# BASS COAST SHIRE COASTAL RISK ASSESSMENT REPORT

## Project Stage 2

Conducted by Life Saving Victoria – Aquatic Risk & Research Department as part of the Surf Life Saving Australia Beach Drowning Black Spot Reduction Program and funded by the Australian Government.

Report prepared for:

Bass Coast Shire, Phillip Island Nature Parks, Parks Victoria & San Remo Foreshore Committee of Management

Life Saving Victoria

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# Contents

## Figures

## Tables



## List of Acronyms

| | |
|---|---|
| ABS | Australian Bureau of Statistics |
| ABSAMP | Australian Beach Safety and Management Program |
| COM | Committee of Management |
| DELWP | Department of Environment, Land, Water and Planning |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| ILS | International Life Saving Federation |
| ISO | International Organization for Standardization |
| LGA | Local Government Area |
| LSV | Life Saving Victoria |
| PV | Parks Victoria |
| SLSA | Surf Life Saving Australia |
| SSC | State Suburb Code |

# 1 Executive Summary

## Background and Objectives

The Bass Coast Shire – Coastal Risk Assessment project was developed as part of the Surf Life Saving Australia (SLSA) Beach Drowning Black Spot Reduction Program, funded by the Australian Government. This project will deliver additional multifactorial treatment options such as pre-arrival public awareness raising methods and safety instruction, in order to remove Bass Coast Shire (BCS) beaches from the national drowning blackspot list.

**Project Objective:** To conduct a coastal risk assessment of priority sections of the Bass Coast Shire.

**Stage 1:** Conduct a vulnerability assessment to determine the priority beach areas within BCS to be risk assessed.

- Completed in 2017/18, the vulnerability assessment identified the priority areas to be risk assessed in Stage 2. Forty-eight (39%) of the 123 identified locations were selected to be risk assessed.

**Stage 2:** Risk assessment of the Bass Coast Shire local government area.

- Given its blackspot status, the need to undertake risk assessment activities specific to signage in the BCS region provided an opportunity to include other aquatic safety treatment and controls beyond safety signage requirements. The risk assessment process facilitated both signage and other multifactorial treatment and control options specific to the identified priority sites.
- The current report summarises the risk assessment process and outcomes of Stage 2, including a range of treatment and controls options.

## Risk Management Methodology

This report documents the risk assessment processes and activities used to address the project objective. The processes align with the International Standard: *ISO 31000:2018 Risk management – Guidelines* and included communication and consultation; establishing the scope, context and criteria elements; the risk assessment including risk identification, analysis and evaluation; development of risk treatments and post-assessment recommendations. These processes and activities are detailed in Sections 3 through 7.

Forty-eight beach locations were selected for inclusion in the report, identified by the Australian Beach Safety and Management Program (ABSAMP).

Hazards were quantified using a variety of methods including:

- Site observations provided on the day of assessment by LSV trained risk assessors;
- Knowledge of the beach profile as outlined in the ABSAMP database;
- Use of various spatial datasets provided by BCS and/ or VicMAP authored datasets specific to the area;
- Reference to the primary and secondary stakeholder survey responses;
- Consideration of fatal and non-fatal drowning event data; and

- Review of rescue histories at patrolled beaches within BCS.

The recommended treatment options provided in this report (Section 9) are considered international best practice, regarding minimisation of risk of drowning and/ or sustaining aquatic related injuries in the coastal environment.

## Risk Assessment Findings

### Hazard summary per Zone

Given the large number of known ABSAMP locations (48) beaches were grouped into five discreet Zones, based on similarity of beach geomorphology and orientation, and location within BCS suburbs. Table 1-1 describes the profiles of each Zone and ranks each Zone based on its overall hazard rank. How this ranking is achieved is described under the 'Beach hazard scores and rankings' sub-heading below.

**Table 1-1 – Zone profiles including summary hazard score and rankings**

| | Zone 1 | Zone 2 | Zone 3 | Zone 4 | Zone 5 |
|---|---|---|---|---|---|
| **Westernmost beach** | **Summerland Bay** | **Surfies Point West** | **Griffith Point** | **Powlett River East** | **Cape Paterson (First Surf)** |
| **Easternmost beach** | **Smith** | **Cape Woolamai South** | **Beach 169** | **Second Surf** | **Undertow Bay** |
| Number of beaches | 11 | 12 | 9 | 12 | 4 |
| Fatal drowning probability (1 or more over 12 months) | <1% | 18% | 26% | 26% | 18% |
| Relative risk of a fatal drowning event occurring within a 12-month period | <0.01% | 1.55 | 3.31 | 1.6 | 4.46 |
| Non-fatal drowning probability (1 or more over 12 months) | 26% | 39% | 18% | 9.5% | 9.5% |
| Overall Zone Hazard Rank | 5 | 2 | 1 | 3 | 4 |

### Beach hazard scores and rankings

The site observations, observed hazards and hazard treatments summaries for each of the 48 beaches are provided in Section 8. The initial and revised hazard scores and ranks for individual beaches are illustrated here in Table 1-2. The 'Initial Beach Hazard Score' is an aggregate of 10 common hazards impacting the likelihood of a drowning and/ or injury event at individual beach locations within each Zone. The beaches are then ranked in terms of their hazard score prior to any existing control measures being considered.

In addition to the initial beach hazard rank, a 'Revised Beach Hazard Score' is provided, which factors localised controls that reduce the likelihood of triggering a hazard event and/ or reducing the consequences of a triggered hazard event. The revised beach hazard score includes the impact of the observed control measures, which was used to calculate the overall rank for each beach (out of 48 beaches).

The initial Zone hazard score can be vastly different to the revised Zone hazard score, due to the presence of localised beach controls (e.g. aquatic safety signage, lifesaving services, zoning and activity controls). Where there are a number of effective, well-maintained and supported controls at a specific site, such as, lifesaving services, the initial hazard score will be significantly impacted. Alternatively, an absence of effective controls will have little impact on the revised beach hazard score.

Table 1-2 lists the 19 beaches that are ranked in the top 15 in terms of their 'Initial Beach Hazard Score' and/or their 'Revised Beach Hazard Score'. This table highlights the impact of the presence or absence of effective localised controls. For example, while beaches such as Woolamai and Cape Paterson\ First Surf are ranked second- and eleventh-most hazardous without considering existing control measures, their ranks drop to a midrange hazard level once existing controls are considered. Conversely, Coral Point West, Cutlers and Powlett River East only place in the top 15 beaches when considering their 'Overall Beach Hazard Rank'. This indicates that more hazardous beaches have more effective control measures in place.

**Table 1-2 – Individual beach hazard score and rankings for 19 key beaches**

| Beach | Suburb | Initial Beach Hazard Score | Initial Beach Hazard Rank | Revised Beach Hazard Score | Overall Beach Hazard Rank |
|---|---|---|---|---|---|
| **Punchbowl** | Bass | 7.09 | 1 | 5.05 | 6 |
| **Woolamai** | Cape Woolamai | 6.76 | 2 | 3.55 | 32 |
| **Magic Lands West** | Cape Woolamai | 6.44 | 3 | 5.43 | 1 |
| **Magic Lands** | Cape Woolamai | 5.99 | 4 | 5.05 | 5 |
| **Beach 171** | Bass | 5.80 | 5 | 4.93 | 7 |
| **Beach 170** | Bass | 5.80 | 5 | 4.93 | 7 |
| **Sunderland Bay** | Surf Beach | 5.71 | 7 | 4.53 | 11 |
| **Beach 169** | Bass | 5.66 | 8 | 5.20 | 2 |
| **Undertow Bay** | Cape Paterson | 5.46 | 9 | 4.68 | 9 |
| **Beach 173** | Bass | 5.39 | 10 | 4.58 | 10 |
| **Cape Paterson\ First Surf** | Cape Paterson | 5.25 | 11 | 2.76 | 36 |
| **Beach 172** | Bass | 5.16 | 12 | 5.16 | 3 |
| **Surf** | Surf Beach | 5.16 | 13 | 4.13 | 15 |
| **Forrest Bluff West** | Surf Beach | 5.16 | 13 | 4.29 | 13 |
| **Forrest Bluff East** | Rhyll | 5.16 | 13 | 4.00 | 17 |
| **Forrest Caves** | Rhyll | 5.16 | 13 | 4.00 | 17 |
| **Coal Point West** | Harmers Haven | 5.12 | 17 | 5.06 | 4 |
| **Cutlers** | Harmers Haven | 5.01 | 18 | 4.29 | 12 |
| **Powlett River East** | Dalyston | 4.79 | 23 | 4.19 | 14 |

## Recommended Actions

The recommended treatment options provided in Section 9 are based on expert opinion and international best practice. Given that the recommendations are provided as aggregated recommendations specific to most beach locations within each Zone, land managers should endeavour to adopt the most appropriate hazard treatments specific to the organisational capabilities and in consultation with relevant stakeholders – including other land managers. Treatment options that are selected and implemented strategically and uniformly by all land managers are likely to be more effective.

One key risk treatment strategy proposed for all sites is signage and this report strongly recommends a Shire-wide uniform signage strategy. Used on public land specific to aquatic recreation drowning and injury event minimisation; it should be implemented in a coordinated and consistent manner. One way to ensure consistency is to implement signage using a baseline standard or framework. The AS/NZS 2416 – *Water safety signs and beach safety flags* Standard is considered the baseline reference document specific to aquatic safety signs.

The basis for all sign design, sizing and placement decisions should be based on a clear and concise communication objective. It would be advantageous for all BCS land managers to agree on a LGA-wide communication objective first and foremost, then develop subset objectives and design requirements for smaller areas or individual beaches. This would facilitate development of a hierarchical signage approach for the whole BCS that then offers land managers flexibility in installing site specific signage consistent with the wider application objective.

Finally, it is recommended that the land managers within BCS commit to a systematic monitoring and review process. Continuous monitoring and review of hazards ensures that new hazards are detected and managed and linked to modification or maintenance of existing action plans. Ongoing reporting will communicate the activities and outcomes, provide information to inform decision-making, improve risk management activities and facilitate interaction with stakeholders.

# 2 Background and Objectives

## 2.1 Background

The Bass Coast Shire (BCS) has been recognised as a national blackspot in terms of coastal drowning risk (Surf Life Saving Australia, 2015). In addition to its estimated residential population of approximately 34,200 (Australian Bureau of Statistics [ABS], 2017), BCS is also popular among day and overnight visitors. The BCS Local Government Area (LGA) received 812,000 overnight visitors in 2014/15 with a tourism expenditure of $350 million (Tourism Research Australia, 2015). In fact, in 2014/15 BCS ranked sixth nationally in terms of its visitor to population ratio out of 76 Tourism Region Profiles (Tourism Research Australia, 2015). With the residential population forecast to increase by a further 34.8% by 2036 (.id, 2015), in addition to growing tourism, action must to taken to ensure the safety of all beach goers at BCS beaches.

The Bass Coast coastline (Figure 2-1) is approximately 200 kilometres in length and makes up 8.12% of the total Victorian coast, ranking it the fourth longest LGA out of 23 LGA entities directly abutting the Victorian coastline (ABS, 2011a). Although it is the fourth largest LGA in terms of coastline length, BCS (including Unincorporated Areas) is the second highest of the 23 LGAs in terms of fatal drowning events. Between 1 July 2000 and 30 June 2016, there were 29 coastline deaths, accounting for 11% of all coastal drowning events during this timeframe (Life Saving Victoria [LSV], 2018). The number one LGA is Mornington Peninsula Shire with 35 drowning events accounting for 14% of all coastal drowning events (LSV, 2018). In addition to these deaths, the BCS region represented 15% (898) of all rescues in the state from eight lifesaving patrol seasons (2007-2015) between the seven lifesaving clubs. These figures demonstrate that the safety of BCS locals and visitors is imperative not only for their health and wellbeing, but also from an economic perspective.

Accessible beach areas abutting the BCS are the primary focus of the study. Based on length of coastline of each Victorian LGA, BCS returns a drowning relative risk ratio of 1.37. This figure signifies that the drowning risk within BCS is 37% higher than what is expected based on state-wide figures. Due to the blackspot status and higher level of drowning risk in the BCS, this LGA is considered a priority area for a coastal risk assessment.

Given these statistics, the Bass Coast Shire – Coastal Risk Assessment project was developed as part of the Surf Life Saving Australia (SLSA) Beach Drowning Black Spot Reduction Program, funded by the Australian Government. Formal approval and additional stakeholder support was provided by BCS, Phillip Island Nature Parks (PINP) and Parks Victoria (PV).

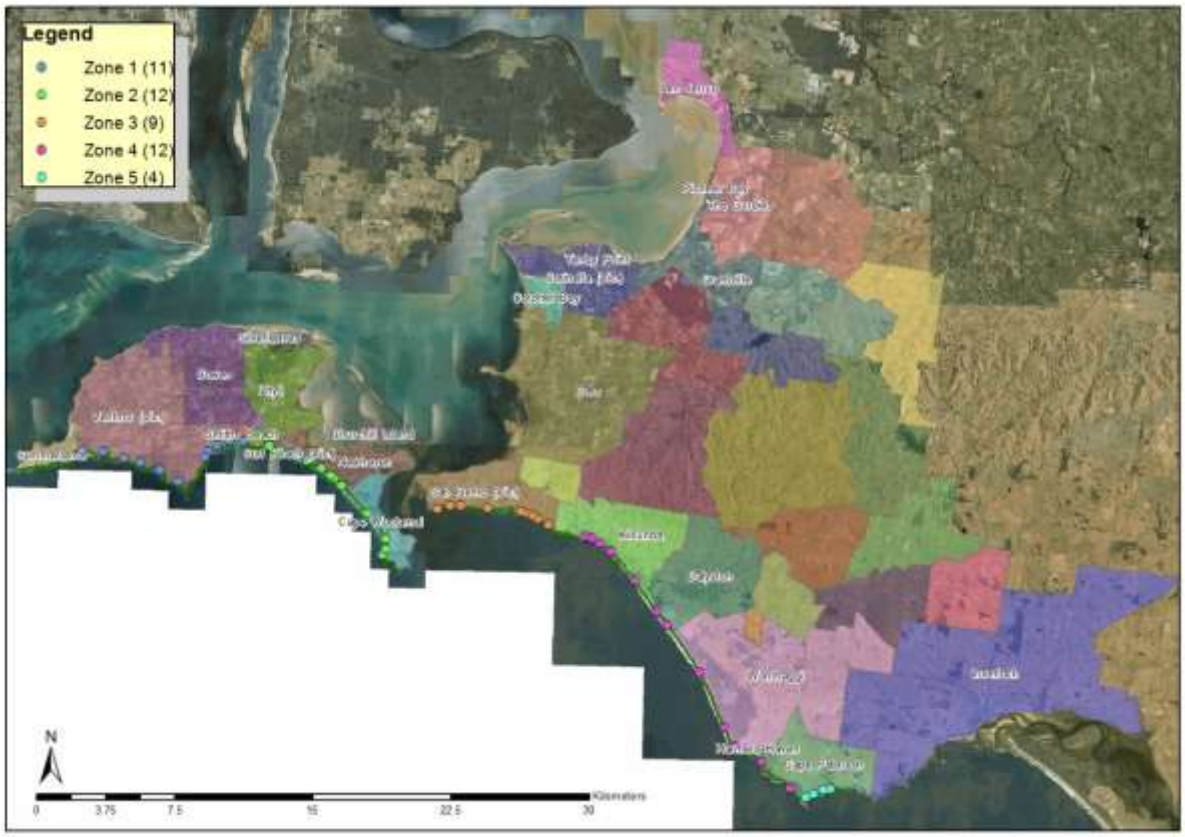



**Figure 2-1 – Map of Bass Coast Shire coastal suburbs and assessment areas per Zone**

### 2.1.1 The case for safety signage

One globally recommended efficient method of communicating hazards at the point of entry to coastal locations is with the use of safety signage (International Life Saving Federation [ILS], 2015). In terms of the application of safety signage in Australia, guidance is provided by the AS/NZS 2416 2416 – *Water safety signs and beach safety flags* Standard (Standards Australia International, 2010a, 2010b, 2010c). This standard as a three-part series, provides guidance of signage regarding:

1. Specifications for water safety signs used in workplaces and public areas (Part 1).
2. Specifications for beach safety flags - Colour, shape, meaning and performance (Part 2).
3. Guidance for use (Part 3) (*including guidance for risk assessment*).

AS/NZS 2416 is essentially a localised version of the International Standard ISO 20712:2008 - *Water safety signs and beach safety flags*, suited specifically to the Australian context. The ISO 20712:2008 Standard is adopted worldwide and has the objective of providing uniformity specific to the application of water safety signs leading to increased familiarity, reduced confusion, and therefore improved safety, for beach users, visitors and the general public.

Safety signage is an integral component of many localised and regional public drowning prevention programs. The Warrnambool City Council provides a best practice example for Victoria with consistent signage which meets the national and international Standards. The

effectiveness of signage can be impacted by a number of applicative factors, such as placement, size and colour. However, water safety signs cannot replace or be used alone for the implementation of aquatic injury prevention. Multifactorial treatment options are recommended, such as pre-arrival public awareness raising, and safety instruction or emergency response supervision as provided by lifeguards.

With 211 kilometres of coastline (including an 11 km segment representing Anderson Inlet) and 123 recognised beach locations which are managed by nine different land managers, it is highly unlikely that all coastal sites within BCS are signposted in a coordinated manner. This includes the possibility that: a) some beach sites may have no aquatic safety signs in place at all, or b) where beaches have signage that it is sited in an inconsistent manner, failing to maximise recognition and/ or being designed in a format inconsistent with the current AS/NZS 2416 Standard.

In addition to the implementation of signage specific to the standard, there are a number of behavioural and attitudinal factors associated with signage that either can increase or reduce their impact and effectiveness. Regarding signage research, Matthews, Andronaco, and Adams (2014) studied the effectiveness of aquatic safety signage within an aquatic environment. This study focused primarily on the applied physical elements of signage rather than on the behavioural and attitudinal factors. 'Currents/ rips' was the hazard foremost in respondents' minds, regardless of whether signage was present warning of this danger. Less than half of the respondents (45%) reported observing any signage. Of those that did report observing signage, the majority noticed the hazard-related symbol signs above any other information provided. Neither composition of the sign (i.e. separated or composite/ standard sign), nor symbol shape affected recognition. Strategies and recommendations were provided, to direct beachgoers to read and heed the information on aquatic safety signage.

The Bass Coast LGA, with its expansive coastline, blackspot status, variety of beach types (i.e. bay and ocean), diversity of land managers and permanent population density, in addition to a seasonal population influx, requires a coordinated approach to risk reduction. This project proposes additional multifactorial treatment options such as pre-arrival public awareness raising, and safety instruction and/ or emergency response supervision as provided by lifesavers in order to remove BCS from the national drowning blackspot list. Treatment recommendations are made based on the results of conducting a systematic risk assessment.

## 2.2 Project Objective and Stages

**Project Objective:** To conduct a coastal risk assessment of priority sections of the Bass Coast Shire.

Funding was sought and obtained from Surf Life Saving Australia (SLSA) as part of the Beach Drowning Blackspot Reduction Program. Initial funding was provided to undertake a vulnerability assessment (Stage 1) to determine priority areas in the BCS requiring a risk assessment (proposed Stage 2):

**Stage 1:** Conduct a vulnerability assessment to determine the priority beach areas within BCS to be risk assessed.

- Completed in 2017/18, the vulnerability assessment identified the priority areas to be risk assessed in Stage 2. Forty-eight (39%) of the 123 identified locations were selected to be risk assessed.

**Stage 2:** *Risk assessment of the Bass Coast Shire local government area*.

- The need to undertake risk assessment activities specific to signage, provided an opportunity to include other aquatic safety treatment and controls beyond safety signage requirements. The risk assessment process facilitated both signage and other multifactorial treatment and control options specific to the identified priority sites.
- The current report summarises the risk assessment process and outcomes of Stage 2, including a range of treatment and controls options.

# 3 Risk Management Methodology

## 3.1 The Risk Management Approach

Risk management activities should precede selection and application of any proposed risk treatments and any refinement of existing control options (ILS, 2015). Risk assessment processes, as part of a wider risk management framework, provide a platform for which treatments and controls can be selected and applied commensurate to identified waterway hazards that may jeopardise beach-goer health and safety. The International Organization for Standardization (ISO) ISO 31000:2018 (2018), defines risk management as the '*coordination of activities to direct and control an organisation with regard to risk*' (ISO, 2018, p. 1). While the current project adopts a risk management perspective to provide overall structure to the management of risks at BCS beaches, it is the assessment of 'risks' at these beaches that is the focus of this report. More specifically, this document provides a reporting mechanism for the assessment of risks, within each of the four nominated beach locations.

This report documents the risk assessment processes and activities used to address the project risk objective. In summary, the objective is focused on minimising the risk of 'aquatic activity-related death or injury' at BCS beaches.

### 3.1.1 The risk assessment process

In assessing the level of beachgoer safety at BCS beaches, and subsequently the impact of beach hazards specific to the project risk objective, a suite of project tasks and activities were used. The management of these risk-orientated tasks and activities was guided with use of *ISO 31000:2018 Risk management – Guidelines*. Key elements of this process are outlined in Figure 3-1.

As described in ISO 31000:2018, "*the risk management process involves the systematic application of policies, procedures and practices to the activities of communication and consulting, establishing the context and assessing, treating, monitoring, reviewing, recording and reporting risk (p. 8)"*. This document summarises the assessment of outcomes associated with the application of this process reflective of good risk management practice.

The process elements outlined in Figure 3-1 are not discrete steps and do not need to be applied sequentially. Although many of the risk assessment processes intuitively link, these linkages are not uniform for all tasks, activities or stages of the process. The methods by which these elements have been addressed for the BCS risk assessment is outlined below.

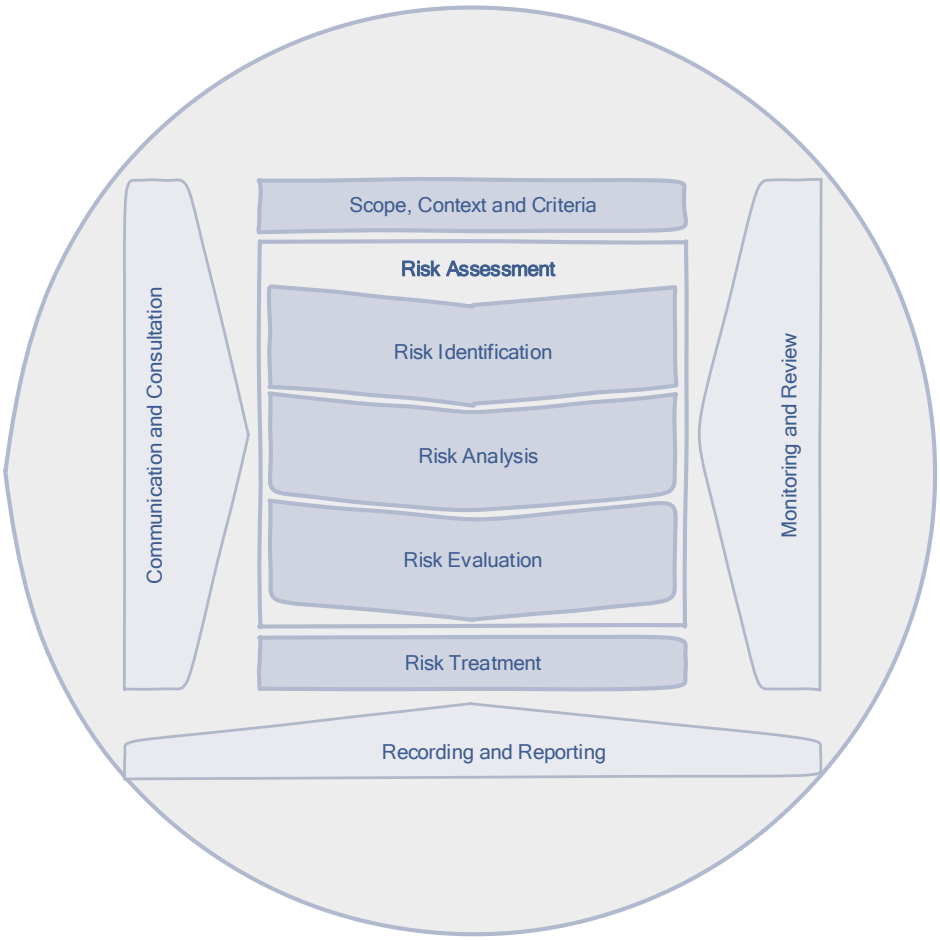



**Figure 3-1 – ISO 31000:2018 Risk Assessment Process (ISO, 2018, p. 9).**

## 3.2 Communication and Consultation

The communication and consultation stage is intended to bring different areas of expertise into the risk management process, to ensure different views are considered when defining and evaluating the risks, to provide sufficient information to facilitate risk oversight and decision-making and facilitate inclusiveness and ownership among those affected (ISO, 2018).

### 3.2.1 Stakeholders

Stakeholder consultation is an important risk management function. Extensive stakeholder consultation was undertaken during the Stage 1 of this project (see - 'Vulnerability Assessment Report – Bass Coast Shire LGA'). The objective of this first stage report was to select a subset of priority assessable beaches to be assessed for physical hazards as part of Stage 2 of the project (the current project). Selection was based on level of vulnerability of sections of BCS coastline.

