*An Effort to Save a Shark*

# Medicating Meadowes

## *With Formidable Interference*

Text and images by Ila France Porcher

**During her study of blacktip reef shark behaviour in Tahiti, ethologist Ila France Porcher came across a sick male shark, steadily growing thinner. As she brought extra food and medicine to him, she noticed other sharks showing a remarkable awareness of the situation not normally expected of sharks.**

During my study of blacktip reef shark behaviour, a male became ill. As he became increasingly emaciated, I tried to get extra food to him, and later to medicate him with antibiotics, which had to be given daily. The other blacktips in the community received little or no food, though they were aware of its scent in the water. Repeatedly, they encountered a situation in which food was present but not available to them. It was clear from their behaviour that they understood this, and the variety of strategies they used to try to obtain it was striking. They revealed a level of awareness unexpected in sharks.

The sick shark was named Meadowes. He had recently returned with his companion, Ruffles, after a two-month absence during the mating season. On their arrival, both were unusually pale gold instead of their usual dark grey brown, which suggested that they had been spending their time in the ocean, out of the sun's rays, thus losing their suntan.

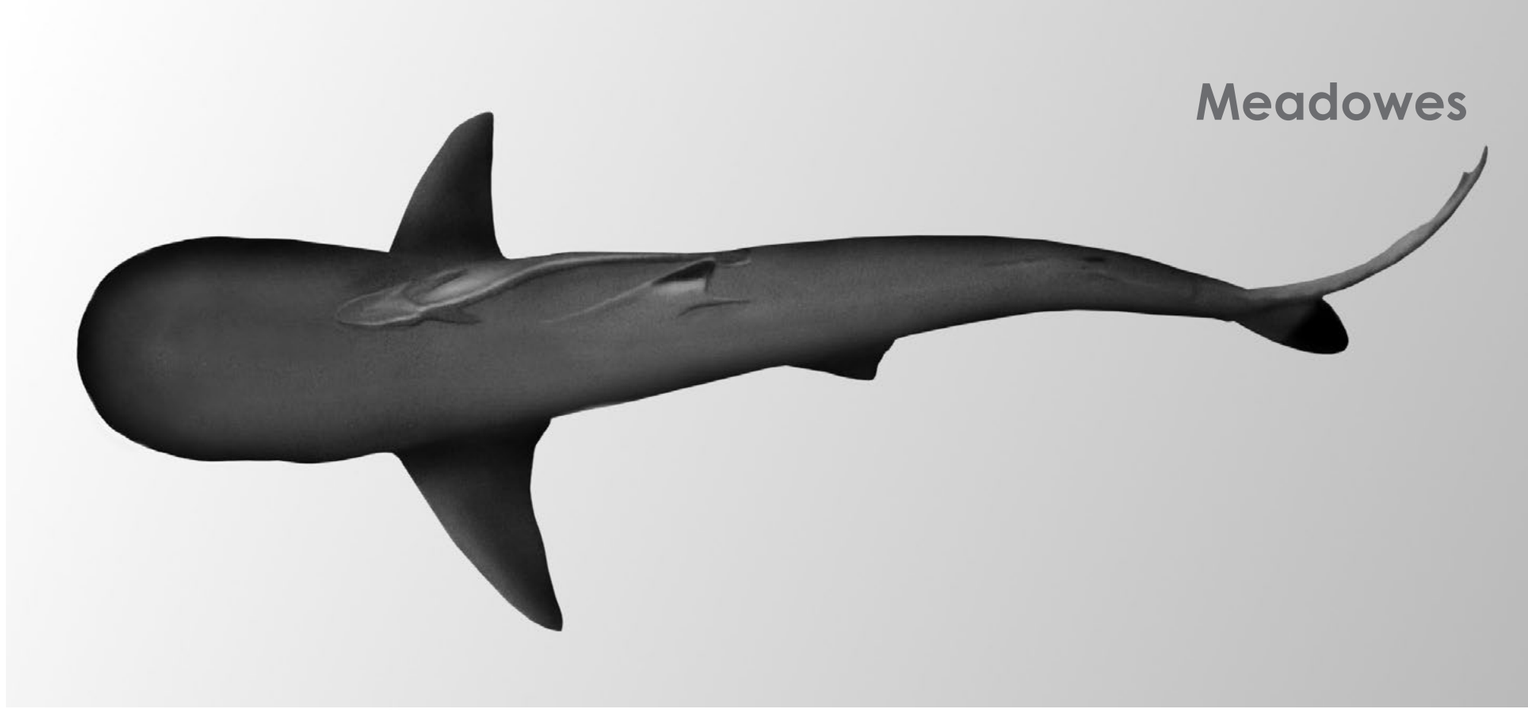
This had been their yearly pattern. With the females roaming in the lagoons, they could easily have circumnavigated the island in a few days while remaining in the shallows within the barrier reef, so I speculated that they had travelled to other islands, as blacktips are known to do.

