

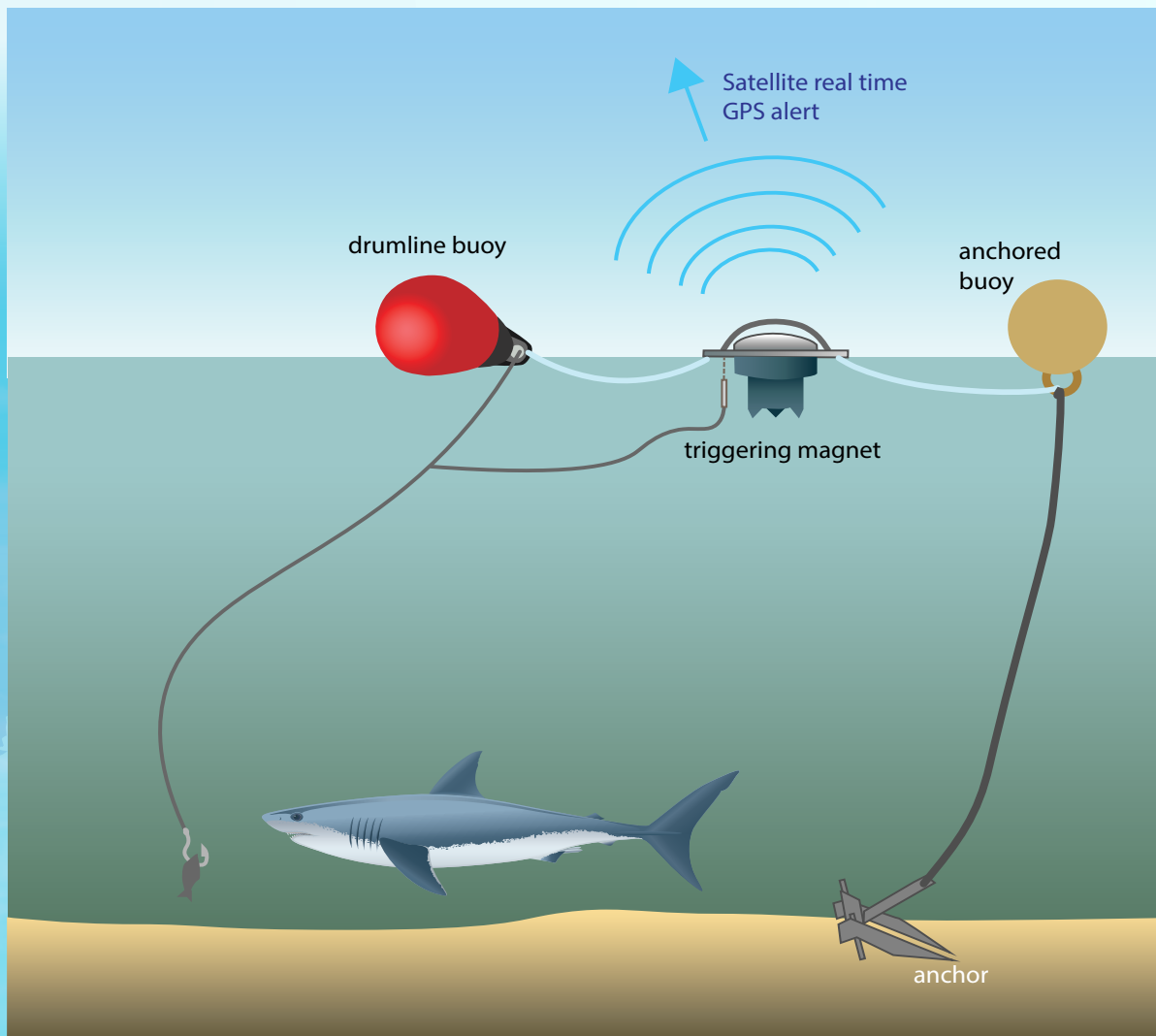
## FREQUENTLY ASKED QUESTIONS

# SMART Drumlines

November 2017

### What are SMART Drumlines?

SMART (Shark-Management-Alert-in-Real-Time) drumlines are a technology that is being trialled by the NSW Government as a shark bite mitigation measure. The state-of-the-art technology differs greatly from traditional drumlines as 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. SMART Drumlines have been successful at catching White Sharks on the North Coast since 2015.