Stakeholder consultation as part of Stage 1 involved two groups: primary and secondary stakeholders. Primary stakeholders were those land managers responsible for the maintenance and safety of beach goers at all accessible BCS beaches. Secondary stakeholders were those defined as having an active interest in the safe provision and use of beaches within the BCS LGA.

The aim of consultation with both primary and secondary stakeholders was to provide an opportunity to formally impart local knowledge and provide site-specific considerations for Stage 2 of the project. Consultation consisted a combination of approaches, including face-to-face meetings for primary stakeholder and online Stakeholder Engagement Surveys for secondary stakeholders. This feedback formed an integral component of the task of ranking and prioritising beaches for Stage 2 of the project. Many of the issues raised by both stakeholder groups were also used to validate selection and relevance of physical hazards to rank assessable beaches against, and to provide different viewpoints for assessors conducting site assessments.

## 3.3 Scope, Context and Criteria

Establishing the scope, context and criteria elements of the project customises the risk management process to allow for an effective risk assessment and practicable risk treatment options (ISO, 2018). These processes include defining the objectives, outcomes, inclusions and exclusions, the physical environment (or context), risk assessment tools and techniques, the resources required, and establishing responsibilities and relationships, which set the scene in terms of assessment parameters and contextualise the project focus. The key issues and primary focus for this project are fatal drowning, non-fatal drowning and aquatic recreation injury events at Bass Coast beaches.

The following project scoping, context and criteria elements are noted for this project:

a. A physical site assessment of each accessible beach is to be undertaken to collect observational hazard data specific to the project criteria;
b. Quantify observed hazards and cross-check them against expected hazard profile based on the local geomorphology;
c. Consider primary and secondary stakeholder responses conducted as part of the consultation phases associated with Stage 1 of the project;
d. Overlay collected data with other relevant Geographic Information System (GIS) datasets such as aerial imagery to fully quantify the likelihood and consequence of observed hazards from the site assessment that could impact on the expressed project risk objective;
e. Provide an initial risk assessment summary (refer to Hazard Registers for each in this report) and a treatment plan summary (refer to Recommended Treatment Options in this report) for each Zone. These aim to facilitate achievement of the project objective once appropriate treatments have been implemented by the project initiators. Additionally, individual beach hazard scores are provided on a site-by-site basis in the supplementary Individual Beach Assessment Report;
f. Consult with the Land Managers and other interested identified stakeholders, once an initial consultative draft report has been provided, and gain feedback into the practicality and feasibility of the recommended risk treatment options;
g. Issue a final report that reflects the design and operational requirements, project feedback phases (i.e. understanding land manager resource capacity) and the inherent environmental conditions of the coastal waterway under assessment.

### 3.3.1 Zone Reporting Areas

Stage 1 of the project identified 48 priority sites for risk assessment. These 48 beaches align with the Australian Beach Safety and Management Program (ABSAMP) database, which

identifies and describes every discreet beach location within Victoria, including BCS (Short, 1996).

Given the large number of beaches, a grouping mechanism was required to facilitate concise reporting. A number of grouping mechanisms were reviewed, and it was decided to group beaches into five zones based on similarity of beach geomorphology and orientation, and location within BCS suburbs, formally referred to as State Suburb Codes (SSC) (ABS, 2011b). The suburban dataset used was sourced from the Australian Bureau of Statistics; *Australian Statistical Geography Standard (ASGS): Volume 3 - Non ABS Structures as at July 2011 shapefile* (ABS, 2011a).

The five distinct zones were created are outlined in Figure 2-1.

Within the BCS LGA there are 45 gazetted suburbs. Of these, 26 (58%) abut a coastal waterway. The 20 fatal coastal drowning events occurred in 10 (38 %) of the 26 suburbs abutting the coastline.

The ABSAMP beach location names and the suburb in which each beach lies are tabled in Table 3-1. Note that a number of these beaches are known locally by other names, therefore it is suggested to review the maps associated with each site in Section 8 to determine the location of any unfamiliar beach names.

**Table 3-1 – List of beaches included in the BCS assessment and treatment process, by Zone and State Suburb Code (SSC).**

| Zone | Location | SSC | ABSAMP Beach Name | |
|---|---|---|---|---|
| **1** | Island | Ventnor | 1 | Summerland Bay |
| | | | 2 | Kitty Miller Bay |
| | | | 3 | Thorny |
| | | | 4 | Hutchinson |
| | | | 5 | Berryss |
| | | | 6 | Storm Bay |
| | | | 7 | Jessie |
| | | | 8 | Racetrack |
| | | | 9 | The Gap |
| | | Smiths Beach | 10 | YCW |
| | | | 11 | Smith |
| **2** | Island | Sunderland Bay | 1 | Sunderland Bay |
| | | Surf Beach | 2 | Surfies Point West |
| | | | 3 | Surfies Point East |
| | | | 4 | Surf |
| | | Newhaven | 5 | Forrest Bluff West |
| | | | 6 | Forrest Bluff East |
| | | | 7 | Forrest Caves |
| | | | 8 | The Colonnades |
| | | Cape Woolamai | 9 | Woolamai |
| | | | 10 | Magic Lands West |
| | | | 11 | Magic Lands |
| | | | 12 | Cape Woolamai South |
| **3** | Mainland | San Remo | 1 | Griffith Point |
| | | | 2 | Back |
| | | | 3 | Beach 175 |
| | | | 4 | Punchbowl |
| | | | 5 | Beach 173 |
| | | | 6 | Beach 172 |
| | | | 7 | Beach 171 |
| | | | 8 | Beach 170 |
| | | | 9 | Beach 169 |
| **4** | Mainland | Kilcunda | 1 | Shelly |
| | | | 2 | Kilcunda West 2 |
| | | | 3 | Kilcunda West 1 |
| | | | 4 | Kilcunda East |
| | | | 5 | Powlett River West |
| | | Dalyston | 6 | Powlett River East |
| | | | 7 | Williamsons |
| | | Wonthaggi | 8 | Cutlers |
| | | | 9 | Coal Point West |
| | | Harmers Haven | 10 | Coal Point East |
| | | | 11 | Wreck Bay |
| | | Cape Paterson | 12 | Second Surf |
| **5** | Mainland | Cape Paterson | 1 | Cape Paterson (First Surf) |
| | | | 2 | The Channel |
| | | | 3 | The Bay |
| | | | 4 | Undertow Bay |

## 3.4 Risk Assessment

A risk assessment according to ISO 31000:2018 is the overall process of risk identification, analysis and evaluation. These process elements are contextualised below given the project risk objective:

**Risk Identification**

- Purpose: to find, recognise and describe the hazards that trigger risk events that might contribute to unintentional drowning or injury events (ISO, 2018).
- Hazards were identified via physical site visits of the 48 beaches. The sites were assessed on foot with Global Positioning System (GPS)-enabled cameras. Site observations included assessment of the subaerial beach and surf zones; defined and undefined access pathways leading to the site; and relevant carpark areas.

**Risk Analysis**

- Purpose: to quantify and understand the way coastal hazards trigger risk events. This includes: the likelihood and consequences of events being triggered by certain hazards; the nature, complexity and connection between hazard events; and the presence and effectiveness of existing observable controls (ISO, 2018).

Analysis was undertaken using a hazard register methodology. This consisted of grouping like hazards into 10 coastal hazard categories. Hazards were assessed in reference to impact to the risk objectives being drowning and aquatic recreation injury minimisation. Each accessible beach site was ranked on the basis of how localised beach hazards impacted project risk objectives. By undertaking this process, examination of localised variation of risk could be assessed.

- Hazards as they impacted the risk objectives were quantified with reference to a range of supporting datasets and information sources. This included:
  i. Site observations provided on the day of assessment by LSV trained risk assessors;
  ii. Knowledge of the beach profile as outlined in the ABSAMP database;
  iii. Use of various spatial datasets provided by BCS and/or VicMAP authored datasets specific to the area;
  iv. With reference to the primary and secondary stakeholder survey responses as outlined in the BCS Vulnerability Assessment;
  v. Consideration of fatal and non-fatal drowning event data; and
  vi. Review of rescue histories at patrolled beaches within BCS.
- The level of hazards-specific information available for all sites was not uniform. As such, a fluid assessment approach was required for the project. Where one of the quantification aspects was absent or greatly reduced there was a greater reliance on other analysis approaches.

| | |
|---|---|
| **Risk Evaluation** | • Purpose: to compare the findings of the risk analysis with the established risk criteria to identify where additional action is required. These actions might include:<br>i. Taking no action;<br>ii. Consider risk treatment options;<br>iii. Analyse further to better understand the hazards and their impact on the risk objectives at a site-specific level;<br>iv. Maintain existing controls and/ or reconsider the objectives (ISO, 2018).<br>• Section 8 (Beach Risk Assessment Summaries) of this report provides a summary of the hazards and control observations within each of the 5 zones. These are the average of the individual beach sites within each zone.<br>• Recommended treatment options were made at a zone level on the basis that they are suitable for a majority of the individual beach locations within that particular suburb. Treatment options cannot be viewed as absolute or unconditional due to the need for the land manager/s and/ or other relevant bodies to consider the resourcing and logistical impacts of implementation. For some treatment options the land manager will need to engage a third party such a LSV for further advice and/ or link with state-wide or national public education policies and frameworks. |

## 3.5 Risk Treatment

Risk treatment involves the selection and implementation of the treatment options that will address drowning and injury risk to beachgoers with a known level of confidence (ISO, 2018). The subsequent treatment plans provided in this report are considered international best practice, regarding minimisation of risk of drowning and/ or sustaining aquatic related injuries in the coastal environment. No single treatment or control option is infallible; however, the use of evidence-based approaches provides selection and applicative baselines for BCS coastal land managers.

### 3.5.1 Drowning prevention strategies

The recommended treatment options proposed in this report are in line with international best practice in drowning prevention. The International Life Saving Federation (ILS, 2015) states the four factors that commonly lead to drowning events in their report, *Drowning Prevention Strategies: A framework to reduce drowning deaths in the aquatic environment for nations/ regions engaged in lifesaving*. These factors are:

1. Lack of knowledge, disregard or misjudgement of the hazard;
2. Uninformed, unprotected or unrestricted access to the hazard;
3. Lack of supervision or surveillance; and
4. An inability to cope once in difficulty (Figure 3-2).

Any of these factors by themselves or in combination could lead to a fatal drowning or aquatic related injury event. To reduce unintentional drowning and injury, an understanding of which factors are prime contributors at a site is useful when selecting hazard treatment options.

The strategies that address each of these factors and reduce the risk of drowning and injury are:

1. Education and information;
2. Denial of access and/ or provision of warnings;
3. Provision of supervision; and,
4. Acquisition of survival skills (Figure 3-2).

To ensure that the most effective treatment approaches are nominated for specific locations, a risk assessment should be conducted to analyse the impact and cost benefit of each treatment option and combination of options. The selection of the most appropriate option(s) often involves balancing the financial, social and environmental impacts of implementing each option against the benefits derived from each application (ILS, 2015).

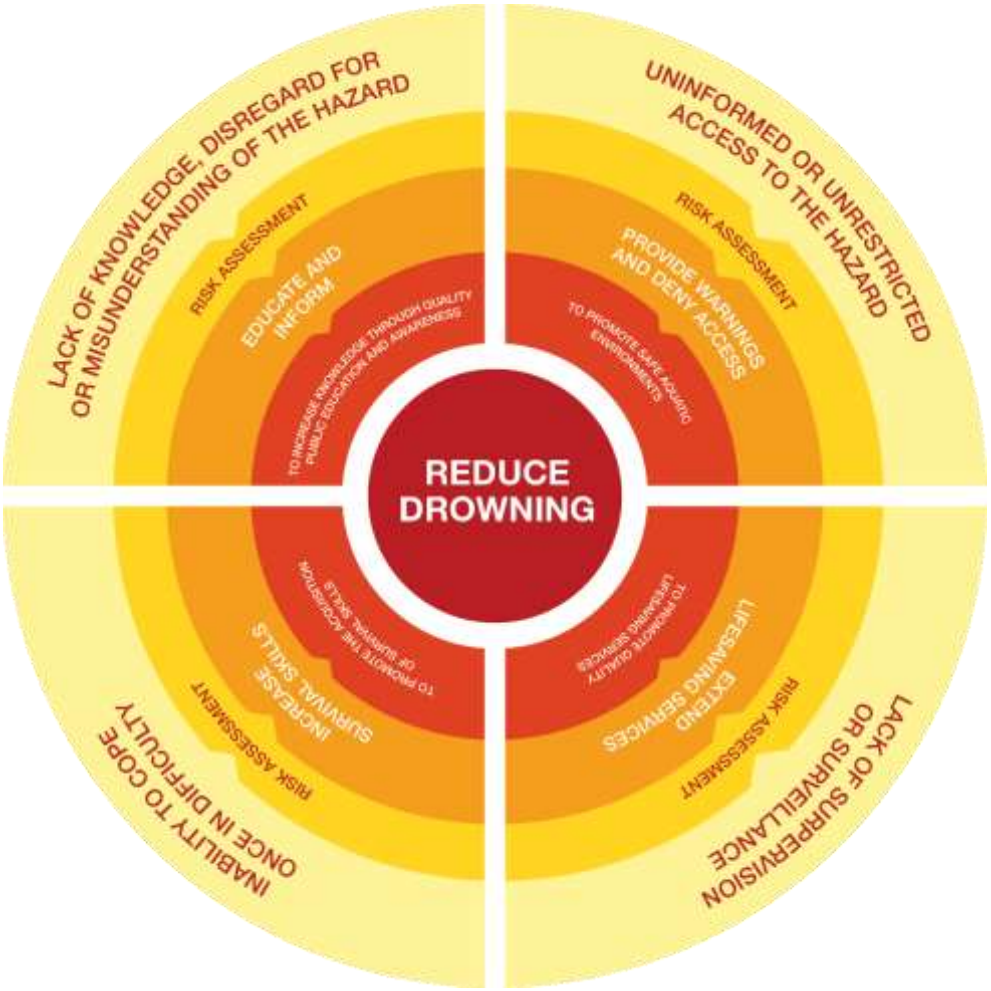



**Figure 3-2 – The Drowning Prevention Chain and strategies to reduce drowning (ILS, 2015, p. 19)**

This report sets out a range of applications in line with the ILS control measures that have been successfully applied throughout the world in various organisations and localities. It provides a list of options that enable the land manager(s) to select the most appropriate initiatives for the aquatic waterway under their management. A comprehensive list of these counter measures with examples of applications from around the world is available in the *Drowning Prevention Strategies: A framework to reduce drowning deaths in the aquatic*

*environment for nations/ regions engaged in lifesaving* report (ILS, 2015) and it is highly recommended that these are reviewed by those involved in decision making. The report is freely available on the ILS website (https://www.ils.org/).

Hazard treatment options to be considered for land manager review are provided below. The options provided aim to give as much detail as possible, specific to the assessed waterway location. However, due to the diverse nature of location characteristics, recommendations in some cases are generic in nature. Land managers should endeavour to adopt the most appropriate hazard treatments, specific to the organisational capabilities and in consultation with relevant stakeholders.

Additionally, given the context of this report it is suggested that all relevant BCS land managers confer regarding treatment option selection and implementation. This way, any new treatments and/ or modifications to existing controls can be undertaken in a coordinated and systemic fashion. This would apply to control aspects such as signage and would avoid the implementation of a land manager-specific signage approach not consistent with other land managers in within BCS.

## 3.6 Monitoring and Review

By undertaking this assessment process, it is recommended that the land managers within BCS commit to a systematic monitoring and review process. Continuous monitoring and review of hazards ensures that new hazards are detected and managed and linked to modification or maintenance of existing action plans. Review processes are often core components and integrated processes associated with many systematic risk management process cycles. This process should be periodical (e.g. annually).

Monitoring and review activities link risk management to other management processes and administrative processes, for example, capital works plans. This incorporated approach facilitates better risk management and continuous improvement. The main input for this step is the watch list of the major risks that have been identified for risk treatment action (Hazard Register). The outcomes of any review process should be in the form of revisions to organisational risk registers and a list of new action items proposed for hazard treatment, or funding opportunities for previously identified and implemented control options.

## 3.7 Recording and Reporting

Finally, the risk management process and the resultant outcomes should be reported in order to communicate the activities and outcomes, provide information to inform decision-making, improve risk management activities and facilitate interaction with stakeholders (ISO, 2018). The present report fulfils this crucial element of the risk management methodology.

# 4 Assessable Beaches and Reporting Areas

Several geographical datasets were used to enhance the assessment process. A primary dataset was the ABSAMP location data (Short, 1996). This dataset is represented by an arbitrary centre point location based on the embayment and length of each identified beach as defined by Short (1996). Generally, a beach is defined as the '*portion of the profile (shoreline) subject to wave action and which is exposed subaerially at least some of the time*' (Davidson-Arnott, 2010, p. 13).

Given the beach definition above, there are many areas of the BCS coastline, such as continuous stretches of cliff face, rock platforms, bluffs and headlands that aren't considered beaches. This is despite some of these areas being relatively accessible and/ or exhibiting subaerial (temporally exposed) terrain (such as rock platform areas). Beaches are commonly bound by major headlands at each end with embayed sections of coastline. As such, headlands and rocky reef areas create parcels of coastline in between beaches. This assessment is primarily focused on accessible sandy shoreline areas; however, does note that rock platform areas pose significant hazards also leading to risk of drowning. In fact, rock fishing and rock walking accounted for 25% (4) of all fatal drowning events within BCS between 1 July 2008 to 30 June 2018.

This document provides summaries based on discrete beach locations specific to each of the five zones. Site observations, hazard summaries and treatment observations are presented for each individual beach, and recommended treatment options based on these are provided as aggregate assessments within each zone.

# 5 Event Probabilities

## 5.1 Fatal Drowning Events

### 5.1.1 Historical fatal drowning events

There were 20 coastal drowning deaths in BCS in the 10-year period from 1 July 2008 to 30 June 2018 – an average of two per year (Life Saving Victoria, 2018). Table 5-1 summarises the key statistics of these incidents.

**Table 5-1 – Key statistics of the fatal drowning events within BCS (1 July 2008 to 30 June 2018) (n = 20)**

| | |
|---|---|
| **Demographics** | • Of the 20 drowning deaths within BCS over the 10-year period:<br>  ○ 90% (18) were male<br>  ○ 40% (8) were aged between 25 and 44 years; followed by 30% (6) aged between 45 and 64 years.<br>• Five individuals (25%) were reported as being from culturally and linguistically diverse backgrounds. This figure may be even higher, as country of birth or ethnicity were unknown in 60% (12) of the drowning deaths. |
| **Location** | • The most common coastal locations where drowning deaths occurred were: the beach (60%, 12); in the ocean (25%, 5); and in a harbour/ bay/ inlet (15%, 3). |
| **Temporal** | • There was an even proportion of fatal drowning incidents occurring on weekends and week days (50%, 10). 30% (6) occurred on a Saturday, followed by 25% (5) on a Monday.<br>• The most common months were January (25%, 5) and October (20%, 4).<br>• The most common season was Summer (45%, 9), followed by Autumn (25%, 5). |
| **Activity** | • The most common activity immediately prior to a fatal drowning was swimming (30%, 6). This was followed equally by: rock fishing; and fishing from a boat (15%, 3 each).<br>• Nine individuals (45%) did not intend to enter the water; they slipped, fell or were swept into the water (e.g. boating, fishing, walking near water). |

### 5.1.2 Probability of a fatal drowning event based on suburb

Based on historical fatal drowning events over this 10-year period (1 July 2008 to 30 June 2018), there was an 86% probability of one or more drowning events occurring over a 12-month period within BCS. For the 48 beaches included in the assessment, those on Phillip Island, had an 18% probability of one or more drowning events occurring within a 12-month period. For mainland beaches, this probability was 55%.

The probability and relative risk ratios of a fatal drowning event occurring were also calculated per Zone to provide a suburban comparison tool (Table 5-2). Although they are both risk-based indicators, each provides a different risk perspective. Probability rates reflect the likelihood of a fatal event occurring within each individual suburban area based on historical averages in that particular area (rate known as the lambda $\lambda$). It does not factor the overall global BCS fatal drowning probability during calculation. In contrast, relative risk ratios provide a 'relative' comparison given a global ratio. Calculated suburban relative risk ratios provide a

comparison of an individual suburban ratio with the 'global' calculated ratio. The relative risk calculations in Table 5-2 are based on the risk of drowning given the length of coastline for each suburb area, compared to an overall drowning ratio per kilometre.

Regarding the probability of one or more fatal drowning events occurring within a given 12-month period, Zones 3 and 4 had the highest probability of 26%, followed by Zones 2 and 5 with 18% (Table 5-2). It should be noted that the two drowning deaths in Zone 2 occurred a year apart over a two-year period being 2016/17 & 2017/18. These two drowning deaths were averaged out over 10 years maintaining methodology consistently. Beaches outside the assessment zone had a combined probability of 63%, with 10 fatal events within the analysis timeframe.

Calculated ratios devised for coastline lengths demonstrated that Phillip Island BCS assessable beaches had a relative risk ratio of 0.39 compared to the total length for all assessable beaches combined. This equates to a 61% lower risk of drowning per kilometre of beach on Phillip Island compared to the overall BCS coastline rate per kilometre (for assessable beach areas only). Taking into account the whole BCS coastline, mainland beaches had a relative risk ratio of 2.48, or 148% increased risk compared to the BCS-wide ratio. In examining individual beach zones, Zone 5 had a relative risk 3.46 times higher than the overall BCS rate with Zone 3 recording a rate 2.31 times greater than the overall BCS risk rate. This demonstrates that, using data from between 2008/09 and 2017/18, BCS beaches on the mainland presented a greater relative fatal drowning risk than those on Phillip Island.

Using both risk perspectives together provides greater insight. An interesting example is Zone 5. Although the probability of drowning in Zone 5 is ranked third (an 18 % chance of a drowning in a given year), it is clearly ranked first in terms of relative risk using the coastline length ratio. This would indicate that the number of annualised drowning events (given 10 years) wasn't extremely high, but the rate is high given that the coastal length in Zone 5 isn't particularly long.

**Table 5-2 – Probability of 1 or more non-fatal drowning events occurring and relative risk of a fatal drowning event occurring within a 12-month period, by Zone**

| Zone | Probability ≥ 1 | Relative Risk Ratio |
|---|---|---|
| **1** – Summerland Bay to Smith | <1% | <0.01% |
| **2** – Sunderland Bay to Cape Woolamai South | 18% | 1.55 |
| **3** – Griffith Point to Beach 169 | 26% | 3.31 |
| **4** – Shelly to Second Surf | 26% | 1.60 |
| **5** – Cape Paterson (First Surf) to Undertow Bay | 18% | 4.46 |
| BCS beaches outside assessment zone | 63% | 0.75 |
| **All BCS beaches** | **86%** | |

# Non-fatal Events

### 5.1.3 Historical non-fatal drowning events

There were 22 coastal non-fatal drowning incidents in BCS in the 10-year period from 01 January 2007 to 31 December 2017 – an average of 2.2 per year.

Information on non-fatal drowning in was provided by Ambulance Victoria (AV). Cases of non-fatal and immersion related injuries attended by AV paramedics were extracted from the VACIS® clinical information system. Potential drowning data for this report was identified via a database search for all drowning related dispatch codes identified at the emergency call-taker level, as well as cases in which paramedics reported a final assessment of 'post immersion'. Only patients reported as suffering respiratory compromise or vomiting as a result of immersion were included in analyses.

#### Probability of a non-fatal event based on suburb

Based on historical fatal drowning events over this 10-year period (1 July 2007 to 30 June 2017), there was an 89% probability of one or more drowning events occurring over a 12-month period within BCS. Twelve of the 22 non-fatal coastal drowning events occurred at beaches included in the assessment. Non-fatal drowning event probabilities were calculated within each Zone. The Zone with the highest probability of one or more non-fatal drowning events occurring within a given 12-month period was Zone 2, with 39% (Table 5-3). This was followed by Zone 1 (26%) and Zone 3 (18%).

**Table 5-3 – Probability of 1 or more non-fatal drowning events within a 12-month period by Zone**

| Zone | Probability ≥ 1 |
|---|---|
| **1** – Summerland Bay to Smith | 26% |
| **2** – Sunderland Bay to Cape Woolamai South | 39% |
| **3** – Griffith Point to Beach 169 | 18% |
| **4** – Shelly to Second Surf | 9.5% |
| **5** – Cape Paterson (First Surf) to Undertow Bay | 9.5% |
| BCS beaches outside assessment zone | 63% |
| **All BCS beaches** | **89%** |

# 6 Rescue Events

Beach attendance and rescue data was analysed for the six beaches that were patrolled by lifesaving clubs within BCS over the 10-year period from 1 July 2007 to 30 June 2017.

To allow for a comparison of rescues between these beaches, attendance and rescue data was used to provide an average rescue rate per 100,000 visitors at each beach. The overall average rescue rate for BCS was 46.4 rescues per 100,000 visitors (Table 6-1). The calculated rescue rates demonstrate that Woolamai had by far the highest rescue rate of all BCS beaches, with 182.1 rescues per 100,000 visitors over the previous 10 years. All other beaches had a rescue rate lower than the overall BCS rate, led by Wonthaggi with 36.0.

In addition to the rescue rates above, relative risk ratios for rescue events at each patrolled location were calculated. These ratios provide a beach-by-beach comparison of the relative risk of a rescue at a particular site, given the overall rescue ratio for BCS. Of the six service sites, Woolamai was highest ranked with a relative risk ratio of 3.92. That is, the likelihood of a rescue occurring at Wollomai was 296% higher than what should be expected across the entire BCS (Table 6-1). All other patrolled beaches had a relative risk ratio lower than the shire-wide baseline (i.e. they had a relative risk ratio lower than 1).

