

Coastal Aquatic Risk Assessment

Two Rocks Review

September 2016



**WESTERN
AUSTRALIA**



**Prepared For:
City of Wanneroo**

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12/09/2016	DRAFT	0.1	R. Duczynski	SLSWA
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DRAFT

1. Background

Surf Life Saving WA (SLSWA) completed a Coastal Aquatic Risk Assessment for the City of Wanneroo in July 2014 covering the Two Rocks area from The Spot south of the Marina through to Durrs Beach on the northern side. Since this risk assessment erosional issues have altered conditions north of Two Rocks Marina forcing the closure of the main beach access point off Sovereign Drive. As a result, a new access is proposed from the northern end of Sovereign Drive. The City of Wanneroo has appointed SLSWA to conduct a Coastal Aquatic Risk Assessment of the section of beach north of Two Rocks Marina (Two Rocks (N)) and provide recommendations regarding beach access to the area.

2. Site Identification

2.1 Area Summary

A 1.5km stretch of beach was assessed from the northern side of the breakwater north to a rocky outcrop (Figure 1). The southern corner of the beach has experienced erosion and is partly backed by a makeshift seawall to protect the backing dunes. The beach receives waves averaging just over 1m, which maintains a low tide terrace and at times, a transverse bar and rip system, with rips occurring along the length of the beach. Along the length of the beach there is a rock platform which extends from the beach out into the wave zone. The beach is backed 4-10m high foredunes with several small blowouts, then vegetated transgressive dunes that extend up to 5km inland. Several 4WD tracks reach the back of the beach.