I watched as the companions roamed a wide area, first scouting nearby, then wandering farther afield. Sometimes they glided side by side, and sometimes one followed the other, tracing a slow, meandering pathway of loops and figure eights. Often, they circled away, only to reunite again. It was the last time I saw Meadowes in good health.

### A wasting illness

Meadowes grew steadily thinner, then emaciated. His skin lost its velvety sheen, and his strength diminished. He no longer travelled with Ruf-

Meadowes resembled a tadpole from above (right). Meadowes' silhouette before and after his illness (below).



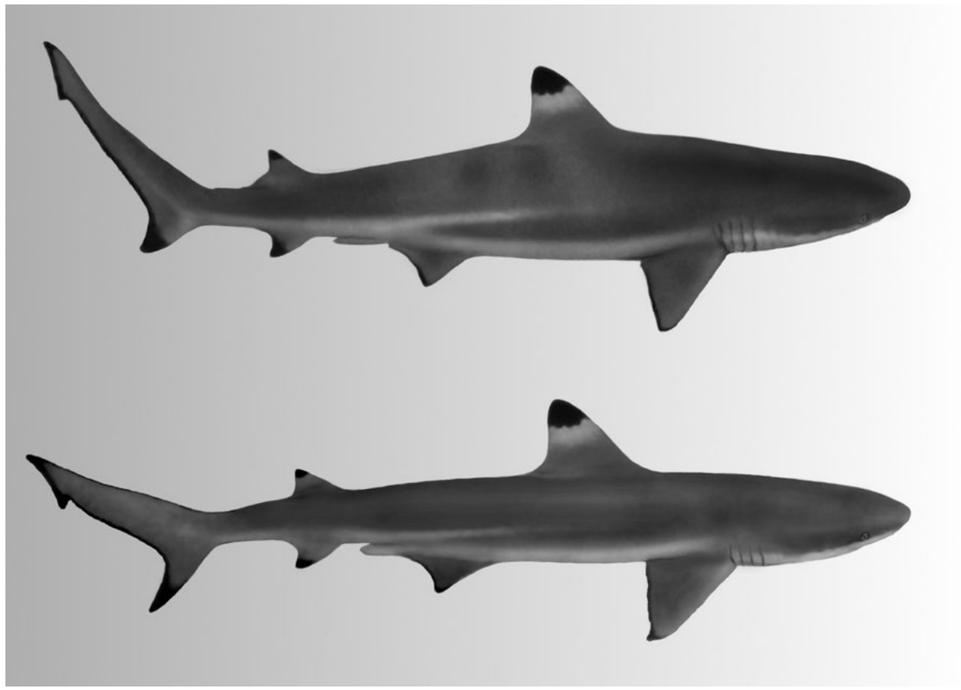

fles. Gradually, his colouring became blotchy and darkened in an unusual way. After two months had passed, he resembled a tadpole when viewed from above.

I began trying to bring food to him, paddling by kayak into his range and releasing scent into the current, in hopes that he would come. But it was hard. After several failures, I brought fish scraps (from a fish shop) to distract the other sharks, along with the pieces of fish meat for Meadowes. But then the scraps vanished instantly, and more sharks arrived. By the time Meadowes approached, 42 blacktips were circling me.

I held his food above the surface and floated it towards him when he came near. He reacted, searched and found it. But the next piece was taken by a nurse shark, and the third by Martha, who was my favourite. She always accompanied me in the lagoon and had immediately understood what I was doing.

Then the other blacktips surged towards me, while Meadowes arced away. I managed to get another four pieces of food to him as he circled through the area. He responded well; he did not shy away, and he accurately searched out the pieces. Many were taken by other sharks. But, considering how many blacktips were following me and trying to locate the source of every bit of scent, Meadowes got them surprisingly often.

One morning, he met me half a kilometre from my usual area, evidently having recognised the sound of my kayak, and he took the food I offered. It seemed he had learned that I would feed him, and, since that would permit me to medicate him, I began wondering about trying to save his life.



But deciding on a medication seemed senseless, since I had no idea what was wrong. Possibly, he had swallowed a fishhook. I contacted Arthur A. Myrberg, Jr. of the University of Miami, who suggested an antibiotic. Tetracycline, he told me, had been used successfully in sharks, if given daily for five days. So, I bought some.

