



GOVERNMENT OF
WESTERN AUSTRALIA

Western Australian Shark Hazard Mitigation

Since 2008, the Western Australian Government has progressively developed a multifaceted shark hazard mitigation strategy to address the complex issue of human-shark interactions and public safety at beaches. Commencing with aerial and beach patrols in 2008, the strategy was significantly expanded to \$22 million following an unprecedented five fatalities between August 2010 and March 2012. Funding was committed to research, shark tagging and tracking, an imminent threat policy to fish for a shark, a beach enclosure trial, and development of a Beachsafe app.

Following the seventh fatal attack in three years at Gracetown on 23 November 2013, the Government further enhanced the existing hazard mitigation measures with the deployment of a limited number of drum lines within a three month trial period between January and April 2014. The program aimed to provide additional protection from the risk of shark interactions to water users at a select number of swimming beaches and surf spots in the metropolitan and south west regions of the state during the high use summer months.

Following the trial program the Government proposed to set drum lines for a further three years, in addition to the shark hazard mitigation measures already enacted. The proposal was designed following a close examination of long-running shark control programs in other jurisdictions, including Queensland and New South Wales, South Africa and Brazil, and included recommendations from a [review](#) of the trial program. The three year proposal was subject to the highest level of environmental assessment in the form of a [Public Environmental Review](#) (PER), with the PER subject to a four-week [public submission process](#). In September 2014 the Environmental Protection Authority recommended that the proposed three year drum line program not be implemented due to a high degree of scientific uncertainty about impacts on the south western white shark population. In October 2014 the Government withdrew the proposal from the Commonwealth assessment process.

Since September 2014, the Government has further complemented the broad range of measures with additional beach enclosures, extended aerial patrols in the State's south west, updated guidelines for taking sharks posing a serious threat to public safety, watchtowers at Cottesloe Beach, a commitment to the maintenance of real-time satellite linked acoustic receivers, opportunistic tagging of white sharks, and public education. Trials of drone technology and the Clever Buoy sonar shark detection system will also take place during the 2016/17 summer, with more than \$33 million now committed to shark hazard mitigation across the State.

The Government remains committed to addressing its duty of care to minimise the risk of shark attack by supporting existing measures, investigating ways to enhance and expand these measures and researching new approaches as they become available.

The Strategy (\$33 million)

Beach safety

Beach and aerial surveillance - contracted through Surf Life Saving WA (SLSWA)

- \$12.237 million for beach and aerial surveillance over five years (2012 - 2017)
- \$654,000 to extend beach patrols in the south west to cover school holiday periods, weekends and public holidays for the 2014/15 summer period.
- \$655,000 per annum for a further three years to maintain the extended patrols in the south west until 2018/19.

Jet skis

- \$1.2m in 2012 to SLSWA for the acquisition, maintenance and training of 12 new jet skis.

Observation towers

- \$175,000 for the construction of two watchtowers at Cottesloe Beach, opened on 23 January 2015.

Protection and response initiatives

Beach enclosures

- \$200,000 to a beach enclosure trial at Old Dunsborough in the City of Busselton.
- \$200,000 to an additional beach enclosure in the City of Busselton, deployed at the Busselton foreshore in November 2015.
- \$200,000 to a beach enclosure at Middleton Beach in the City of Albany, deployed in March 2016.
- \$400,000 to a beach enclosure at Sorrento Beach in the City of Joondalup, deployed December 2016.
- \$200,000 to a beach enclosure for Quinns Beach in the City of Wanneroo, to be deployed January 2017.

Drum line trial

- \$1.282 million to a trial drum line program between January and April 2014.

Serious threat policy

- \$2.8 million for the implementation of the serious threat policy (2012-2020).
- Relocation of a Department of Fisheries boat to Margaret River to boost response capacity for shark sightings and incidents in the south west.

