

Angels and demons: protecting the devil ray

Thanks to a team of scientists devil rays were given worldwide protection in April 2017. Jane Hosegood at Bangor University tells us about her role in protecting the rays by helping to develop genetic tools to catch out illegal traders.



The leaping devil ray.

Jane out on location.



Devil rays, close cousins of the enormous manta rays, are stars of nature documentaries. They tend to collect together in large numbers, and some species leap from the water. Because of this, they are popular with divers and, like mantas, important for tourism. But these charismatic creatures are under threat from humans.

Devil rays are pulled out of the sea in huge numbers, all over the world, and butchered on beaches for their gill plates, the feather-like organs they use to filter plankton and small fish (their preferred prey) from the oceans.

The gill plates are then sold in markets in parts of Asia as a purported health tonic, despite the fact there is no scientific evidence whatsoever to support this claim. To make matters worse, females take many years to reach maturity, and only produce a single live pup every few years. Huge declines of these rays have been documented all over the world - at a rate of 99% in some places.

New law

So what is being done? In Autumn 2016, the Convention on the International Trade in Endangered Species (CITES) met in South Africa, for its 17th conference. This is the organisation responsible for regulating trade in some of the world's most infamous wildlife products, including elephant ivory and rhino horn. The meeting happens every three years, and delegates from the 183 signatory countries discussed listing all nine devil ray species under the convention, to regulate the trade in the species and their parts.

In some areas, populations have declined by 99%.

I was lucky enough to be present at the meeting and to see the devil ray proposal achieve the required two-thirds majority vote. These new regulations make it illegal to trade in devil rays, or any of their parts, across international borders without a permit showing the trade is not detrimental to the wild population.

Genetic identification

One of the main concerns about enforcing the devil ray regulations is telling apart species that look very similar. That gets even more difficult for those monitoring the trade who are often presented with gill plates and not the whole specimen. The devil ray listing will greatly benefit the existing protections for manta rays, as manta gill plates can no longer be hidden among devil ray gill plates. A large part of my work focuses on developing

CUTTING CRIME

Strict EU legislation on labelling and traceability has existed since 2000 but traditional certification techniques are vulnerable to fraud. Bangor's research funded by the European Commission and supported by NERC, produced tests that can accurately establish the origin of fish and make sure the food we buy is what it says on the label which promotes sustainable fishing. The technique has improved stock management by the UK government and European Commission. It is also used by the Marine Stewardship Council, lowering the likelihood of fraud in the supply chain.



Paul Hilton | Manta Trust

The gill plate trade. In recent years people have started selling gill plates as a traditional medicine although they weren't used historically, there is no evidence of them giving any health benefits and the trade is hugely damaging to population sizes.

tools that can identify a devil ray, or any of its parts, and which region it has come from. This will help enforce and monitor the new CITES regulations. I am also doing the same for the manta rays, which were listed on CITES in 2013.

We take tissue samples from individuals of known species and sequence short fragments of their DNA. This allows us to build a picture of the genetic signatures of each species and population. Then we can use that to compare with samples from an unknown part. We are looking for the smallest possible amount of information we can get from a sample that is unique enough to a particular species to give us confidence in identifying it.

The project is fortunate to have had a lot of support from international researchers and organisations, and therefore has access to one of the world's most comprehensive sets of manta and devil ray tissue samples, which will allow the final tool to be as robust as possible. The hope is that with regulations such as CITES effectively enforced, marine life will still be as vibrant and exciting for many generations to come.

Jane Hosegood is studying for a NERC-funded PhD with the Royal Zoological Society of Scotland as a partner and her research has been supported by a number of organisations. Jane is also Genetics Project Manager to the Manta Trust, a charity that supports worldwide conservation of manta rays and their habitat. This article was originally published by The Conversation at bit.ly/rays_conversation where you can also see a full list of funders and partners.