This rescue data demonstrates that although there were no fatalities at Woolamai beach between 1 July 2007 to 30 June 2017

Andersons Inlet (Inverloch) was also patrolled between the 2011/12 and 2014/15 seasons as an overflow for Inverloch; with two rescues recorded in 2012/13. As this site is not a consistently patrolled location and has limited data, it was removed from this analysis.

**Table 6-1 – Rescues per 100,000 beach visitors and relative risk ratios at patrolled BCS beaches between 2008/09 and 2017/18**

| Patrolled Beach | Attendance (10-year average) | Rescues (10-year average) | Rescue Rate (per 100,000 visitors) | Relative Risk Ratio |
|---|---|---|---|---|
| **Cowes** | 24,672 | 5.9 | 23.9 | 0.51 |
| **Cape Paterson** | 10,398 | 1.4 | 13.5 | 0.29 |
| **Inverloch** | 48,367 | 7 | 14.5 | 0.31 |
| **Smiths Beach** | 54,190 | 7.8 | 14.4 | 0.31 |
| **Woolamai** | 32,573 | 59.3 | 182.1 | 3.92 |
| **Wonthaggi** | 22,752 | 8.2 | 36.0 | 0.78 |
| **All beaches** | 192,952 | 89.6 | 46.4 | 1.00 |

# 7 Beach Characteristics

Six beach types were identified within the BCS assessment area. Table 7-1 provides a distributional summary of beaches based on beach type for the area. The typical characteristics of these beach types and common hazards specific to each type are provided in Table 7-2 below.

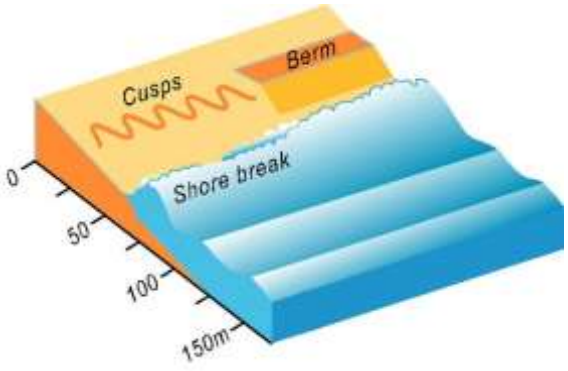
**Table 7-1 – Distribution of Beaches Based on Beach Characteristic**

| Beach Type | Frequency (%) | Hazard Rating Min | Hazard Rating Max |
|---|---|---|---|
| Reflective (R) | 13 (27.1%) | 4 | 8 |
| Low Tide Terrace (LTT) | 4 (8.3%) | 5 | 6 |
| Transverse Bar & Rip (TBR) – Rhythmic Bar & Beach (RBB) | 9 (18.8%) | 7 | 8 |
| Reflective (R) – Low Tide Terrace (LTT) | 6 (12.5%) | 4 | 6 |
| Transverse Bar & Rip (TBR) | 10 (20.8%) | 6 | 8 |
| Low Tide Terrace (LTT) – Transverse Bar & Rip (TBR) | 6 (12.5%) | 5 | 6 |
| **Summary** | **48** | **4** | **8** |

**Table 7-2 – Characteristics of common beach types within BCS (Short, 1996; Short & Woodroffe, 2009)**

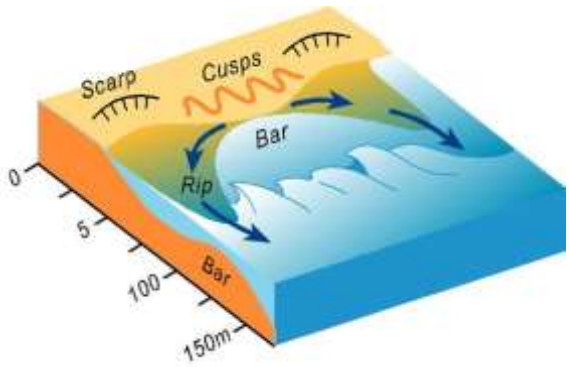
## Reflective

- The most common beach type found along the BCS coastline.
- Lower energy beaches, characterised by relatively narrow and steeper swash zone (wave break zone).
- Coarser sand results in a steeper gradient and deep nearshore zone.
- To be considered reflective, modal wave height must be less than 0.5 metre, with no bar or surf zone – waves move unbroken to the shore, where they collapse or surge up the beachface.
- Due to low waves and deep nearshore zone, waves do not break until they reach the base of the beachface (remaining wave energy is released over very short distance, called a shorebreak).
- Reflective beaches often have a beach step (usually 30 centimetres to 1 metre high), located around the low-water mark at the beachface base and comprises coarse materials including rocks, cobbles, boulders and shells.
- The combination of the steep beachface, a potential step-like drop off into deep water and the sudden wave energy expenditure as a shorebreak can produce hazardous conditions, particularly where waves exceed 1 metre.
- The steepness makes footing difficult, a strong shorebreak can knock people over and drag them down the beach, and if carried past the step move them into deep water.



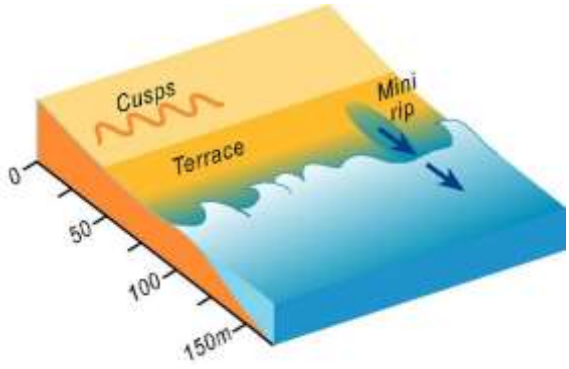
## Transverse Bar & Rip (TBR)

- Most common and widespread of Australia's wave-dominated beach types – many popular surf beaches fall into this category. Second most common beach type found within the assessment area.
- Characterised by fine to medium sand, average wave height of 1.5 metres and bars appear transverse (or perpendicular) to and attached to the beach.
- The bars are usually separated by deeper rip channels and currents, with regularly spaced bars and rips (mean spacing ranges from 150 metres on lower energy beaches and may exceed 500 metres on higher energy beaches). The spacing and surf zone width increases with both increasing wave period (time between successive wave crests) and wave height.
- Due to alternation of shallow bars and deeper rip channels, longshore variation occurs in the way waves break across the surf zone, alternating between lower energy swash in lee of the bars and higher energy swash/ shorebreak in lee of the rips.
- Waves over 1.5 metres rips may double in speed (about 2 metres per second), meaning someone could be carried out from the shore to beyond the breakers in 20 to 30 seconds. Rips are also hazardous due to their greater depth (channels are usually 0.5 to 1 metre deeper than the adjacent bar, with a maximum depth of 3 metres) and faster seaward-flowing water that forms megaripples on the rip channel floor (sand ripples 1 to 2 metres in length and 0.1 to 0.3 metre high, slowly migrating seaward).
- Consequently, it is more difficult to maintain footing in rip channels for three reasons: deeper water, stronger current and a less compact sea floor.



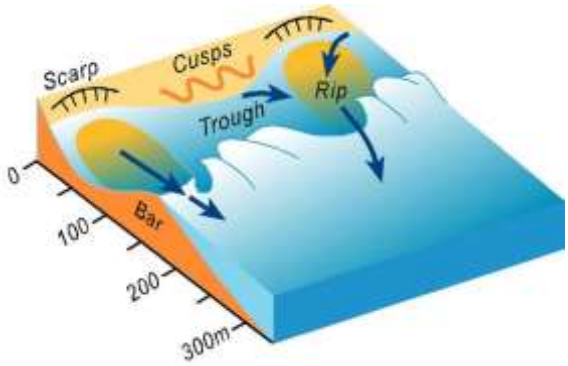

## Low Tide Terrace

- Lowest energy intermediate beach type, with a wave height averaging 1 metre and fine to medium sand.
- Moderately steep beachface, joined to an attached bar or terrace at low tide (the bar or terrace usually extends 20 – 50 metres seaward).
- May be flat and featureless, have a slight central crest, called a 'ridge', and potentially cut by mini-rips (small, shallow rip channels) every 100 to 200 metres.
- At high tide, when waves are less than 1 metre, they may pass completely over the bar and not break until the beachface (similar to a reflective beach). However, during spring low tide, the entire bar is usually exposed as a ridge or terrace running parallel to the beach, with waves breaking by plunging heavily on the bar's outer edge. Under typical mid tide conditions, when waves are less than 1 metre, they break across the bar and a low surf zone is produced.
- If no rip channels are present, rips flow across the bar in a shallow, transient manner.
- Potential hazards include deep water close inshore at high tide, presence of rips when waves are breaking, variable water depth due to rip holes and bars may be cut by deep channels and troughs and adjoining rocks and reefs.



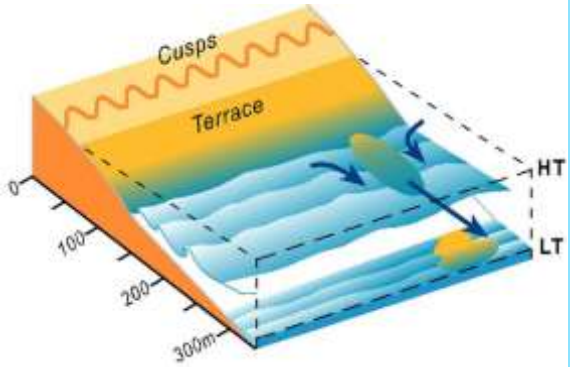
## Rhythmic Bar & Beach (RBB)

- Most common of the high-energy beach types that occur on Australia's southern coast, characterised by relatively fine to medium sand, exposure to waves averaging above 1.5 metres and an outer bar, separated from the beach by a deep trough.
- The bar varies in width and elevation alongshore, with shallower areas projecting landward and deeper sections seaward (giving the bar a rhythmic appearance). In the deeper rip sections, waves may remain unbroken until they reach the beachface, which in turn erodes and reworks the shoreline to form curved scarps.
- The surf zone may be 100 to 150 metres wide, with the bar, rips and alternating protruding and eroding sections spaced every 250 to 500 metres alongshore.
- Waves break more heavily on the shallower bars, where they flow into the deeper trough, moving shoreward and longshore as a rip-feeder current within a rip-feeder channel.
- The most hazardous aspects of this beach type concern the variation of the bars, troughs and rips, influencing drop-off and depth differences, from shallow to deep and deep to shallow water.




## Reflective – Low Tide Terrace

- This beach state oscillates between reflective and low tide terrace types, depending on beach energy levels (a result of varying tidal and weather conditions).
- Characterised by short period waves averaging 0.45 metre in height, a relatively steep, cusped, reflective high tide beach with medium sand and downward-sloping beachface to low tide, abruptly falling to a low gradient, finer sand low tide terrace, which can extend tens of metres seaward.
- At high tide, waves flow unbroken over the terrace and break on the beachface. As the tide falls, waves increasingly break across the terrace, and at low tide, break on the outer edge, producing a wide, shallow surf zone.
- Rips may be present at low tide, cutting a channel across the terrace. Other potential hazards include gradient and depth variations, plunging low tide waves on the outer bar and potentially strong shorebreak at mid to high tide, particularly when waves exceed 1 metre in height.




## Transverse Bar & Rip - Rhythmic Bar & Beach

- This beach state oscillates between TBR and RBB types, depending on beach energy levels (as a result of varying tidal and weather conditions).
- It is an intermediate beach type, higher energy than a reflective beach and lower energy than a dissipative one, and experiences hazards present in both TBR and TBB types, i.e. variation of the bars, troughs and rips, potential difficulty maintaining footing in the rip channels due to deeper water, stronger current and a less compact sea floor.

# 8 Beach Risk Assessment Summaries – Zones 1 to 5

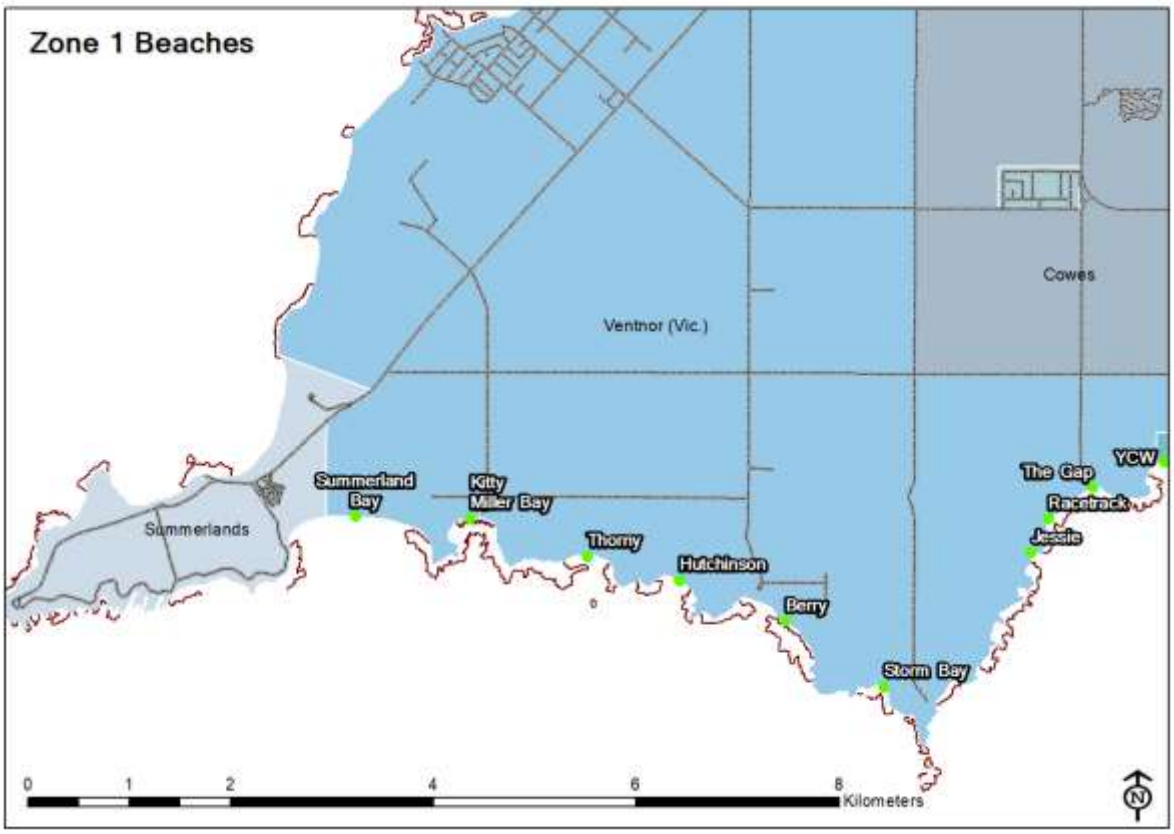
This Section summarises the site observations and hazard summary and treatment observations for each of the 48 beaches, grouped by Zone. Table 8-1 illustrates the profile of each Zone in terms of common characteristics, as well as the probability of one or more fatal and non-fatal drowning events occurring within a 12-month period, and the relative risk of a fatal drowning event occurring within a 12-month period. Zone 3 is ranked most hazardous with a 26% probability of one or more fatal drowning events, an 18% probability of one or more non-fatal events, and a relative risk of a fatal drowning event occulting 2.31 times higher than the overall BCS. This is followed by Zone 2, which has an 18% probability of one or more fatal drowning events occurring within a 12-month period, a 39% probability of a non-fatal drowning event (the highest of all Zones), and a relative risk of a fatal drowning event occurring 0.55 times higher than the overall BCS. Section 4 provides detailed information on beach types.

**Table 8-1 – Zone profiles**

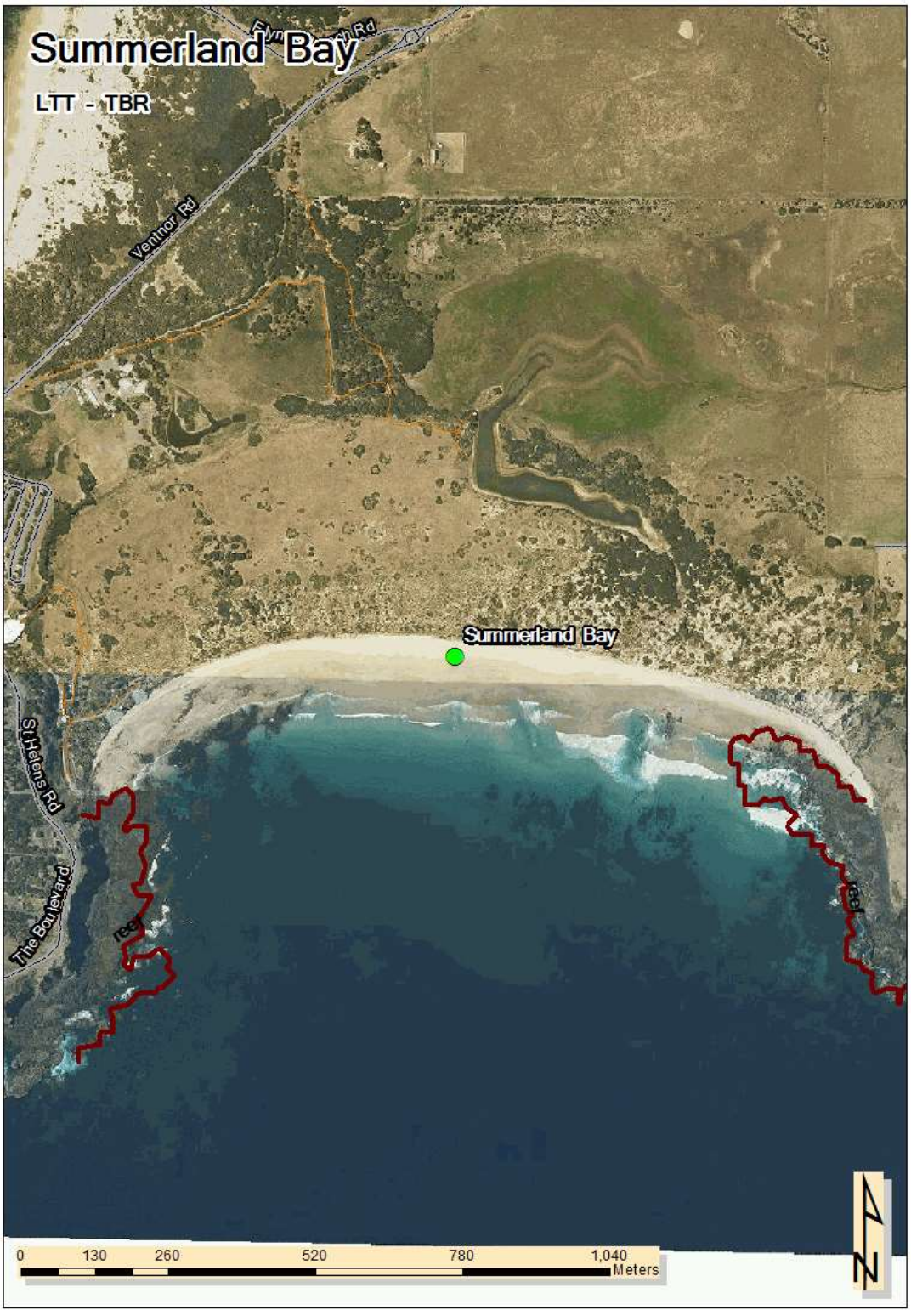
| | Zone 1 | Zone 2 | Zone 3 | Zone 4 | Zone 5 |
|---|---|---|---|---|---|
| Westernmost beach | Summerland Bay | Sunderland Bay | Griffith Point | Shelly | Cape Paterson (First Surf) |
| Easternmost beach | Smith | Cape Woolamai South | Beach 169 | Second Surf | Undertow Bay |
| Number of beaches | 11 | 12 | 9 | 12 | 4 |
| Location | Phillip Island | Phillip Island | Mainland | Mainland | Mainland |
| Common characteristics | Discrete beaches backed by bluffs; rock platforms at each end; SSW or SE facing | Mainly continuous beaches; SW-facing | Discrete beaches backed by bluffs; sandstone headlands separate; south facing | Continuous sandy beaches intertidal rock flats; SW-facing | Discrete beaches separated by headlands; extensive rock platforms; SSE-facing |
| Common beach types | • SSW-facing R/LTT;<br>• SE-facing LTT/TBR | • LTT<br>• TBR | • R<br>• LTT<br>• TBR | • R<br>• TBR/RBB | • LTT/TBR<br>• R |
| Fatal drowning probability (1 or more over 12 months) | <1% | 18% | 26% | 26% | 18% |
| Relative risk of a fatal drowning event occurring within a 12-month period | <0.01% | 1.55 | 3.31 | 1.6 | 4.46 |
| Non-fatal drowning probability (1 or more over 12 months) | 26% | 39% | 18% | 9.50% | 9.50% |
| Overall hazard rank | 5 | 2 | 1 | 3 | 4 |

# Zone 1 – Beach Risk Assessment Summary

| Zone Profile | Zone 1 |
|---|---|
| Westernmost beach | Summerland Bay |
| Easternmost beach | Smith |
| Number of beaches | 11 |
| Location | Phillip Island |
| Common characteristics | Discrete beaches backed by bluffs; rock platforms at each end; SSW or SE facing |
| Common beach types | • SSW-facing R/LTT;<br>• SE-facing LTT/TBR |
| Fatal drowning probability (1 or more over 12 months) | <1% |
| Relative risk of a fatal drowning event occurring within a 12-month period | <0.01% |
| Non-fatal drowning probability (1 or more over 12 months) | 26% |
| Overall hazard rank | 5 |



## 8.1 Summerland Bay



### 8.1.1 Site Observations

Obs 1 – Existing aquatic safety sign at the start of the defined access path down to Summerland Bay beach.

Obs 2 – Eastern view of the headland at the 1.2 km long embayed Summerland Bay beach.

Obs 3 – Phelans Bluff at the western end of the beach.


Obs 4 – First aid and automated external defibrillator (AED) kept in the observation tower infrastructure for the popular penguin parades.

Obs 5 – Grandstand seating infrastructure present for the popular penguin parade.

Obs 6 – Defined access at start of main access point leading from the Penguin Parade Visitor Centre down to the beach.