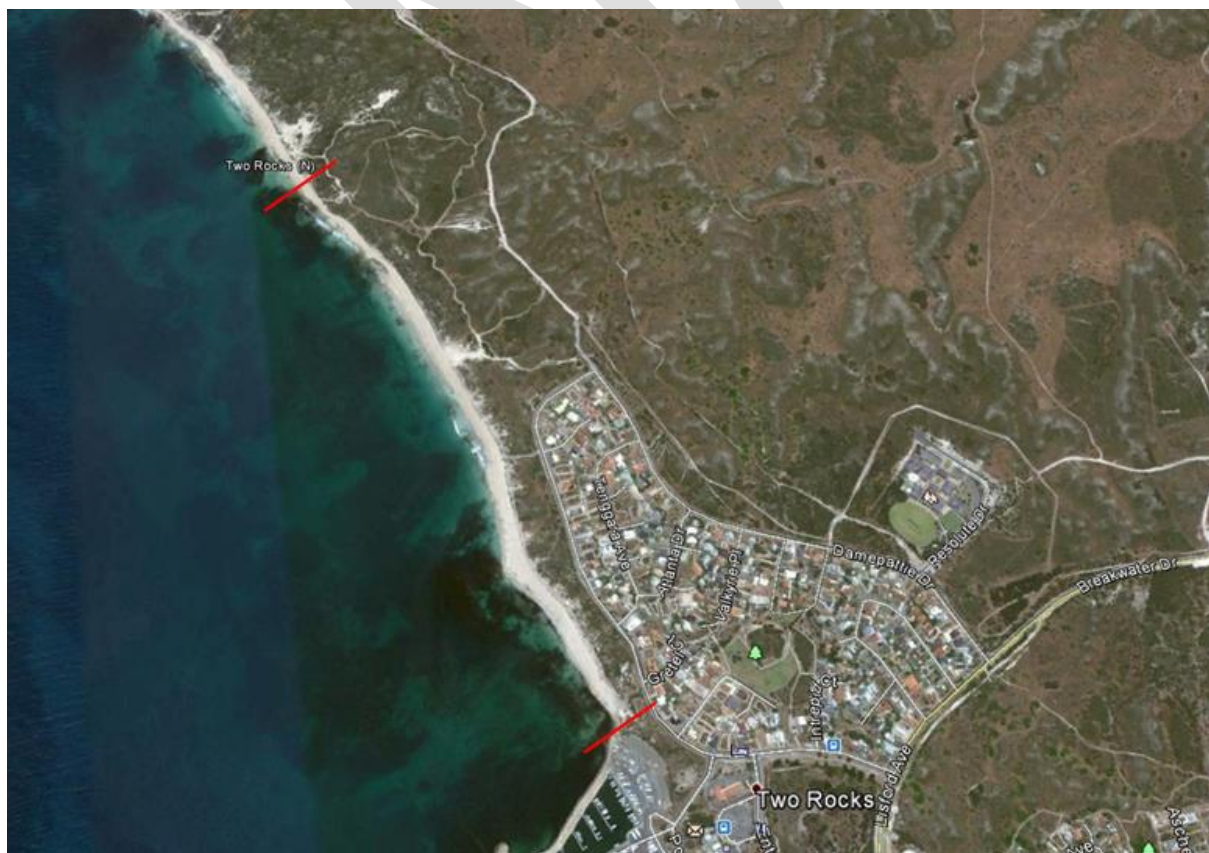


Figure 1: Overview of study area with north and south limits marked in red. (Google Earth)

2.2. Observations

There are currently four access points to Two Rocks (N), two of these are informal access points located just north of the marina, one formal access from the middle of Sovereign Drive which is currently closed and an informal access to be formalised at the northern end of Sovereign Drive. Details of these access points are provided in Appendix B. The two informal access points at the southern end are ineffectively closed off with users able to access the beach via steep dunes and a rock wall. Continued access through these points is hazardous to beach users and will lead to continued erosion of the dunes. The main stair access at the centre of the beach is an ongoing issue; at the time of initial risk assessment in 2014 this path led beach users straight into the water. Currently the dunes beneath the stairs are heavily eroded making the stairs unsafe for use. As a result of this the City of Wanneroo has proposed the development of a new access track at the northern end of Sovereign Drive. In its current state this track is an uneven four wheel drive grass and sand track which weaves through the dunes reaching the beach through a large blowout.

The 1.5km section of beach extending north from the Two Rocks Marina, inclusive of both the beach in front of the existing staircase and the beach in front of the proposed short term access track, is not ideal for swimming activities due to the presence of submerged rocks and reef platforms which occur consistently along the beach extending from the beach into the wave zone. These rock platforms can be exposed or submerged depending on tide, waves and weather conditions. They pose a hazard to recreation in the water with risk of head injuries and other minor injuries from slipping or being dumped on the rocks by waves. The beaches to the south of Two Rocks Marina (Wreck Point through to The Spot) are more suitable for swimming and other recreational activities. The section of beach north of the Marina is suitable for other recreational activities including beach walking/jogging, fishing and other beach based activities.

3. Recommendations

In terms of beach access to the area, the proposed access seems suitable in terms of safety and ease of access given the presence of an existing informal track and reduced dune height in the blowout compared to alternative access points. The City of Wanneroo should consider formalising the new access track with fencing to ensure beach users stick to the designated path through the blowout. This will prevent the creation of more informal tracks through the dunes and prevent further erosion of dunes. Given the width of the track and access through the dunes the City of Wanneroo should consider formalising this track for use as an emergency access for approved vehicles.

Appendix D contains appropriate signage to be installed at each of the new track. There are many informal tracks through the dunes which branch off the formal track and use of these could result in beach users missing signage. Formalising the track will to ensure all beach users accessing the beach are exposed to the beach signage.

RECOMMENDATION 1

The City of Wanneroo should formalise the access track at the northern end of Sovereign Drive and install appropriate signage at either end of the track.

RECOMMENDATION 2

The City of Wanneroo should consider closing all informal access to the beach.

RECOMMENDATION 3

The City of Wanneroo should consider formalising the new access track as a wider four wheel drive track providing access to emergency vehicles.

