Shark Hazard Dataset – Reported shark sightings and tagged shark detections

What is it?

The dataset consists of potential shark hazard information.

There are 2 types of data in this dataset. These include shark sightings that have been reported to the Western Australian Water Police 24 hour communication centre and tagged shark detection data that has been recorded by the WA Department of Fisheries (DoF) from 25 satellite-linked ocean receivers across the state. Shark Sighting information is sent in real time as a detection occurs or report is made, by text message to beach safety agencies in case a beach may require closing. This information is also available publically at the locations below so that people can make an informed decision about using the water:

http://twitter.com/slswa
http://sharksmart.com.au/shark-activity

To reduce the risk of any misuse or misinterpretation of this data this document should be read in conjunction with all documents provided by DoF.

What's it for?

 The data contained in the dataset shows reported shark sighting and tagged shark detection information.

Dataset Sources

WA Department of Fisheries Shark Monitoring Network
Western Australian Shark Sighting and Notification System (used by Water Police)

Dataset

This dataset contains information from two separate systems. To identify which system has generated specific data please refer to the field "ObjectId". If this field contains an alphanumeric value it has been created through the Western Australian Shark Sighting and Notification system from reports made to the Water Police. If the "ObjectId" contains a numeric value it has been created by the Department of Fisheries through the Shark Monitoring Network (SMN).

The column label below named "Sighting" pertains to the Western Australian Shark Sighting and Notification system used by Water Police in WA. This system was created so that members of the public can call in and make a report when they encounter a suspected shark hazard. It is also used by Department of Parks and Wildlife (DPAW), Department of Fisheries (DoF), and Surf Life Saving Western Australia (SLSWA) to report shark hazards to the public, and as a back-up system if there is any outage from the SMN. In addition to reports of sharks, sightings also include reports of whale carcasses as these can result in an increased risk of encountering a shark.

The column label below named "Detection" pertains to the Shark Monitoring Network which was created by the Department of Fisheries. Shark detections are notifications, triggered when a tagged shark swims within 500m of a satellite-linked receiver. These receivers monitor sharks that have previously been fitted with acoustic transmitters or 'tags'. The DoF operates and monitors 25

satellite-linked receivers, located across the Perth metropolitan area, Geographe Bay, Cape Naturaliste and Albany. A custom system has been developed to interpret and transmit tag information in real-time. Any detection data from a shark of a size and species that could present a risk to people is transmitted via satellite and automatically relayed to the relevant agencies.

Fields

Field	Sighting	Detection	Current Values	Additional business descriptors
RawDataId	This is a unique ID for each message. This ID can be used to regenerate a historical message with a current date/ time value	This is a unique ID for each message. This ID can be used to regenerate a historical message with a current date/ time value		
Object Id	This is a unique ID for each message.	Non unique numeric value. Can be used to determine how many individual detections from each animal have been triggered from a SMN station.	Current format = WAnnnnnTSE	The object ID field in this dataset refers two different types of information. For sightings this is a unique identifier per report or message. For detections, the object ID is a unique shark/station receiver combination. This allows data from a single shark to be aggregated at a receiver location (for example 4 detections, from 1 white shark at certain time intervals) without identifying the individual shark by tag number. There are a number of reasons for not identifying individual sharks, including agreements for confidentiality of tag details with external research partners.
Distance	How far offshore the interaction happened.	N/A		Distance offshore is used by safety agencies in determining when beaches will be closed. Many response agencies follow the Surf Life Saving WA procedure, which has guidelines for closures according to the size and distance off-shore. Sightings within 1km of shore are more likely to result in a beach closure.
DistanceUnit	Only populated if the Distance is used.	N/A	• <m offshore> • <km offshore>.	
InteractionValue	The type of interaction that is reported, by agencies or the public	"Detected"	• sighted • tagged and released • caught and released • detected	A detection occurs when a tagged shark swims within 500m of a satellite linked receiver. The acoustic tag is detected by the receiver and relevant information is then transmitted. Each tagged shark may be detected multiple times, at 5 min intervals while the tagged shark remains in range. The interaction for 'sightings' is usually a sighting report. Detections is included as a value so if the Shark Monitoring Network has an outage, the sighting system can be used as a back-up system - to provide this information publicly. Tagged and released refers to a shark being caught and acoustically tagged, and caught and released refers to a released shark which has not been acoustically tagged.
InteractionID	The unique id of the type of interaction that the public reports.	4	• 1 = sighted • 2 = tagged and released • 3 = caught and released • 4 = detected	
TownProximity	Determination of closest town.	N/A	Refer to document CoastalFeaturesDataset.pdf	This feature provides additional locational information where coastal feature names may be replicated across the state. For

