



# ANGEL SHARK PROJECT: CANARY ISLANDS

## Exploring how eDNA could be used to monitor Angelsharks in the Canary Islands

Blog by Fenella Wood, Angel Shark Project MSc Student in 2018

Ever wondered how you could use DNA to verify the presence of a shark? Last year I had an incredible opportunity to answer this question by working with the Angel Shark Project. I first got involved with the Angel Shark project back in 2017 when I interned with them during their field campaign. I immediately became in awe of Angelsharks, especially the neonates and was fortunate enough to continue working with them by forming my own research project.

As part of my MRes at Plymouth University with the help of Michael Cunliffe at the Marine Biological Association and Alex Hayward at the University of Exeter. My research looked at developing a method to identify the presence of Angelshark DNA in water. This technique is referred to as environmental DNA (eDNA).

### So how does one get eDNA from an Angelshark .....

- First, Angelsharks lose cells (containing DNA) into the water. This can happen via loss of skin cells but normally cells are lost during excretion.
- Next you need to collect some water as so...



- This water is then filtered across a very fine membrane to collect those cells and any loose DNA.
- **Fun fact:** I filtered 231 litres of water for this project.



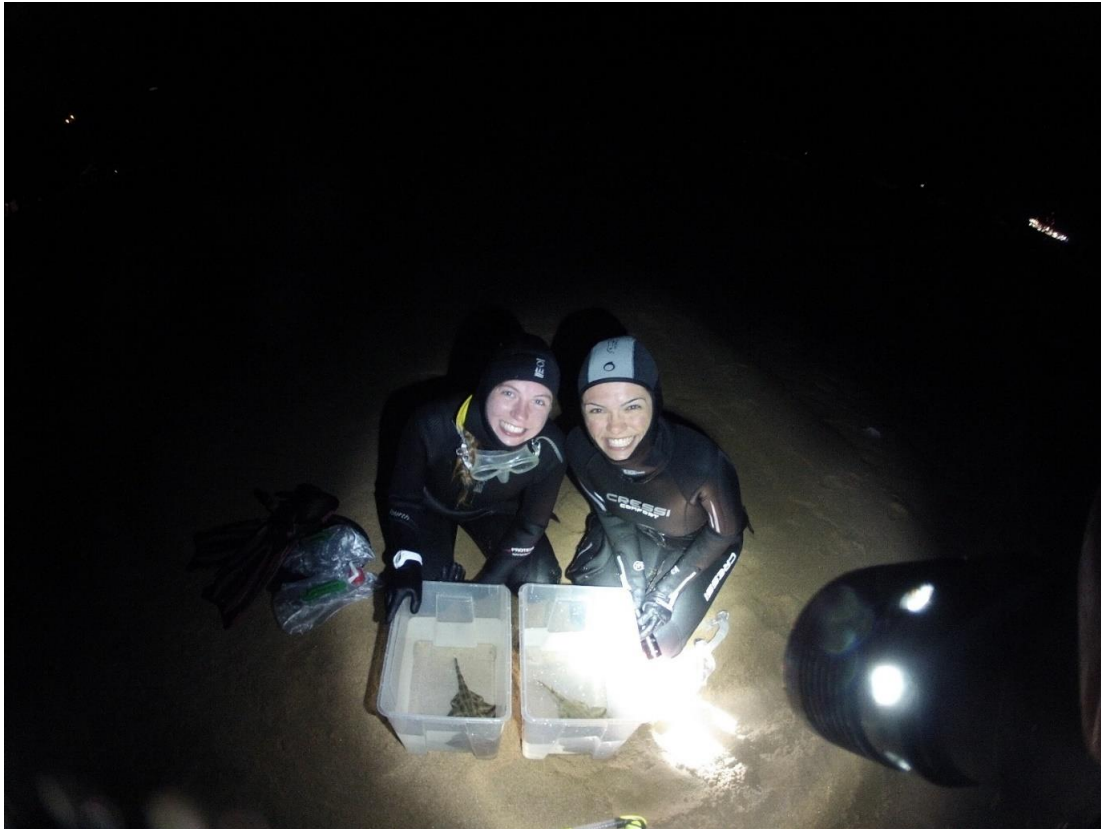
- Add some special ingredients to extract DNA from the membrane.
- Run a PCR (Polymerase Chain Reaction) – this allows us to replicate Angelshark DNA, so we have a lot more to work with. Quantitative-PCR, a more specialised version was able to quantify the amount of eDNA found in each sample.

### **So what did this tell us?**

By testing this method, we showed that the presence or absence of eDNA corresponds to the presence or absence of Angelsharks. This was great news, but since my project specifically investigated nursery sites, eDNA could not be used to identify size or age of the Angelsharks, therefore surveying is still needed. However, eDNA was still useful to locate new beaches that might be used as nursery sites, which without eDNA would have taken a huge amount of effort to find.

This method can now be used to survey a greater number of beaches that have not previously been investigated and eDNA will be particularly helpful if applied to other locations to find Angelsharks, such as here in the United Kingdom, where water conditions make surveying a lot more challenging.

Here's some more shots from our field trip in May.



Eva Baumgartner-Ojea and I very excited to catch the first Angelsharks of the trip.



Close up of a juvenile Angelshark.

Close



From left to right: Joanna Barker, Eva Baumgartner-Ojea, Fenella Wood (me), Silvia Rao and David Jiménez-Alvarado. Preparing to start surveying.



Night survey with three snorkellers in the water.