

FREQUENTLY ASKED QUESTIONS

SMART drumlines

November 2018

What are SMART drumlines?

As part of the NSW Government's \$16 million Shark Management Strategy, SMART (Shark-Management-Alert-in-Real-Time) drumlines are one of the shark bite mitigation measures currently being trialled. The state-of-the-art technology differs greatly from the operation of traditional drumlines as they are designed and operated under our trials to maximise the survival of sharks and other marine animals. They allow sharks to be tagged, relocated, and released alive. SMART drumlines comprise of an anchor and rope, two buoys, and a satellite-linked communications unit which is attached to a trace and baited hook.

How are they deployed?

SMART drumlines are deployed around 500 m offshore in 8–15 m of water, away from swimmers and surfers to allow sharks to be intercepted beyond the surf zone. They are deployed by an experienced team of contractors and/or DPI scientists. SMART drumlines are deployed and retrieved every day during daylight hours only, weather permitting. They are not left out overnight.

What happens when a shark is captured?

When a shark is captured, the pressure on the line triggers the communications unit which alerts DPI scientists or contractors via phone call, email and text message to the presence of an animal on the line. The team then responds immediately to the SMART drumline alert to manage the animal. Sharks and any other marine fauna caught on SMART drumlines can be tagged, relocated approximately 1km offshore, and released, allowing us to collect data about sharks and their seasonal pattern of movements along the NSW coast. Sharks caught using SMART drumlines and tagged with satellite tags are being detected more than 12 months later, with the longest period between tagging and last detection of 865 days. Preliminary analysis of satellite tagged sharks suggests that they often head further offshore immediately after release (for the first 24-48 hours).

Where do the sharks go?

Once the shark is tagged, DPI can then provide alerts to the community when the tagged sharks come within 500m of one of our 21 VR4G listening stations located from Kingscliff to Merimbula.

Between 2 December 2015 and 9 September 2018, SMART drumlines intercepted 370 target sharks including; 300 White Sharks, 43 Tiger Sharks, and 27 Bull Sharks. Sixty-two

per cent of these sharks were later detected on a VR4G; 211 White Sharks, 13 Bull Sharks, and 4 Tigers Sharks.

Overall, the average number of days until an individual shark was first detected on a VR4G was 74 days after being tagged and released, and ranged from 0-605 days. By species, it was an average of 75 days for White Sharks, 66 days for Bull Sharks, and 9 days until Tiger Sharks were first detected.

The average distance travelled from the tagged location to where a shark was first detected on a VR4G was 17 km, and ranged from 0-985 km. White and Tiger Sharks moved the greatest distance before they were first detected, on average 173 and 135 km, respectively, with Bull Sharks only moving an average of 26 km.

How successful are SMART drumlines?

SMART drumlines have been successful for catching and tagging White, Bull and Tiger sharks with minimal bycatch and mortality. The trials to date have demonstrated their ability to capture sharks and trigger the system with instant alerts. They have proven to be four-times more effective at catching target sharks with minimal bycatch of non-target animals than mesh nets during two, six-month trials on the North Coast in 2016 and 2017. DPI will continue its research to fine tune this gear for use in all coastal NSW conditions. This involves testing different gears (hooks, trace lengths and trace material), bait types to maximise catch rates of target shark species only, and videoing the activity of non-target animals around SMART drumlines before and after capture using underwater cameras.

What is a ‘target shark’?

‘Target sharks’ are White, Bull and Tiger sharks – the three sharks that are predominantly involved in serious shark attacks in NSW.

Do the SMART drumlines attract sharks to the area?

SMART drumlines are positioned well away from shore, and are set to intercept and catch target sharks as they travel along our coastline, reducing the chances of an interaction with water users. The single mullet that is deployed on each SMART drumline is unlikely to lead to attraction of sharks from any distance and no burley is used. Drumlines have been effectively used in the Queensland and South African shark attack mitigation programs, with no indication that sharks are attracted inshore as a result of baiting. The SMART drumlines have caught approximately 396 target sharks and 149 non-target animals out of more than 22,000 sets of the gear (~2.5% catch rate). If the SMART drumlines were attracting sharks, then this number would be much greater.

