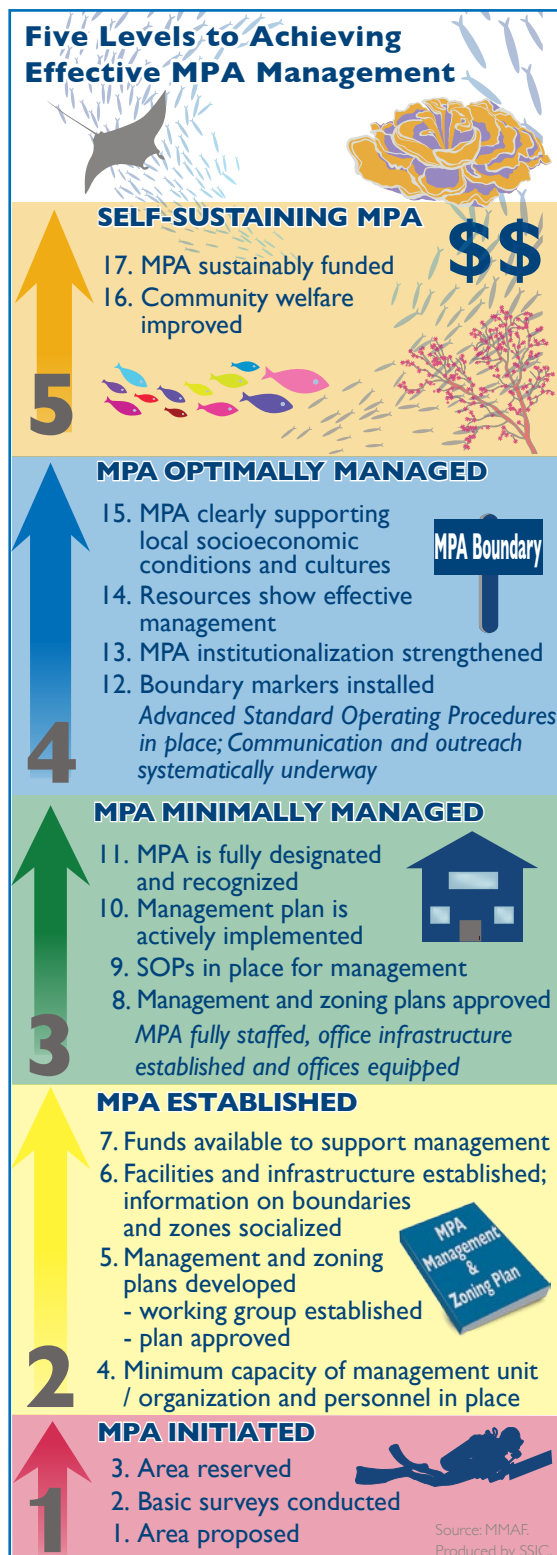
This tool identifies five levels to ascend in order to achieve effective management. Each level is color-coded, with the lowest level (1 – red), indicating that the MPA has been initiated, and the highest level (5 – gold), indicating that the MPA is self-sustaining. At the moment there are no MPAs in Indonesia that have achieved level 5 or gold status. Even the famous MPA in Raja Ampat is still at level 4 (blue), and the vast majority of MPAs in the country remain at level 1 (red). There is clearly still a lot of work to do before Indonesia's existing and emerging MPAs can be considered 'effectively managed'.

Moving forward, several efforts are underway to accelerate MPA establishment and effective management. Provinces across the country have recently been developing their first 'marine spatial plans', which include designating areas for MPAs. The policies and regulations guiding MPA development are being streamlined (see page 14), and the evaluation system (E-KKP3K) is being reviewed to ensure it takes into account the long-term impact of management in maintaining and preserving the marine ecosystem at the site. Therefore, while work is on track to achieve Indonesia's target of establishing 30 million hectares of MPAs by 2030, much more commitment and investment is needed in terms of infrastructure, staffing and skills-building for these MPAs to be fully and effectively managed. #

5 COREMAP (2013). Facts and Figures on Indonesia's Natural Resources. ADB.

6 MMAF and USAID SEA Project (2018).

7 MMAF (2012). Decree of the Director General of Marine, Coasts and Small Island, KepMen no: 44/KP3K/2012 Concerning Technical Guidelines for Evaluating the Management Effectiveness of Aquatic, Coasts and Small Island Conservation Areas (*Evaluasi Efektivitas Pengelolaan Kawasan Konservasi Perairan, Pesisir dan Pulau-Pulau Kecil - E-KKP3K*). Jakarta: MAFF, DJKP3K, DGKKJL.



Meet the **Smartest Animals** (and the most loving mothers) in the Sea

By Asri Lestari, USAID SEA Project.



Some scientists believe that the octopus may be the smartest marine animal under the water. Not only do they have a bigger brain than other cephalopods, but they also have incredible problem-solving skills.

In 2009, researchers from the Victoria Museum in Melbourne, Australia, documented instances of the veined octopus (*Amphioctopus marginatus*) collecting discarded coconut shells, and carrying them about as accessories. When presented with a danger they simply ‘flipped’ the shells on top of themselves to use as a shield. At the Seattle Aquarium in the U.S., scientists challenged their octopi to open bottles (enticing them with juicy crab treats inside), to great success. This led to aquariums around the world likewise challenging the octopi in their care, and in 2014 ‘Ozy the Octopus’, from the Island Bay Marine Education Center in Wellington, New Zealand, became the unofficial world record-holder for the fastest bottle opening (54 seconds).

In response, the Seattle Aquarium decided to up the ante, giving their octopi a child-proof tablet bottle (the push-and-turn variety) to open. Billye, a giant pacific octopus (*Enteroctopus dofleini*) was the first to try it, taking 55 minutes to work out how to unscrew the bottle. She got better with practice, however, later managing to open it in an average of just five minutes. This suggests that the problem-solving skills of octopi may be better than the average human toddler’s (and their perseverance and patience certainly a lot higher!).

It isn’t all fun and games for octopus in the wild, however. Living as solitary creatures, mating can be a particularly violent affair. Some female octopi have a rather unfortunate tendency to cannibalize (eat) their partners after mating, and to avoid getting too close, males have developed a modified arm (a hectocotylus) to be able to

deposit their sperm from a distance. Given the lack of care female octopi show their mates, it is surprising to find that they are enormously caring mothers. They stay with their eggs, brooding them like a mother hen, and continually wafting fresh oxygenated water over them to help the development of the young. They don’t go out for food. They starve themselves to care for their offspring. And once the babies hatch, the females – exhausted and starving – generally die. Males don’t have much luck either, as they also usually die within months of first mating.

These extraordinary creatures are a reminder that intelligence, and motherly love in particular, can come in a wide variety of forms. #

Cartoon graphic (top): Squidward, the turquoise octopus that appears in *SpongeBob SquarePants*



Photo: Depositphotos.com

Ecotourism in MPAs: a challenge or an opportunity?

Many MPAs in Indonesia are located in areas of outstanding natural beauty. The attributes that make these areas important to manage (healthy reefs, vibrant fish populations, etc.) are the same attributes that attract tourists to these areas. This can create both challenges and opportunities.

