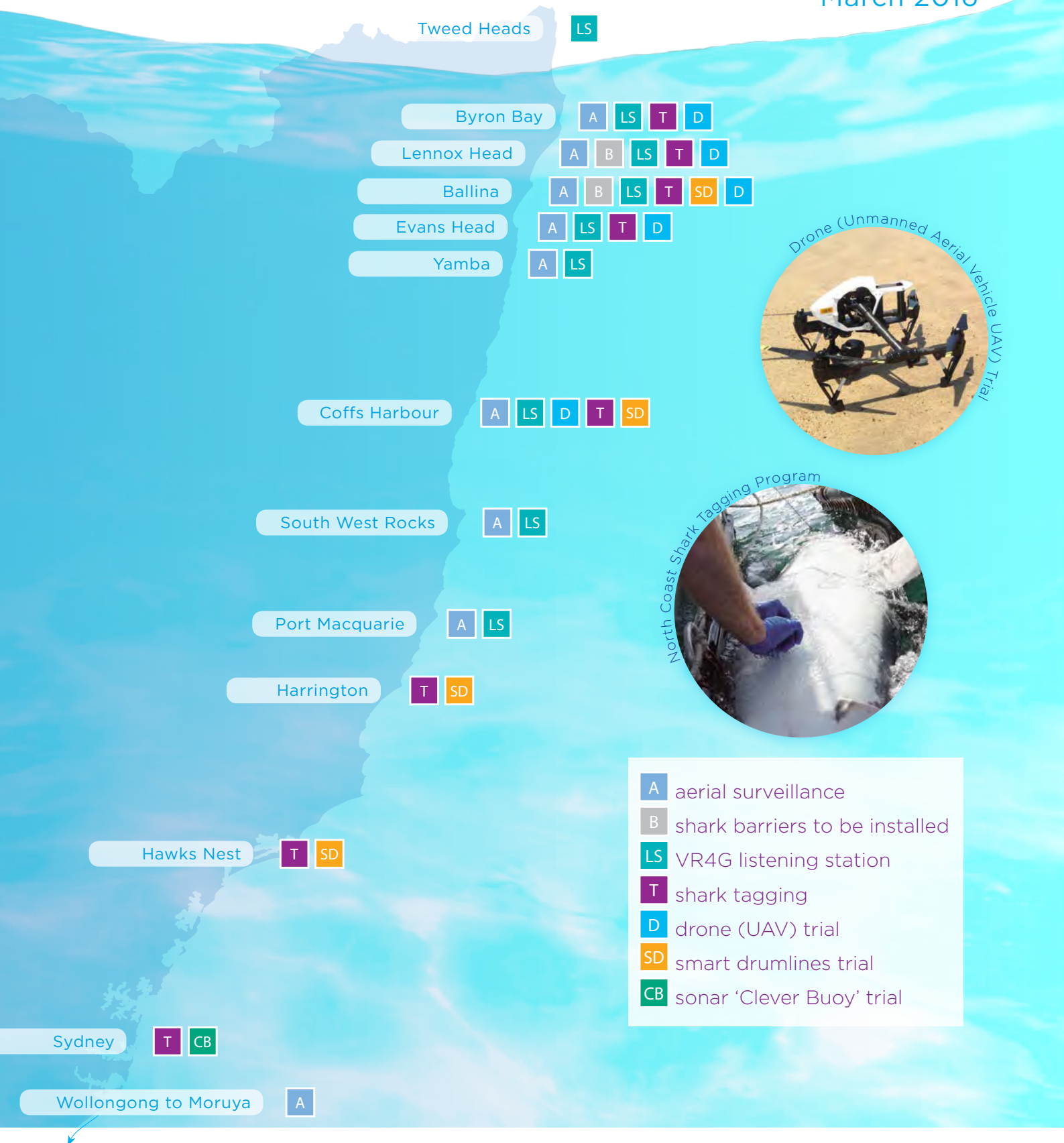


# NEW SOUTH WALES SHARK MANAGEMENT STRATEGY

March 2016



- A** aerial surveillance
- B** shark barriers to be installed
- LS** VR4G listening station
- T** shark tagging
- D** drone (UAV) trial
- SD** smart drumlines trial
- CB** sonar 'Clever Buoy' trial

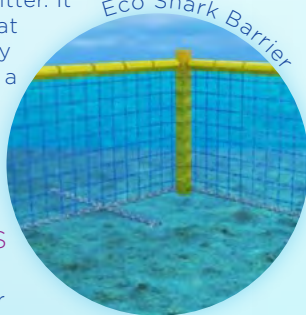
# SHARK MANAGEMENT STRATEGY TECHNOLOGIES

## AERIAL SURVEILLANCE



Aerial surveillance is used to monitor sharks that may be dangerous to swimmers and secondly, to record other marine wildlife that will help scientists understand factors that may influence shark movements and distribution. Aerial surveillance will continue on weekends (weather permitting) from Byron Bay to Evans Head and from South Wollongong to Moruya. During holiday periods, aerial surveillance will occur every day along the NSW coast. If the pilot spots a shark that poses a threat to surfers or swimmers, a call is immediately made to 000 and to the local Surf Lifesaving Club. Information is also available via @NSWSharkSmart on Twitter. It is important to remember that water users will be made very aware if the helicopter spots a potentially dangerous shark as the helicopter reduces its height to hover, a siren is sounded, and beach authorities are notified.