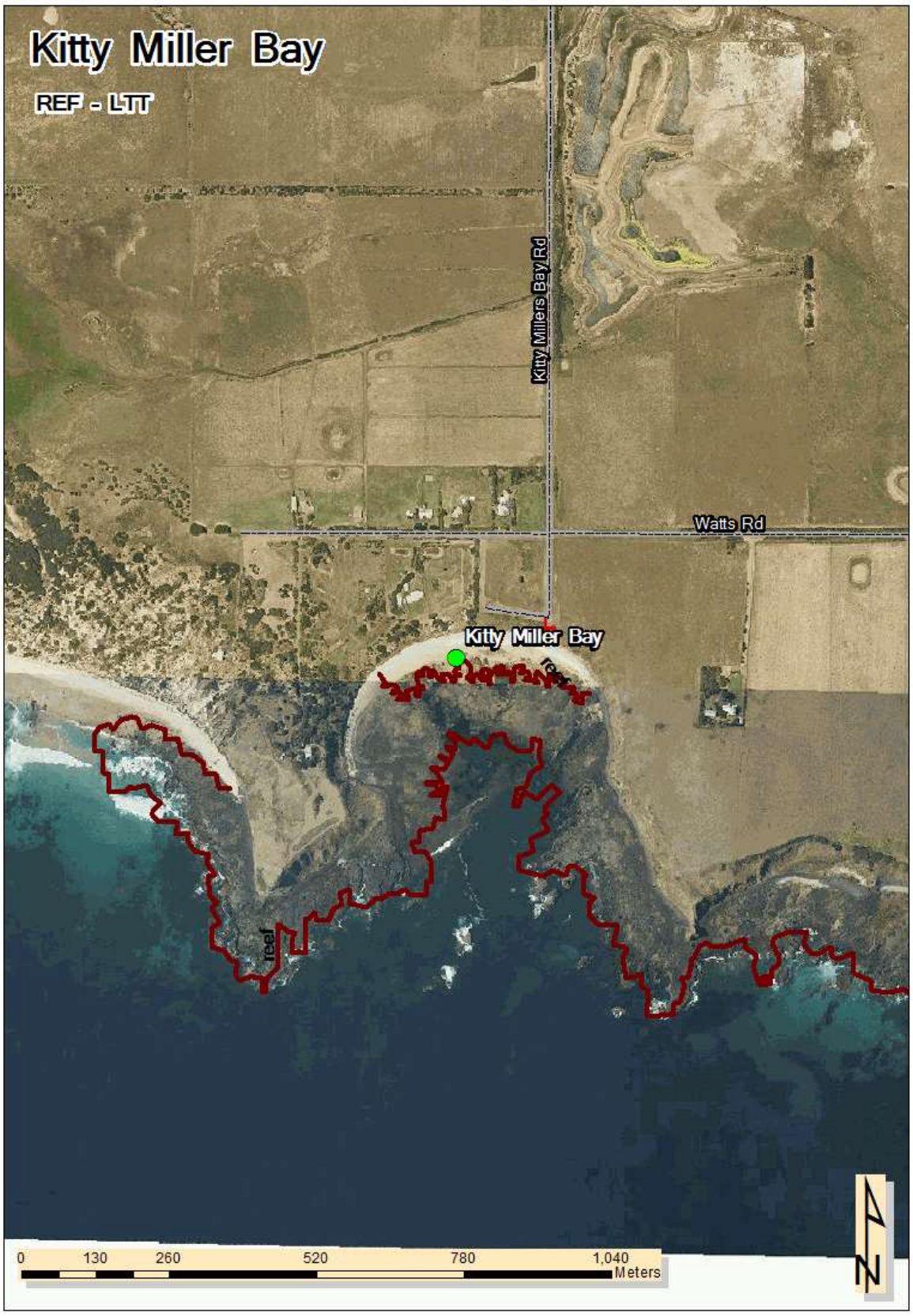
### 8.1.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.4 | 0.2 | 0.08 | 7 | 0.5 | 0.2 | 0.1 | 8 | 0.18 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 1 | 0.6 | 0.5 | 0.3 | 2 | 0.60 | 1 |
| **Currents (rips)** | 0.6 | 0.5 | 0.3 | 1 | 0.4 | 0.5 | 0.2 | 5 | 0.50 | 3 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.5 | 0.25 | 3 | 0.50 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.4 | 0.3 | 0.12 | 6 | 0.4 | 0.4 | 0.16 | 6 | 0.28 | 6 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.3 | 0.09 | 9 | 0.15 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.4 | 0.4 | 0.16 | 4 | 0.4 | 0.6 | 0.24 | 4 | 0.40 | 5 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 5 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 2 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 7 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **1.45** | | | | **1.94** | | **3.39** | |
| **Control Effectiveness** | | | | | | | | | **0.49** | |
| **Revised Beach Hazard Score** | | | | | | | | | **1.72** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Arrival information present, however not all specific to aquatic recreation safety. |
| **On-site education** | 1 | 0.5 | 0.5 | On-site education but again not specific to aquatic recreation safety and swimmer safety. |
| **Barriers** | 1 | 0.9 | 0.9 | Good infrastructure noted at time of assessment. |
| **Defined access** | 1 | 0.9 | 0.9 | Good infrastructure noted at time of assessment. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access sign noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.8 | 0.8 | Regulations noted at the time of assessment. |
| **Activity management** | 1 | 0.8 | 0.8 | Activity management noted at time of assessment. Activities are primarily specific to the penguin parade. |
| **Trained observers** | 1 | 0.4 | 0.4 | Staff and observers noted at time of assessment specific to Penguin Parade Visitor Centre. Ability to respond to an aquatic emergency is unknown. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 1 | 0.8 | 0.8 | Provided on-site. |
| **Lifeguard services** | 1 | 0.4 | 0.4 | Staff and observers noted at time of assessment specific to Penguin Parade Visitor Centre. Ability to respond to an aquatic emergency is unknown. |
| **Activity restrictions** | 1 | 0.5 | 0.5 | Restrictions in place regarding use on the beach for recreational swimming during certain hours of the day. |
| **Community education** | 1 | 0.4 | 0.4 | Education primarily specific to the Penguin Parade. |
| **Public rescue equipment** | 1 | 0.5 | 0.5 | Public defib noted at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | Not noted at the time of assessment. |
| | | | **0.5** | |

## 8.2 Kitty Miller Bay



### 8.2.1 Site Observations

Obs 1 - Existing aquatic safety sign located at the entrance of a defined access path at the western end of the small car park off Kitty Miller Bay Road.


Obs 2 – Sign uses a 'No Lifesaving Service' symbol that is not found in the current AS/NZS 2416 Standard.


Obs 3 – Emergency Beach Access Number (EBAN) located at Kitty Miller Bay beach.

Obs 4 – Profile view of the beachface and backing dunes in an eastward direction.

Obs 5 – Close up view of the defined access sign at the top of the beach access stairwell. Although the sign is in good position, sign content and need to compete for reader attention makes in in need for review.

Obs 6 – Numerous signs at the eastern defined beach access path, competing for attention of the beachgoer.

### 8.2.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.5 | 0.3 | 2 | 0.6 | 0.5 | 0.3 | 3 | 0.60 | 2 |
| **Topological and man-made hazards** | 0.6 | 0.4 | 0.24 | 5 | 0.6 | 0.4 | 0.24 | 6 | 0.48 | 6 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 8 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.5 | 0.25 | 4 | 0.5 | 0.6 | 0.3 | 3 | 0.55 | 5 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.6 | 0.36 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.78 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.7 | 0.4 | 0.28 | 3 | 0.7 | 0.4 | 0.28 | 5 | 0.56 | 4 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.3 | 0.15 | 7 | 0.7 | 0.3 | 0.21 | 7 | 0.36 | 8 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 3 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.00** | | | | **2.51** | | **4.51** | |
| **Control Effectiveness** | | | | | | | | | **0.23** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.46** | |

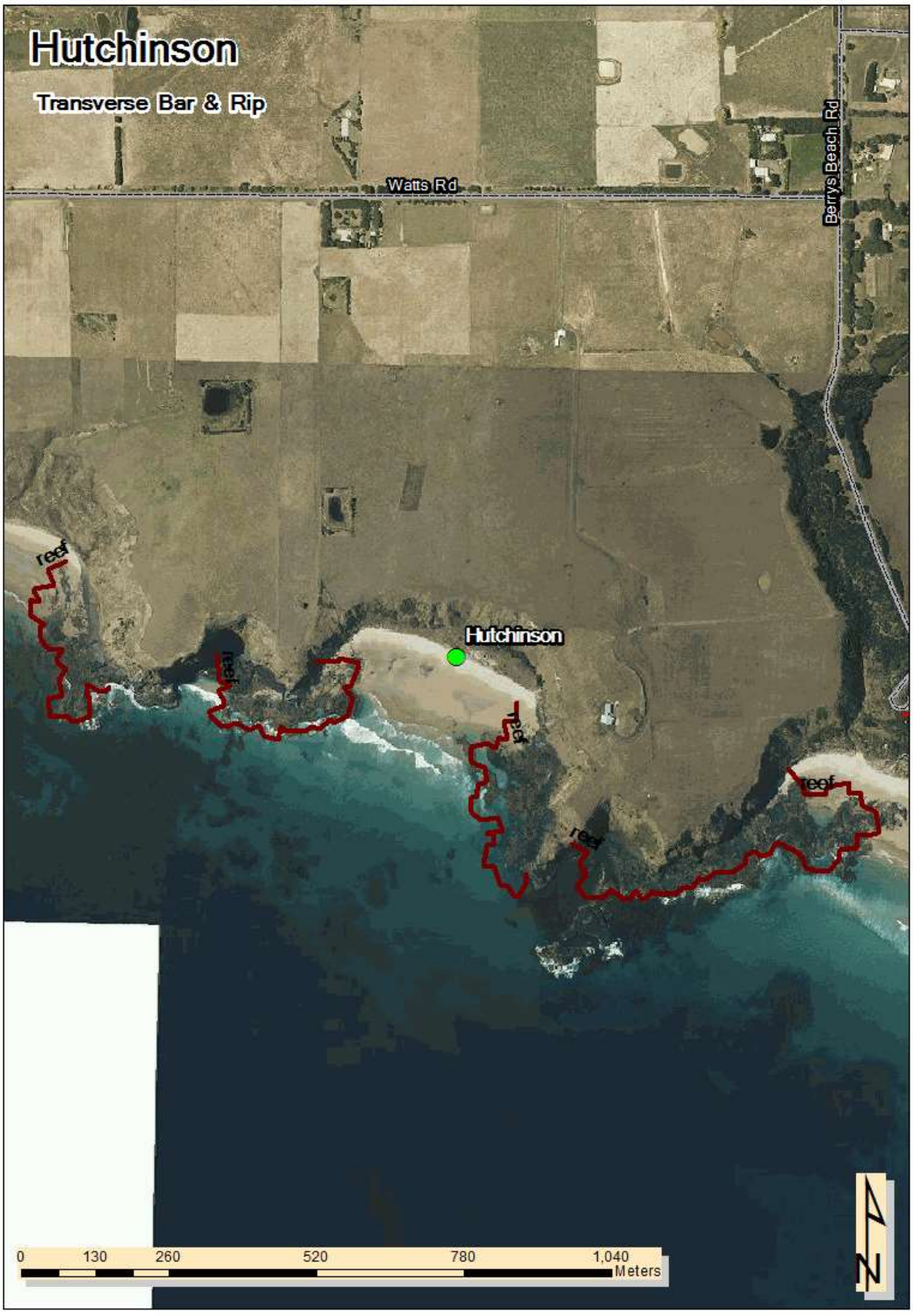
**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information and other site information noted on arrival. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.7 | 0.7 | Barriers noted at time of assessment. |
| **Defined access** | 1 | 0.6 | 0.6 | Defined access noted at time of assessment. Emergency access limited to personnel on foot. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access sign noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.23** | |

## 8.3 Thorny

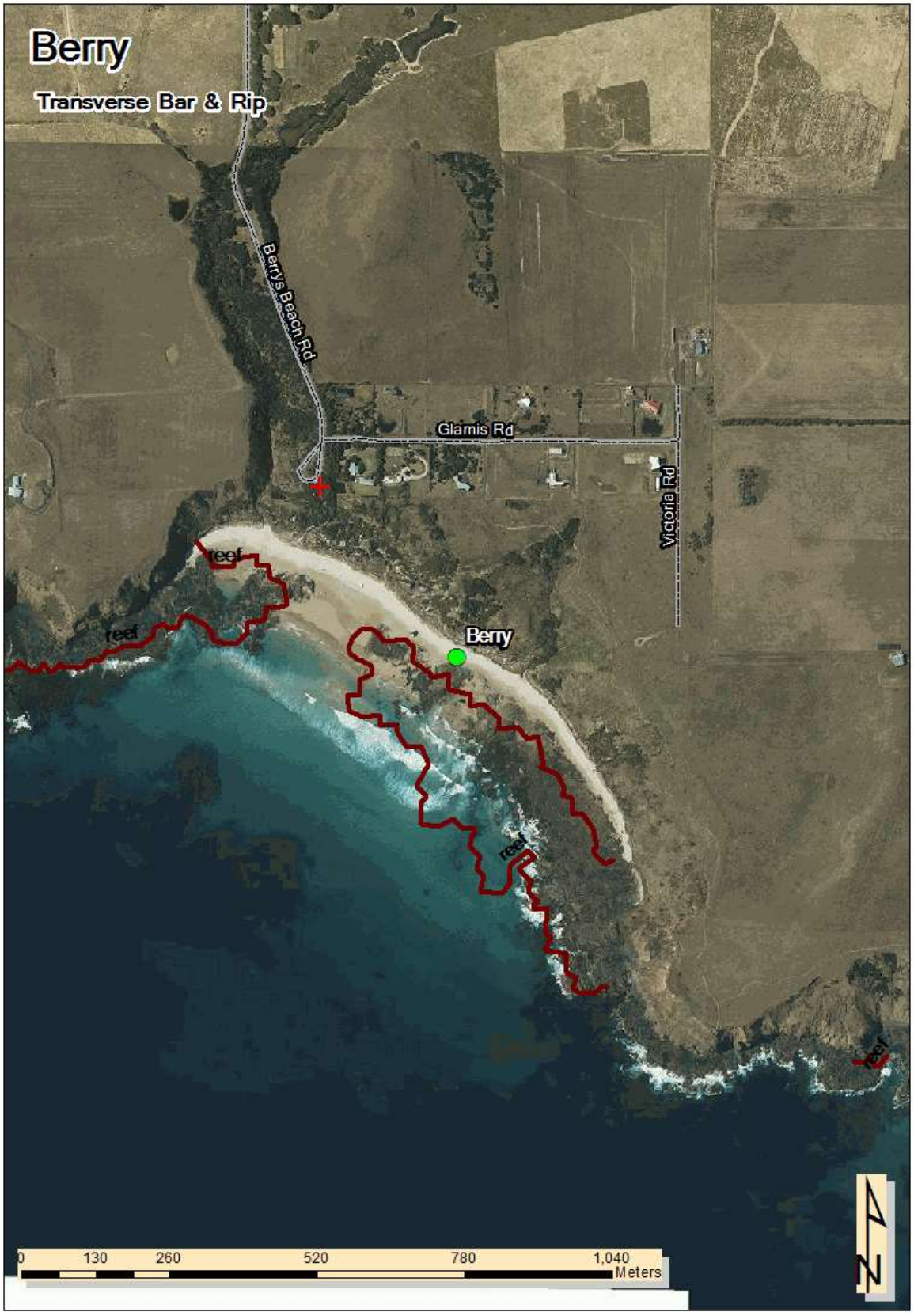

** This beach (Thorny), along with Hutchinson, was not accessible at the time of site observations. They are isolated and backed by private farmland, with no public access. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.4 Hutchinson




**This beach (Hutchinson), along with Thorny, was not accessible at the time of site observations. They are isolated and backed by private farmland, with no public access. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.5 Berrys


Berry
Transverse Bar & Rip
Berrys Beach Rd
Glamis Rd
Victoria Rd
reef
reef
Berry
reef
reef
0
130
260
520
780
1,040
Meters
N

### 8.5.1 Site Observations

Obs 1 - Numerous signs at the defined beach access path competing for beachgoer attention at Berrys beach.

Obs 2 – Sign uses a 'No Lifesaving Service' symbol that is not found in the current AS/NZS 2416 Standard. Some water damage noted on the signs in this location.


Obs 3 – PINP stylised access sign at Berrys beach.

Obs 4 –. Although a moderately good timber access point with hazard signage, some areas are slippery and steep, requiring sections to have wire mesh overlays to prevent slipping.

Obs 5 – View of the western headland at Berrys beach.

Obs 6 – Evidence of numerous areas throughout the beach with intertidal rock and reef areas.

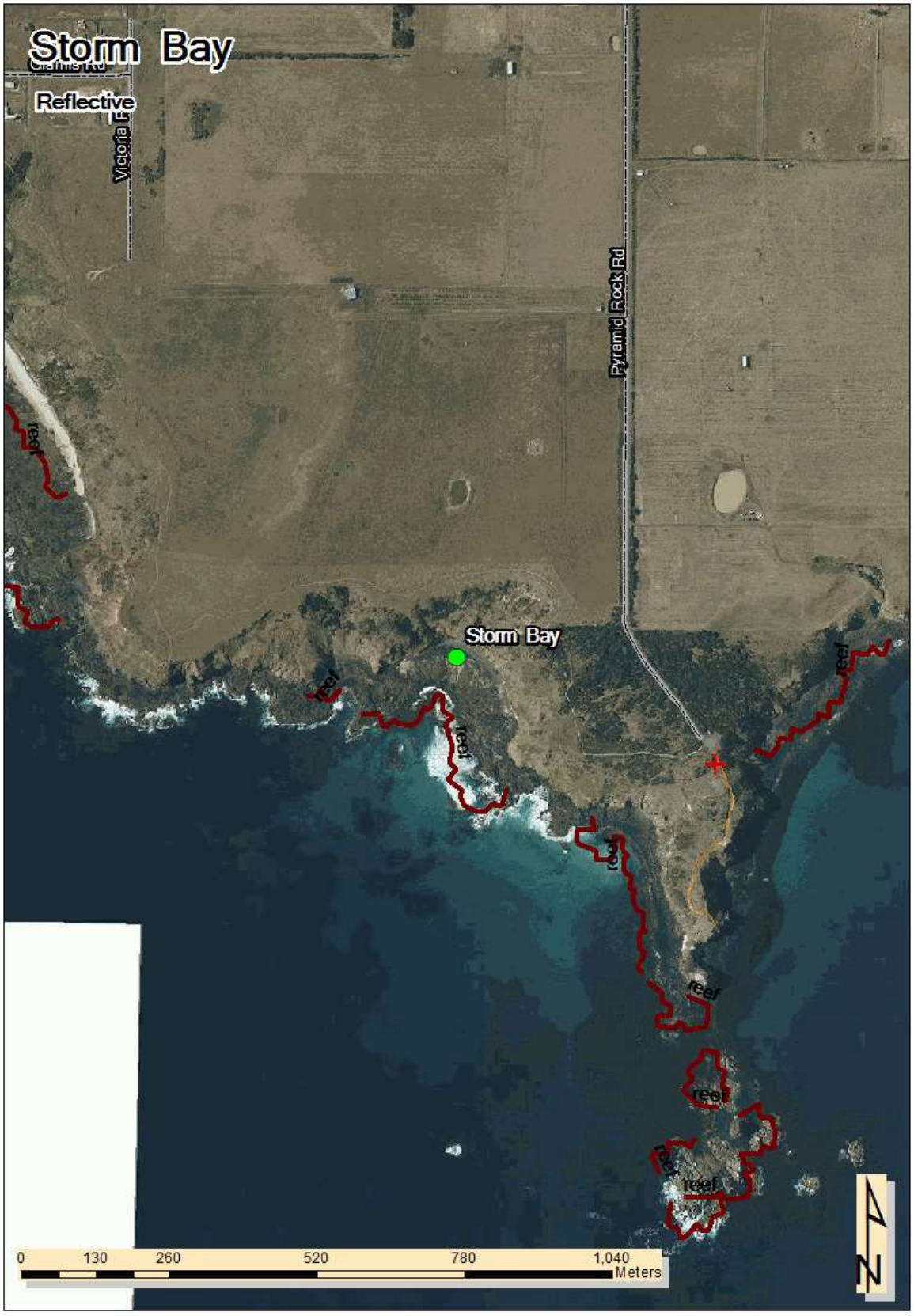
### 8.5.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.5 | 0.3 | 3 | 0.6 | 0.5 | 0.3 | 4 | 0.60 | 3 |
| **Topological and man-made hazards** | 0.6 | 0.4 | 0.24 | 5 | 0.6 | 0.4 | 0.24 | 6 | 0.48 | 6 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 8 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.6 | 0.36 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.78 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.6 | 0.36 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.78 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.7 | 0.4 | 0.28 | 4 | 0.7 | 0.4 | 0.28 | 5 | 0.56 | 5 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.3 | 0.15 | 7 | 0.7 | 0.3 | 0.21 | 7 | 0.36 | 8 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.11** | | | | **2.63** | | **4.74** | |
| **Control Effectiveness** | | | | | | | | | **0.22** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.70** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information and other site information noted on arrival. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety education besides aquatic safety signage noted at the time of assessment. |
| **Barriers** | 1 | 0.7 | 0.7 | Barriers noted at time of assessment. |
| **Defined access** | 1 | 0.6 | 0.6 | Defined access noted at time of assessment. Emergency access limited to personnel on foot. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access sign noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.22** | |

## 8.6 Storm Bay


Storm Bay
Reflective
Victoria Pt
Pyramid Rock Rd
Storm Bay
reef
reef
reef
reef
reef
reef
reef
reef
0
130
260
520
780
1,040
Meters
N

### 8.6.1 Site Observations

Obs 1 - PINP stylised signage as at commencement of defined access path leading to Strom Bay beach from car park area off Pyramid Rock Road.

Obs 2 – Individual hazard signs used to remind walkers of the unprotected and eroding cliff edges in the area.

Obs 3 – Well maintained and graded, defined access path leading to Storm Bay beach, however access to the beach is extremely difficult and hazardous.

Obs 4 – View down to Storm Bay from an elevated vantage point, highlighting the hazardous nature of the terrain and descent to access the beach.


Obs 5 – Pertinent reminder about the hazards associated with rock fishing at the site. The area has numerous rock platforms and boulders.

Obs 6 – Individual hazard signs notifying that the beach is not accessible.

### 8.6.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.7 | 0.7 | 0.49 | 1 | 0.7 | 0.8 | 0.56 | 1 | 1.05 | 1 |
| **Topological and man-made hazards** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.6 | 0.3 | 4 | 0.55 | 4 |
| **Currents (rips)** | 0.1 | 0.2 | 0.02 | 6 | 0.1 | 0.2 | 0.02 | 7 | 0.04 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.1 | 0.2 | 0.02 | 6 | 0.1 | 0.2 | 0.02 | 7 | 0.04 | 7 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.1 | 0.2 | 0.02 | 6 | 0.1 | 0.2 | 0.02 | 7 | 0.04 | 7 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.1 | 0.1 | 0.01 | 9 | 0.1 | 0.2 | 0.02 | 7 | 0.03 | 10 |
| **Slippery surfaces and uneven ground (terrain)** | 0.6 | 0.6 | 0.36 | 2 | 0.6 | 0.7 | 0.42 | 2 | 0.78 | 2 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 4 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 3 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 5 | 0.15 | 5 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 5 | 0.3 | 0.1 | 0.03 | 5 | 0.06 | 6 |
| **Initial Beach Hazard Score** | | | **1.35** | | | | **1.96** | | **3.31** | |
| **Control Effectiveness** | | | | | | | | | **0.21** | |
| **Revised Beach Hazard Score** | | | | | | | | | **2.63** | |

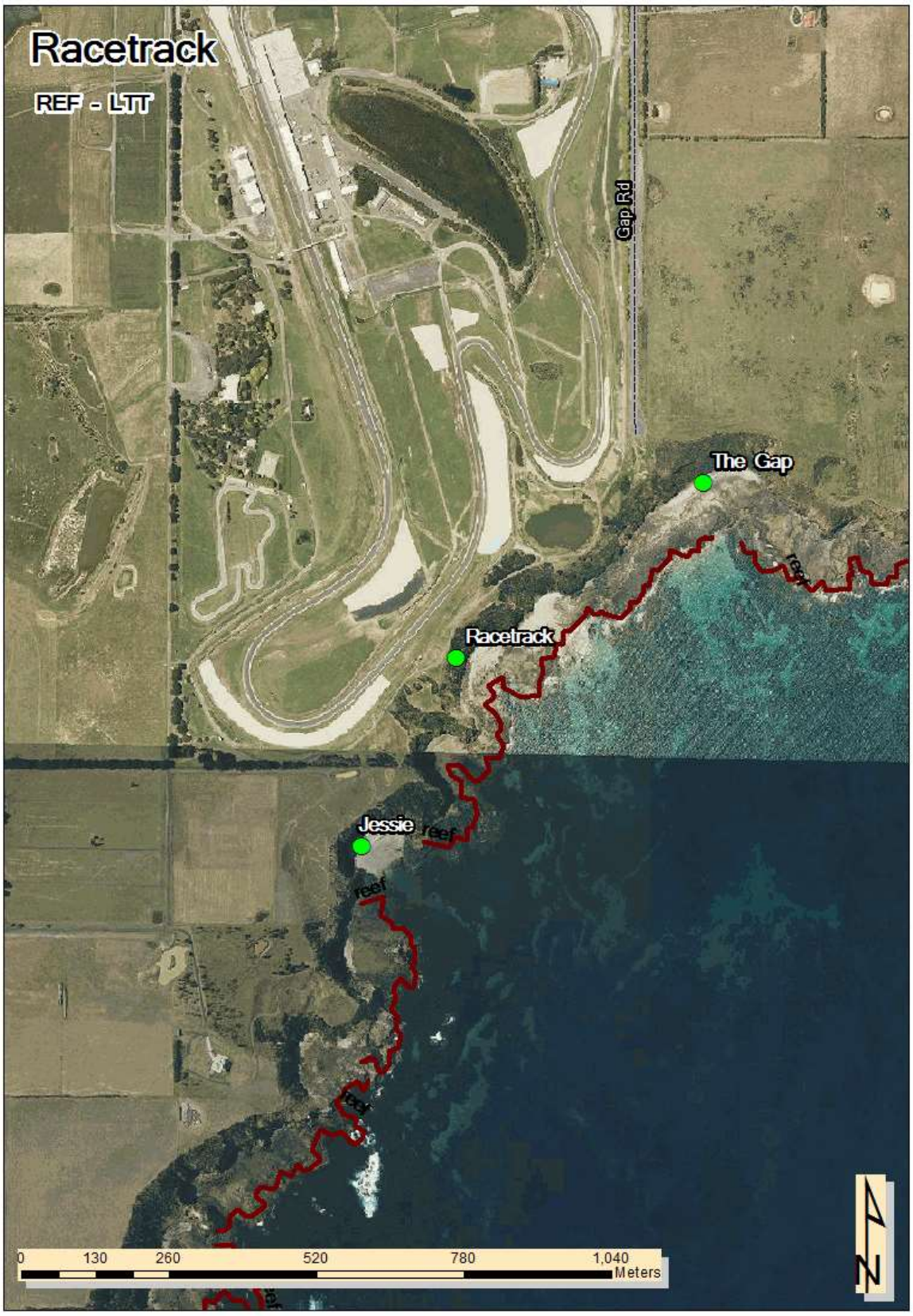
**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.7 | 0.7 | Rock fishing safety and 'No Beach Access' signs noted at time of assessment. |
| **On-site education** | 1 | 0.6 | 0.6 | Some stylised interpretive/ directional signage noted at time of assessment. |
| **Barriers** | 1 | 0.4 | 0.4 | Some defined access and barriers along Pyramid Rock boardwalk. Limited use of barriers along cliff edge specific to Storm Bay beach. |
| **Defined access** | 1 | 0.4 | 0.4 | Some defined access along Pyramid Rock boardwalk. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.4 | 0.4 | Defined access sign for Pyramid Rock noted at time of assessment. No specific sign for Storm Bay as it is not accessible, and swimming is not advised. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.6 | 0.6 | Regulations noted on interpretive/ directional signage. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.21** | |

## 8.7 Jessie


**This beach (Jessie), along with Racetrack and The Gap, was not accessible at the time of site observations. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.8 Racetrack

