

OCEAN NEWS

A decade of data shows Seychelles islands are special places for manta rays

Photo by Lauren Peel | © Save Our Seas Foundation



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A decade of data shows D'Arros Island and St François Atoll are special places for Seychelles' manta rays

'Manta rays are one of those species that form a bridge of connection for people who aren't necessarily sure if the water is for them yet,' begins [Dr Lauren Peel](#). 'And then they meet a manta for the first time... They discover a whole new passion and they really care about looking after them.'

As the Project Adviser for the Seychelles Manta Ray Project, Lauren's commitment to manta ray conservation is undeniable. But it's her delight at sharing the process of discovery with citizen scientists that infuses the project with momentum. 'And then they find out they can take photos to help us research and conserve mantas! Citizen scientists form a big part of the Seychelles Manta Ray Project, not only because of the data they share with us, but because they really help to raise awareness about manta rays throughout Seychelles. The fact that we don't have many mantas occurring around the Inner Islands means that they are not well known in that area and therefore fewer people are on the lookout for them or are even aware of the plight that these animals are facing.'

Lauren is the lead author of a new publication, '[Remote hideaways: first insights into the population sizes, habitat use, and residency of manta rays at aggregation areas in Seychelles](#)', in the journal *Marine Biology*. The paper draws on more than a decade of underwater photographs collected during research dives and submitted to the project by citizen scientists between 2006 and 2018 to estimate the population sizes and movement patterns of manta rays in Seychelles. 'It sounds like an easy task, answering these seemingly simple questions. How many manta rays are there? Where are they going? But when you consider the scale of Seychelles and how remote these coral reefs are, the whole process becomes more challenging and exciting. Not knowing where the next manta ray will pop up...'

A reef manta ray surface feeds just off D'Arros Island in Seychelles Amirantes. Photo © Guy Stevens | Manta Trust

This is why Lauren and her colleagues, including representatives from the Save Our Seas Foundation D'Arros Research Centre (SOSF-DRC), the Manta Trust, the University of Western Australia, the Australian Institute of Marine Science and the Island Conservation Society, drew on the power of community to gather as much information as possible. 'Citizen science is valuable for the data collection process. This study in particular highlights the value of combining data captured opportunistically by citizen scientists with that of routine surveys, particularly across vast and remote study areas. That's how we have been able to provide important information about the conservation needs of globally threatened species in a remote region of the Western Indian Ocean.'

The researchers used unique pigmentation patterns on mantas to identify 236 individual reef manta rays from underwater photographs. Oceanic mantas were rarely seen, but reef mantas were frequently encountered in the archipelago, with the majority of records confirmed at the remote D'Arros Island and St François Atoll.

'D'Arros is the largest-known aggregating site for reef manta rays in Seychelles,' explains Dillys Pouponeau, a research officer at the SOSF-DRC whose MSc studies focus on manta rays around D'Arros Island and St Joseph Atoll. 'Reef manta rays are a keystone species, so it is essential to study them to determine when, why and how they utilise this site,' she says. 'Our goal is to understand the characteristics that make D'Arros special and why it supports such a large aggregation of mantas compared to other islands in Seychelles.'

A reef manta ray visiting a cleaning station off D'Arros Island. Photo © Guy Stevens | Manta Trust

Near-pristine and flung far from the hubbub of more populous islands, D'Arros Island and St François Atoll share a feature that makes them popular with researchers as well as mantas. 'Their remoteness keeps the manta aggregations rather isolated in nature,' explains Lauren. 'This provides an important opportunity to both conserve manta rays in Seychelles and gather important baseline information about their biology and ecology in the absence of common human disturbances.' And with the recent release of the eAtlas for Important Shark and Ray Areas (ISRAs) in the Western Indian Ocean, it's important to re-emphasise which areas are vital to the long-term survival of sharks and rays. 'There were ISRAs delineated for D'Arros Island and St Joseph Atoll, as well as for St François Atoll, and our manta ray data fed into that process and helped inform their delineation. It was incredible to be part of this feat,' says Lauren.

