

Recovery of reef sharks and manta ray in Misool, Indonesia

SUMMARY

An innovative conservation model incorporating tourism, community development and biodiversity protection has transformed a marine ecosystem impacted by destructive shark and ray fishing, winning international recognition in the process.

SPECIES PROFILES

Countless species in coral reefs around Misool Island have benefited from the ongoing conservation work. Sharks and rays include:

LOCATION

Misool Island, Raja Ampat Archipelago, Indonesia.



BLACKTIP REEF SHARK

These medium-sized sharks live in shallow waters, and often stay close to the same small areas around coral reefs.¹

VU IUCN RED LIST STATUS
Vulnerable

Aa SCIENTIFIC NAME
Carcharhinus melanopterus

Kg WEIGHT
up to 24kg

Length LENGTH
up to 1.8m



GREY REEF SHARK

This medium-sized shark is a coastal shallow-water species found around tropical coral reefs.

EN IUCN RED LIST STATUS
Endangered

Aa SCIENTIFIC NAME
Carcharhinus amblyrhynchos

Kg WEIGHT
up to 35kg

Length LENGTH
up to 2.5m



REEF MANTA RAY

One of the world's largest ray species, reef mantas are found in coastal and pelagic tropical and subtropical waters.²

EN IUCN RED LIST STATUS
Endangered

Aa SCIENTIFIC NAME
Mobula alfredi

Kg WEIGHT
up to 700kg

Width WIDTH
up to 4.5m



HISTORICAL POPULATION TRENDS

In the 1980s and 90s, sharks and rays were common in the abundant waters around Misool Island. Rays were only consumed locally, while the fisher communities had little interest in fishing for sharks.³ But the situation changed abruptly around the turn of the century, when international demand for high-value shark products – particularly their fins – created a new and lucrative market for targeted fishing.⁴ Meanwhile, manta gill plates became sought-after for use in Chinese medicine.⁵

Massive overexploitation was swift. With no management plans in place, local

and foreign vessels targeted shark and ray populations across the Raja Ampat region, and by the mid-2000s⁶ anecdotal reports suggested they had been almost fished out – divers spoke of whole trips where they saw no sharks at all.

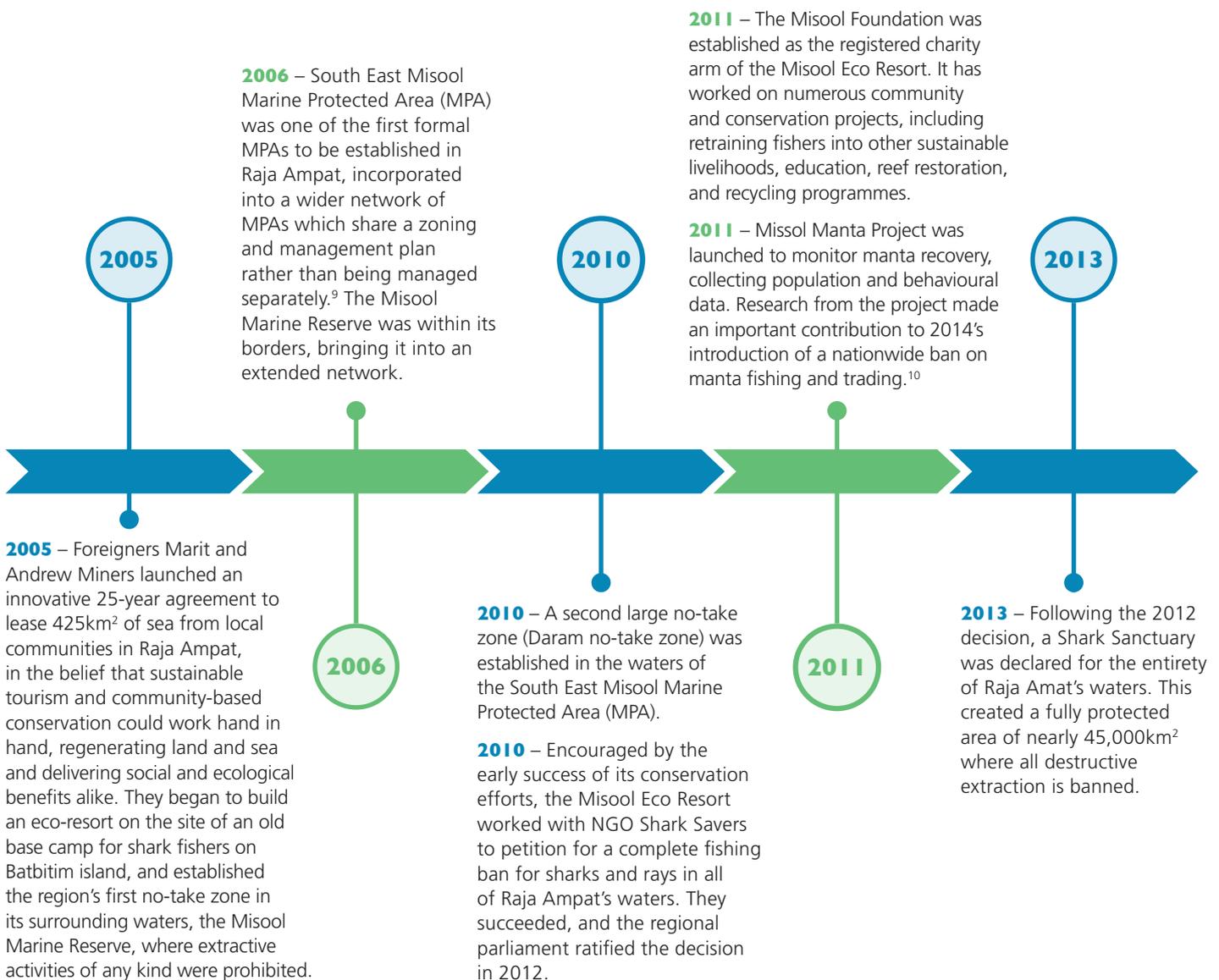
Fishing methods used were unsustainable and unethical. Evidence of shark finning around Misool was discovered in 2006: fishers would pay US\$30 for a permit from local villages which gave them the right to fish for sharks for 30 days, during which time they could expect to catch about 300 sharks. That worked out at 10 cents per shark – but with the right contacts