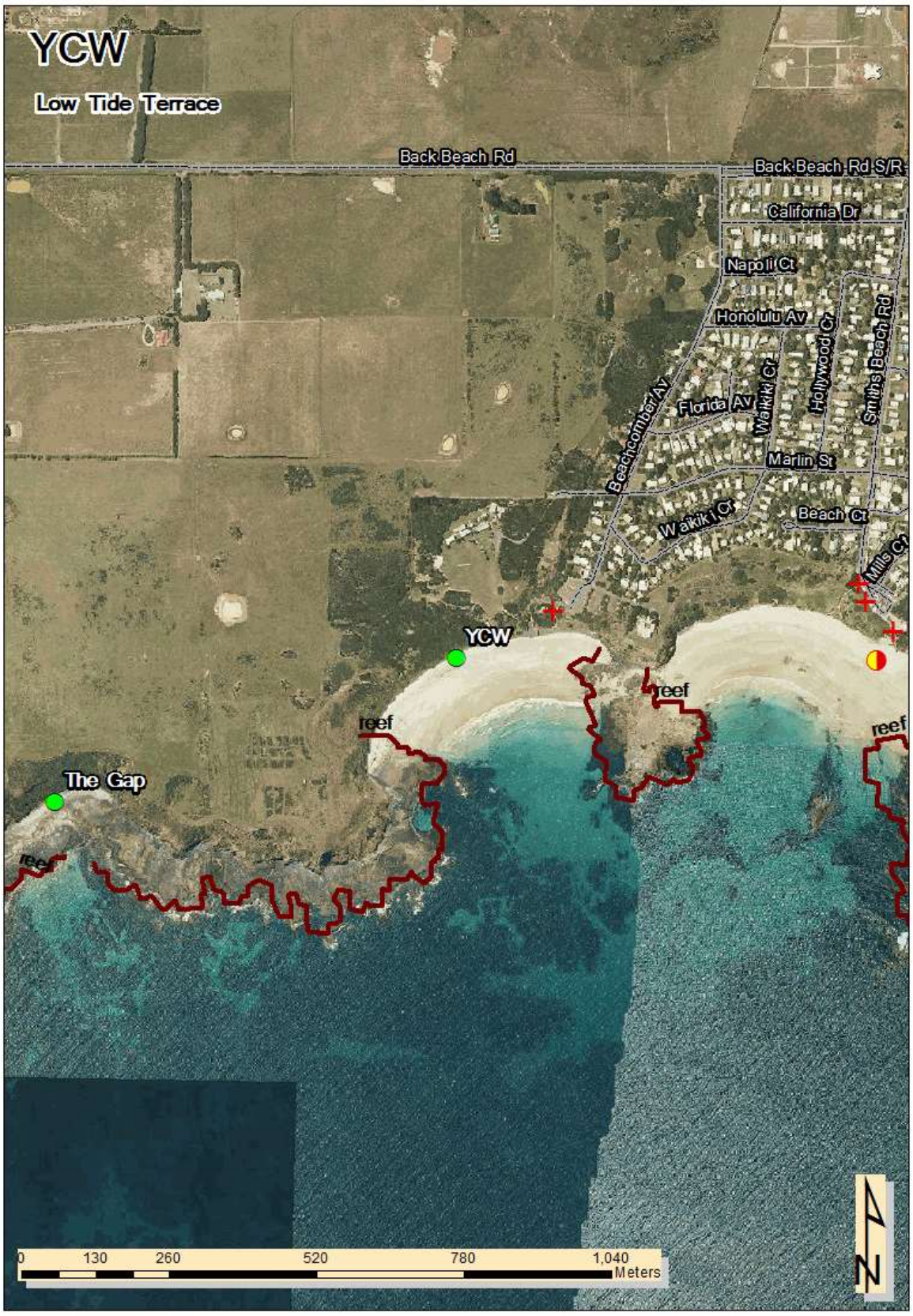



**This beach (Racetrack) along with Jessie and The Gap, was not accessible at the time of site observations. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.9 The Gap


**This beach (The Gap) along with Jessie and Racetrack, was not accessible at the time of site observations. As such, modified observations, hazard summaries and treatment observations are provided for this location.

## 8.10 YCW


YCW
Low Tide Terrace
Back Beach Rd
Back Beach Rd S/R
California Dr
Napoli Ct
Honolulu Av
Hollywood Cr
Smiths Beach Rd
Beachcomber Av
Florida Av
Waikiki Cr
Marlin St
Waikiki Cr
Beach Ct
Mills Ct
YCW
reef
reef
reef
The Gap
reef
0 130 260 520 780 1,040
Meters
N

### 8.10.1 Site Observations

Obs 1 – EBAN marker noted at site. Care needs to be made to ensure the marker can be seen from accessible road networks and from the beachface.

Obs 2 – View of the elevated headland and rock platform at the foot of the headland.

Obs 3 – Backing bluffs seen backing a flat featureless beachface. Elevated headland seen in the background.

Obs 4 – Pseudo defined access path with EBAN seen in the background.


Obs 5 – Good use of signage to communicate that no lifesaving service is provided at the site.

Obs 6 – Defined access sign with the 'No Lifesaving Service' symbol that is not found in the current AS/NZS 2416 Standard.

### 8.10.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.5 | 0.3 | 1 | 0.7 | 0.5 | 0.35 | 4 | 0.65 | 1 |
| **Topological and man-made hazards** | 0.5 | 0.5 | 0.25 | 2 | 0.5 | 0.6 | 0.3 | 5 | 0.55 | 5 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 2 | 0.4 | 0.5 | 0.2 | 7 | 0.45 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.5 | 0.25 | 2 | 0.6 | 0.6 | 0.36 | 2 | 0.61 | 2 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.5 | 0.25 | 2 | 0.6 | 0.6 | 0.36 | 2 | 0.61 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.3 | 0.09 | 9 | 0.15 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.5 | 0.25 | 2 | 0.6 | 0.5 | 0.3 | 5 | 0.55 | 5 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **1.79** | | | | **2.56** | | **4.35** | |
| **Control Effectiveness** | | | | | | | | | **0.20** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.48** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information and other site information noted on arrival. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.5 | 0.5 | Some barriers and barrier planting along walkways and boardwalks. |
| **Defined access** | 1 | 0.5 | 0.5 | Combination of sand and soil defined access and wooden boardwalks down to the beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access sign noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.20** | |

## 8.11 Smith


Smith
LTT - TBR
Back Beach Rd
Back Beach Rd S/R
Back Beach Rd S/R
Back Beach Rd S/R
Golden Ct
Galleon Ct
Sunset Dr
Clipper Ct
California Dr
Gilmore St
Dolphin Dr
Napoli Ct
Evenglow Ct
Honolulu Av
Hollywood Cr
Smiths Beach Rd
Murray St
Barramundi Av
Beachcomber Av
Florida Av
Waikiki Cr
Marlin St
Marlin St
Salmon Row Ct
Waikiki Cr
Beach Ct
Mills Ct
reef
Smith
reef
0
130
260
520
780
1,040
Meters
N

### 8.11.1 Site Observations

Obs 1 - Primary access sign at Smith beach that has been vandalised.

Obs 2 – EBAN and disabled access signage at the site. This information could be incorporated into one composite access sign.

Obs 3 – Defined access sign to be repositioned of the tree foliage to be trimmed to allow an unobstructed view.

Obs 4 – View of the newly built patrol tower at Smith beach. This facility should help promote and enhance supervision services at the beach.

Obs 5 – View of the relatively flat and featureless beachface with the headland in the background.

Obs 6 – Provision of a maintained smooth beach access path with a defined access sign at the entrance.

### 8.11.2 Hazard Summary and Treatment Observations

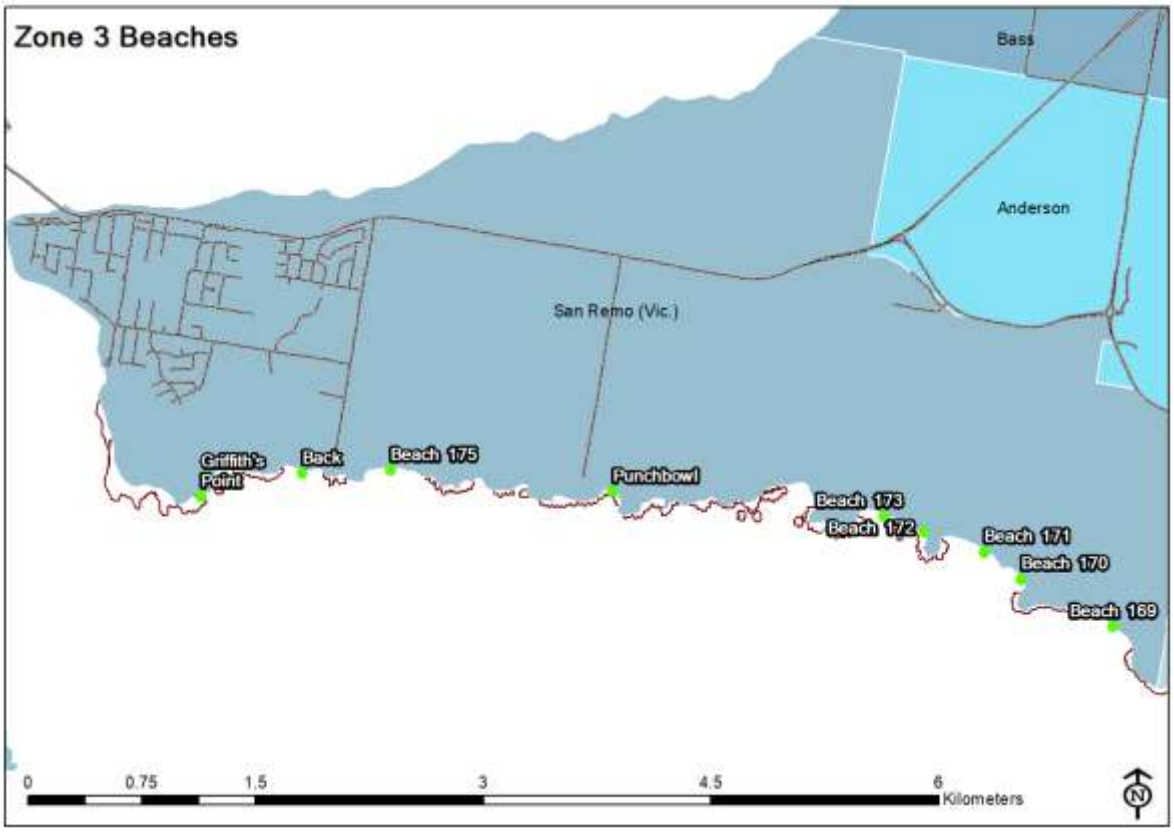
| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.5 | 0.25 | 7 | 0.50 | 6 |
| **Topological and man-made hazards** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.6 | 0.3 | 4 | 0.55 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 3 | 0.3 | 0.5 | 0.15 | 8 | 0.40 | 8 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.72 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.72 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.5 | 0.6 | 0.3 | 4 | 0.46 | 7 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.5 | 0.25 | 3 | 0.6 | 0.5 | 0.3 | 4 | 0.55 | 4 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 3 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **1.94** | | | | **2.74** | | **4.68** | |
| **Control Effectiveness** | | | | | | | | | **0.46** | |
| **Revised Beach Hazard Score** | | | | | | | | | **2.54** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information and other site information noted on arrival. |
| **On-site education** | 1 | 0.5 | 0.5 | Site is patrolled and serviced with lifeguards. An assumption is made that local education programs as provided formally and informally. |
| **Barriers** | 1 | 0.7 | 0.7 | Good use of barriers in combination with defined access. |
| **Defined access** | 1 | 0.7 | 0.7 | Good use of barriers in combination with defined access. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined and open access sign noted at time of assessment. Consider reviewing content, placement and sizing of sign content. Open access sign was vandalised. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 1 | 0.5 | 0.5 | Activities managed by lifesaving club for lifesaving club sanctioned activities and events. |
| **Trained observers** | 1 | 0.5 | 0.5 | Activities managed by lifesaving club for lifesaving club sanctioned activities and events. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 1 | 0.7 | 0.7 | During lifesaving patrol times and periods. |
| **Lifeguard services** | 1 | 0.8 | 0.8 | During lifesaving patrol times and periods. |
| **Activity restrictions** | 1 | 0.6 | 0.6 | During lifesaving patrol times and periods. |
| **Community education** | 1 | 0.5 | 0.5 | During lifesaving patrol times and periods and other surf community education programs. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.46** | |

# Zone 2 – Beach Risk Assessment Summary

| Zone Profile | Zone 2 |
|---|---|
| Westernmost beach | Sunderland Bay |
| Easternmost beach | Cape Woolamai South |
| Number of beaches | 12 |
| Location | Phillip Island |
| Common characteristics | Mainly continuous beaches; SW-facing |
| Common beach types | • LTT<br>• TBR |
| Fatal drowning probability (1 or more over 12 months) | 18% |
| Relative risk of a fatal drowning event occurring within a 12-month period | 1.55 |
| Non-fatal drowning probability (1 or more over 12 months) | 39% |
| Overall hazard rank | 2 |



## 8.12 Sunderland Bay

### 8.12.1 Site Observations

Obs 1 – Emergency vehicle access at the western-most entrance with multiple signs. Although partially obscured by vegetation, the water safety sign is reflective of some of the guidance principles outlined in AS/NZS 2416.

Obs 2 – View of the narrow, embayed beach back by 20 m high bluffs.

Obs 3 – View of the emergency marker for Sunderland Bay, a 300 m wide stretch of reflective beach.

Obs 4 – Signage warning of unstable cliffs with directions to defined beach access point.

Obs 5 – West-facing view of Sunderland Bay beach, characterised by sections of submerged and sub-aerial rock and reefs.

Obs 6 – Undefined access point opposite Elaine Street leading to a dangerous rocky outcrop below unstable cliff. Secondary safety signage present.

### 8.12.2 Hazard Summary and Treatment Observations

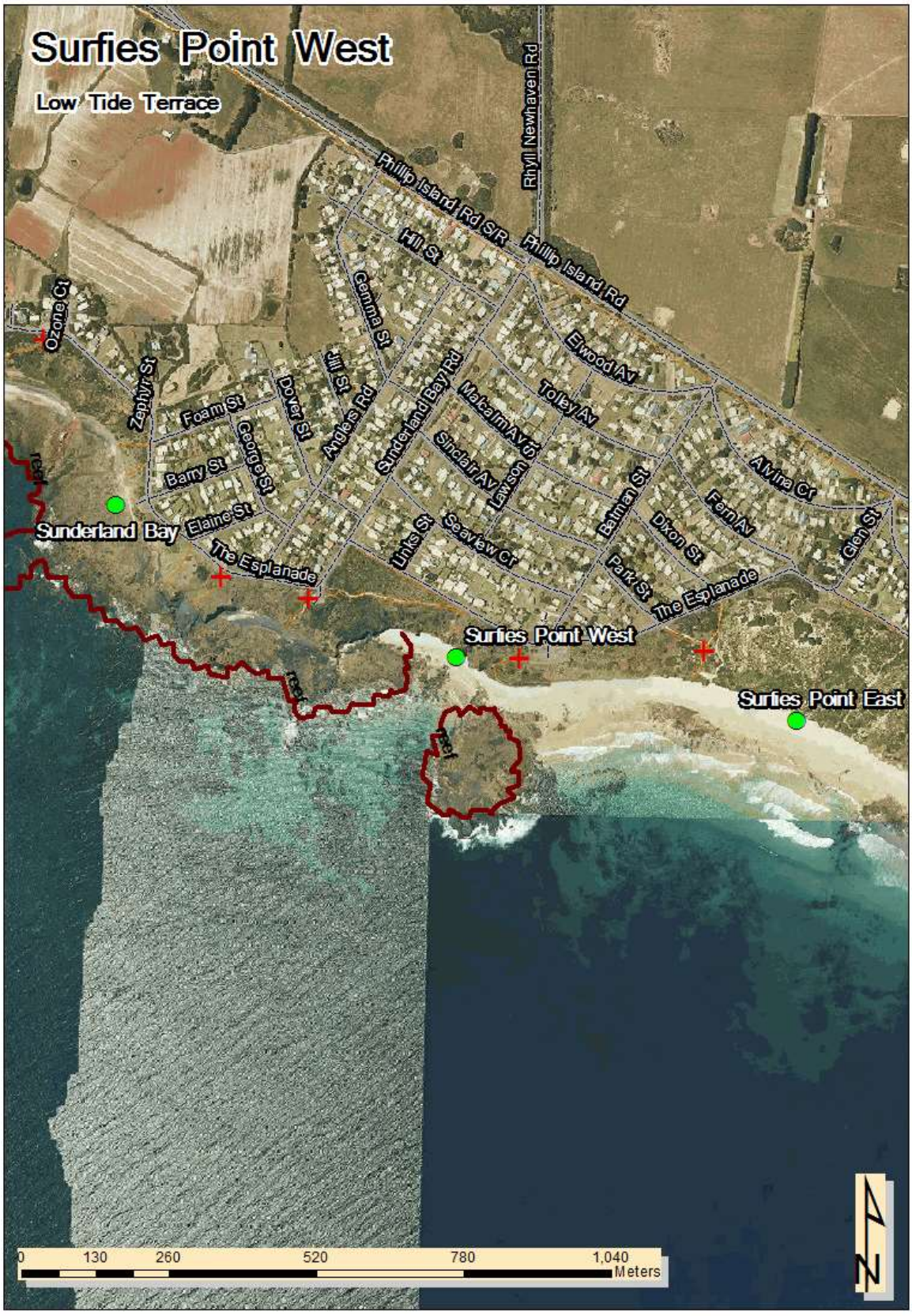
| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.6 | 0.36 | 3 | 0.6 | 0.7 | 0.42 | 3 | 0.78 | 3 |
| **Topological and man-made hazards** | 0.6 | 0.3 | 0.18 | 6 | 0.7 | 0.6 | 0.42 | 3 | 0.60 | 5 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 7 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.8 | 0.7 | 0.56 | 1 | 0.8 | 0.8 | 0.64 | 1 | 1.20 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.8 | 0.7 | 0.56 | 1 | 0.8 | 0.8 | 0.64 | 1 | 1.20 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.2 | 0.2 | 0.04 | 8 | 0.2 | 0.2 | 0.04 | 9 | 0.08 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.5 | 0.25 | 4 | 0.7 | 0.6 | 0.42 | 3 | 0.67 | 4 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 3 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.37** | | | | **3.34** | | **5.71** | |
| **Control Effectiveness** | | | | | | | | | **0.21** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.53** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.7 | 0.7 | Aquatic safety information and other site information (such as rock fishing) noted on arrival. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.4 | 0.4 | Limited barriers and/or barrier planting used along walkways/ paths. |
| **Defined access** | 1 | 0.4 | 0.4 | Uneven and narrow sand and soil defined access paths. Emergency access gate noted. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access sign noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity and beach not accessible restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |

0.21

## 8.13 Surfies Point West



### 8.13.1 Site Observations

Obs 1 – One of the small car park areas provided off The Esplanade.


Obs 2 – Stylised PINP sign provided at the car park entrance at Surfies Point (West).

Obs 3 – Firm defined access surface with a defined access sign and barriers leading down to the beach.


Obs 4 – Individual hazard sign communicating the hazard associated with the unprotected and unstable cliff edge.

Obs 5 – Uneven and narrow defined access path across the backing dune/ bluff areas of Surfies Point West beach.

Obs 6 – The presence of rock outcrops can influence existence and behaviour of rip currents.

### 8.13.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.5 | 0.25 | 7 | 0.50 | 6 |
| **Topological and man-made hazards** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.6 | 0.3 | 4 | 0.55 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 3 | 0.3 | 0.5 | 0.15 | 8 | 0.40 | 8 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.72 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 1 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.5 | 0.6 | 0.3 | 4 | 0.46 | 7 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.5 | 0.25 | 3 | 0.6 | 0.5 | 0.3 | 4 | 0.55 | 4 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 3 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **1.94** | | | | **2.68** | | **4.62** | |
| **Control Effectiveness** | | | | | | | | | **0.21** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.64** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information and other site information noted on arrival. Stylised PINP signs also used. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.4 | 0.4 | Barriers used along walkways/ paths and boardwalks. Some cliff edges exposed. |
| **Defined access** | 1 | 0.6 | 0.6 | Gravel and soil defined access paths. Some narrow, uneven and sandy access areas noted. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.7 | 0.7 | Defined access signs noted at time of assessment. Consider reviewing content, placement and sizing of sign content. Several keep clear unstable cliffs signs also used. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions noted. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.21** | |

## 8.14 Surfies Point East

### 8.14.1 Site Observations

Obs 1 - Safety sign alerting that there is direct beach access from at this location and that there are hazards in the area.

Obs 2 – Defined access signposted at the start of the wooden stepped boardwalk providing access onto the beach.

Obs 3 – View of the stepped boardwalk onto the beach. Elevation of the headland is notable as are the periodic outcrop of rocks.

Obs 4 – A defined access boardwalk and safety signage is provided; however other access points are not controlled or restricted.

Obs 5 – View of intertidal rock platforms and boulders backing the beach.

Obs 6 – View of one of the many outcrops of rocks that can influence existence and behaviour of rip currents.

### 8.14.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.5 | 0.25 | 7 | 0.50 | 6 |
| **Topological and man-made hazards** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.6 | 0.3 | 4 | 0.55 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 3 | 0.3 | 0.5 | 0.15 | 8 | 0.40 | 8 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.7 | 0.7 | 0.49 | 1 | 0.91 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.5 | 0.6 | 0.3 | 4 | 0.46 | 7 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.5 | 0.25 | 3 | 0.6 | 0.5 | 0.3 | 4 | 0.55 | 4 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 3 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.06** | | | | **2.75** | | **4.81** | |
| **Control Effectiveness** | | | | | | | | | **0.21** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.79** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information and other site information noted on arrival. Stylised PINP signs also used in the area. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.4 | 0.4 | Barriers used along walkways/ paths and boardwalks. Some cliff edges exposed. |
| **Defined access** | 1 | 0.6 | 0.6 | Gravel and soil defined access paths. Some narrow, uneven and sandy access areas noted. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.7 | 0.7 | Defined access signs noted at time of assessment. Consider reviewing content, placement and sizing of sign content. Several keep clear unstable cliffs signs also used. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions noted. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.21** | |

## 8.15 Surf


Surf
LTT - TBR
Bayview Av
Dunvegan Cr
Phillip Island Rd
Back Lane Phillip Island Rd
Stradbroke Cr
Highview Cr
Manly Pl
Surf Cr
Hopetoun Cr
Pine Av
Page Av
Bruce Av
The Esplanade
Surf
Reef
Forrest Bluff West
0 130 260 520 780 1,040
Meters
N

### 8.15.1 Site Observations

Obs 1 – Safety sign with the 'No Lifesaving Service' symbol that is not part of the existing AS/NZS 2416 Standard. An additional sign of this type was observed at Bruce Avenue.

Obs 2 – Headland area at Surf beach with an intertidal rock platform at the base.

Obs 3 – Another defined access sign with the ambiguous 'No Lifesaving Service' symbol that is not part of the existing AS/NZS 2416 Standard.

Obs 4 – Stepped boardwalk access directly on loose cobbles stones providing an unstable and uneven walking surface.

Obs 5 – Headland area with intertidal rock reef at the base.

Obs 6 – Intertidal reef and rock at the eastern end of the small 400 m long embayed beach.

### 8.15.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.7 | 0.35 | 4 | 0.60 | 3 |
| **Topological and man-made hazards** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.6 | 0.3 | 5 | 0.55 | 5 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 3 | 0.3 | 0.5 | 0.15 | 8 | 0.40 | 8 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.7 | 0.7 | 0.49 | 1 | 0.91 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.7 | 0.7 | 0.49 | 1 | 0.91 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.5 | 0.6 | 0.3 | 5 | 0.46 | 7 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.5 | 0.25 | 3 | 0.6 | 0.5 | 0.3 | 5 | 0.55 | 5 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 3 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.18** | | | | **2.98** | | **5.16** | |
| **Control Effectiveness** | | | | | | | | | **0.20** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.13** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information and other site information noted on arrival. Stylised PINP signs also used in the area. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.4 | 0.4 | Barriers used along walkways/ paths and boardwalks. Some cliff edges exposed. |
| **Defined access** | 1 | 0.5 | 0.5 | Gravel and soil defined access paths. Boardwalk access leads directly onto pebble and small boulders. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access signs noted at time of assessment. Consider reviewing content, placement and sizing of sign content. Some aged unstable cliff signs noted. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions noted. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.20** | |

## 8.16 Forrest Bluff West

### 8.16.1 Site Observations

Obs 1 - PINP stylised arrival/ location sign.


Obs 2 – Defined access sign labelled 'Forrest Caves' in proximity to the beach known as 'Forrest Bluff West' in ABSAMP.

Obs 3 – Stepped boardwalk access down to the beach.

Obs 4 – View of EBAN provided at the beach.

Obs 5 – Boardwalk covered with an enhanced surface to provide safer access to the beach. Interpretive signage board can be seen to the right to the boardwalk.

Obs 6 – View of the elevated backing dunes/ low lying bluffs and the headland in the background.