Photo: USAID SEA / Mawar Minora Sihotang

Where tourism is poorly managed, it can create enormous problems. High numbers of tourists can cause cultural degradation, trigger community conflicts, and considerably damage natural assets that attracted visitors in the first place. In some areas of Indonesia, such as in Borobudur Temple in Java or the Komodo National Park, visitor attractions are being 'loved to death' and thus require strict management to maintain their quality and attractiveness.

If well-managed, however, tourism can bring enormous opportunities to an area. Tourism provides jobs. It can improve infrastructure, economic opportunities locally, and social networks. When linked to natural assets, it can provide a great motivation for local communities and wider stakeholders to protect their natural and cultural resources. The best examples of this are places that implement 'ecotourism' and have well designed marine conservation and tourism development plans, such as Raja Ampat in West Papua, where local stakeholders benefit through jobs, increased awareness, and sustainable fisheries due to the marine tourism industry.

So, what is 'ecotourism' ...?

The Global Ecotourism Network defines ecotourism as *"responsible travel to natural areas that conserves the environment, sustains the well-being of local people, and involves interpretation and education (for staff, communities and guests)"*.

Ecotourism is not simply then 'nature-based tourism'. Firstly, ecotourism expects a level of responsibility in terms of protecting natural assets, both for visitors and in support of conservation management. Second, it should sustain the well-being of local people. Community engagement is crucial. By implementing ecotourism, it is anticipated that local communities improve their livelihoods, no longer carry out destructive activities in the environment, and respect the conservation and sustainable management of the areas' natural and cultural attractions. Third, ecotourism provides education. Implemented correctly, ecotourism is expected to increase awareness and knowledge for visitors, managers, and the public on the value of biodiversity and the importance of conservation.

There are many examples in Indonesia where poor or destructive resource management was successfully transformed through community-based ecotourism. In some regions, perpetrators of environmental destruction (such as illegal loggers, bird poachers, and fish bombers) have themselves become successful ecotourism providers and protectors of nature-based tourism attractions. There are also good examples of collaboration between private sector enterprises and local community organizations for ecotourism management



By Ary Suhandi, INDECON and
Stacey Tighe, USAID SEA Project.

(such as hoteliers and investors establishing collaborative agreements with local communities). Cases such as the Tiga Warna Clungup Mangrove Conservation community group in South Malang, East Java, exemplify best-practice approaches. This group has determined a quota of visitors for each tourism attraction, has a strictly-implemented no-emission-zone, and a policy to reduce plastic waste. The group also decides when to close the area to visitors, e.g. during important cultural events (such as Christmas, Eid, and New Year) to allow the area to 'rest'. Local communities are empowered to say "enough" at any given time; avoiding the temptation of simple economic gain in order to ensure the ecosystem, and their local economy, is sustainable in the long-term.

These examples show that ecotourism can be adopted, as long as all stakeholders share a vision, and work together to harmonize economic improvement and ecological protection.

Planning for ecotourism includes conducting studies on the 'carrying capacity' of the site, and establishing systems to minimize negative impacts (e.g. waste) from visitors. Ecotourism sites should develop quality information and guides for visitors about how the program supports the ecosystem and the local community, and the tourist attractions of the area should be monitored and managed with full community support.

Therefore, well-managed ecotourism in MPAs can provide significant opportunities for local communities to diversify their livelihoods, which in turn provides an important incentive for communities to engage in collaborative management of their area. Effectively implemented ecotourism in MPAs demonstrates that conservation, sustainable management, and local prosperity can be successfully intertwined for a sustainable future. #



Photo: Y Putra / CTC



Photo: USAID SEA / Mawar Minora Sihotang

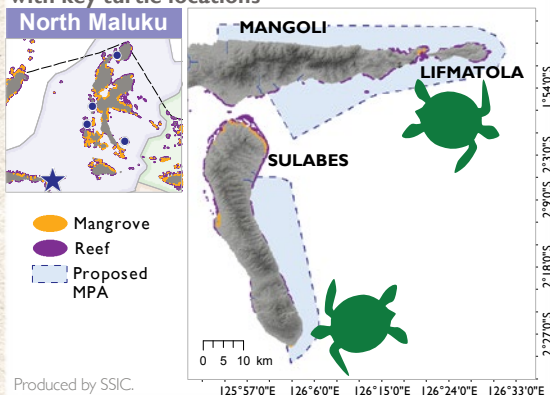
snorkeling adventurer



Indonesia is a haven for sea turtles,
and MPAs protect habitat they need
to feed and breed.

In the Sula Islands, CTC researchers recorded **41 sea turtles in just one survey!** This included both critically endangered hawksbill turtles (*Eretmochelys imbricata*) and endangered green turtles (*Chelonia mydas*). The Sula Islands are in the final stage of becoming a designated MPA, covering an area of 123,436 hectares.

Sula Islands MPA provisional area
with key turtle locations



* Reference: Welly et al. (2017). *Kondisi Biofisik dan Sosial ekonomi, Kepulauan Sula, Maluku Utara*. Jakarta: USAID SEA Project.



FAST FACTS

"If you are a whale, beaked or blue, the Seram Sea is the place for you!"

Whales in the Seram Sea⁽¹⁾

The stunning Seram Sea in Maluku Province is a critical area for whales. In surveys conducted by CTC and APEX Environment, under the USAID SEA Project, two exciting whale species were observed in these waters – the beaked and the blue. With its high prevalence of deep seamount clusters, the Seram Sea provides essential habitat for the deep-diving toothed Beaked whale (family *Ziphiidae*). Blue whales (family *Balaenoptera*) are the largest animal in the world, growing up to 30 meters long and weighing up to 173 tons. Globally, sightings of this endangered species are rare, so you can imagine the excitement of SEA Project researchers to encounter 19 of these beauties in the first two years of the project.



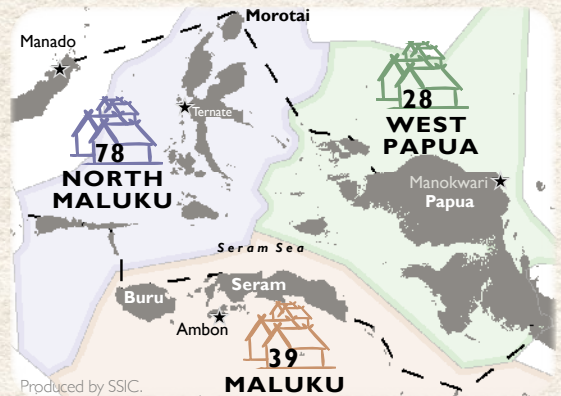
Blue Whale

Photo: Depositphotos.com

Socioeconomic surveys for MPAs

In the first two years of the USAID SEA Project, socioeconomic surveys were conducted in **145 villages** in eastern Indonesia.

This included household surveys to assess the living conditions of coastal communities in the region, as well as income and other sociological surveys to inform and guide SEA Project planning. Understanding the socioeconomic realities of people living within and around an MPA is essential to incorporating societal and cultural considerations into MPA design and development.



