Untangling the debate on white shark populations

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A white shark population survey by CSIRO has stirred up some political debate, but what do the numbers really tell us?

There's been some hot debate this past week among politicians about sharks.

On one side, they say shark population numbers "make a compelling case" for potentially lethal measures against the animals.

On the other, they're calling "bullshit", saying the numbers are stable or declining.

And they're all referencing the same CSIRO report.

So what's the truth on this fishy issue?

I spoke to the lead author of the CSIRO paper, Dr. Richard Hillary, to find out.

It's in the family

In case you haven't heard, the CSIRO paper estimated the numbers of the two white shark populations in Australia: the eastern and the southern western.

"If you draw a line from Wilsons Promontory in Victoria down to Tasmania, everything to the east of there is one population, including New Zealand."

This was no small feat to achieve. Estimating shark population numbers is something that's proved notoriously difficult in the past.

"Usually what we try and do in more standard fisheries things is try and take how many fish you caught, figure how hard you actually had to work to catch them, and that gives you an idea of how many there are."

But this method doesn't work as well with sharks. Caught sharks are rarely recorded, especially since environmental protection methods were put in place. So historically, the records are patchy, which means we've never really had a full understanding of how many sharks there were in our waters.

So CSIRO had to get a little creative to come up with a new method. Current genetics are now good enough that we can estimate shark numbers based on how closely related they are.

If there are lots of adult sharks in an area randomly mating, you'd expect the offspring to be quite genetically different and less closely related. Whereas if there's only a small number of breeding adults, many of their offspring will be full or half brothers and sisters.

"If we focus on half brothers and sisters, now the more adults there are, the less likely you are actually to find them," says Richard.

"So we use that specific relationship between the chance of you finding a half brother and sister and how many adults there are to turn that around and say, OK, given that we found this many brothers and sisters, how many adults do we actually have?"

But to work that out, you need a DNA sample.

So how exactly do you take a DNA sample from a big, toothy white shark?

"Carefully—if they're alive!" Richard laughs.

"Because they have a very thick skin, it's quite difficult. You have to really get a biopsy from into the muscle tissue."

This is performed by experienced shark researchers, usually while they're conducting other projects, like acoustic tagging of white sharks.

"A lot of the samples come from animals that have been fitted with an acoustic tag, and the states do a lot of work in this," says Richard, "so we're reasonably sure we can get access to continuing numbers of samples."

To cull or not to cull

As you can see in the graphic above, the number of adults in the southern western population is two times higher than the eastern population.

These numbers are what have spurred concerns in the pro-cull camp. Having higher numbers of sharks in the west than the east has some pollies suggesting WA takes more serious protection measures against sharks in the interest of human safety.

But Richard says the evidence just isn't there yet to make such decisions.

"In terms of issues like protection, we don't think this work gives any kind of evidence one way or the other," he says.

"We have to know how many there used to be, and we just don't know that."

What this work does do is set the foundation for future population monitoring. Now that we have a good idea how many sharks there are, we can understand a lot better how it changes over the years.

"Now at least we have a basis to evaluate those proposals."

The golden number of sharks

The debates about sharks seem to be a never-ending tug of war between human safety and ecosystem health.

We know that removing top predators from ecosystems can have devastating consequences, as can a shark taking a bite out of a surfer.

With these two competing interests at heart, how many sharks do we actually want to see in the sea?

"I wish we really knew that!" says Richard.

"There's still so much we don't understand, and I know scientists say that a lot, but it's always true."

Part of working out how many sharks are 'too many' or 'not enough' is having a better overall understanding about sharks and how they operate.

For example, a spanner in the works of the cull debate is the fact that high shark populations aren't always correlated with higher rates of human interaction.

"It sometimes shocks people that the highest densities you'll probably

find for white sharks is in and around Port Stephens in New South Wales," Richard tells me.

"They're primarily there for food. But there's a lot of them there and a lot of people in the water, but you never hear of any interactions."

"So there's a lot of things we need to figure out, and that's been part of the process of developing this very large acoustic tagging dataset."

Acoustic tagging is helping CSIRO researchers work out where sharks are, where they're going and what they're going there for.

They're also hoping to tease apart the finer details around human-shark interactions.

While CSIRO takes care of the science, you can always help protect yourself by being shark smart or exploring alternative mitigation methods for yourself.

I just hope we can all cool our jets about shark numbers and leave these fish in the sea—at least until the research has something to say about it.

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