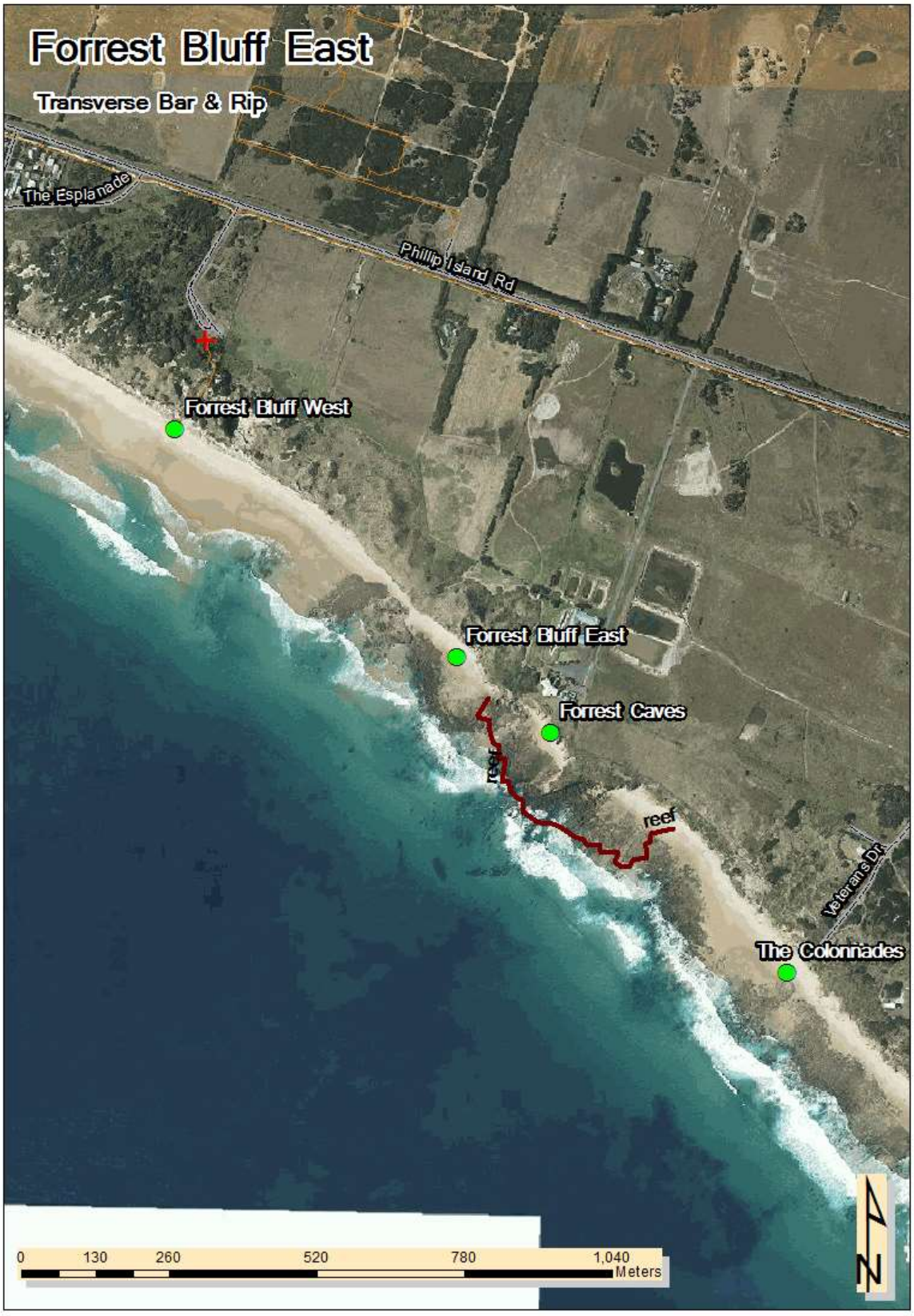
### 8.16.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.7 | 0.35 | 4 | 0.60 | 3 |
| **Topological and man-made hazards** | 0.5 | 0.5 | 0.25 | 3 | 0.5 | 0.6 | 0.3 | 5 | 0.55 | 5 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 3 | 0.3 | 0.5 | 0.15 | 8 | 0.40 | 8 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.7 | 0.7 | 0.49 | 1 | 0.91 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.7 | 0.7 | 0.49 | 1 | 0.91 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.5 | 0.6 | 0.3 | 5 | 0.46 | 7 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.5 | 0.25 | 3 | 0.6 | 0.5 | 0.3 | 5 | 0.55 | 5 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 3 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.18** | | | | **2.98** | | **5.16** | |
| **Control Effectiveness** | | | | | | | | | **0.17** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.29** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

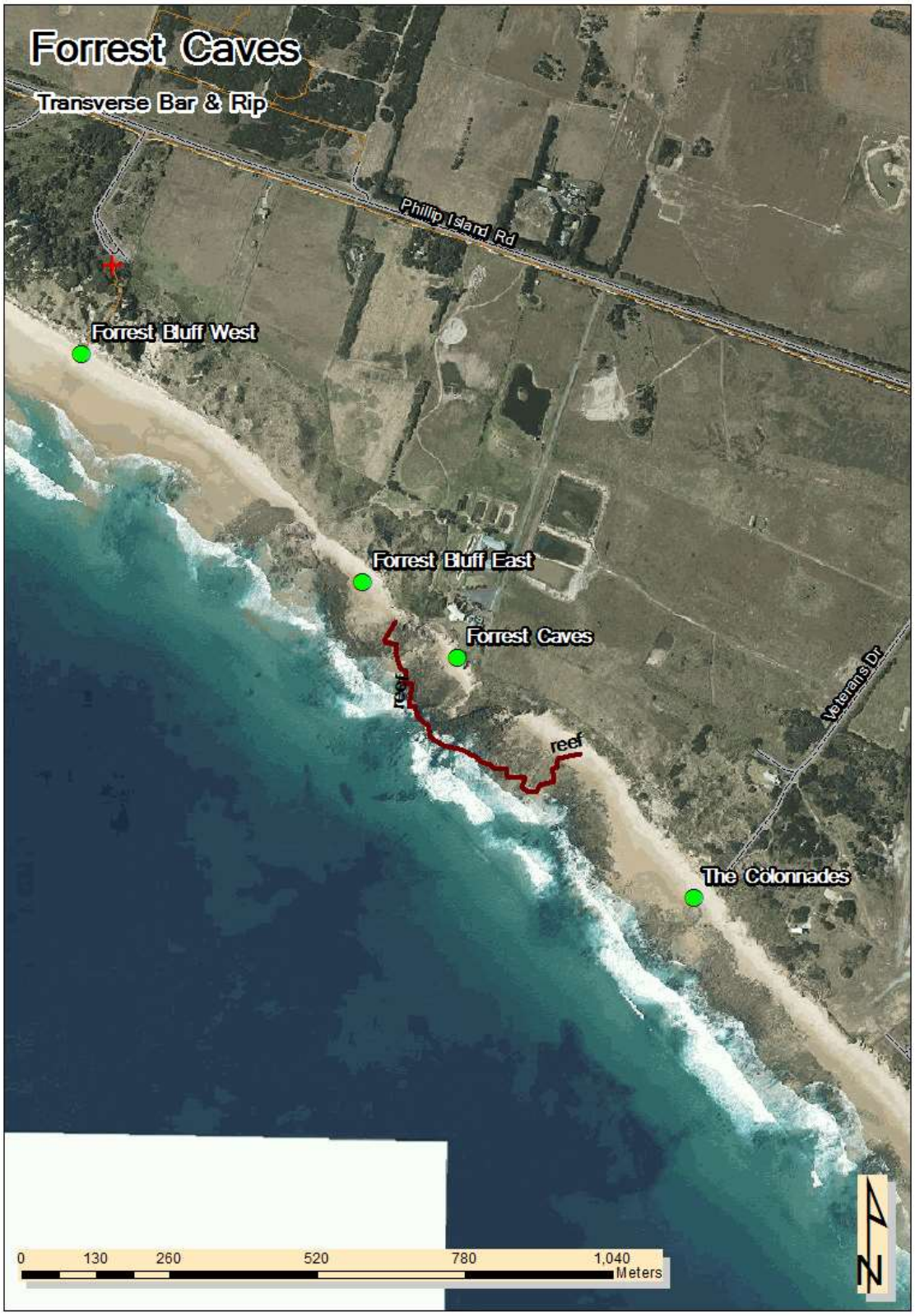
| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Limited arrival information. Some stylised PINP signs also used in the area. |
| **On-site education** | 1 | 0.1 | 0.1 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.4 | 0.4 | Barriers used along boardwalks to beach. Some elevated bluff edges exposed. |
| **Defined access** | 1 | 0.5 | 0.5 | Sand and soil defined access path leading to boardwalk down to beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access sign noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.6 | 0.6 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions noted. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.17** | |

## 8.17 Forrest Bluff East




**This beach (Forrest Bluff East) along with Forrest Caves, was not accessible at the time of site observations. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.18 Forrest Caves




**This beach (Forrest Caves) along with Forrest Bluff East, was not accessible at the time of site observations. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.19 The Colonnades

### 8.19.1 Site Observations

Obs 1 - Safety sign with the 'No Lifesaving Service' symbol that is not part of the existing AS/NZS 2416 Standard.

Obs 2 – PINP stylised arrive signage at The Colonnades.

Obs 3 – EBAN provided at the beach.

Obs 4 – Backing bluffs, steep beachface and undying shoreline/ intertidal zone creating an environment with high variability.

Obs 5 – An access point that ultimately leads to the beach but is not clearly marked.

Obs 6 – Another safety sign with the 'No Lifesaving Service' symbol that is not part of the existing AS/NZS 2416 Standard. Signs should also be reviewed in terms of placement and symbol and text heights.

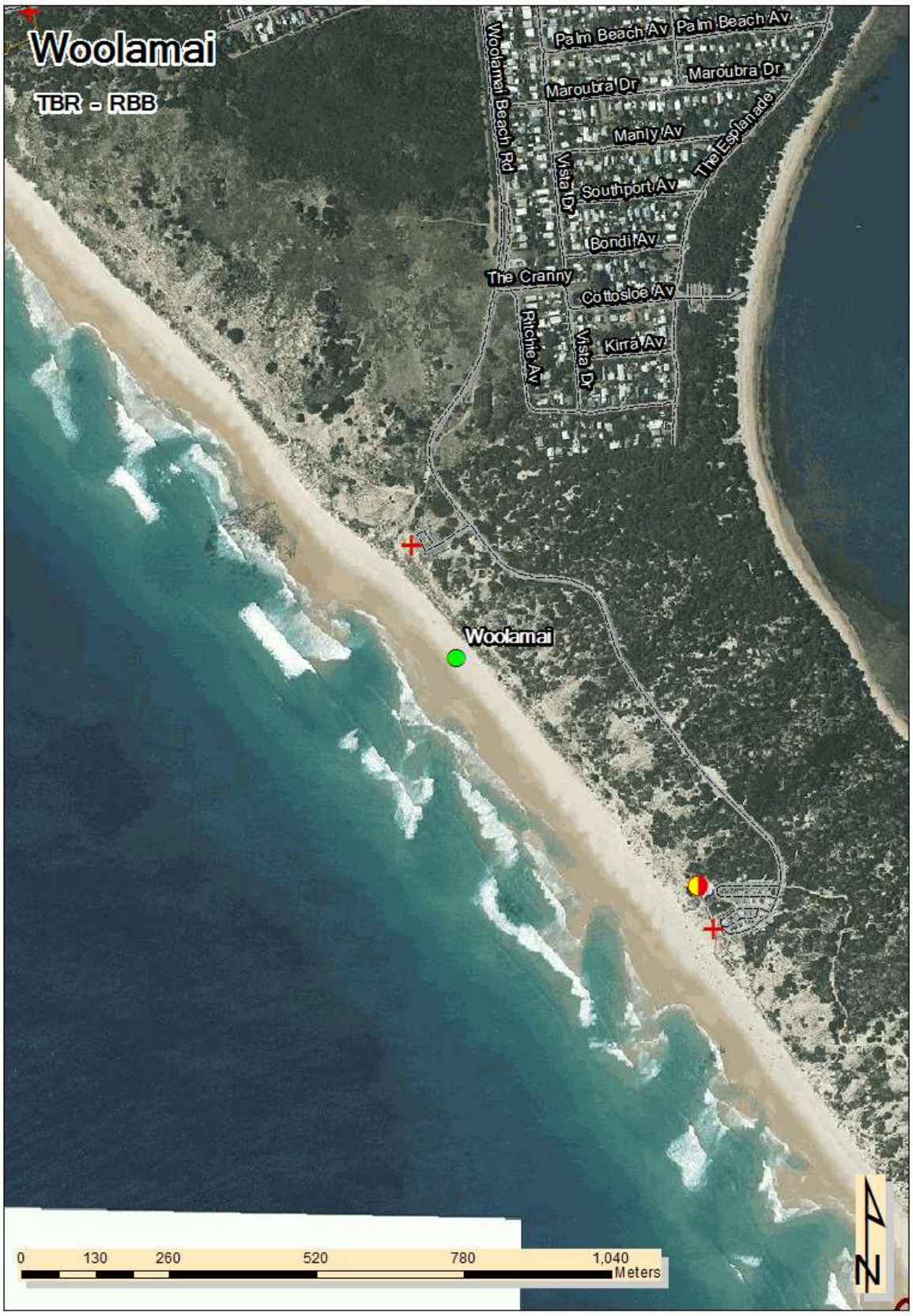
### 8.19.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.6 | 0.3 | 3 | 0.5 | 0.7 | 0.35 | 4 | 0.65 | 3 |
| **Topological and man-made hazards** | 0.5 | 0.5 | 0.25 | 4 | 0.5 | 0.6 | 0.3 | 5 | 0.55 | 5 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 4 | 0.3 | 0.5 | 0.15 | 8 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.6 | 0.36 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.78 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.6 | 0.36 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.78 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.4 | 0.5 | 0.2 | 7 | 0.36 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.5 | 0.25 | 4 | 0.6 | 0.5 | 0.3 | 5 | 0.55 | 5 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.11** | | | | **2.74** | | **4.85** | |
| **Control Effectiveness** | | | | | | | | | **0.19** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.91** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information and other site information noted on arrival. Stylised PINP signs also used in the area. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.4 | 0.4 | Barriers used along section of paths, boardwalks and stairs. |
| **Defined access** | 1 | 0.4 | 0.4 | Sand and soil-based access until boardwalk and stair access onto beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access signs noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations, no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations, no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions noted. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.19** | |

## 8.20 Woolamai



### 8.20.1 Site Observations

Obs 1 – Open access sign at the main beach entrance. Sign is consistent with the design intention and application clauses of AS/NZS 2416.

Obs 2 – Defined access sign located in proximity to the clubhouse at Woolamai beach.

Obs 3 – EBAN at Woolamai beach.

Obs 4 – Wide boardwalk access with a gentle slope providing access down to the beach.

Obs 5 – View of the backing dunes at Woolamai beach.

Obs 6 – Stepped access provided onto the beach from the walking path southeast of the Woolamai clubhouse.

### 8.20.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.7 | 0.4 | 0.28 | 6 | 0.7 | 0.4 | 0.28 | 8 | 0.56 | 7 |
| **Topological and man-made hazards** | 0.7 | 0.6 | 0.42 | 4 | 0.7 | 0.6 | 0.42 | 4 | 0.84 | 4 |
| **Currents (rips)** | 0.9 | 0.8 | 0.72 | 1 | 0.7 | 0.8 | 0.56 | 1 | 1.28 | 1 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.8 | 0.7 | 0.56 | 2 | 0.7 | 0.7 | 0.49 | 3 | 1.05 | 2 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.7 | 0.5 | 0.35 | 5 | 0.8 | 0.5 | 0.4 | 6 | 0.75 | 5 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.5 | 0.3 | 0.15 | 7 | 0.5 | 0.6 | 0.3 | 7 | 0.45 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.7 | 0.49 | 3 | 0.8 | 0.7 | 0.56 | 1 | 1.05 | 2 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 4 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **3.15** | | | | **3.61** | | **6.76** | |
| **Control Effectiveness** | | | | | | | | | **0.48** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.55** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Interpretive and arrival information noted. |
| **On-site education** | 1 | 0.5 | 0.5 | Site is patrolled and serviced with lifeguards. An assumption is made that local education programs as provided formally and informally. |
| **Barriers** | 1 | 0.8 | 0.8 | Barriers provided. |
| **Defined access** | 1 | 0.8 | 0.8 | Good defined access. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.8 | 0.8 | Aquatic safety signage in place at time of assessment. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations noted. |
| **Activity management** | 1 | 0.5 | 0.5 | Activities managed by lifesaving club for lifesaving club sanctioned activities and events. |
| **Trained observers** | 1 | 0.5 | 0.5 | Activities managed by lifesaving club for lifesaving club sanctioned activities and events. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 1 | 0.7 | 0.7 | During lifesaving patrol times and periods. |
| **Lifeguard services** | 1 | 0.8 | 0.8 | During lifesaving patrol times and periods. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Activity restrictions signposted. |
| **Community education** | 1 | 0.5 | 0.5 | During lifesaving patrol times and periods. |
| **Public rescue equipment** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Floatation devices** | 1 | 0.3 | 0.3 | During lifesaving patrol times and periods. |
| | | | **0.48** | |

## 8.21 Magic Lands West

### 8.21.1 Site Observations

Obs 1 - Rocky backing bluffs backing Magic Lands and Magic Lands West beaches.

Obs 2 – Rocky backing bluffs.

Obs 3 – Intertidal rock and reef areas.

Obs 4 – Intertidal rock platforms and reefs at both Magic Lands and Magic Lands West beaches.

Obs 5 – Small sandy section of beach in between rocky platforms at Magic Lands West beach.

Obs 6 – Rocks found at the base of backing bluffs and headlands in the area.

### 8.21.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.4 | 0.24 | 6 | 0.6 | 0.4 | 0.24 | 8 | 0.48 | 7 |
| **Topological and man-made hazards** | 0.5 | 0.6 | 0.3 | 5 | 0.5 | 0.6 | 0.3 | 6 | 0.60 | 5 |
| **Currents (rips)** | 0.9 | 0.8 | 0.72 | 1 | 0.7 | 0.8 | 0.56 | 1 | 1.28 | 1 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.8 | 0.7 | 0.56 | 2 | 0.7 | 0.7 | 0.49 | 3 | 1.05 | 2 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.7 | 0.5 | 0.35 | 4 | 0.8 | 0.5 | 0.4 | 5 | 0.75 | 4 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.5 | 0.3 | 0.15 | 7 | 0.5 | 0.6 | 0.3 | 6 | 0.45 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.7 | 0.49 | 3 | 0.8 | 0.7 | 0.56 | 1 | 1.05 | 2 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 4 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.99** | | | | **3.45** | | **6.44** | |
| **Control Effectiveness** | | | | | | | | | **0.16** | |
| **Revised Beach Hazard Score** | | | | | | | | | **5.43** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.2 | 0.2 | Aquatic safety information and other site information noted on arrival at Woolamai beach and distant access/ network walking path. |
| **On-site education** | 1 | 0.1 | 0.1 | Site-specific aquatic safety signage provides a limited on-site education platform. Signage is some distance away from beach. |
| **Barriers** | 1 | 0.4 | 0.4 | Some barriers used along section of paths, boardwalks and stairs. |
| **Defined access** | 1 | 0.4 | 0.4 | Sand and soil-based access until boardwalk and stair access onto beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access signs noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.6 | 0.6 | Regulations in place at time of assessment. Distance reduces the effectiveness. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions noted. Distance reduces the effectiveness. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.16** | |

## 8.22 Magic Lands

### 8.22.1 Site Observations

Obs 1 - Rocky outcrops are scattered along the shoreline with greater concentration of rocks near headlands and at the base.

Obs 2 – View of the elevated rocky headland area at Magic Lands beach.

Obs 3 – Loose boulders and rocks found at the base of the headland areas.

Obs 4 – Section of sandy beach at Magic Lands, which is approximately 800 m in length.

Obs 5 – View of the rock and small boulders at the base of the headland in the foreground and patch of sandy beach in the background.

Obs 6 – Scattered and submerged rocks at the base headland at Magic Lands beach.

### 8.22.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.5 | 0.3 | 5 | 0.6 | 0.5 | 0.3 | 6 | 0.60 | 5 |
| **Topological and man-made hazards** | 0.5 | 0.6 | 0.3 | 5 | 0.5 | 0.6 | 0.3 | 6 | 0.60 | 5 |
| **Currents (rips)** | 0.8 | 0.7 | 0.56 | 1 | 0.6 | 0.7 | 0.42 | 2 | 0.98 | 2 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.7 | 0.6 | 0.42 | 3 | 0.6 | 0.6 | 0.36 | 5 | 0.78 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.7 | 0.5 | 0.35 | 4 | 0.8 | 0.5 | 0.4 | 4 | 0.75 | 4 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.5 | 0.3 | 0.15 | 7 | 0.5 | 0.6 | 0.3 | 6 | 0.45 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.7 | 0.49 | 2 | 0.8 | 0.7 | 0.56 | 1 | 1.05 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 7 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.75** | | | | **3.24** | | **5.99** | |
| **Control Effectiveness** | | | | | | | | | **0.16** | |
| **Revised Beach Hazard Score** | | | | | | | | | **5.05** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.2 | 0.2 | Aquatic safety information and other site information noted on arrival at Woolamai beach and distant access/ network walking path. |
| **On-site education** | 1 | 0.1 | 0.1 | Site-specific aquatic safety signage provides a limited on-site education platform. Signage is some distance away from beach. |
| **Barriers** | 1 | 0.4 | 0.4 | Some barriers used along section of paths, boardwalks and stairs. |
| **Defined access** | 1 | 0.4 | 0.4 | Sand and soil-based access until boardwalk and stair access onto beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Defined access signs noted at time of assessment. Consider reviewing content, placement and sizing of sign content. |
| **Regulations** | 1 | 0.6 | 0.6 | Regulations in place at time of assessment. Distance reduces the effectiveness. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. Call-out facility in place from Woolamai during summer season. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions noted. Distance reduces the effectiveness. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.16** | |

## 8.23 Cape Woolamai South


**This beach (Cape Woolamai South) along with Griffith's Point, was not accessible at the time of site observations. As such, no observations, hazard summaries or treatment observations are provided for this location.

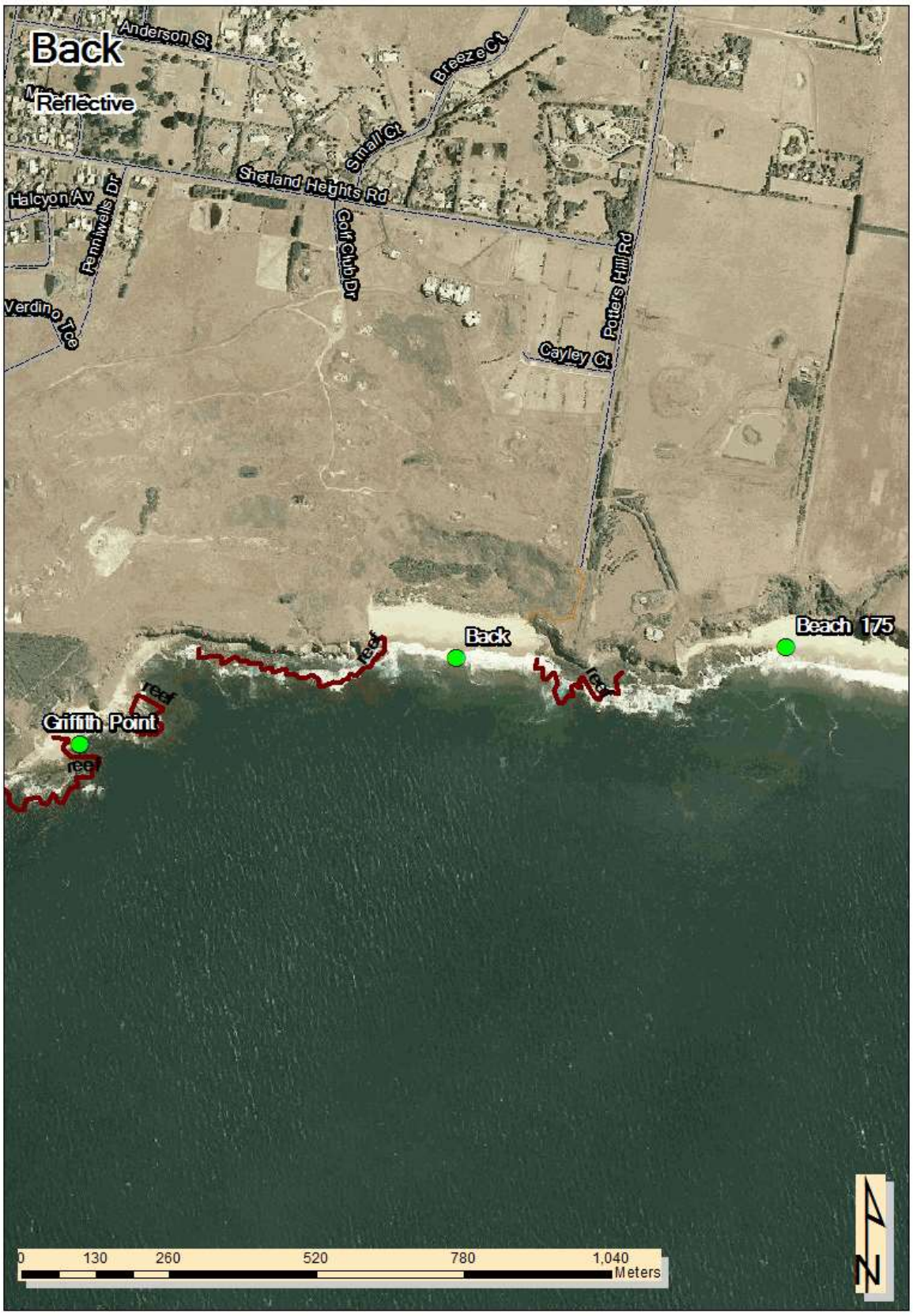
# Zone 3 – Beach Risk Assessment Summary

| Zone Profile | Zone 3 |
|---|---|
| Westernmost beach | Griffith Point |
| Easternmost beach | Beach 169 |
| Number of beaches | 9 |
| Location | Mainland |
| Common characteristics | Discrete beaches backed by bluffs; sandstone headlands separate; south facing |
| Common beach types | • R<br>• LTT<br>• TBR |
| Fatal drowning probability (1 or more over 12 months) | 26% |
| Relative risk of a fatal drowning event occurring within a 12-month period | 3.31 |
| Non-fatal drowning probability (1 or more over 12 months) | 18% |
| Overall hazard rank | 1 |

## 8.24 Griffith's Point


**This beach (Griffith's Point) along with Cape Woolamai South, was not accessible at the time of site observations. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.25 Back (Potters Hill Road)



### 8.25.1 Site Observations

Obs 1 – Hazard sign placed at the early beach access point.