Biodiversity & Conservation in Fakfak⁽²⁾

An area called Sebakor, in Fakfak, West Papua, might be the most marine biodiverse part of the planet!

In just **one dive** at Sebakor, Conservation International researchers recorded over 300 species! In nearby Kokas, the marine habitat is so unique that recent surveys discovered **seven species as yet unknown to science**, including new species of pipefish, damselfish, and shrimp goby.

"Thank you for the support of the USAID SEA and CI so that all citizens [in Fakfak] can get information about conservation. The hope is that conservation can last for decades. And it can overcome the [fishers] problem of having to travel far away to find fish."



Photo: CI

Mahmud Bauw,
Village Head of
Tuberwasa Village, Fakfak
Regency, Teluk Nusalasi
Van Den Bosch MPA

(1) Kahn et al. (2017). *Technical Report: A rapid ecological assessment (REA) for marine mammals in the Banda and Ceram seas*. Jakarta: USAID SEA Project.

(2) Hidayat et al. (2018). *Penilaian Bio-Ekologi dalam rangka Rencana Pengelolaan dan Pengembangan Zonasi Kawasan Konservasi Perairan Fakfak di Papua Barat*. Tetra Tech: USAID SEA Project.

A simple man with a **big dream**

By Rudyanto, USAID SEA Project.



“I want to establish a research station in Koon where people can come, not just as a tourist to enjoy the beautiful view, but also to contribute to science and conservation.”

Photo: Nurcholis Efendi / Komunitas Baronda Ambon

Meet Muhammad Miftah Watimena (known as Vitho to his friends). Vitho is the Prince of Kataloka, an *adat* area located on Koon, a small remote island south-east of Maluku's Seram Island. He is an unassuming young man, with a big dream. Armed with a degree in political science, and currently studying for a master's degree in anthropology, Vitho knows that the Koon shoal – an area of three small islands (Koon, Grogos and Nukus) which are under the domain of his father, the King of Kataloka – are richly endowed with oceanic wealth. It is an area of exceptional marine biodiversity, and is possibly one of the largest reef fish spawning sites in Maluku, perhaps in all of eastern Indonesia.

The marine waters of this area are already protected through a *Ngam Decree* (local *sasi* regulation), and in collaboration with the neighboring King of Kiltai, the wider Koon-Neiden area has been reserved as a formal MPA through a Governor's Decree. However, Vitho knows that despite having official 'protected' status, on-the-ground management is everything, and since the region is becoming an increasingly popular tourist destination, sustainable management principles will need to be promoted in the area.

This is Vitho's dream: he wants the local communities of the region to prosper, but doesn't want the area to be damaged. For Vitho, the

solution is the development of 'research-based ecotourism'.

This means no mass tourism, and marketing the area to a particular niche audience – by no means a small undertaking. Vitho knows this is going to take a lot of work, and will require partnering with NGOs, research institutions, responsible tourism operators, and local government. But it doesn't deter him. #



“I am sure this can be achieved and is good, not only for the environment but also for the local economy.”

Photo: Depositphotos.com

Strengthening Policies to Support the Effective Development and Management of MPAs and MPA Networks

By WCS Team.

Indonesia has the highest marine biodiversity in the world, and an abundance of marine resources. It is also, however, experiencing some of the highest levels of overexploitation.

To reverse the loss of these critical resources – both for biodiversity conservation, and for food security – the nation has already established more than 20 million hectares of MPAs. However, the majority of these sites are still in their initiation stage (level 1 – red), and few have developed far enough to achieve effective management sufficient to produce ecological or social benefits.

This is primarily due to: (a) the long and cumbersome process of establishing an operational MPA under the current policies and regulations; (b) unclear objectives for individual MPAs, coupled with difficulties in measuring their management effectiveness, and (c) the realization that some conservation objectives require either very large areas or strategic *networks* of MPAs to be established.

To address these challenges, in 2018, the Directorate of Marine Conservation and Biodiversity (KKHL) in the Ministry of Marine Affairs and Fisheries, began the process of developing new ministerial regulations, technical guidelines, and assessment tools for the development and management of MPAs and MPA networks. Supported by the USAID SEA Project, this process is engaging and involving wider units within the Ministry and associated government agencies, universities and NGOs.

One of the new ministerial regulations aims to combine and simplify three existing regulations, concerning the design of MPAs (defining boundaries and zoning), and the steps required for establishment, capacity development and operational management. This regulation also aims to clarify the roles and responsibilities of different

levels of government (particularly provincial governments) related to managing MPAs.

The USAID SEA Project is supporting this work, and has proposed a new framework that includes clear science-based criteria for establishing MPAs and MPA networks (considering, for example, the percent of area protected, the distance between connected sites, and other factors to ensure that sites can become robust and resilient MPAs). The framework, developed with support from SEA Project partner, The Nature Conservancy, helps to identify targets for conservation objectives (such as replenishing and enhancing fish stocks, or protecting migration routes, feeding and breeding areas of turtles, dolphins and whales).⁸

In addition to this, at a larger scale, work is underway to strengthen the ministerial regulation about developing administrative mechanisms (such as collaborative management agreements) to oversee multiple MPA networks. The revised regulations include a stronger, simpler tool to assess management effectiveness, incorporating considerations of ecosystem integrity over time, and socioeconomic and governance indicators.

The 15 MPAs in the USAID SEA Project portfolio are amongst the first to apply these new regulatory approaches, and the science-based criteria – developed to support these regulations – will be utilized in the design of the first provincially-based MPA networks (in North Maluku, Maluku, and West Papua). Further, to this the administrative systems being developed to support multiple MPA networks will be tested in the SEA Project's target area (Fisheries Management Area number 715) to maximize connectivity and productivity of the provincial networks. #

8 Green et. al. (2014). Designing Marine Reserves for Fisheries Management, Biodiversity Conservation, and Climate Change Adaptation, *Coastal Management*, 42:2, 143-159.

What is an MPA Network?

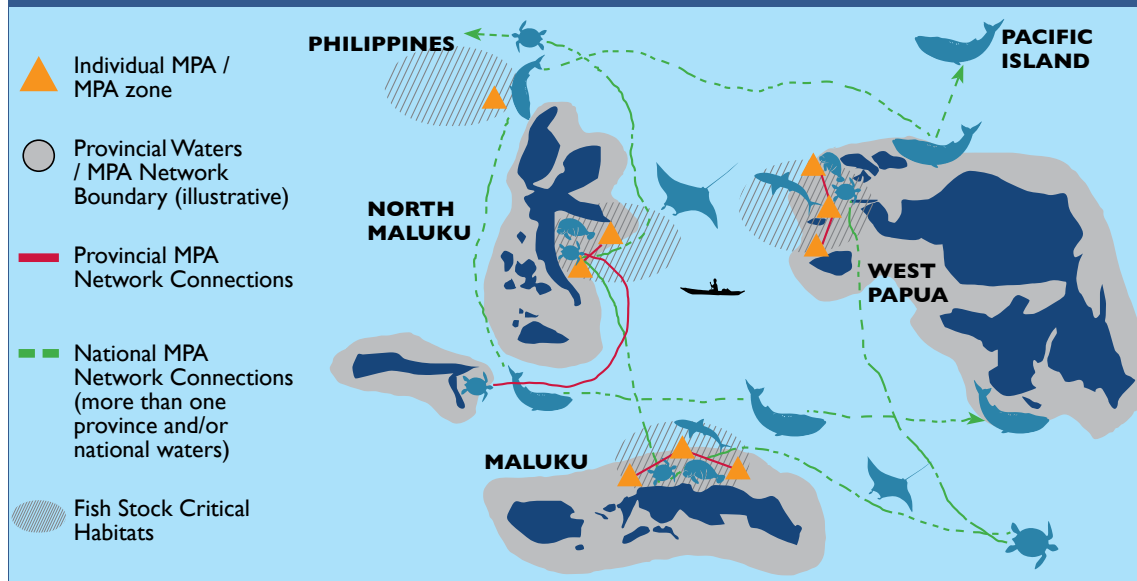
By Stacey Tighe, USAID SEA Project.