in the fin trade, each one could then be sold on for US\$1,000.

Meanwhile other harmful fishing practices – from dynamite fishing to high-harvest non-specific gear – caused widespread habitat destruction and impacted marine biodiversity. An absence of monitoring made regulation very difficult, and in any case only minimal penalties were in place.⁷ By 2007, non-governmental organization (NGO) WildAid judged that “the reefs of the Misool Marine Reserve had been destroyed by dynamite fishing and turtle egg harvesting, shark finning, and manta ray hunting were rampant”.⁸



RECOVERY TIMELINE





KEY SUCCESS FACTORS

The founders of the Misool Eco Resort and the Misool Foundation were not professionals and had never done anything like this before – but their vision of leveraging pristine reefs to fund conservation work was a persuasive one, and they worked hard to bring local communities on board and get the authorities on side with their plans.

Involving, employing and supporting local communities has been key to the model's success. Creating alternative jobs for shark fishers has been particularly important. The Raja Ampat government has helped the Misool Foundation develop sustainable local livelihoods with a US\$ 90,000 grant, building a mariculture facility to employ former fishers and empowering local women with jobs processing coconut oil. Profits from these enterprises will fund other economic development projects.¹¹

The experience of other NGOs has been useful in setting up MPAs and the shark sanctuary in the region – The Nature Conservancy, Conservation International, and Shark Savers have all contributed to the project. Meanwhile WildAid Marine has worked with Misool Eco Resort to help enforce the no-take zones,¹² providing safety and surveillance equipment and a patrol boat for the park rangers – all of them former shark-fishers who now work closely with the marine police to protect the animals they once fished.



BENEFITS OF RECOVERY

There has been an amazing recovery in the waters around the Misool Eco Resort, which has won many accolades both for its achievements in sustainable tourism and for its contribution to conservation – it was named a Mission Blue Hope Spot in 2017 and the next year it received a Global Ocean Refuge Platinum Award, while the World Travel and Tourist Council gave it the highly prestigious Tourism for Tomorrow award.¹³ Despite its remoteness, Misool has become a popular destination for high-end marine tourism. Revenues from visitors to the shark sanctuary provides economic benefits for the community and funds for further wildlife protection, creating a virtuous sustainable circle.