Appendix A: Graphical Observations



Stair access from Sovereign Drive in May 2014.



Stair access from Sovereign Drive in September 2016.



View south from the proposed new access showing consistent reef platforms along the beach.



View north from the proposed new access showing reef platforms. Note that some rock platforms are submerged in the surf zone.






Informal beach access from the north side of Two Rocks Marina.





Steep beach access via dunes on the north side of Two Rocks Marina.



Appendix B: Access Points


Access Reference	Photo	Access Location Description	GPS Position	Current Access Risk Treatment	Proposed Risk Treatment for Access	Type	Hazards
1 (8350)		Proposed new access	-31.484561, 115.580231	Gated access	Install Open Access Sign Formalise Access (fences)	Informal Access	Uneven surfaces snakes
2 (8351)		Proposed new access	-31.485899, 115.581988	Gated access	Install Open Access Sign Formalise Access (fences)	Gated access	Uneven surfaces Snakes
3 (8349)		Informal access	-31.492616, 115.582975	Defined Access Sign	Fence off access	Informal Access	Dune erosion Steep access Uneven surfaces Snakes Drop off



4 (8348)		Informal Access	-31.493012, 115.582751	Defined Access Sign	Fence off access	Informal Access	Dune erosion Steep access Uneven surface Snakes Drop off
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Appendix C: Risk Register and Risk Treatment Plan



Ref	Hazard Description (location)	Photo	Risk(s)	Risk Matrix's			Risk Groups	Existing Controls/Treatment Plans	Recommended Additional Controls/Treatment Plans	Action Priority & Residual Risk Level
				C	L	Risk Level				
1 (26969)	Rock Formations		rock collapse head injuries spinal injuries	Extreme	Unlikely	High	beach users swimmers surfers	Signage	-	High
2 (26967)	Rock shelves/platforms		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High



Ref	Hazard Description (location)	Photo	Risk(s)	Risk Matrix's			Risk Groups	Existing Controls/Treatment Plans	Recommended Additional Controls/Treatment Plans	Action Priority & Residual Risk Level
				C	L	Risk Level				
3 (269 66)	Erosion		Environmental damage	Medium	Almost Certain	High	beach users	Signage on some access tracks	Restrict access to dunes through formalising access tracks and closing informal tracks	High
4 (269 65)	Rock shelves/ platforms		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High


Ref	Hazard Description (location)	Photo	Risk(s)	Risk Matrix's			Risk Groups	Existing Controls/Treatment Plans	Recommended Additional Controls/Treatment Plans	Action Priority & Residual Risk Level
				C	L	Risk Level				
5 (26978)	Submerged rocks		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High
6 (26977)	Submerged rocks		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High

Ref	Hazard Description (location)	Photo	Risk(s)	Risk Matrix's			Risk Groups	Existing Controls/Treatment Plans	Recommended Additional Controls/Treatment Plans	Action Priority & Residual Risk Level
				C	L	Risk Level				
7 (26970)	Submerged rocks		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High
8 (26972)	Rock shelves/platforms		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High

Ref	Hazard Description (location)	Photo	Risk(s)	Risk Matrix's			Risk Groups	Existing Controls/Treatment Plans	Recommended Additional Controls/Treatment Plans	Action Priority & Residual Risk Level
				C	L	Risk Level				
9 (269 71)	Rock Shelves / Platforms		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High
10 (269 68)	Uneven surfaces		trip/fall	Minor	Unlikely	Low	beach users	Gated access	Install signage Formalise access track	Low









































Ref	Hazard Description (location)	Photo	Risk(s)	Risk Matrix's			Risk Groups	Existing Controls/Treatment Plans	Recommended Additional Controls/Treatment Plans	Action Priority & Residual Risk Level
				C	L	Risk Level				
11 (26979)	Rock shelves/platforms		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High
12 (26973)	Dune erosion		Environmental damage Collapse of stair access	Medium	Almost certain	High	Beach users	Signage on some access tracks	Restrict access to dunes through formalising access tracks and closing informal tracks	Extreme