A well-designed and effectively-managed MPA can achieve multiple ecological and social objectives. However, it is also important to protect wider eco-regional systems, that include multiple habitats and areas for the different life stages of marine species.

Unfortunately, it is very costly and impractical to protect huge areas of the sea, so scientists have learnt how to design 'networks' of smaller, individual MPAs, that – if designed and positioned well – can effectively 'protect' a much larger area.

For example, if you want to set up an MPA network to protect a migratory species, like whales or turtles, you will need to establish a series of MPAs at various sites that are important for the animals' life cycle. This may include areas where the species breed, where they have their babies, and where they feed. If possible, you would also want to protect the routes that the animals travel between sites. To effectively manage an 'MPA network' requires collaboration between the different MPAs within that network. #

ILLUSTRATION OF MPA NETWORKS IN INDONESIA



Firdaus Agung Kurniawan,
Ph.D.
Head of KKHL Sub-Directorate
of Marine Protected Area
Networks and
International Conventions

“The development of MPA networks in Indonesia is guided by the enactment of Ministerial Decree No. 13/2015. Although several documents and guidelines are available, those are mostly either focusing on networks (or sets) of MPAs or on a conceptual framework. Through the SEA Project we plan to develop both practical guidelines and real implementation of MPA Networks within FMA 715. It has been very challenging as basically MPA network management is more complex than the management of individual MPAs. But as the SEA Project has been pooling the best available resources and experts within the country and region, we believe we will have a functional MPA network soon in Indonesia.”

Traditional Governance of Marine and Coastal

Across Indonesia, traditional marine governance practices were active at the local level for many hundreds of years. These practices were usually established by community leaders and endorsed by local spiritual (*adat*) leaders. However, with a rapidly growing population, an intensifying demand for fish and marine resources, and the migration of people and cultures, these traditional frameworks began to fade in many regions by the early 20th century. Today efforts are underway to regalanize these customary practices, and embed them within formal management systems by incorporating community management practices into MPA design and development.

Sasi

Generally occurring in eastern Indonesia, this system implements a temporary closure of a particular area to fishing or extraction, to enable the ecosystem and associated fishery species to regenerate. In the past, *sasi* was used to build up resources in time for key community activities (such as festivals or feasts), to ensure a maximally productive harvest was available when the area was reopened just prior to the event.

Closures are implemented for periods lasting from a few months to a few years and are generally intended to promote regeneration of nearshore sessile species, such as clams, sea cucumbers, and trochus (top shells). In different communities, the *sasi* concept has various names; *kera kera* in Fakfak (West Papua), *tabob* in southeast Maluku, *lilifuk* in Kupang, and *yot dan yutut* in the Kei Islands.

Panglima laot

Existing in Aceh (far west Indonesia), this traditional institution has the customary mandate to guide the livelihood activities of fishers. Operational since the 17th century, the term literally translates as ‘sea commander’ in Acehnese, and the head of *Panglima laot* in a given area serves as a liaison between fishers and government representatives. The institution also works to settle any disputes between fishers, and promotes agreed-upon practices both for the betterment of fishers’ livelihoods and wider society.



⁹ MMAF and USAID SEA Project (2018).

Ecosystems in Indonesia

Extracted and adapted from
*'The State of the Sea: Indonesia'*⁹

Mane'e

Practiced in parts of North Sulawesi for hundreds of years, *Mane'e* is an agreement between fishers to prohibit fishing in key areas, usually for one year. It is a deeply bound tradition under 'eha' (local regulation), and established through local *adat* institutions. When fishing is permitted, it takes place during low tide, with fishing gear made from roots and coconut leaves, prepared by the whole community as a sign of respect for the ocean.

Awig-awig

This is practiced in areas of Lombok and Bali. *Awig-awig* is a customary arrangement for developing local *adat* regulations to govern resource use and conflicts. It is said to promote harmonious relationships between people and with God. Through *awig-awig*, communities can come together to agree on issues of access, as well as other governance frameworks for managing their marine and coastal environment.



Celebrations at an adat declaration ceremony in South Sorong. Photo: VWF

The Imekko Indigenous People: Sustaining the Shrimp of South Sorong

Photo: USAID SEA / Topandi

By Siti Yasmina Enita and Ehdra Beta Masran, World Wide Fund for Nature – Indonesia.

“When I look at the mangrove trees along the coastline of the Imekko — from Kokoda, Metemani, Inanwatan, Kais, Warongge and Bakoi River — the damage is great compared to 30 years ago.”

Johanes Regoy, a member of the Imekko community in South Sorong, West Papua, shares this concern with many of his neighbors. The mangroves of this region provide essential habitat for the extensive shrimp fishery that the Imekko people rely on; and it has been declining rapidly in recent decades.

Rewind to thirty years ago, and the region was fished almost exclusively by the Imekko people and their neighboring West Papuans. But over the years, fishers from other areas of Indonesia have been arriving in increasing numbers to exploit these rich waters.

“We, the Imekko community, couldn’t do anything. Our community rules to protect our fishing area were unwritten, unrecognized and unenforceable.”

Since the launch of the USAID SEA Project, WWF-Indonesia have been working with the Imekko to reinstate customary management systems in the area, through the establishment of *sasi*. The *sasi* areas are determined based on

the key commodities for the fishers (shrimp, mud crabs and fish), and to protect indigenous species in the region (particularly sharks, turtles, and coastal birds that are endemic to South Sorong). These areas will then form the basis for a more formalized MPA, with endorsement and support from both the provincial and national government.

Through various activities conducted with the Imekko — including awareness raising, training, and community fora — the community has recognized that the goals of biodiversity conservation and sustainable management align with their own *adat* goals for a sustainable existence. Johanes Regoy, who has gone on to become a champion for the establishment of the South Sorong MPA, summed it up when he said:

“My prayer has been heard.”

In 2018, an *adat* declaration provided a clear endorsement for *sasi* establishment, and showed the communities’ support for the efforts underway in this region. The declaration states:

‘The community — through adat leaders, women, tribal leaders, and village heads — hopes that this project will help us to improve living standards in the future. Because marine resources are a necessity for us, our children and our grandchildren; we need to understand how to protect the coastal environment’. #

Building Skills for MPA Practitioners

By Rein Paat and Hesti Widodo, Coral Triangle Center.