Obs 2 – Two different safety signs competing for reader attention.

Obs 3 – Elevated view of Back beach.


Obs 4 – Provision of existing EBAN system at the site.

Obs 5 – Stepped boardwalk providing access to the beach.

Obs 6 – Defined access sign at the foot of the boardwalk.

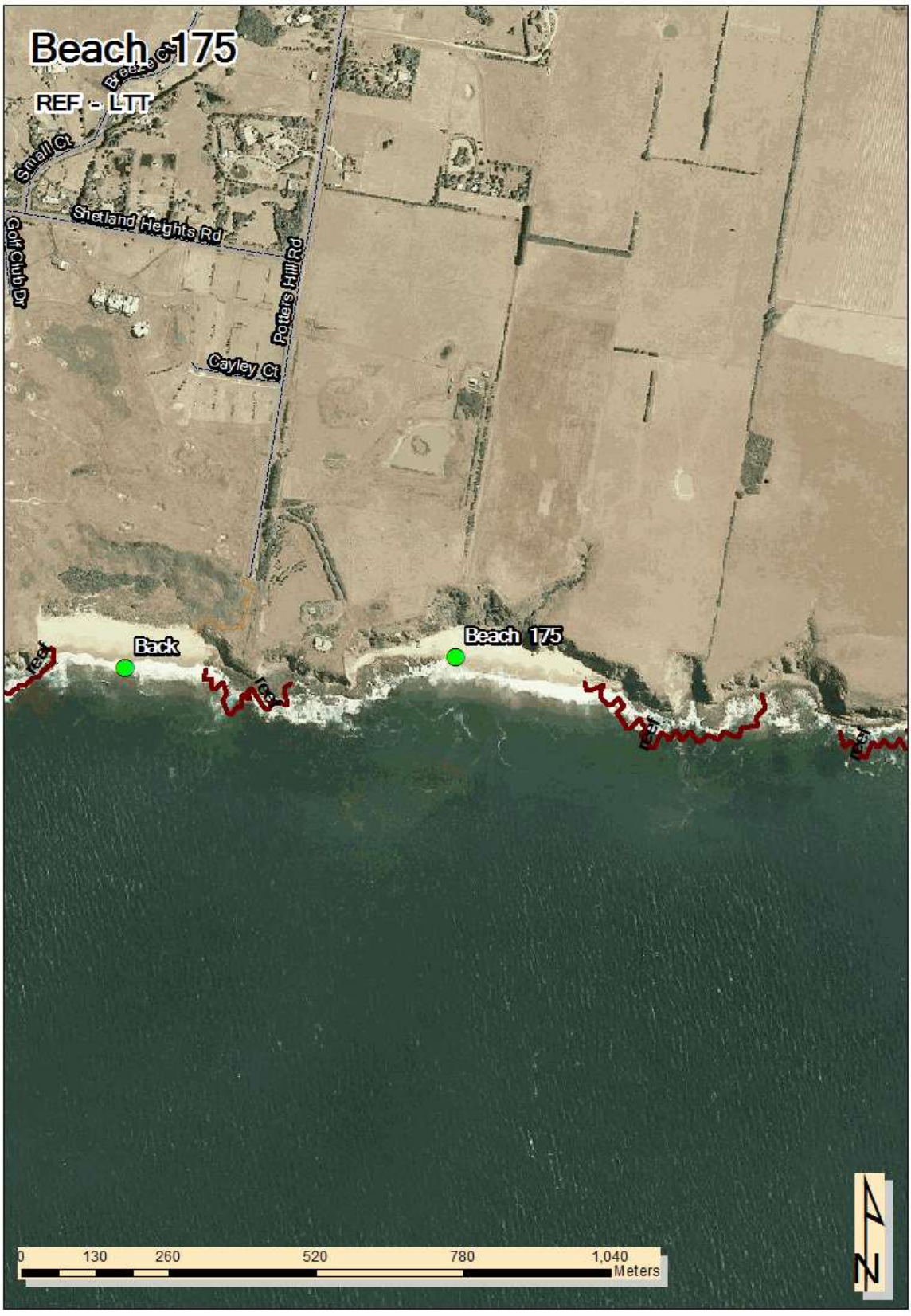
### 8.25.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.5 | 0.25 | 2 | 0.6 | 0.5 | 0.3 | 4 | 0.55 | 3 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 1 | 0.6 | 0.6 | 0.36 | 2 | 0.66 | 1 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 3 | 0.5 | 0.4 | 0.2 | 5 | 0.44 | 5 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.4 | 0.24 | 3 | 0.4 | 0.4 | 0.16 | 6 | 0.40 | 6 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.4 | 0.2 | 5 | 0.8 | 0.4 | 0.32 | 3 | 0.52 | 4 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.2 | 0.2 | 0.04 | 8 | 0.2 | 0.3 | 0.06 | 9 | 0.10 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.3 | 0.3 | 0.09 | 7 | 0.3 | 0.4 | 0.12 | 8 | 0.21 | 7 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 6 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 2 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 7 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **1.54** | | | | **2.12** | | **3.66** | |
| **Control Effectiveness** | | | | | | | | | **0.21** | |
| **Revised Beach Hazard Score** | | | | | | | | | **2.91** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

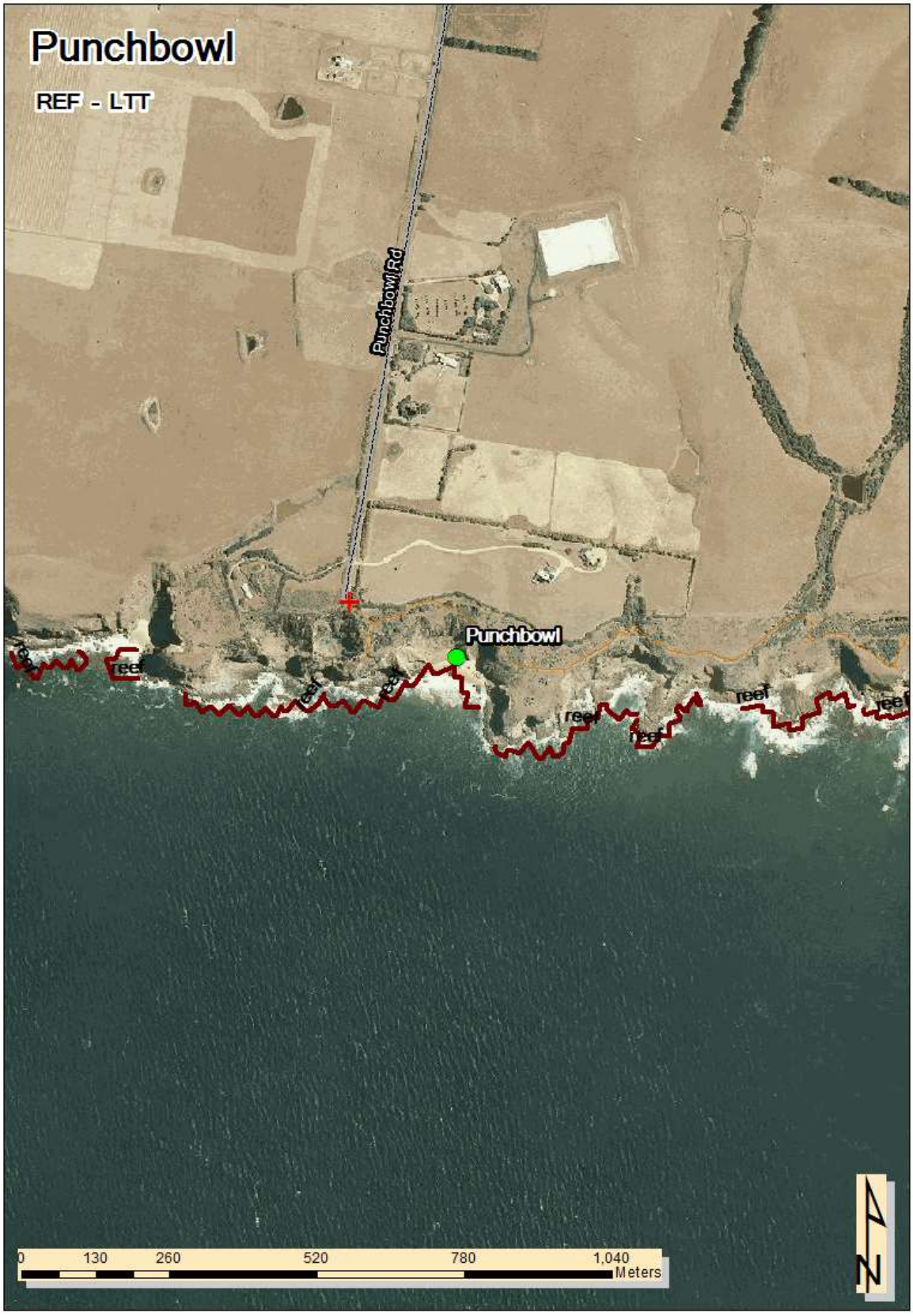
| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.5 | 0.5 | Aquatic safety information noted on arrival. |
| **On-site education** | 1 | 0.2 | 0.2 | Site-specific aquatic safety signage provides a limited on-site education platform. |
| **Barriers** | 1 | 0.6 | 0.6 | Boardwalk and stairs with barriers. |
| **Defined access** | 1 | 0.6 | 0.6 | Boardwalks and stairs. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.7 | 0.7 | Signs noted at time of assessment. Consistent with AS/NZS 2416. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations in place at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Beyond regulations no activity management noted at the time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.21** | |

## 8.26 Beach 175




**This beach (Beach 175) along with Beach 172, Beach 169 and The Arch, was not accessible at the time of site observations. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.27 Punchbowl



### 8.27.1 Site Observations


Obs 1 – Primary access sign at main entrance point. The 'No Lifesaving Service' symbol is not part of the AS/NZS 2416.1 Standard.

Obs 2 – Individual hazard signs used in the area in addition to several composite signs. 'Currents' and 'No Lifesaving Service' signs are not consistent with the symbols outlined in AS/NZS 2416.

Obs 3 – Prohibition totems used on way to lookout platform.

Obs 4 – Interpretive signage in amongst a range of safety signs at the site.


Obs 5 – Another defined access sign variation that uses the 'No Lifesaving Service' symbol that is not part of the AS/NZS 2416.1 Standard.

Obs 6 – View of the elevation and rocks making the site particularly dangerous and shows why access is restricted.

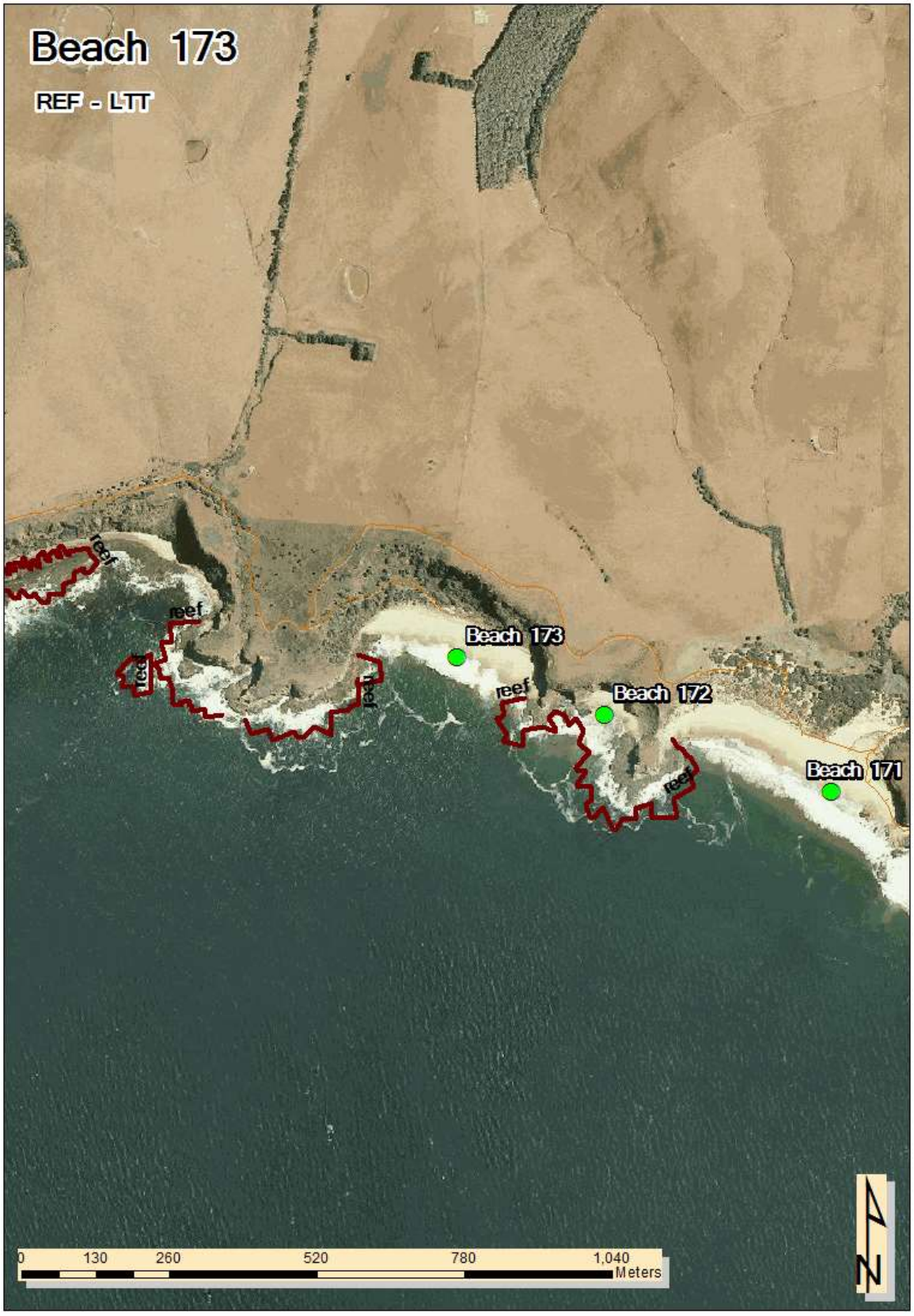
### 8.27.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.8 | 0.8 | 0.64 | 1 | 0.8 | 0.8 | 0.64 | 1 | 1.28 | 1 |
| **Topological and man-made hazards** | 0.6 | 0.3 | 0.18 | 6 | 0.7 | 0.6 | 0.42 | 5 | 0.60 | 5 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 8 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.8 | 0.7 | 0.56 | 3 | 0.8 | 0.8 | 0.64 | 1 | 1.20 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.8 | 0.7 | 0.56 | 3 | 0.8 | 0.8 | 0.64 | 1 | 1.20 | 3 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.5 | 0.15 | 7 | 0.4 | 0.5 | 0.2 | 7 | 0.35 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.8 | 0.8 | 0.64 | 1 | 0.8 | 0.8 | 0.64 | 1 | 1.28 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 5 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **3.15** | | | | **3.94** | | **7.09** | |
| **Control Effectiveness** | | | | | | | | | **0.29** | |
| **Revised Beach Hazard Score** | | | | | | | | | **5.05** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.6 | 0.6 | Arrival and interpretive signage informing visitors that beach is not accessible. |
| **On-site education** | 1 | 0.4 | 0.4 | Some local on-site education regarding hazards of rock fishing. |
| **Barriers** | 1 | 0.7 | 0.7 | Physical barriers in place to limit access to the beach. |
| **Defined access** | 1 | 0.7 | 0.7 | Defined access to lookout platform with barriers, |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Combinations of signage consistent with elements of AS/NZS 2416. Suggest simplification of signage program. |
| **Regulations** | 1 | 0.7 | 0.7 | Site-specific regulations noted. |
| **Activity management** | 1 | 0.7 | 0.7 | Activity sought to be managed with a physical obstruction to limit access. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 1 | 0.2 | 0.2 | No site-specific community education other than signposting that the beach is not accessible and hazards are present. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.29** | |

## 8.28 Beach 173 (Half Moon Bay)



### 8.28.1 Site Observations


Obs 1 - Defined access sign, partly consistent with AS/NZS 2416. A review of the symbols and symbol and text height specific to viewing distance should be undertaken.


Obs 2 – Defined access sign variation that uses the 'No Lifesaving Service' symbol that is not part of the AS/NZS 2416.1 Standard. Every effort should be made to keep sign styling and symbology consistent.

Obs 3 – Use of etched wood waypoint signs along the coastal walk.

Obs 4 – Elevated view of Beach 173 from the coastal walk.

Obs 5 – Another safety sign style variation along the George Bass Coastal Walk.

Obs 6 – Narrow, sandy and uneven access path leading onto the beach. Should be kept in mind as to how emergency services will transverse this path with rescue equipment.

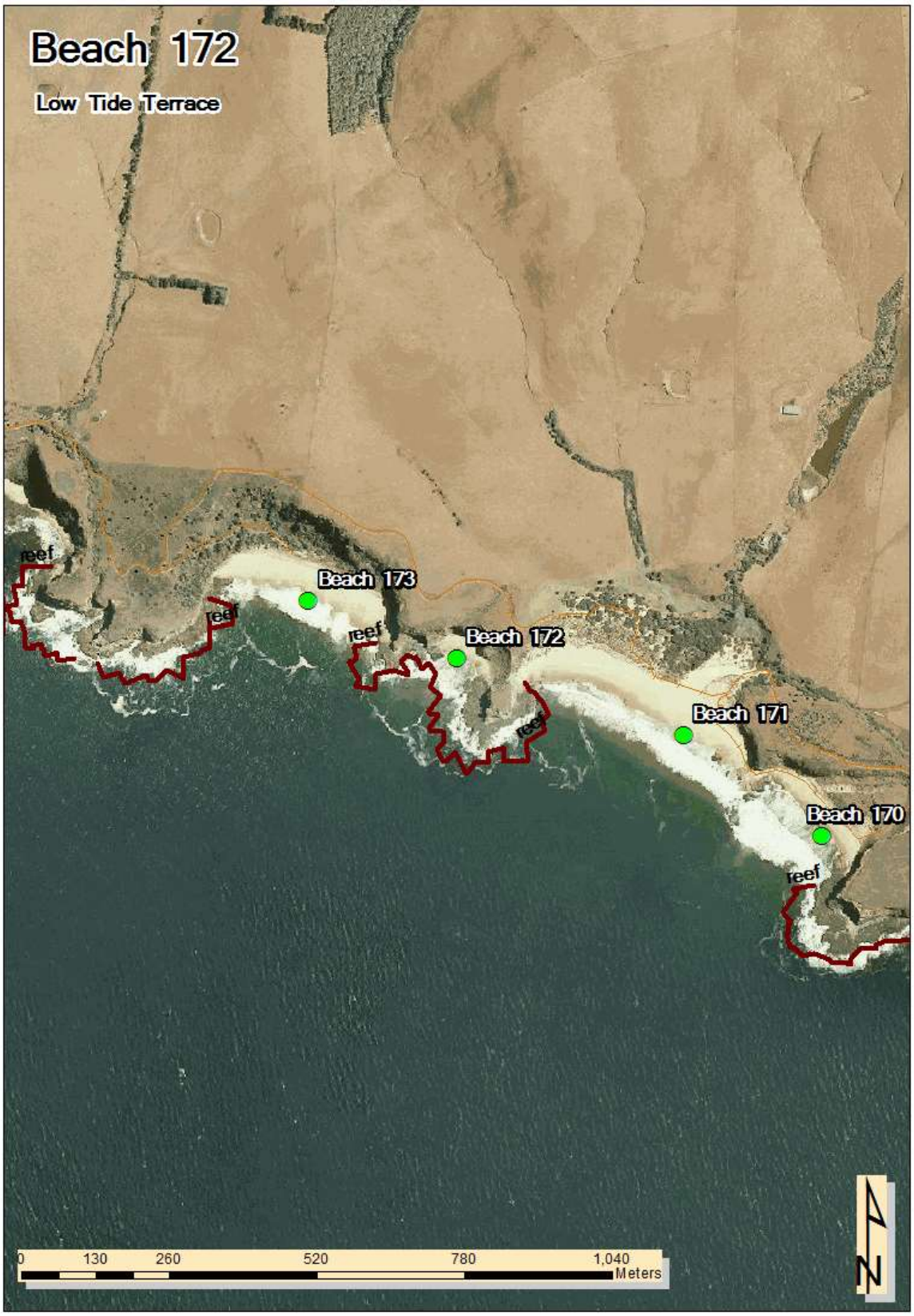
### 8.28.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.6 | 0.36 | 3 | 0.6 | 0.7 | 0.42 | 3 | 0.78 | 3 |
| **Topological and man-made hazards** | 0.6 | 0.3 | 0.18 | 6 | 0.7 | 0.6 | 0.42 | 3 | 0.60 | 5 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 7 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.6 | 0.8 | 0.48 | 1 | 0.90 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.6 | 0.8 | 0.48 | 1 | 0.90 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.3 | 0.09 | 8 | 0.4 | 0.4 | 0.16 | 7 | 0.25 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.6 | 0.6 | 0.36 | 3 | 0.7 | 0.6 | 0.42 | 3 | 0.78 | 3 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 3 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.25** | | | | **3.14** | | **5.39** | |
| **Control Effectiveness** | | | | | | | | | **0.16** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.55** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.3 | 0.3 | Limited physical barriers; some barrier planting used. |
| **Defined access** | 1 | 0.4 | 0.4 | Some defined sand and soil access. Elevated bluffs accessible. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.5 | 0.5 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.6 | 0.6 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.16** | |

## 8.29 Beach 172




**This beach (Beach 172) along with Beach 175 and The Arch, was not accessible at the time of site observations. As such, no observations, hazard summaries or treatment observations are provided for this location.

## 8.30 Beach 171 (Sandy Waterhole)

### 8.30.1 Site Observations

Obs 1 - Elevated view of the 400 m small embayed sandy beach with small headlands at either end.

Obs 2 – Defined access sign consistent with AS/NZS 2416. A review of the symbols and symbol and text height specific to viewing distance should be undertaken.

Obs 3 – Sandy access point with vegetation along the backing dunes.

Obs 4 – Profile view of the beach. Foreground view shows a relatively flat beachface with the beach getting steeper and undulating at the headland.

Obs 5 – Provision of existing EBAN system at the site.

Obs 6 – Illustration of the shifting sand at this beach. This can be problematic in terms of barriers and defined access paths placement.

### 8.30.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.6 | 0.36 | 3 | 0.6 | 0.7 | 0.42 | 3 | 0.78 | 3 |
| **Topological and man-made hazards** | 0.6 | 0.3 | 0.18 | 6 | 0.7 | 0.6 | 0.42 | 3 | 0.60 | 5 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 8 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.7 | 0.7 | 0.49 | 1 | 0.7 | 0.8 | 0.56 | 1 | 1.05 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.7 | 0.7 | 0.49 | 1 | 0.7 | 0.8 | 0.56 | 1 | 1.05 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.4 | 0.5 | 0.2 | 7 | 0.36 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.6 | 0.6 | 0.36 | 3 | 0.7 | 0.6 | 0.42 | 3 | 0.78 | 3 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 3 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.46** | | | | **3.34** | | **5.80** | |
| **Control Effectiveness** | | | | | | | | | **0.15** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.93** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.3 | 0.3 | Limited physical barriers. |
| **Defined access** | 1 | 0.4 | 0.4 | Some defined sand and soil path access. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.5 | 0.5 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.6 | 0.6 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.15** | |

## 8.31 Beach 170

### 8.31.1 Site Observations

Obs 1 - Soil based access path leading to the beach.

Obs 2 – Defined access sign consistent with the design intention of AS/NZS 2416. A review of the symbols and symbol and text height specific to viewing distance should be undertaken.

Obs 3 – Sandy backshore areas at the foot of the backing bluffs.

Obs 4 – Provision of existing EBAN system at the site. Sign should be able to be clearly seen from the beach and access paths.

Obs 5 – View of waves of moderate energy breaking over the outcrops of rocks.

Obs 6 – Undulating beachface and connected intertidal sandbars/ zones makes the beach highly variable and a hazardous place to swim.