Ref	Hazard Description (location)	Photo	Risk(s)	Risk Matrix's			Risk Groups	Existing Controls/Treatment Plans	Recommended Additional Controls/Treatment Plans	Action Priority & Residual Risk Level
				C	L	Risk Level				
13 (26974)	Rock Shelves / Platforms		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High
14 (26975)	Rock Shelves / Platforms		head injuries spinal injuries slip/trip/fall	High	Possible	High	beach users swimmers surfers	Signage on some access tracks	Install signage Formalise access tracks Close off informal tracks	High

Ref	Hazard Description (location)	Photo	Risk(s)	Risk Matrix's			Risk Groups	Existing Controls/Treatment Plans	Recommended Additional Controls/Treatment Plans	Action Priority & Residual Risk Level
				C	L	Risk Level				
15 (26976)	Dune erosion		Environmental Damage	Medium	Almost certain	High	Beach Users	Signage	Fence off access	High

Appendix D: Recommended Signage

Table H6


<div>Example Only</div> <div></div>	<div>Location Identification:</div> <table><tr><td>Beach Name:</td><td>North Two Rocks</td></tr><tr><td>Site Reference:</td><td>Sovereign Drive. In case of emergency dial '000'</td></tr><tr><td>Sign Type:</td><td>Level 3 - Open Access Sign</td></tr><tr><td>GPS Location:</td><td>31°29'9.90"S 115°34'55.76"E</td></tr><tr><td>Location Description and Siting:</td><td>Install sign on the right hand side of the access track from the northern end of Sovereign Drive.</td></tr></table>	Beach Name:	North Two Rocks	Site Reference:	Sovereign Drive. In case of emergency dial '000'	Sign Type:	Level 3 - Open Access Sign	GPS Location:	31°29'9.90"S 115°34'55.76"E	Location Description and Siting:	Install sign on the right hand side of the access track from the northern end of Sovereign Drive.								
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Sign Type:	Level 3 - Open Access Sign																		
GPS Location:	31°29'9.90"S 115°34'55.76"E																		
Location Description and Siting:	Install sign on the right hand side of the access track from the northern end of Sovereign Drive.																		
<div>Hazards and Warnings:</div> <table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>No Lifesaving Service</td><td>Dangerous Current</td><td>Submerged Rocks</td><td>Dumping Waves</td><td>Snakes</td><td>Uneven Ground</td></tr><tr><td>NARSSM WS,15</td><td>NARSSM WS,29</td><td>NARSSM WS,35</td><td>NARSSM WS,41</td><td>NARSSM WS,10</td><td>NARSSM WS,7</td></tr></table>								No Lifesaving Service	Dangerous Current	Submerged Rocks	Dumping Waves	Snakes	Uneven Ground	NARSSM WS,15	NARSSM WS,29	NARSSM WS,35	NARSSM WS,41	NARSSM WS,10	NARSSM WS,7
																			
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<div>Information:</div> <table><tr><td><div><div>NARSSM IS, 1</div></div><div><div><div>Keep children under supervision at all times AS/NZS 2416.1 WSW002</div></div></div></td></tr></table>		<div><div>NARSSM IS, 1</div></div> <div><div><div>Keep children under supervision at all times AS/NZS 2416.1 WSW002</div></div></div>																	
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<div>Regulations:</div> <table><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td>No Dogs Allowed</td><td>No Vehicles</td><td>No Trail bikes</td><td>No Littering</td><td>Camping Prohibited</td></tr><tr><td>NARSSM RS, 41</td><td>NARSSM RS, 3</td><td>NARSSM RS, 4</td><td>NARSSM RS, 10</td><td>NARSSM RS, 43</td></tr></table>							No Dogs Allowed	No Vehicles	No Trail bikes	No Littering	Camping Prohibited	NARSSM RS, 41	NARSSM RS, 3	NARSSM RS, 4	NARSSM RS, 10	NARSSM RS, 43			
																			