## Medicating the shark

But then the weather turned stormy, and it was a week before I could get back to the sharks. As I put some scraps on the sand, Meadowes took one and left. He seemed weaker still. He moved slowly, his skin was blotchy, and his once-white belly was dark. He looked as if he had been smeared with mud. While the silhouettes of healthy sharks are all smooth arcs, those arcs in him were flat or concave. Although I waited for him to come back, holding his medicated food above the surface, he did not return.

Over the following days, I tried repeatedly. Sometimes he came but did not respond to the food, and sometimes he passed through and left. His eyes became filmed, his movements slow and uncertain. I regretted not having tried to treat him earlier, when he might still have had the strength to respond.

On one occasion, when I floated the medicated food directly before him, he shied away while Martha swooped in from the left and snatched it. With so many sharks circling close around me, it was impressive how often it was Martha who got the food. She was remarkably perceptive and actually observed me in order to have her nose at my hand at the moment I produced food.

Meadowes cruised through the surrounding coral, while the excitement faded and the other sharks began to disperse. But when I wafted him the second medicated morsel, he did not respond. I retrieved it, and the next time, he reacted but missed it and continued to circle. I got it away from the fish that had pounced on it and was suddenly aware that one of the resident females was at the surface right behind me, followed by a long line of blacktips. I darted out of the way as she lunged upon the food.

But, right at that moment, a large grouper emerged from the coral, took it, and carried it into its hole. It was an excellent illustration of the difficulties involved in medicating Meadowes.

## The witnesses' tactics

It was a bad sign that the other sharks were now approaching me from behind, where they knew I could not see them. Every day, they seemed to be one step ahead of me, as I tried every way I could think of to get medication to the sick shark.

Bad weather continued the next day, and in the evening, I set off in heavy rain with two chunks of fish meat containing tetracycline, determined to medicate Meadowes and simply ignore the other blacktips. No scent leaked from my kayak, and underwater, no sharks were present. Martha circled me and left.

But when I poured fish scent into the lagoon, she reappeared, joined by her companion, and by the time

Martha targets the medicated food (right). Sparkle missed (below).

Meadowes arrived half an hour later, 17 blacktips were circling me steadily, counterclockwise. Martha was closest, circling clockwise.

At Meadowes' approach, I got the medication and followed him, holding it above the surface. He arced away and was just a movement in the distance when he began a long, slow turn. I headed to intercept him. As he neared, I threw the piece towards him, and he seemed to notice. But it fell into the coral and was instantly covered by fish. I retrieved it, and when I threw it to him again, he circled closer, now paying attention. The third time I threw it, he targeted it. The rest of the blacktips were accelerating in, led by Sparkle, a spunky adolescent, who dove upon the food. She missed. Meadowes glided beneath her and took it.

From all directions, sharks closed in and circled me, counterclockwise. When I got back to the kayak, I was alone, but they were all coming behind me, and immediately, I was in a mass of sharks, all trying to be close to me when there was not enough room for them all.

I waited for another ten minutes for Meadowes to circle back, and then Martha arrived. When she zoomed over my shoulder from behind and turned into my face, I saw no further reason to stay and leapt into the kayak. The surrounding water was solid with sharks.

The next day, the unpredictable south wind was blowing hard. I had been able to get a few fish scraps with which to distract the other sharks, but as soon as it was in place, they swirled over it, and it was gone.

It took Meadowes over half an hour to come, and by then, more than 40 sharks were circling, and the sun was setting. I held his medicated food above the surface and followed him until I could

float it to him, but he did not respond. I dropped the second dose in front of his face, but it drifted away covered with fish. I tried again, and this time the fish helped him locate it. Though sharks were approaching from all sides, he swept down and got it. His weakness was evident as he swam slowly southward, swallowing repeatedly as he disappeared into the gloom.

## Smart sharks

But Meadowes needed to be medicated five days in a row, so there were still three days to go. On the following day, no sharks were visible when I went underwater, but as soon as I released some scent, they materialised from beyond visual range. Soon, 25 of them were circling me counterclockwise, again with Martha in a tight clockwise orbit.