			example, Back Beach, near Bunbury, or Back Beach near Esperance. It is used both in message creation, and in the front end of the sighting system to reduce the available options to coastal features in that area.
Field	**Sighting**	**Detection**	**Current Values**	**Additional business descriptors**
LocationValue	Processed name which is typically a combination of the FullName and FeatureType fields created by DoF and displayed on the Sharksmart activity map.	SMN station name as determined by DOF.	Refer to document CoastalFeaturesDataset.pdf	Location Value was created to provide a meaningful combination name to assist in identifying the correct location when the information is transmitted. This field is less than 60 characters to meet constraints around the length of the total message when posting to social media (twitter).
SightingNumberValue	If there is one shark sighted the value is 1, otherwise a <space x> is appended so that the message that goes to Twitter and Sharksmart read 3 x sharks sighted.	N/A. This value is always equal to 1.	• 1 • 2 x • 3 x • 4 x • 5 x • 6 x • School of	
ReportDateTime	This field is used if the time of the report is greater than 20 minutes from the time of the sighting.	N/A		This field was developed to accurately represent delayed reports, where a call may not be made at the time of the initial sighting / interaction. This has operational implications as beach closures are usually in place for 1 hour from the most recent sighting, unless it is a delayed report. This also allows people to make a personal decision based on the associated risk.
SightingDateTime	This is the date/ time that the caller making the report interacted with the shark	Detection Date/ time.		
SightingSizeValue-	Estimated size of the shark.	N/A	• 0.1 increments between 1m and 6m eg. 1m 1.1m 1.2m .. • small • medium • large	Sightings: Information is provided on the estimated size when it is reported, as it is a report near to real time, and it may assist in risk decisions. Detections: Information is not provided on size as the system only has the size at the time the shark was tagged recorded. An internally placed acoustic tag may last for up to 10 years, and the size at the time the shark is detected may be substantially different to the initial records. Only sharks which are of a size and species which could be hazardous to people, or are of a size which would potentially trigger a beach closure activate real time detection notifications from the Shark Monitoring Network
SightingSpeciesValue	Estimated species of the shark.	Confirmed species of the shark. If the species of the shark is unknown this field will be empty	• blacktip • blue • bronze whaler • bull • grey nurse • hammerhead • mako • other • tiger • unknown sp.	Species can influence decisions on beach closures, and are relevant to an an individual's personal decision on using the beach, so this information is included. Whale carcasses as these can result in an increased risk of encountering a shark. Where species = whale carcass, this results in different information being pushed through the sighting system – eg. No size included.

Field	Sighting	Detection	Current Values	Additional business descriptors
			• whale carcass • whaler • white •	
OwnerValue	Who made the report to water police.	"Fisheries advise"	• DPAW report • Fisheries advise • Public report • SLS lifesavers report • SLS Westpac Heli report	Listing the owner can assist both the public and response agencies making decisions about shark hazard, DPAW - Department of Parks and Wildlife SLS Lifesavers – Surf Life Saving WA beach patrol lifeguards SLS Westpac Heli – Surf Life Saving WA helicopter patrol – operates for set periods of the year in the Perth metropolitan area and the South West.
LocationDetail	Free text field of extra information that the caller provides that will add value to the public report (usually location information).		Free Text	
LocationX/ LocationY	The co-ordinates of the nearest recorded coastal feature to where the interaction happened. There are 2 points for each location; X and Y. Sightings are not always an accurate representation of where the interaction occurred. For example, a sighting could be made anywhere at a beach however we only have one registered point for inshore and/or offshore.	Actual location of the SMN station.	Refer to document CoastalFeaturesDataset.pdf	Detections are shown at the location of the receiver and may have occurred a maximum distance of 500m from that point. Sightings: The description of the coastal features dataset should be read in conjunction with this description. In addition, any use of the latitude and longitude search function should consider the coastal features data set document, and specifically the way the location X and Y have been developed. A maximum of two points are registered for each known beach or coastal feature name. The recorded X and Y for sighting reports within 1km of shore are shown at the centre point of the beach or closest water feature (eg. reef) of the report. Sightings 1km offshore or greater are shown 1km offshore from the centre point of the beach. Where the coastal feature is not a beach, there is no off-shore location recorded. The default X and Y coordinates are pushed regardless of distance from the reported point. When mapping, this approach allows information to be aggregated on a single point, or pin in existing systems, so relevant risk information is presented, rather than pins overlapping and potentially being obscured, It also allows information to be quickly and automatically pushed using the coastal feature name provided at the time of the report, which is consistent with existing business processes,

How was it created?

A first historical data set was produced from the Shark Monitoring Network that showed all notifications that had publically been sent regarding a detection of a shark at a satellite linked receiver, which had previously been acoustically tagged.

A second historical data set was produced from the Western Australia Shark Sighting and Notification System, used by Water Police showing all notifications that had been sent to the Shark Activity Map at http://sharksmart.com.au/shark-activity