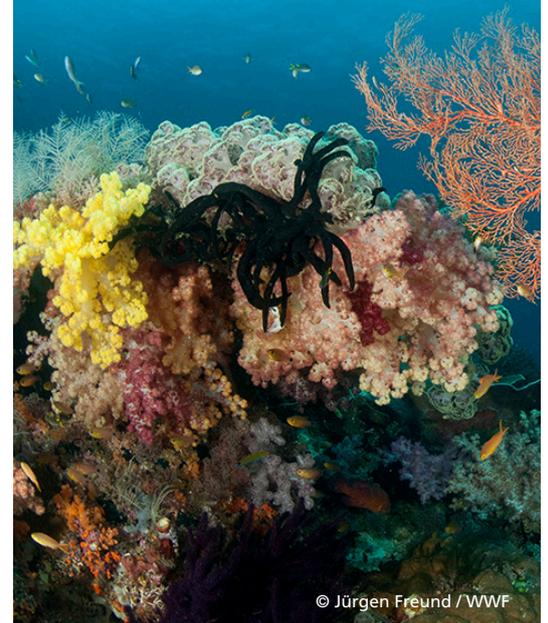
More data is needed on the detail of marine population recovery in the area, but the evidence clearly shows that it is taking place. Following the establishment of the no-take zones in 2005 and 2010, a month-long study in 2012 found sharks had returned to the area¹⁴ – and 48 out of the 50 sightings were inside the no-take zones rather than the open access zones of the South East Misool MPA. Scientists believe the significantly higher abundance was a result of the effective protection, providing both a refuge for sharks and an increase in the availability of prey. A later study showed a three-fold increase in shark numbers between 2013 and 2015.¹⁵ A survey on reef manta rays reported that South East Misool MPA showed the second highest abundance of reef manta rays among 10 sites surveyed.¹⁶

For the local community, the new model has been a game-changer: the eco-resort and foundation have created 250 jobs, 96% of them taken by Indonesians. Former shark fishers working as rangers and in community education are making more money than they ever did catching sharks.¹⁷



There is greater biodiversity – that is to say, a larger number and greater diversity of fish, coral, and mollusks – on these reefs than anywhere on earth. A single football field-sized patch of Misool's reefs has nearly five times the number of coral species as the entire Caribbean Sea.

Dr Mark Erdmann,
Conservation International





A later study showed a three-fold increase in shark numbers between 2013 and 2015. A survey on reef manta rays reported that South East Misool MPA showed the second highest abundance of this species among 10 sites surveyed.

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CHALLENGES

Shark conservation efforts have affected the livelihoods of many local fishers, especially those who relied on shark fishing. They have had to move to other areas, further away and less productive, with increased fuel costs and reduced catches. Nevertheless, perhaps because of the alternative livelihood possibilities made available by the project, only 10% indicated they would ignore the rules and continue fishing.¹⁸

The innovative long-term lease at the heart of the Misool story is complex,¹⁹ and took more than a year to draw up. It needs to be continuously negotiated and managed, evolving over time – but so far this is a challenge that's been successfully embraced.

The remoteness and size of the area limits mass tourism and the environmental issues it causes, but it does make management and enforcement difficult. The Covid-19 pandemic has removed tourist funding from the Misool Resort, so there is less money for patrols and an increased risk of illegal, unreported and unregulated (IUU) fishing.²⁰

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LESSONS LEARNED

- The private sector can play a vital role in protecting and regenerating natural areas
- Involving, employing and supporting local communities was key to the conservation model's success
- Creating alternative livelihoods for former shark fishers proved particularly important
- Cross agency and institutional collaboration are needed to manage an area this large – as is sustained funding
- International recognition from prestigious organizations – and the publicity generated – has been very positive, raising hopes for replicating the model elsewhere
- Post-pandemic, relying heavily on tourist revenue is risky: other sustainable income streams need to be explored



This factsheet was produced by the Shark and Ray Recovery Initiative (SARRI), a partnership between Elasmoproject, James Cook University, Wildlife Conservation Society, and WWF, working together to recover some of the most threatened sharks and rays in their last refuges around the world.

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FOR FURTHER INFORMATION: To learn more about the Shark and Ray Recovery Initiative and discover the other factsheets from this series, visit www.sarri.org.

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