



FOUNDATION

shark tagging updates



june 2005

In October 2003 the AQWA Foundation team, comprising members of the CSIRO and AQWA, achieved a fantastic result in tagging five great white sharks in the south of Western Australia.

Tagging was conducted just south of Tooregullup Beach in Doubtful Island Bay - half an hour by boat from Bremer Bay, in Western Australia's Great Southern Region. Tooregullup Beach was the location in which nine adult sperm whales beached themselves. Although this was an unfortunate event, the whale's bodies attracted great whites to this area creating a fantastic opportunity. More than twelve great whites were seen over the three days of the expedition which is incredible as no great whites were found during the previous tagging trip.

A variety of tags were used including PAT (pop-off archival transponding) tags, standard ID tags and satellite tags.

Unfortunately, no information was received from the satellite tags. There are two possible reasons for this including:

The tagged sharks did not come to the surface frequently enough or at the right times for the tag transmissions to be detected by satellites.

Alternatively, the lithium batteries within the tags failed to deliver sufficient current for the tags to transmit properly. Lithium batteries can be temperamental, particularly if they are in tag units for a while. However, despite the current lack of information from the satellite tags, one of the PAT tags that detached from a tagged 3m female shark has provided some very exciting data on the shark's movements.

The tag started transmitting from the northern area of Shark Bay. The shark swam up the western WA coast at the time of year observations have pointed to a seasonal movement of sharks in the area. Another shark tagged with a PAT tag in South Australia at the same time also appeared in Shark Bay. This suggests a link between the sharks seen in southern Australia and the sharks along the southern and western WA coast – something we have previously not been able to establish.

The actual track of the shark is fairly hard to decipher as the tag estimates longitude (east-west) more accurately than latitude (north-south). The best estimate is that the shark tagged off Doubtful Island Bay on 4 October remained in the vicinity of Bremer Bay for a few days (2-4) after tagging. The shark then headed west to near Cape Leeuwin (about 500 km west of Bremer) by approximately 10-12 October. This suggests that the shark moved consistently for these days (given that the average swimming speed of white sharks is approximately 3 km per hour when travelling). The longitude data then placed the shark on the west coast from at least the 29 October onwards and the positions cluster broadly around the Shark Bay region from 6 November onwards.

The swim depth data (although limited to 8 days across the track) suggests the shark mainly swam in depths of 0-10 m with the deepest depths being 50 – 75m.



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In summary, it appears that the shark stayed within the vicinity of Bremer Bay for only a couple of days after tagging (despite the continued attraction provided by the dead whales); moved steadily west to the Cape Leeuwin region by mid October where it may then have continued briefly offshore before returning to the coast and moving north past Perth in late October, reaching the Shark Bay region by early November.

These time frames would suggest that the shark travelled steadily throughout its move from Bremer to Shark Bay – a distance of approximately 1700km!

october 2003

Sasha Thompson – AQWA's Marine Biologist – has just returned from an incredible experience tagging sharks in southern Western Australia. This is her exciting story...

I have just returned from the third shark tagging expedition with scientists Dr John Stevens and Mr Barry Bruce from CSIRO Marine Research. This expedition, which was part of an AQWA Research Foundation funded project to study the movement patterns of white sharks in southern Australian waters, was an enormous success. Six white sharks were tagged using three different types of tags. Two of these tags were satellite-tracking tags. The scientists are currently waiting to see if the tags are working properly and, if this is the case, this will allow AQWA members to follow the sharks' progress via our website.

Tagging was conducted just south of Tooregullup Beach in Doubtful Island Bay. Doubtful Island Bay is half an hour by boat or 1.5 hours by 4WD from Bremer Bay, in Western Australia's Great Southern Region. Tooregullup Beach is the location in which nine adult sperm whales recently beached themselves. Although this was an unfortunate event, the whale's bodies have attracted white sharks to this area. More than twelve white sharks were seen over the three days of the expedition.

During the first day, two PAT (pop-off archival transponding) tags were fitted. The first PAT Tag was fitted to a 3m female. This tag will record information about the sharks movements and swimming behaviour for four months, after this time it will detach from the shark, float to the surface and transmit its data via satellite to the CSIRO researchers. The second tag was fitted to a 2.5m female and will collect data for six months.

Despite only one standard ID tag being fitted on the second day, there was constant action. To lure sharks to the boat, fish oil and burley were regularly added to the water and large salmon were dangled from lines and a float off the back of the boat. As a white shark approached, the line was pulled in bringing them towards the boat. The trick was to pull the line in faster than a 4 m Great White swims! While John pulled in the line, Barry got the tagging pole into position. For satellite tags, this pole has a compressed gas cylinder, a trigger, an emergency release, and an area between which the dorsal fin needs to be placed. Getting the tagging pole into position was tricky as ideally the Great White would swim towards you, however, most sharks approached from the side.