Eco Shark Barrier



## SHARK BARRIERS

Shark barriers are a physical barrier which separate sharks from water users. They do not entangle sharks or other marine life. Shark barriers are comprised of high-grade and durable eco-friendly nylon and polyethylene materials. Eco Shark Barrier has been awarded a contract to trial a shark barrier at Lighthouse Beach, Ballina. Installation is expected to occur around April 2016. Global Marine Enclosures has been awarded a contract to trial a shark barrier at Lennox Head. Both trials are for three years, during which time the barriers will be monitored and maintained.

## DRONE (UNMANNED AERIAL VEHICLE (UAV)) TRIAL

An unmanned aerial vehicle or drone is able to provide aerial surveillance of coastal waters and provide real-time vision of the area. NSW is trialling the use of drones. A five week trial has been completed at Coffs Harbour and a second trial comparing helicopter and drone sightings has been completed in the Byron region. Results are positive and trials with regular drone surveys at key locations will provide the next element of testing this emerging technology.

## SHARK TAGGING PROGRAM

The shark tagging program involves locating, catching and tagging sharks. Scientists tag white sharks with both externally mounted satellite tags and surgically inserted acoustic tags. The tags register the natural movements of the sharks to help determine the environmental and biological factors affecting their movements and distribution. The white shark component of this project is done in collaboration

with CSIRO. NSW DPI shark scientists are continuing this ongoing program targeting white, bull and tiger sharks. To see the last location of the satellite tagged white sharks visit [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au)

## VR4G LISTENING STATION

A satellite linked (VR4G) listening station is a receiver that detects tagged sharks and other marine animals swimming within 500m. Captured information goes to a satellite and is then instantaneously sent to the public and beach authorities via Twitter and SMS. Ten listening stations have been positioned on the NSW north coast at Tweed, Byron Bay, Lennox Head, Ballina, Evans Head, Yamba, Coffs Harbour, South West Rocks, Port Macquarie and Forster. A further ten VR4G listening stations will be deployed at other NSW beaches in the future.

Additional information on the movements of acoustically tagged sharks comes from VR2 receivers - there are hundreds of these along the NSW coast. Unlike the VR4Gs, these receivers store the data which then has to be manually downloaded at regular intervals.

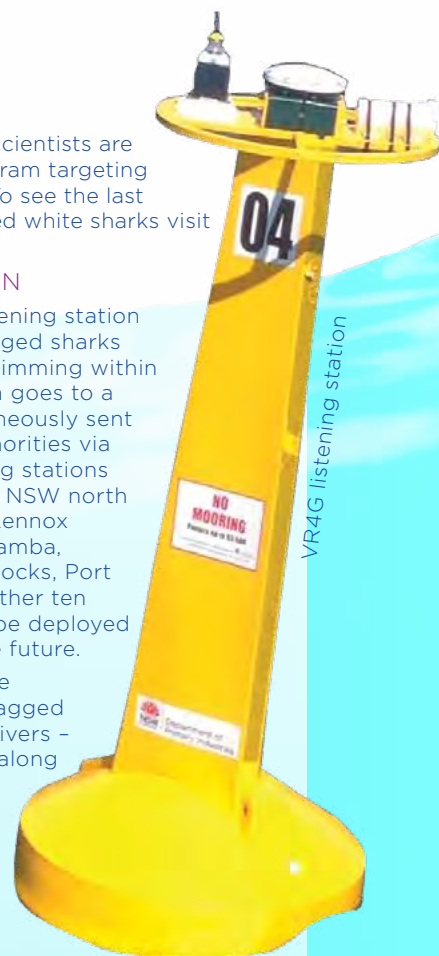
## SMART DRUMLINES

SMART (Shark Management Alert in Real Time) Drumlines differ greatly from traditional drumlines as they are not designed to kill sharks. The state-of-the-art technology alerts a response team when a shark is captured. The team then respond immediately to tag and relocate the shark. Initial testing of the 'SMART Buoy' technology occurred in the Bellinger River, south of Coffs Harbour, in late 2015 with scientists from Reunion Island. Further trials have taken place at several locations along the NSW coast and will continue in order for scientists to determine the best use of this technology. It is important to note these drumlines are only deployed when a team is on hand for immediate response.

## SONAR TECHNOLOGY 'CLEVER BUOY'

Sonar is a rapidly advancing surveillance technology. 'Clever Buoy' uses new sonar technology coupled with tailored software to detect shark-sized objects and relay this information to shore. 'Clever Buoy' was deployed at Bondi Beach for the first trial with other suitable sites to be determined along the NSW coast in the future.

*NSW Government recognises technical support from the Department of Fisheries Western Australia.*



VR4G listening station



Aquarius Barrier