'I hope that the release of our publication will also help make even more information available about these critical places for sharks [and in our case, rays],' she continues. 'But I also do think that the ISRA status of these places, in combination with the Seychelles marine spatial plan that has been generated and gazetted as well as overlapping significant area designations [such as Key Biodiversity Areas and Ecologically or Biologically Significant Marine Areas], will benefit manta ray conservation in Seychelles. It will also help us to do more much-needed research about these animals and extend our reach throughout the archipelago to increase our coverage in areas that we haven't yet been able to focus on as intensely.'

Each manta ray has a unique spot pattern on their belly which researchers use to identify individuals. Photo by Lauren Peel | © Save Our Seas Foundation

Given that these key aggregation sites at D'Arros Island and St François Atoll are remote, the question remains – why is management and protection needed? 'We are fortunate to not experience many direct impacts because of the difficulty of access,' agrees Dillys. 'However, a few vessels do cross the area and a manta has been hit by a boat propeller, which highlights the challenge of managing boat movements effectively. And the impacts are not only direct. I have observed micro-plastics and micro-filaments in plankton samples where mantas were seen feeding, so I want to investigate whether they occur in all the samples collected. Climate change and the resulting temperature changes may also affect plankton density. So I plan to investigate this aspect during the current El Niño event.'

'The level of protection afforded to manta rays within the marine protected areas gazetted around D'Arros Island and St François Atoll will depend on the regulations incorporated into their management,' adds Lauren. 'Prohibiting the capture of individuals and implementing safe ecotourism interaction protocols would provide a significant improvement in conserving a key manta aggregation area within the archipelago.'

Wherever possible, the researchers also collected information about how manta rays behave, from cleaning and socialising to feeding and courtship. 'This whole process was an adventure that probably generated more questions than it answered!' quips Lauren. New technology has helped them capture footage never seen before. 'MantaCam [a remote camera system used to monitor manta ray visits to the cleaning station at D'Arros Island over a two-month period] worked really well at D'Arros Island and helped us to observe courtship behaviour, which we had never seen before at the cleaning station,' she says. 'By removing humans from the water, this remote camera really changed the game.'

Research assistant Luke Gordon installing the manta cam at the cleaning station in 2017. Photo by Lauren Peel | © Save Our Seas Foundation

Dillys and the team at the SOSF-DRC are prioritising mantas as one of their long-term monitoring projects. 'We are now taking advantage of technology to monitor them more effectively than before. Our MantaCam is scheduled and swapped in a way that ensures we always have a camera on at the cleaning stations. We're also starting to integrate drones into our surveys. These new methods enable us to monitor the mantas in a non-invasive manner and for longer than ever before, gathering data on them in their natural state.'

'It's onwards and upwards for the Seychelles Manta Project and we will continue to grow,' enthuses Lauren. 'We have a great foundation and with our expanding network of dedicated collaborators we'll continue trying to better understand the populations, critical habitat and connectivity of manta rays in Seychelles to inform the establishment of management strategies for aggregations that occur elsewhere in the archipelago, in the Western Indian Ocean and beyond.'

With a passion that tumbles unchecked into her work, the vital role of citizen scientists in helping to achieve these goals is high on Lauren's agenda to nurture and grow. 'It's not just about data capture, it's also about sharing experiences and wonder and promoting the enjoyment of the ocean in any way we can,' she says. 'Over the past decade, citizen science has enabled us to start answering questions and grow a network of people who are helping us to monitor mantas throughout the archipelago. They help us seek mantas in new places and ask questions. Sparking an interest in and starting conversations about manta rays across Seychelles is an exciting part of the Seychelles Manta Ray Project.'

Manta rays gather just off the coral reef at D'Arros Island. Photo by Rainer von Brandis | © Save Our Seas Foundation