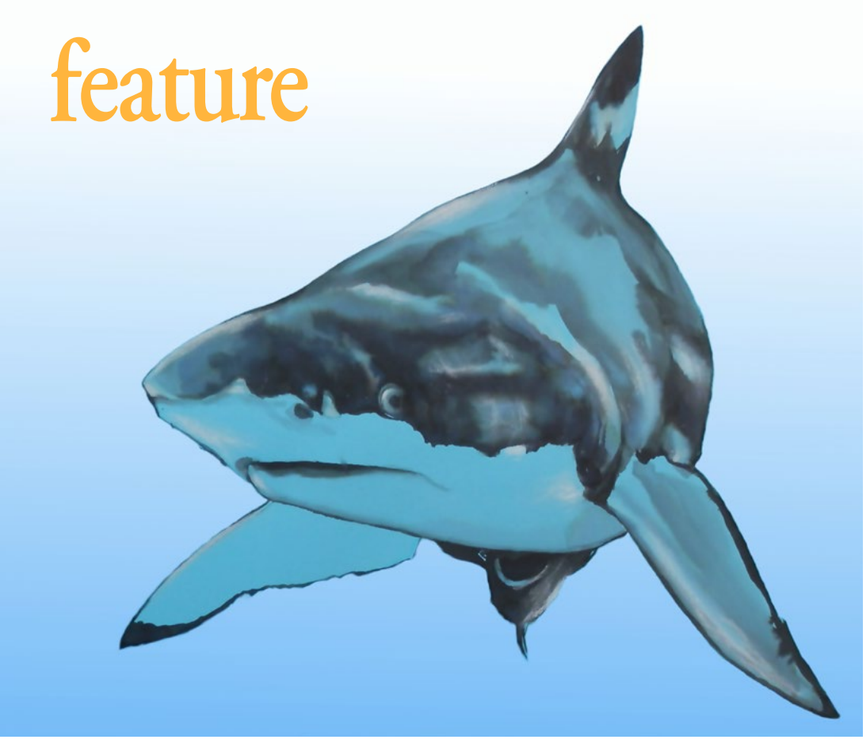
I waited motionless, and they circled as darkness slowly fell. Eventually, they began to disperse, and when only two remained, the others had been gone for half an hour.

I had been saving a chunk of fish meat to distract them while medicating Meadowes and decided to give it to the two who remained, who were both favourites. One was a very young, infrequent visitor. So, I reached into the kayak (which was right beside me), took it out, tore it in two, and threw a piece to each of the two sharks present.

But neither of them reacted. Instead, Sparkle, Martha and several others soared in. Sparkle zoomed to one of the pieces and gulped it down, while Martha snatched the other. Then, the group circled me quickly and closely, evidently to see if more food might be forthcoming. It was a long time before they dispersed into the night.

## An unexpected shark tactic

I was astonished by their actions. Clearly, some of them had understood that circling me was not a successful strategy. But to wait for half an hour,



Portrait of Martha

beyond visual range, for a signal that food was forthcoming, one that they could only detect through hearing and the lateral line sense, was remarkable.

They had accurately detected the precise moment to accelerate into the scene and snatch the food that had, indeed, become available. This was especially surprising since I had not finned to the kayak to get the food. I had just reached in, picked it up, torn it in two and tossed it. So, the signal that food was there was a minimal one. Furthermore, the two sharks who were actually present and had also been waiting had not perceived it.

## Complex thinking

The sharks' actions revealed their ability to focus on something for a significant span of time. Listening and feeling the vibrations in the water, they were waiting for a possible signal that food might be forthcoming, which involved integrating what they perceived with memories of past events.

In other words, they were holding an idea in mind while comparing it with their perception of what was happening and anticipating taking action. They were focused on a future possibility that was neither present nor visible, with the intention of influencing an anticipated future event on detection of the right signal. The concept of time—a remembered past and a future to come—was also involved.

In displaying awareness of a past on which to base their strategies, and a future for which they could plan and try to influence, they showed their capacity for complex thinking (cognition). Consciousness is evident in that there is necessarily an "I", or "self", doing the thinking. Such sophisticated behaviour implies a type of awareness and cognition that challenges the traditional view of sharks.

So, in the end, it was not only Meadowes' decline that remained with me, but the vivid presence of the others—their persistence, their inventiveness and their unmistakable engagement with what was happening around them. They knew that food existed and that it was being withheld. They experimented, adapted and refined their strategies accordingly. In their behaviour, there was intention. And where there is intention, there is a self that is aware.

Although I went to the lagoon every evening for more than a week, each time ready to treat Meadowes, I never saw him again. Eventually, I concluded that he had died. ■

*Ethologist* ***Ila France Porcher****, author of* **Yes, Fish Feel Pain**, **The True Nature of Sharks** *and six other books on wildlife behaviour, spent 15 years closely observing fish and shark behaviour in Tahiti, resulting in several scientific papers. Her writings are based on decades of first-hand observations of wildlife and focus on the individuality and intelligence of individuals, challenging traditional views of animal minds. Her work has been featured on* Shark Week*, in scientific discussions, conservation debates and international media for its unique blend of field observation, art and science.*