As the number and maturity of MPAs grows in Indonesia, it is critical to ensure there are sufficiently skilled people to operate and manage them.

Each province and MPA requires around 15 or more trained staff, as well as capable partners, in order to manage the MPAs effectively. Skills need to be built amongst civil service staff at all levels (in the national, provincial, and district marine agencies), as well as amongst local NGOs, communities, and the private sector.

In the early stages of MPA development, skills-building is usually focused on ensuring a strong basic understanding of the benefits of MPAs (for fisheries productivity, livelihoods, and biodiversity), as well as how to design, establish, and operate an MPA. This includes understanding the various co-management systems that can be adopted to engage, motivate, and empower local stakeholders (MPA IOI). MPA-related staff, particularly Fisheries Extension Officers in the civil service, also need to learn how to reach out and communicate effectively with local communities, to share information on sustainable fisheries, and to explain the role of MPAs (and particularly no-take zones) in helping fish stocks recover and grow. They need the skills to engage with local fishers and communities, and to understand local perceptions and attitudes, in order to align the MPA development process to with local interests and concerns. In addition



Community training for MPA design

to this, government staff need to be fully aware of the legal instruments surrounding MPA establishment and management, law enforcement, and monitoring (including both biophysical and socioeconomic monitoring).

At the more advanced level, MPA managers and stakeholders need to learn about MPA zoning and design, in order to draft zoning and management plans. Depending on the needs of a site, other common forms of training may include: dive training (for scientific monitoring), English language training, patrol training, and education on sustainable tourism and fisheries management.

Since the launch of the USAID SEA Project, more than 1,000 individuals have received training, with SEA Project partners, the Coral Triangle Center (CTC), delivering nearly 50 percent of these. CTC is a long-term partner of the Ministry of Marine Affairs and Fisheries, and supports the preparation of national-level formal competency standards for civil servant staff. In 2018, two new MPA competency standards were legally established – one for marine tourism management in MPAs, and one for MPA outreach. This institutionalization of training and capacity building is essential to ensure skills-building is supported nationwide for the effective management of MPAs into the future. #



Introductory MPA training

So, you have set up an MPA.

It is legally established, zoned, and everybody knows about it. It has been designed to increase fish stocks, and protect biodiversity. Tourists are drawn to the area to see the stunning natural beauty of the site.

But what if fishers simply continue business as usual? What if they fish in the no-take zones? Or use destructive fishing methods? What if the MPA regulations are simply ignored? This is an important part of the puzzle for MPA managers. It isn't enough to simply set up an MPA and expect it to work. Resource users need to **change their behavior** to comply with MPA rules, and the regulations need to be **enforced**.

Community-driven Enforcement in MPAs

By Christiana Yuni, USAID SEA Project.

Enforcing the regulations of an MPA is essential for effective management.

If the no-take zones are ignored, or non-permitted destructive fishing gear is used, it undermines the entire integrity of the area, at considerable cost not only to the marine species, but also to the people whose livelihoods depend on the productivity of the sea. At the same time, heavy-handed enforcement from MPA managers can result in local resource-users feeling like they are in an 'Us' and 'Them' scenario – this divides support for the area, and works counter-productively to any long-term sustainability.

Therefore, in Indonesia an important system for engaging community members in proactive surveillance and enforcement activities has evolved. This system offers enormous potential for promoting the buy-in, engagement, and support of local resource-users, as well as providing regular observation services, which are often too costly for an MPA management unit to implement. Known as POKMASWAS, these 'community surveillance groups' are recognized under national law, and supported with training so that they can effectively monitor and collect information in their local MPAs.

The USAID SEA Project is supporting the work of these groups at a range of levels. Nationally, efforts are underway to amend an important ministerial regulation governing these groups'

roles, in order to promote harmony between the formal surveillance practices under national law, and those operating at the local-level through customary law. A training program is also being developed at the national level to support POKMASWAS groups nationwide, with a modular staged approach to training.

In the SEA Project's focus provinces of North Maluku, Maluku, and West Papua, work is underway to support the establishment of new POKMASWAS groups in the Project's MPAs. The national-level training is being trialed with these groups, and includes topics such as: recognizing threats to the MPA ecosystem; conducting MPA zoning and management planning; communicating effectively with stakeholders to promote compliance with the zoning and management plan; and understanding the types of violations that might occur in the MPA (both how to recognize them, and how to report them). The SEA Project is also engaging these groups in various studies and surveys to strengthen their sense of ownership and responsibility towards the marine environment.

This engagement and empowerment of local communities – ensuring they have recognition and respect as collaborative managers of their own resources – is a key step towards achieving local compliance in an MPA and, ultimately, achieving effective MPA management. #



Changing Behaviors

*Extracted and adapted from 'The State of the Sea: Indonesia' 10
Image from Gombos, M., et al. (2013).*

Managing an MPA is about managing people. The people who use, and rely upon, the resources of an MPA are required to adjust their behavior to comply with the MPA's rules.

Whether that involves stopping fishing in a no-take zone, or changing fishing gear to ensure it's not destructive to the environment, or limiting fish catches from an area, or avoiding catching protected species – it all comes down to changing the behavior of people.

Unfortunately, changing behaviors isn't easy. There are lot of factors that influence how people and societies choose to behave. Therefore, to begin you need to understand what influences people. What are the motivations and perceptions of the target audience? What makes people behave the way they do?

In some cases, you may discover that people are not aware of the damage their current behavior is having on the environment – behaviors such as destructive fishing, coral extraction, or the collection of endangered species – and in these cases education and awareness raising is vital. However, this oftentimes isn't enough to lead to change (we might know something is wrong, or bad for us, like smoking, but we often still do it). Changing behaviors requires a shift in attitude, and an embracing of a new behavior.

Also, any obstacle(s) to behavior change need to be removed (for example, a fisher may want to switch to an eco-friendly fishing gear, but cannot afford it). Change needs support. The path to change needs to be clear, possible, and practical.

For many people, their path to change also needs to be endorsed and supported by the people around them. In all societies there are 'key influencers' – such as civil leaders, local musicians, respected elders or religious leaders – whose own behavior and attitude can influence others and galvanize change. These people are often called 'change agents', or 'champions'; and they are the ones you want publicly and passionately advocating changes of behavior in MPAs. People listen to them. People will be influenced by them.

In the USAID SEA Project, efforts are underway to identify and engage 'champions' in the project's 15 focus MPAs. To date, 143 champions have been identified, from more than 60 different communities situated within these MPAs. Through these champions, and through the use of social marketing and wider communication tools, change can happen. It can – and it must – if MPAs are to be sustainable and productive into the future. #

10 MMAF and USAID SEA Project (2018).

Want to learn more?

The State of the Sea: Indonesia is a three-volume publication available from the USAID SEA Project. These books provide an overview of marine and coastal management in Indonesia, including detailed insights into the establishment and effective management of MPAs.

The books are reader-friendly, and aimed at non-technical audiences as well as professionals in marine and coastal management. They share Indonesia's story: what has happened to the marine environment in recent decades, and what is being done to tackle the challenges faced.