On numerous occasions the pole and tag were in position over the dorsal fin but the trigger could not be



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pushed to attach the tag. Two times, half of the satellite tag was brushed off the pole and fell to the sea floor. Worth over \$5000 each, we had to try and find where the tags had landed and scoop them up with a net and two poles! Luckily visibility was excellent and the bottom not too far down – enabling Geoff Campbell (skipper of the vessel we were on), to retrieve both tags. Retrieving the tags was made more interesting by the number of Great Whites swimming by!

By Day three, John and Barry had redesigned the trigger and found a way to link the two parts of the tag together – preventing it from being pulled off. During the morning there were a few unsuccessful attempts; from 11am until about 3pm no sharks approached the boat, but then in the afternoon, two sharks in quick succession approached the boat and were successfully tagged. The first shark to have a satellite tag fitted was a 2.5m female, the second a 2.3m female. At this size they are still juveniles. (Males mature at 3.5m and females at 4.5 – 5.0m).

We don't know enough about the biology or behaviour of the Great White to understand why we mainly saw them at this site in the morning and late afternoon. Now that we may be able to follow the movements of the two white sharks fitted with satellite tracking tags on a regular basis, we hope to learn a lot more about these magnificent creatures.

Sasha Thompson
AQWA Community Education Manager

August 2003

The AQWA Foundation is delighted to release the first amazing results from our white shark tagging project. The information has been obtained from the special tracking device fitted to a 3.5m female white shark in early May.

The device, a pop-off archival transponder (PAT) tag recorded information about the shark's movements and swimming behaviour for two months before releasing itself from the shark and sending its data via satellite back to CSIRO researchers in Hobart.

The shark was tagged east of Bremer Bay on 5 May and the tag released from the shark approximately 35 km west of Esperance on the 6 July. PAT tags are designed to transmit their data over a 10 day period after releasing but, unfortunately, contact with the tag was lost after four days and not all of the data was received. The tag is believed to have washed ashore approximately 16 km west of Esperance when the signal was lost. The tag will retain its data indefinitely and it is hoped that it may yet be found and the data retrieved.

Despite the disappointment of losing contact with the tag, the data that was transmitted is very exciting. It suggests that the shark travelled at least 1300 km during the two month period. It is believed that the shark initially headed east before doubling back and swimming west to the vicinity of Cape Leeuwin by the 31 May. It then gradually swam east again to the Esperance area where the tag released on 6 July. The data also suggests



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that the shark stayed reasonably close to the coast in waters no more than 100 m in depth.

The next phase of the project commenced in August. The team again went off the coast of Esperance where they hoped to fit PAT tags and satellite tags to white sharks. Unfortunately, despite remaining in the Esperance area for a number of days, the team were unable to locate any great whites.

May 2003

The AQWA Foundation is delighted to announce that the Great White Shark tagging project has begun.

A team comprising members of CSIRO (Commonwealth Scientific & Industrial Research Organisation), AQWA and Channel Nine were recently on a boat off Bremer Bay, in the south of Western Australia. This was an area that local fishermen had suggested held the most potential for seeing White Sharks.

The team used burley to attract sharks to the boat and then attempted to attach three types of tag:

Visual identification tag

Pop-Off Archival Tags: Also called PAT's, these tags record information such as swimming depth, water temperature and light levels. This information provides a crude way of estimating latitude and longitude, hence enabling calculation of the approximate track of the shark. PAT's are programmed to release from the animal after a specified time. The tags then float to the surface where their information is transmitted to satellites.

Satellite Tags

These tags are a new and exciting development and will provide vital information on Great White Sharks. The tags transmit data to a satellite every time the shark surfaces (roughly once every two days) enabling researchers to build a very accurate picture of the behaviour and movement of the tagged sharks. The trip was a success and the team managed to tag a 3.5 metre female Great White Shark with a PAT – the first time a White Shark has been tagged in Western Australian waters. Information from the tag is currently being processed and results will be given to all Foundation members in the near future.

Unfortunately, the shark did not stay around the boat long enough to enable a satellite tag to be attached and, despite spending a further four days on the ocean, the team did not come into contact with another Great White Shark.

Planning is now underway for a second trip with the hope of tagging more animals, which will help build a bigger picture of this fascinating shark's behaviour and movements.