## How are they deployed?

SMART drumlines are located around 500 m offshore in 8-15 m of water. They are deployed by an experienced team of contractors and/or DPI researchers. SMART drumlines are deployed in good weather when they can be checked and retrieved with ease.

## What happens when a shark is hooked?

When a shark is hooked, 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, and released.

## Where do the sharks go?

Once a shark is tagged, it is relocated approximately 1km offshore. DPI can then provide alerts to the community via our network of 21 VR4G listening stations when the sharks come close to shore during their large scale movements during the year. Recent tracks from tagged sharks shows that they often head further offshore immediately after release (for the first 24-48 hours), some are even travelling up to 60km a day!

## How successful are SMART drumlines?

Our DPI Shark Tagging Team is having success in tagging the target White, Tiger and Bull sharks using SMART drumline technology with minimal bycatch and mortality. The trials to date have demonstrated their ability to capture sharks and trigger the system with instant alerts. DPI will continue its research to fine tune this gear for use in 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 animals around SMART drumlines before and after capture using underwater cameras.

## How did the nets compare to the SMART drumlines during the trial?

Data from the first six month North Coast shark net trial are summarised below:

- » Caught in the nets - cumulative figures
  - Nine target sharks caught (three White, three Bull, three Tiger Sharks); five deceased, four alive.
  - A total of 266 non-target animals were caught in the nets; 47% were released alive.
- » Caught on SMART Drumlines - cumulative figures
  - 36 target sharks (31 White, 3 Tiger and 2 Bull Sharks); one White Shark deceased (entangled), all others released alive.

## Do the SMART drumlines attract more sharks to the area, given they are baited?

The SMART drumlines are positioned well away from shore. 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 used in the Queensland and South African shark attack mitigation programs, with no indication that sharks are attracted inshore as a result of the baiting.

## What happens to non-target species caught on SMART drumlines?

Any non-target animal caught on SMART drumlines is released alive immediately. All data so far shows excellent survival rates for bycatch with minimal mortalities reported to date.

## 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. Queensland Boating and Fisheries Patrol can be called on to undertake disentanglement activities depending upon the circumstances and the availability of trained staff and suitable resources in NSW.

## 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. Their relocation by the response team and natural reaction to move offshore after release also provides a non-lethal method of removing sharks further away from an area in the short to medium term and further enhances the utility of SMART drumlines as a non-lethal bather protection tool.

## How many SMART drumlines are currently deployed and why were these locations chosen?

Six NSW regions were selected to have SMART drumlines deployed, using an evidence-based risk management approach, informed by a combination of the history of unprovoked shark interactions, the presence of tagged target sharks on the VR4G network, and sightings of sharks in aerial surveillance.

There are 100 SMART drumlines available for use in NSW and currently we are trialling them in the following locations.

- » Lennox Head and Evans Head: Up to 35 SMART drumlines until 30 June 2018.
- » Coffs Harbour and Sawtell: 10 SMART drumlines trialled between 1 Aug 2017 and 1 Feb 2018
- » Forster/Tuncurry: 10 SMART drumlines trialled between 1 Aug 2017 and 1 Feb 2018
- » Kiama and Shell Cove: 10 SMART drumlines to be trialled between 1 Nov 2017 and 1 May 2018
- » Ulladulla and Narrawallee: 10 SMART drumlines to be trialled between 1 Nov 2017 and 1 May 2018
- » 25 SMART drumlines retained by DPI for research

## What other data are we learning from SMART Drumlines?

SMART drumlines are also an important research tool to better understand the movements and distribution of sharks. DPI scientists monitor the movements of tagged sharks to gain a better understanding of their movement patterns. When a tagged shark swims past our network of 21 VR4G acoustic listening stations, it is broadcast automatically via the DPI SharkSmart Twitter account @NSWSharkSmart and also on the SharkSmart app (itunes.apple.com). This program provides vital information about sharks and helps to improve our understanding of the behaviour and movements of the population of White, Bull and Tiger sharks that live on the east coast of Australia.

## 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.

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 hooked 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 the natural movements of the sharks 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 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. Our tagged White Sharks even swim across to New Zealand and back. 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.

## Are the tagged White Sharks starting to return to the area?

All sharks exhibit what is known as 'philopatric behaviour', that is they return to particular region repeatedly during the course of their lives. White Sharks are no different and it can therefore be expected that some will return to the NSW coast during the course of their lives.

## Has a tagged shark ever bitten a person?

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