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NARSSM RS, 41	NARSSM RS, 3	NARSSM RS, 4	NARSSM RS, 10	NARSSM RS, 43															
<div>References:</div> <div>1. AS/NZS: 2416.1. 2010. Water safety signs and beach safety flags. Specifications for water safety signs used</div>																			

in workplaces and public areas (ISO 20712-1: 2008 MOD)







- a. Where available use symbols in diamond enclosure from this standard.
2. ISO 7010: 2011. Graphical symbols – Safety colours and safety signs – Registered safety signs
3. National Aquatic and Recreational Style Guide Manual (Version 3. July 2006).
 - a. Use this manual to guide the development of the sign style.





Table H7

<p>Example Only</p> 	Location Identification:	
	Beach Name:	North Two Rocks
	Site Reference:	Sovereign Drive. In case of emergency dial '000'
	Sign Type:	Level 3 - Open Access Sign
	GPS Location:	31°29'4.76"S 115°34'48.96"E
	Location Description and Siting:	Install sign at the bottom of the access track on the left hand side where it can be easily seen.



Hazards and Warnings:

					
No Lifesaving Service	Dangerous Current	Submerged Rocks	Dumping Waves	Snakes	Uneven Ground
NARSSM WS,15	NARSSM WS,29	NARSSM WS,35	NARSSM WS,41	NARSSM WS,10	NARSSM WS,7

Information:

 <p>NARSSM IS, 1</p>	<p>Yanchep Lagoon (Yanchep SLSC) is patrolled only when red and yellow flags are displayed. *8.3km South. Refer www.beachsafe.org.au or www.wanneroo.wa.gov.au. *Approximate assessment</p>	 <p>Keep children under supervision at all times</p> <p>AS/NZS 2416.1 WSW002</p>
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Regulations:

				
No Dogs Allowed	No Vehicles	No Trail bikes	No Littering	Camping Prohibited
NARSSM RS, 41	NARSSM RS, 3	NARSSM RS, 4	NARSSM RS, 10	NARSSM RS, 43

References:

- AS/NZS: 2416.1. 2010. Water safety signs and beach safety flags. Specifications for water safety signs used in workplaces and public areas (ISO 20712-1: 2008 MOD)
 - Where available use symbols in diamond enclosure from this standard.

2. ISO 7010: 2011. Graphical symbols – Safety colours and safety signs – Registered safety signs
3. National Aquatic and Recreational Style Guide Manual (Version 3. July 2006).
 - a. Use this manual to guide the development of the sign style.



References

The following documentation was provided by the City of Wanneroo to assist in compilation of this interim report:

- City of Wanneroo. Coastal Management Plan – Part 1 (July 2012)
- City of Wanneroo Local Laws. Local Government Act 1995. Dog Act 1976. City of Wanneroo Animal Local Law 1999.
- Draft Perth Coastal Planning Strategy. December 2008.

Other documentation and reference points include:

- SLSA Australian Coastal Public Safety Guidelines (2007) 1st Edition
- Australian Beach Safety and Management Program. SLSA and Dr. Andrew Short (University of NSW). Beaches of the Western Australia Coast: Eucla to Roebuck Bay (2005). University of Sydney Publications. SLSA Coastal Aquatic Risk Assessment Process
- AS/NZS 2416.1:2010 Water safety signs and beach safety flags - Specifications for water safety signs used in workplaces and public areas (ISO 20712-1:2008, MOD)
- AS/NZS 2416.3:2010 Water safety signs and beach safety flags - Guidance for use
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- Surf Life Saving Australia (2013) National Coastal Safety Report 2013. SLSA: Sydney.
- www.coastsafe.org.au
- www.ripcurrents.com.au
- www.beachsafe.org.au
- www.bom.gov.au