Launched in October 2018 at the prestigious Our Ocean Conference, these books are available in print form, as downloadable PDFs and e-books, and can be accessed in both English and Bahasa Indonesia. They have been jointly produced by the Ministry of Marine Affairs and Fisheries and the USAID SEA Project.

Get your copy from the USAID SEA Project office (see back cover for address), or online at: <https://www.sea-indonesia.org/resources/stateofthesea>



Protecting Endangered and

Indonesia is fortunate to host exceptional and rare marine life. Flamboyant and fascinating species are frequently showcased in the media, attracting both local and worldwide attention. This celebrity creates awareness of the diversity of the underwater world, but also, tragically, leads to activities that can threaten species' survival.

For example, the Disney movie *Finding Dory* led to the over-collection and subsequent decline of the blue regal tang fish (*Paracanthurus hepatus*), a relatively rare fish that cannot reproduce in captivity. Many other species are harvested for use in collections (from private aquariums to public zoos). In their natural habitat they can be harassed by tourists, extracted for religious or cultural use, or targeted as exotic delicacies, sometimes beyond the point where they are able to sustain a healthy population.

Because of these behaviors, some of the once abundant unique and charismatic marine species in Indonesia are now endangered or threatened. Protection of these animals (and marine plant species) at all stages of their life cycle is needed to reverse these trends. MPAs are one (and perhaps the strongest) tool to achieve this, because they can:

Prohibit capture: For rare or overfished species, a ban on fishing can offer important protection; bans can be temporary (while the population recovers), or permanent (for very rare species). The animals most at risk tend to be those that require several years to reach breeding maturity, and / or have low reproductive rates (i.e. a few infrequent offspring) such as the coelacanth fish (thought to be already extinct, it was recently re-discovered), as well as dugongs, dolphins, whales, and sharks. For this reason, Indonesia recently banned fishing for manta rays nationally, and other countries are banning shark capture completely (zero harvest permitted nationwide, and large fines imposed on illegal catches). In rare cases where these fish are caught as by-catch and die, they should be brought to scientists for study rather than sold for food or other products. Since it is difficult to police the sea, MPAs provide a sanctuary for these animals, and can help protect healthy populations so that they can recover from decline.

Protect habitat: In addition to prohibiting the capture of threatened species, **it is also important to protect their habitat so that they have a safe refuge to roam, forage, and hide throughout the different stages of their life cycles.** The general guideline is to protect 20 to 30 percent (more if possible) of their habitat by classifying key areas as 'no-take zones'. If the population is very threatened, the recommended protected area of habitat is 30 to 40 percent. Areas where calves or babies are born and grow should be particularly protected, to ensure that offspring can grow strong enough to migrate with their parents or survive on their own. If managed well, these sanctuaries can often acquire economic support through carefully managed tourism and /or the international community.

Threatened Species

By Stacey Tighe, USAID SEA Project.

Protect breeding/spawning sites

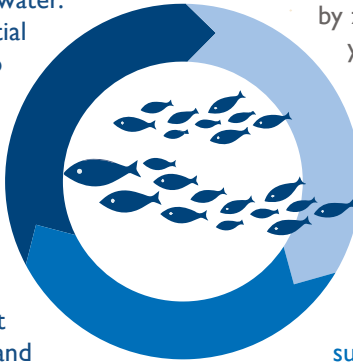
Many fish spawn in aggregations linked to the lunar cycle, and over many hundreds of years fishers have learned to target these aggregations, as they can catch lots of fish in a single trip. This practice results in some of the biggest (and most productive) spawners being taken out of the population and, every year, fewer fish come together to spawn. Even those species that have lots of offspring, or release many eggs, need protection for their young. Therefore, it is essential to protect these aggregations from being fished. During significant spawning events (such as grouper fish or coral spawning times) activity should be limited to avoid any disruption to the spawning process, and to avoid harm to the larvae / eggs as they travel through the water.

This is not only important in the water. Coastal areas are also essential for turtles and marine birds to breed, and need to be retained in their natural state. Coastal development often destroys turtle nesting beaches, and breeding sites can be disrupted by hunters and collectors, making these areas critical for protection. MPAs can zone these important breeding areas, both in the water and along the coastline, as 'no-take', either permanently or at least during breeding seasons.

having only camouflage as protection. In such a case, having a no-take rule is critical, but so is protection from wider threats (such as setting a minimum distance that tourist scuba divers can approach the sea horse's sea fan so that novice divers do not accidentally destroy it with an awkward kick). Similarly, for green turtles and dugongs, which require large areas of healthy seagrass to eat, there should be no activity in the area that allows anchors or nets to drag along the bottom and damage the seagrass. Additionally, the area needs to be protected from coastal development (which might, for example, replace a seagrass meadow with a bar or restaurant). These restrictions can be implemented through MPA zoning regulations.

Protect birthing and juvenile habitats

Once newborns arrive they require protection during their juvenile and vulnerable phases. Coral reefs and mangrove areas are particularly important for young marine species. Many sharks, for example, birth their pups in mangrove areas, where the pups can feed on small prey and be protected until they can handle larger prey in the open seas. Mangroves are also a safe haven for many coral reef fishes and some young pelagic fish (I used to catch baby barracuda in my mangrove sample net – they were all teeth, and tiny bodies). Therefore, a general guideline is to protect 20 to 30 percent of the key areas for juvenile fish, with no fishing allowed, as well as protect the habitat from pollution, harvesting, and other harmful activities. MPAs can provide this protection by zoning these critical habitats for the young to safely grow.



Protect home ranges

Moving from youth into adulthood, many endangered and threatened species require particular habitats and conditions to survive, and these too need protection.

For instance, certain seahorses live their whole life on a single sea fan. They can be found there every day and are easy targets for collectors,

These are a few ways that MPAs can protect endangered or threatened species. As always however, it can only work where the MPAs are effectively managed. It requires knowledgeable staff to patrol, protect, and care for endangered and threatened species, and no-take regulations to be strictly enforced, with severe penalties when broken. When successful, carefully-managed tourism to see rare species can also generate sustainable financing for the management of the MPA. #

The Faithful cows of the sea



Photo: Depositphotos.com

Indonesia's seas are host to a uniquely slothful mammal known as the dugong (*Dugong dugon*). Often referred to as 'sea cows' these animals graze on seagrass and like to sleep and rest (which they do a lot!) bobbing about on the surface of the water.

Growing up to three meters in length, and weighing up to 500 kilograms, these impressively large sea creatures like to live in warm coastal waters, particularly calm bays, where they can find fields of seagrass to forage. As mammals, they need to breathe air at the surface of the sea, but are able to stay under the water, happily grazing, for up to six minutes at a time.

Legend has it that these animals may have historically been mistaken for 'mermaids', as they lounge on the surface, their 'arms' folded in recline, but are able to swiftly dive under the water with a swish of the tail. Their eyes are also similar to human eyes, and produce 'tears', adding further mystique to these lumbering creatures. Perhaps most interesting of all, dugongs are monogamous. Once they find a mate, they stay faithfully together for life, like a married couple, communicating with each other through a complex language of chirps, squeaks, barks, and trills.