How do you ensure the safety of migrating whales in these areas?

DPI works closely with Office of Environment and Heritage (OEH), as the lead agency for marine fauna disentanglement, and has trained whale disentanglement staff available to assist with responding to any potential incidents. DPI and OEH also work closely with the Queensland Boating and Fisheries Patrol who have extensive skills and response capability in close proximity to the North Coast.

So far there have been four occasions when there has been an interaction between a whale and a SMART drumline. Often the animals are swimming by and get their pectoral fin caught in the anchor line. On each of these occasions, the SMART drumline broke along the bungy cord, which it is designed to do under such circumstances and minimised the risk of any entanglement. All gear was retrieved and the whales were observed swimming away.

How do SMART drumlines make beaches safer?

Intercepting and catching sharks as they travel along our coastline reduces the chances of an interaction with water users. The relocation of captured target sharks by the response team and the natural reaction of sharks to move offshore after release in the short to medium term, indicates that SMART drumlines are a useful non-lethal protection tool.

Why are more White Sharks caught on the SMART drumlines than Bull Sharks?

SMART drumlines are deployed during the day when they can be accessed more easily if an alert is triggered by a captured animal. White Sharks are known to forage throughout the day and night, whereas Bull Sharks are believed to be predominantly active during the night.

What have we learned from tagging sharks?

Sharks are fitted with tags to register their natural movements to determine the environmental and biological factors affecting their distribution in coastal waters. Understanding these factors will assist in identifying potential areas of increased risk to water users.

Information gathered to date highlights that White Sharks do not consistently exhibit a systematic movement pattern along the NSW coast, with tagged individuals distributed anywhere between Queensland, New South Wales, Tasmania, South Australia, and Western Australia on any given month. These tracks can be seen here:

dpi.nsw.gov.au/fishing/sharks/management/shark-tagging-project.

In general, White Sharks move northwards into NSW waters during autumn and winter and south again when the warmer waters of the East Australian Current push into NSW waters in spring and summer. Our tagged White Sharks even swim across to New Zealand and up to Papua New Guinea and New Caledonia.

On the other hand, tagged Bull Sharks show far more consistent behaviour, with adults moving between the far northern Great Barrier Reef in winter to south of Sydney in summer. Non-adult Bull Sharks appear to be more confined to major rivers and estuaries, until they initiate the long-distance movements later in life.

Do tagged sharks return to the area?

All sharks exhibit what is known as 'philopatric behaviour', that is they return to particular reefs and habitats repeatedly during the course of their lives. White, Tiger and Bull sharks are no different and are likely to spend more time in some areas than others during their migratory movements. It can therefore be expected that some will return to the NSW coast during the course of their lives, and contrary to the urban myth, they do not take up permanent residency at any site in NSW waters.