Drone trial

- \$88,000 committed to SLSWA to undertake a trial of drone surveillance technology between December 2016 and January 2017

Clever Buoy trial

- \$500,000 committed to a trial of the Clever Buoy sonar shark detection technology at City Beach between December 2016 and March 2017.

Shark monitoring and notifications systems

Shark Response Unit

- \$4.28 million allocated over nine years (2011-2020) for the Shark Response Unit, including:
 - the SharkSmart website and activity map <http://sharksmart.com.au>;
 - notifications and alert systems; and
 - a community engagement strategy, including a community perceptions program.
- \$150,000 for the development of the BeachSafe app with SLSWA and additional community awareness.
- \$3.7 million allocated 2013-2020 for the WA Shark Monitoring Network and shark tagging and tracking. Results from a seven-year shark monitoring research program can be found [here](#).

Science and research

- \$1.7 million allocated to research projects including:
 - A correlation study to investigate possible links between shark interactions and environmental conditions ([Department of Fisheries, 2012](#)).
 - [White shark population estimates](#)
 - The effectiveness of netting as a shark hazard mitigation [measure](#).
 - Shark Monitoring Network feasibility trial.
- \$1.9 million allocated to the below eight Applied Research Programs through the Office of Science to investigate non-lethal shark detection and deterrent technologies.

Detection

<u>Project</u>	<u>Timeframe</u>
Advanced vision system for automatic shark detection and tracking	Feb 2013 - March 2015
Sonar imaging and detection of sharks	June 2013 – Nov 2016
Development testing of low impact acoustic-based shark detection system	Oct 2015 – Oct 2018

Deterrents

<u>Project</u>	<u>Timeframe</u>
Development and testing of novel shark deterrents	Feb 2013 - May 2015
Testing and enhancement of existing shark deterrents	Feb 2013 – May 2015
Discovering visual, electrical and hydrodynamic cues that trigger shark attacks.	Feb 2014 - May 2015
Integrated surfboard electronic shark deterrent to protect surfers	Feb 2014 - March 2016
Characterisation and masking of acoustic signatures of beach-goers than may attract sharks	March 2014 - March 2017

Further information on the Applied Research Programs can be found by visiting the [Office of Science website](#) and [associated media statement](#).

Agency and organisational responsibilities

The Department of the Premier and Cabinet

The Department of the Premier and Cabinet continues to oversee the strategy in Western Australia and monitor developments in other jurisdictions to inform any potential for complementary or alternative shark hazard mitigation measures.

The Department of Fisheries

The Department of Fisheries is responsible for providing advice and information to water users, coordinating responses to sharks posing a serious threat to public safety, maintaining the Shark Monitoring Network, tagging sharks and finalising research into the ecology of the southwestern white shark population, including population estimates and behaviour.

Water Police

WA Police is the lead agency responsible when a serious shark incident occurs, involving a fatal shark bite or a marine search and rescue response. WA Water Police will act as the first point of contact for initial reports of shark sightings and incidents, and initiates the communication of the information to other agencies. All shark sightings should be reported to (08) 9442 8600.

The Office of Science

The Office of Science continues to oversee the applied research grants focussing on non-lethal shark detection and deterrent technologies.

Surf Life Saving WA

Surf Life Saving WA is responsible for the implementation of a broad range of protection and response initiatives consisting of aerial and beach surveillance, watch towers and jet skis. For more information, visit the website at <http://surflifesavingwa.com.au/>.

References, links and additional information

[Western Australian Shark Hazard Mitigation Drum Line Program 2013 – 2014 Review](#)

[Western Australian Shark Hazard Mitigation Drum Line Program. Public Environmental Review](#)

[Western Australian Shark Hazard Mitigation Drum Line Program. Response to submissions on Public Environmental Review](#) Environmental Protection Authority

[Guidelines for taking sharks posing a serious threat to public safety](#) Department of Fisheries

Department of the Premier and Cabinet
December 2016