Reaching maturity at around ten years, dugongs have a life expectancy of up to 70 years. When dugongs have babies, the pregnancy lasts for an entire year, and when the calf is born it forms a strong bond with its mother, with whom it generally stays for the first 18 months of life.

By Asri Lestari, USAID SEA Project.

As slow swimmers, these cumbersome animals face threats from predators such as sharks, killer whales, and crocodiles. However, their biggest threat of all is man. Not only are their precious seagrass foraging grounds disappearing at an alarming rate due to coastal development, extraction, and pollution, but their habit of resting on the surface of the water puts them at a high risk of being struck by ships or engine propellers. Unscrupulous traders also catch these majestic creatures to trade on the black market, to private zoos and curio-traders.

By the mid-1990s, estimates suggested that Indonesia's dugong population had dropped to just 1,000 individuals. Today, the dugong is classified as 'vulnerable' to extinction, and we simply do not know how many remain. What we do know is that seeing one is a rare and special sight, and they need to be actively protected wherever they survive. #

SEA

FAST FACT

In the first two years of the USAID SEA Project, research scuba divers surveyed marine habitats and species at target sites a total of 3,097 times!

This included 1,372 separate transects surveyed through manta tows, 1,149 transects followed to assess reef habitat, and 576 reef fish surveys. In addition to this, 11 spawning aggregation surveys and 39 seagrass surveys were conducted.

MANTA TOW

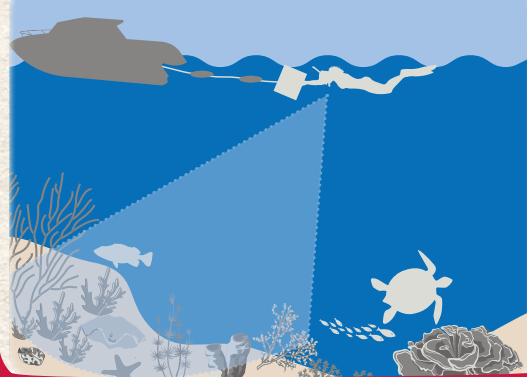


Photo contest winners



Returning Home

Fahreza Ahmad

In August 2018, a photograph competition, launched by 'Friends of the SEA', welcomed submissions from across Indonesia. Of all the stunning images received, two were declared the winners by the judge of the contest (the acclaimed documentary photographer, Tantyo Bangun).

The two award winners — Fahreza Ahmad and Adiprayogo Liemena — won the opportunity to travel to one of the USAID SEA Project sites to photograph the stunning environment and capture images of project activities.

CONGRATULATIONS Fahreza & Adiprayoga!

Taken in Lhok Seudu Bay (in the village of Teupin Layeu, Aceh Besar District) this photo captures fishers returning to shore with a healthy harvest of fish. In this region of Indonesia, these *palong* fishers generally begin fishing in the dead of night, setting out to sea around 2.30 am. The *palong* fishing technique uses simple manual tools (a net and a lamp to shine in the water to catch fish), and boats generally carry up to four fishers per vessel, with two vessels working together to operate the gear.

Their target catch is mostly anchovies (as shown here), but they also regularly catch squid or other shoaling fish. The vessels don't carry any ice to preserve the fish, therefore as soon as the sun starts to rise the fishers return to shore to sell their catch at the Lhok Seudu Auction House. From there, the fish are immediately salted and processed, resulting in some of the highest-quality salted-fish in the Aceh Province.

Taken in Alor, East Nusa Tenggara, this photo shows a traditional fish trap ('*bubu*'). These fishing traps, in various forms, are thought to have been used in Indonesia for many thousands of years. The *bubu* is traditionally made from bamboo, and woven with funnelling to draw in and catch unwary fish and crustaceans. It is usually placed in reef areas, at up to six meters depth, so that fishers can easily swim down to place their trap, and later recover it. Unfortunately, badly-placed traps can easily damage fragile corals, and fishers are encouraged to place them on rocky substrates or in sandy areas.



Bubu

Adiprayogo Liemena

Unlike some areas of Indonesia and other tropical coastlines, where fishers 'mark' the placement of their traps using home-based floats and buoys, in Alor fishers often leave their trap unmarked, simply remembering where they placed it. While traps are laid relatively close to shore, and near familiar landmarks, it remains no mean feat to find them again, as you will know if you have ever tried to return to a particular place in the sea without any navigation aids. This shows both the skill of the Alor fishers, and their deep familiarity and connectivity with the ocean around them. #

MPAs in Indonesia: Looking Ahead

By Stacey Tighe,
USAID SEA Project.

Indonesia has a very special marine environment, as most people who understand oceans recognize. A strong focus on national-level marine management (practised in Indonesia and the global community for over two decades) is fully justified as we face the challenges of an increased human population, dwindling resources, climate change, and other threats.

The national government is best placed to address external threats, such as foreign and illegal fishing, and global environmental issues. However, history has shown that in the end, it is the people on the ground – local communities and coastal stakeholders – who ultimately support or hamper conservation. Therefore, a ‘sandwich approach’ – using both a ‘top-down’ and ‘bottom-up’ design, development, and management strategy – is critical for achieving marine conservation.

The articles in this newsletter provide a brief glimpse into many elements that support MPAs. Combined, these components can help create and operate effective MPAs in Indonesia.

Policy and governance: Clear and logical frameworks of policies and regulations, supported by current science and experience, are the foundation of good MPA governance. Happily, this year the work to revise and integrate marine conservation regulations through the MMAF holds great potential for revitalized programs in the years ahead. The key challenge now is to continue to strengthen the ability of provincial governments to take on their new responsibilities of developing and managing MPAs. Also ripe for innovation and effort is the development of strong partnerships – within and between communities, individuals, universities, private sector businesses, and government agencies – to create an intricate weaving of resources and services, capacities and users, to embed effective MPAs into the institutions of Indonesia.

Capacity building: Although capacity building is one of the most important elements of effective management, it is extremely difficult to do well, and requires support to government

and resource-users over many generations. The SEA Project is working to institutionalize capacity building into existing organizations such as the governmental civil service, universities, NGOs, and communities. Indonesia has made a lot of progress, and is now producing trained staff to join the provinces in managing their MPAs. Learning networks and social media also provide the means to accelerate innovative learning among peers. All that is needed now is a more integrated platform to help leverage these tools, and time to conduct ongoing trainings.

Community co-management: As noted, communities are key! Two aspects discussed here are central to maintaining marine resources for the benefits of local communities that rely on them: (1) **Local community surveillance groups** (POKWASMAS) provide perhaps the quickest and most effective way to encourage compliance with local MPA regulations, though can be challenging to establish and require an investment of time and resources; (2) **Adat management** approaches empower communities to safeguard their natural heritage, often making all the difference at the local level, though challenging to adopt and develop at any larger scale. Indonesia, more than many other countries, recognizes these community co-management approaches and has an increasing number of programs to support them.

Endangered and threatened species: MPAs are traditionally known as areas to conserve special or threatened species. In addition to market controls (such as regulations against harvesting, buying, selling, importing, or exporting these species) MPAs serve as the best tool for their survival, particularly when established in partnership with local communities who know where these animals are, and who want to protect them. Hopefully MPAs can help rebuild endangered populations through expanded no-take zones, education, and enforcement.