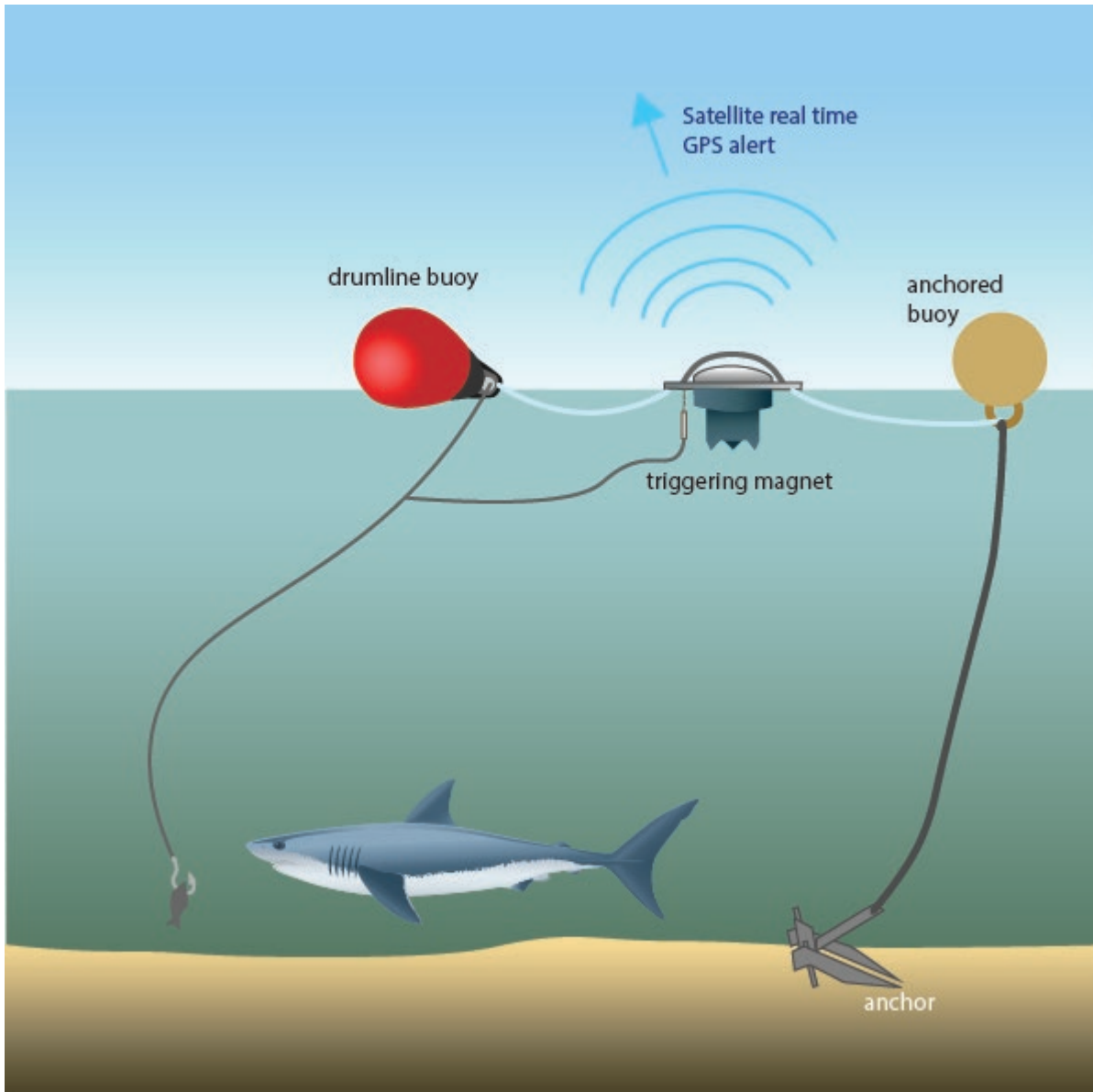
Has a tagged shark ever bitten a person?

A tagged shark has not been identified as being involved in a shark bite incident.

How can you make sure you're safe from sharks in the ocean?

Sharks are a natural part of our environment and we can never guarantee there won't be interactions. However a better awareness and understanding of sharks and their behaviour can help everyone enjoy the beach and reduce their risk of a shark encounter. The best risk mitigation is actually at a personal level, whether it be through education, behaviour, and/or the use of [personal deterrents](#). DPI's SharkSmart public awareness campaign provides useful tips to minimise the risk of being in waters where sharks may

be present. Download the [SharkSmart app](#) and follow us on Twitter [@NSWSharkSmart](#) to get the latest information.



For more information on the NSW Government's Shark Management Strategy, visit dpi.nsw.gov.au/sharks

Follow our tagged sharks on Twitter [@NSWSharkSmart](#) or download the [SharkSmart App](#)

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