Financing MPAs and tourism: Financing MPAs can involve a range of mechanisms, including government funding, endowments, user fees, and tourism. As tourism grows worldwide, tourists and resource managers need to insist

Photo: M Welly / CTC

Please explore the USAID SEA website (www.sea-indonesia.org) for much more information and to access USAID SEA documents and reports

that we follow ‘sustainable tourism principles’, and maintain the highest possible standards of ecotourism within MPAs. Again, communities are the key: tourism brings visitors into local homes, streets, and beaches, and asks local people to share their precious natural resources. There is room for innovation in ecotourism, from crowdfunding to social media learning networks.

Research: While not discussed much in this newsletter, research in marine conservation requires strong support and funding, indefinitely. In the process of mapping threats and conservation targets, we come up with uncertainties: *Is beach A or B a more important nesting area to protect first? Where are the key spawning aggregation sites?* Research is critical to understanding an area and its human impacts, as well as learning how best to protect the ecosystem for its integrity and services. Indonesian universities are producing the scientists to answer these questions, but more programs that support MPA research are required.

Dr. Alan White began this newsletter by suggesting **three keys to support effective MPAs — so where are we with these, and what is next?**

Well-designed and effectively-managed MPAs. We now have a good understanding of how to design MPAs. New regulations in Indonesia will include clear guidelines, and will initially be applied in the 15 MPAs in the USAID SEA Project portfolio. But there are 31 other provinces and over 100 other MPAs in Indonesia. Happily, MMAF is encouraging them to review and revise their designs and zoning to better address conservation and fisheries issues.

Several programs in the last two decades have generated good-practice examples and models of effective MPA management. We now need a major push to gain more experience in operating MPAs, standardize MPA development and management approaches for the Indonesian context, and build sufficient technical and management personnel, especially in the provinces. The plan is to ‘graduate’ from developing individual MPAs, to networks of MPAs, which can better protect conservation targets throughout their lifetimes and habitats.

Monitoring, evaluation, and response-feedback systems. No MPA or MPA network can be considered ‘well-managed’ without ongoing monitoring of the natural resources and their use. Quantitative and qualitative monitoring efforts need to be incorporated into adaptive management of an area, as do research results that inform us of local and global trends. This approach to management is new in Indonesia, and mostly site based, and still in the process of institutionalization. However, these programs show promise and just need ongoing focus, efforts, time and stable resources to blossom.

Integration of socioeconomic factors supporting MPAs. One of the most common reasons MPAs fail is due to social conflicts over resource use. Local stakeholders and their needs MUST be integrated into the design of any MPA program from the beginning, building trust and engagement to empower people to collaboratively manage an area. We have seen progress in this area in Indonesia over the past two decades, but case studies and scientific research are not always utilized by scientific practitioners hired to design MPAs. It takes an integrated team of specialists – from the fields of science, social science, economics, and governance – to make it all work.

Indonesia has hundreds of MPAs, and all are currently facing a transition of governance to the underprepared provinces. This transition will create great frustration, but also great possibilities for management and innovation — particularly where we can find ways to decentralize key management actions to local officials and communities.

The final reminder is for all those involved in MPAs to work as a team.

It is a new era of MPA governance and management in Indonesia, and we have a strong foundation and great potential to show the world how to develop and operate MPAs successfully. #

Partners

Activities under the USAID SEA Project are led by Tetra Tech, and implemented by a consortium of partners at the national, regional, and local level.



Implementing multi-level interventions under the SEA Project, WWF's work includes: coordinating activities in West Papua; undertaking fisheries assessments; advancing the design and implementation of an Ecosystem Approach to Fisheries Management (EAFM) through Fishery Improvement Projects and wider incentivization mechanisms; supporting the effective management of MPAs; advancing sustainable marine tourism across sites; and enhancing skills and capacity at a range of levels.

Sites: North Maluku (Ternate, Tidore, Weda); Maluku (Sawai, Koon, Buano Islands); West Papua (South Sorong, Sorong, Bintuni)



Yayasan Masyarakat dan Perikanan Indonesia

Focusing on large pelagic (tuna) fisheries, MDPI's work includes: promoting incentives through Fair Trade and associated schemes for the adoption of EAFM practices; supporting research, design, and management for sustainable fisheries; establishing fora and building skills.

Sites: North Maluku (Kayoa, Bisa [Obi/Bacan], Sula); Maluku (Sawai, Parigi, Bula)



Establishing a network of locally-managed marine areas; building skills building to enhance community governance; advancing tenurial rights and livelihood initiatives to promote sustainable fisheries management.

Sites: Maluku (West Seram, Central Maluku)



Promoting improved governance of flying fish resources in target areas, UNIPA's work includes research and community engagement to improve sustainability of the fishery, and enhance fisher income and welfare.

Sites: West Papua (Fakfak)



Focusing on North Maluku, WCS's work includes: coordinating activities with the North Maluku government agencies; undertaking fisheries research; and supporting intervention design and implementation for EAFM; addressing destructive fishing practices and the illegal wildlife trade; supporting the establishment and effective management of MPAs; promoting law enforcement and enhanced capacity at the provincial level.

Sites: North Maluku (Morotai, Ternate, Tidore, Mare, Guraici, Weda, Widi)

Marine Change

Focusing on the development and utilization of a tailored economic rate of return (ERR) methodology as a tool to model use-patterns and economic considerations in target areas, Marine Change's work aims to optimize investment decisions surrounding both fisheries and sustainable tourism.

Sites: North Maluku (Morotai, Mare, Widi); Maluku (Sawai, Lease)



Providing direct social and economic benefits to local communities through the development or enhancement of community businesses, including nature-based tourism.

Sites: North Maluku (Morotai, Mare)



Focusing on anchovy fisheries, UKIP supports research, fishery intervention design, and sustainable fisheries management in target areas.

Sites: West Papua (Misool, Kabui)



Supporting the design, development, establishment, and co-management of new MPAs in target areas.

Sites: West Papua (Fakfak)



CORAL TRIANGLE CENTER

Advancing capacity building to support the effective design, establishment and management of MPAs, CTC's work includes: multi-level training and skills-building; promoting the engagement of local communities and the empowerment of MPA champions; supporting the effective design of MPA sites; promoting species management.

Sites: North Maluku (Sula); Maluku (Buano, Lease, Ay-Rhun)



Reforming fisheries management through the establishment of territorial user rights for fisheries (TURFs) to incentivize behavior change in target communities in order to enhance fisheries productivity and advance sustainable livelihoods.

Sites: West Papua (Mayalibit Bay, Dampier Strait)



Supporting the creation of incentives for tuna fishers (pole-and-line and hand line) to promote sustainable fishing practices, advance skills, and progress towards MSC certification across Fisheries Management Area (FMA) 715.

Sites: Fishing ports in Maluku, North Maluku, & West Papua



Supporting the development of MPA networks for each province and across FMA 715, and building capacity in the technical aspects of MPA design as fishery management tools.

Sites: FMA & province-wide.

Talking SEA:

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