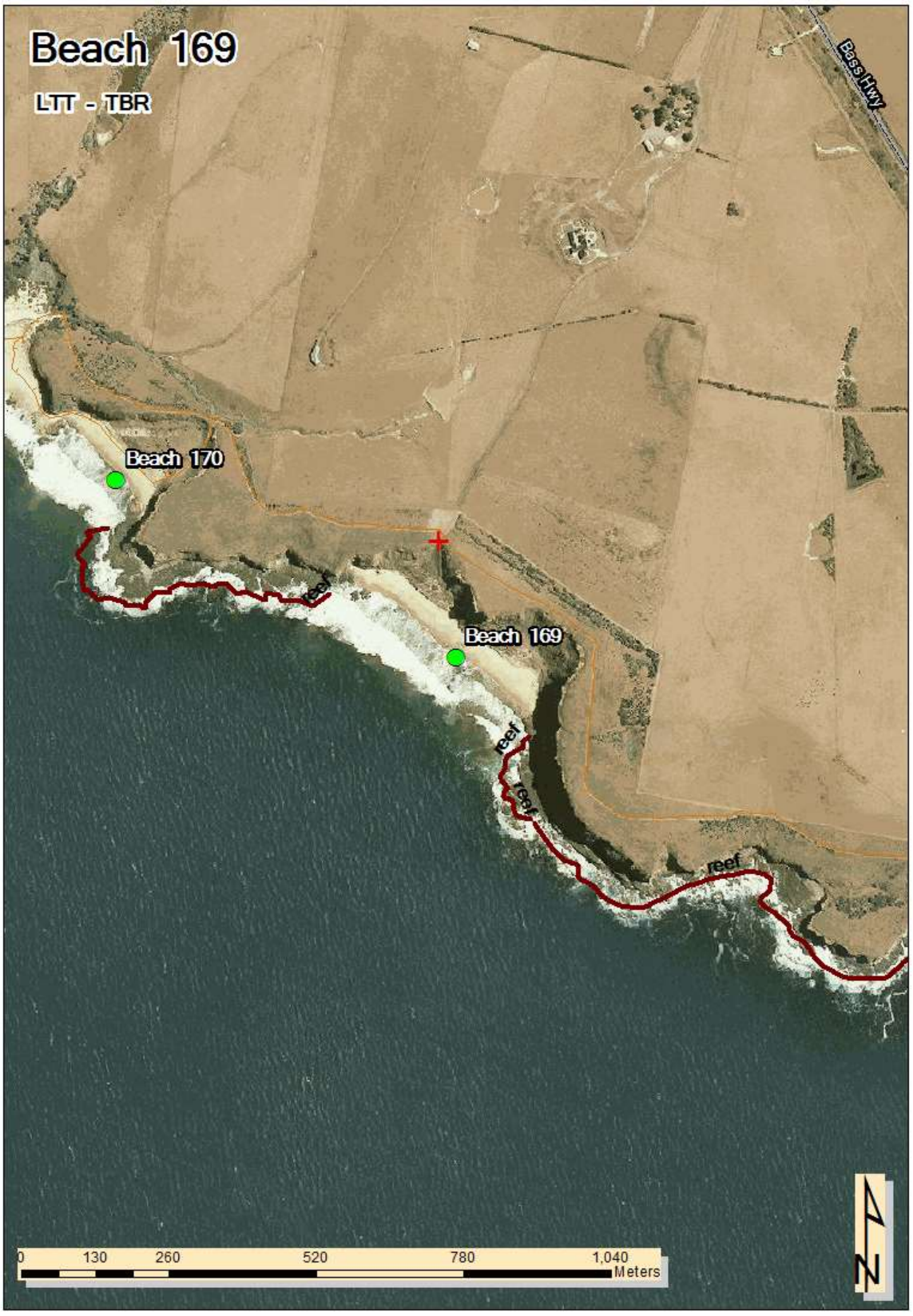
### 8.31.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.6 | 0.36 | 3 | 0.6 | 0.7 | 0.42 | 3 | 0.78 | 3 |
| **Topological and man-made hazards** | 0.6 | 0.3 | 0.18 | 6 | 0.7 | 0.6 | 0.42 | 3 | 0.60 | 5 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 8 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.7 | 0.7 | 0.49 | 1 | 0.7 | 0.8 | 0.56 | 1 | 1.05 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.7 | 0.7 | 0.49 | 1 | 0.7 | 0.8 | 0.56 | 1 | 1.05 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.4 | 0.5 | 0.2 | 7 | 0.36 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.6 | 0.6 | 0.36 | 3 | 0.7 | 0.6 | 0.42 | 3 | 0.78 | 3 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 3 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.46** | | | | **3.34** | | **5.80** | |
| **Control Effectiveness** | | | | | | | | | **0.15** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.89** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.3 | 0.3 | Limited physical barriers. |
| **Defined access** | 1 | 0.4 | 0.4 | Some defined sand and soil path access. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.5 | 0.5 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.6 | 0.6 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.15** | |

## 8.32 Beach 169




**This beach (Beach 169) was deemed unsafe to access via the steep eroding path to the beach. As such, modified observations, hazard summaries or treatment observations are provided for this location.

### 8.32.1 Site Observations

Obs 1 - Etched waypoint sign found along the elevated and unprotected bluffs.

Obs 2 – Safety sign beside the very dangerous access path. Path is steep, narrow, slippery, and appears very seldom used.

Obs 3 – Defined access sign consistent with the design intention of AS/NZS 2416. Sign placed in a location where reading it may be dangerous.

Obs 4 – Profile view of the elevated and unprotected backing bluffs at Beach 169. Waves at the time of assessment were breaking with moderate levels of energy.

Obs 5 – View of a wave after breaking in the intertidal zone.

Obs 6 – Illustration of a poorly placed and potentially dangerous safety sign. The sign should be placed to provided advanced warning of hazards.

### 8.32.2 Hazard Summary and Treatment Observations

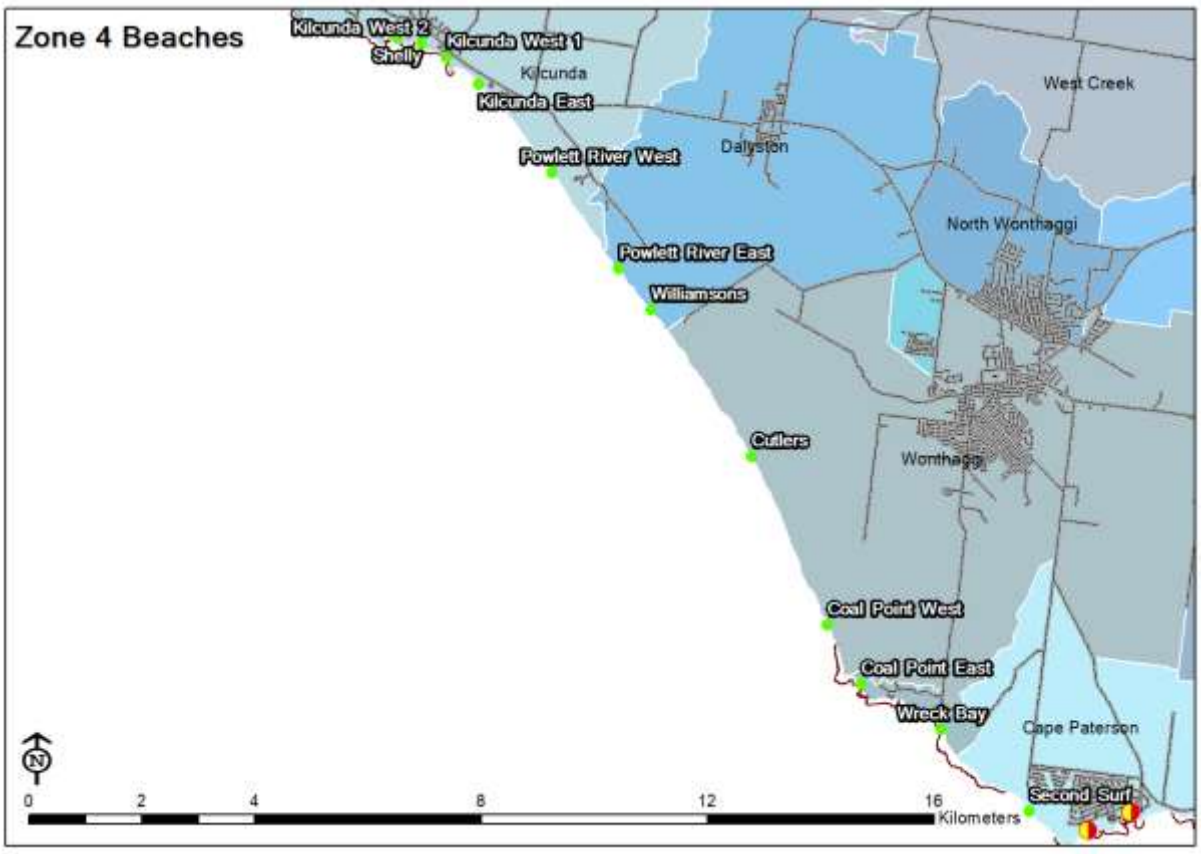
| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.7 | 0.6 | 0.42 | 1 | 0.7 | 0.8 | 0.56 | 1 | 0.98 | 1 |
| **Topological and man-made hazards** | 0.6 | 0.4 | 0.24 | 5 | 0.7 | 0.8 | 0.56 | 1 | 0.80 | 2 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 8 | 0.40 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.6 | 0.36 | 2 | 0.6 | 0.7 | 0.42 | 3 | 0.78 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.6 | 0.36 | 2 | 0.6 | 0.7 | 0.42 | 3 | 0.78 | 3 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.4 | 0.5 | 0.2 | 7 | 0.36 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.6 | 0.6 | 0.36 | 2 | 0.7 | 0.6 | 0.42 | 3 | 0.78 | 3 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 3 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | 2.32 | | | | 3.34 | | 5.66 | |
| **Control Effectiveness** | | | | | | | | | 0.08 | |
| **Revised Beach Hazard Score** | | | | | | | | | 5.20 | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

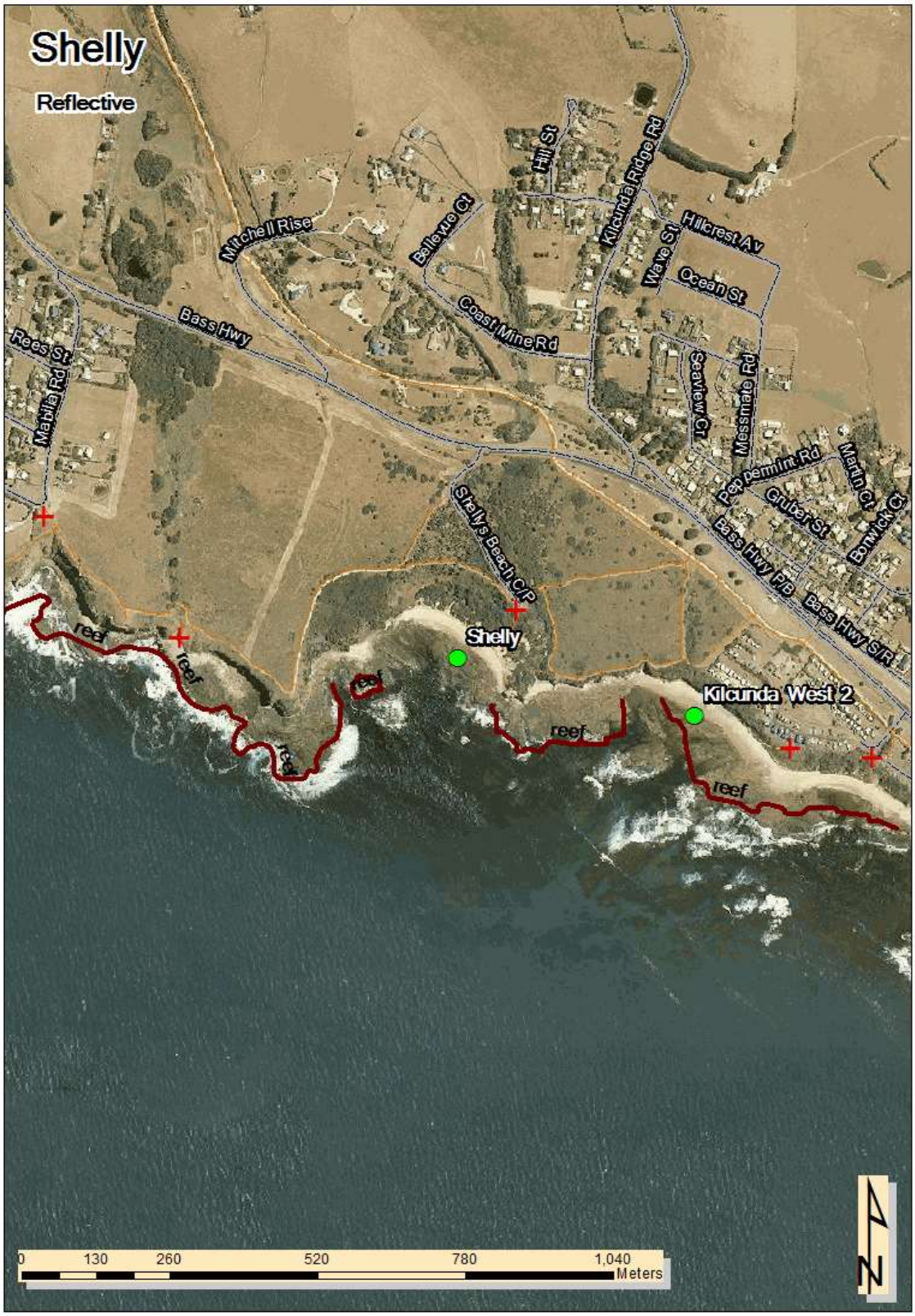
| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.2 | 0.2 | Access signage present, however not placed in suitable locations. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 0 | 0 | 0 | No physical barriers prevented access down very steep, eroding path. Elevated unprotected bluffs. |
| **Defined access** | 0 | 0 | 0 | No defined access path, however an undefined sandy, rocky, eroding path leads down to the beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.4 | 0.4 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.5 | 0.5 | Site specific regulations noted. Review sign placement. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ Carer Supervision needs not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.1 | 0.1 | Some signposted activity restrictions. Review sign placement. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.08** | |

# Zone 4 – Beach Risk Assessment Summary

| Zone Profile | Zone 4 |
|---|---|
| Westernmost beach | Shelly |
| Easternmost beach | Second Surf |
| Number of beaches | 12 |
| Location | Mainland |
| Common characteristics | Continuous sandy beaches intertidal rock flats; SW-facing |
| Common beach types | • R<br>• TBR/RBB |
| Fatal drowning probability (1 or more over 12 months) | 26% |
| Relative risk of a fatal drowning event occurring within a 12-month period | 1.6 |
| Non-fatal drowning probability (1 or more over 12 months) | 9.50% |
| Overall hazard rank | 3 |



## 8.33 Shelly


Shelly
Reflective
Hill St
Kilcunda Ridge Rd
Bellevue Ct
Mitchell Rise
Hillcrest Av
Wave St
Ocean St
Coast Mine Rd
Bass Hwy
Rees St
Mabilia Rd
Seaview Cr
Messmate Rd
Peppermint Rd
Martin Ct
Gruber St
Berwick Ct
Bass Hwy PB
Bass Hwy S/R
Shelly's Beach C/P
Shelly
Kilcunda West 2
reef
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0 130 260 520 780 1,040
Meters
N

### 8.33.1 Site Observations

Obs 1 – Aquatic safety signage and emergency marker installed on the far western bluff, leading directly to a rock platform.

Obs 2 – Aquatic safety signage at the entrance to the carpark and away from the access point. In this location, people are unlikely to pass the sign on foot and view the contents.

Obs 3 –Emergency vehicle access point.

Obs 4 – An aquatic safety sign at the defined access point, containing elements that are consistent with AS/NZS 2416.

Obs 5 – View of the south-south-west facing beach and bluffs fronted by intertidal rock platforms.

Obs 6 – View of the narrow, high tide sand beach backed by low foredunes and 20 m high grassy bluffs.

### 8.33.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.3 | 0.15 | 6 | 0.6 | 0.3 | 0.18 | 7 | 0.33 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 6 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 2 | 0.4 | 0.6 | 0.24 | 5 | 0.54 | 5 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.8 | 0.6 | 0.48 | 1 | 0.8 | 0.6 | 0.48 | 1 | 0.96 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 6 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.02** | | | | **2.48** | | **4.50** | |
| **Control Effectiveness** | | | | | | | | | **0.13** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.90** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.2 | 0.2 | Access signage present, however not placed in suitable locations. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.3 | 0.3 | Limited physical barriers. Elevated unprotected bluffs. |
| **Defined access** | 1 | 0.4 | 0.4 | Some defined sand and soil path access. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.4 | 0.4 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.5 | 0.5 | Site-specific regulations noted. Review sign placement. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.1 | 0.1 | Some signposted activity restrictions. Review sign placement. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.13** | |

## 8.34 Kilcunda West 2

### 8.34.1 Site Observations


Obs 1 – A deteriorating CPR information sign noted at the top of the stairs leading down to Kilcunda West 2 beach.

Obs 2 – An aquatic safety sign at the entrance of the western-most defined access path leading to the beach.

Obs 3 – The access path is steep in sections and entry onto the beach is provided using stairs.

Obs 4 – West-facing view of the narrow, high tide sand beach backed by low foredunes and 20 m high grassy bluffs.

Obs 5 – East-facing view of the near continuous rock flats that characterise Kilcunda West 2 beach.

Obs 6 – Warning sign atop the bluffs in the caravan park advising of unstable cliffs.

### 8.34.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.3 | 0.15 | 6 | 0.6 | 0.3 | 0.18 | 7 | 0.33 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 6 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 2 | 0.4 | 0.6 | 0.24 | 5 | 0.54 | 5 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.8 | 0.6 | 0.48 | 1 | 0.8 | 0.6 | 0.48 | 1 | 0.96 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 6 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.02** | | | | **2.48** | | **4.50** | |
| **Control Effectiveness** | | | | | | | | | **0.17** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.74** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.2 | 0.2 | Access signage present, providing arrival information. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.3 | 0.3 | Limited physical barriers. Elevated bluffs noted. |
| **Defined access** | 1 | 0.4 | 0.4 | Some defined sand and soil path access and stairwell access onto the beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.7 | 0.7 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.4 | 0.4 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.17** | |

## 8.35 Kilcunda West 1

### 8.35.1 Site Observations

Obs 1 - Use of a defined access sign in the car park area. These signs are consistent with permissible design principles of AS/NZS 2146.3.

Obs 2 – View of the gravel carpark above Kilcunda West 1 beach.

Obs 3 – Aquatic safety sign found at the defined access point leading from the carpark to the beach via wooden stairs.

Obs 4 – The emergency marker here is obscured by vegetation.

Obs 5 – View of the narrow, high tide sand beach backed by low foredunes and 20 m high grassy bluffs.

Obs 6 – Elements of the sign are consistent with the application intention of AS/NZS 2416, with information on the nearest patrolled beach.

### 8.35.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.3 | 0.15 | 6 | 0.6 | 0.3 | 0.18 | 7 | 0.33 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 6 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 2 | 0.4 | 0.6 | 0.24 | 5 | 0.54 | 5 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.8 | 0.6 | 0.48 | 1 | 0.8 | 0.6 | 0.48 | 1 | 0.96 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 6 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.02** | | | | **2.48** | | **4.50** | |
| **Control Effectiveness** | | | | | | | | | **0.17** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.74** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.2 | 0.2 | Access signage present, providing arrival information. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.3 | 0.3 | Limited physical barriers. Elevated bluffs noted. |
| **Defined access** | 1 | 0.4 | 0.4 | Some defined sand and soil path access and stairwell access onto the beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.7 | 0.7 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.4 | 0.4 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.17** | |

## 8.36 Kilcunda East

### 8.36.1 Site Observations

Obs 1 - Defined access path with handrail barriers down to the beach.

Obs 2 – Example of a badly damaged aquatic safety sign at a defined access stairway. The emergency marker in the background is clearly visible.

Obs 3 – View of the waves approaching the beach on a low to medium wave energy day.

Obs 4 – Another defined access sign used in proximity to access pathways down to the beach. Review symbol and text viewing distance requirements.

Obs 5 – Review placement of sign. Defined access signs should be used at defined access points. If it is a general warning or open access warning, the sign would need to be larger to accommodate a greater viewing distance.

Obs 6 – Defined access paths in proximity to commencement of access path. Review content and placement. Consider appending less hazard symbols.

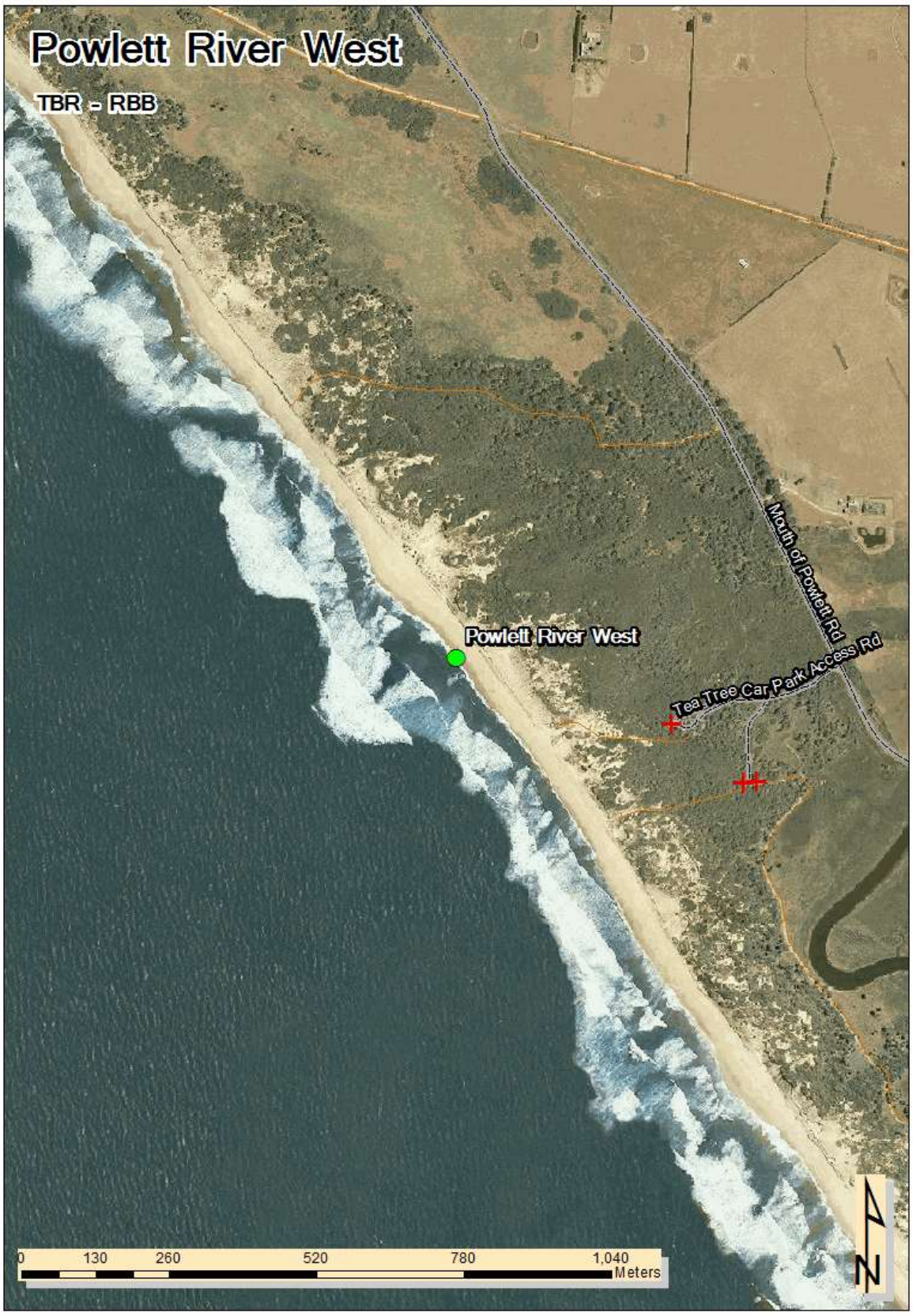
### 8.36.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.3 | 0.15 | 6 | 0.6 | 0.3 | 0.18 | 7 | 0.33 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 4 | 0.6 | 0.6 | 0.36 | 4 | 0.66 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 6 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.5 | 0.7 | 0.35 | 5 | 0.77 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.84 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.6 | 0.42 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.84 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 6 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 5 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.20** | | | | **2.59** | | **4.79** | |
| **Control Effectiveness** | | | | | | | | | **0.19** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.86** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present, providing arrival information. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.5 | 0.5 | Barriers used on boardwalk stair access paths. |
| **Defined access** | 1 | 0.5 | 0.5 | Multiple car park access points onto beach. Some defined sand and soil path access and stairwell access onto the beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. Maintenance required on signs. |
| **Regulations** | 1 | 0.7 | 0.7 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.4 | 0.4 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.19** | |

## 8.37 Powlett River West



### 8.37.1 Site Observations

Obs 1 - Use of a defined access sign with elements that are consistent with AS/NZS 2146. Evidence of weathering and graffiti.

Obs 2 – Post and wire fencing prevents access to the unstable dunes. Emergency marker visible in the background.

Obs 3 – A high energy surf zone characterises this beach. A bar runs along the beach, which is often detached and cut by strong rips.

Obs 4 – Parks Victoria stylised signage near the carpark.

Obs 5 – Aquatic safety sign installed along Powlett River. Rock outcrops exist at the river mouth.

Obs 6 – One of four pseudo defined access paths leading to Powlett River West beach.

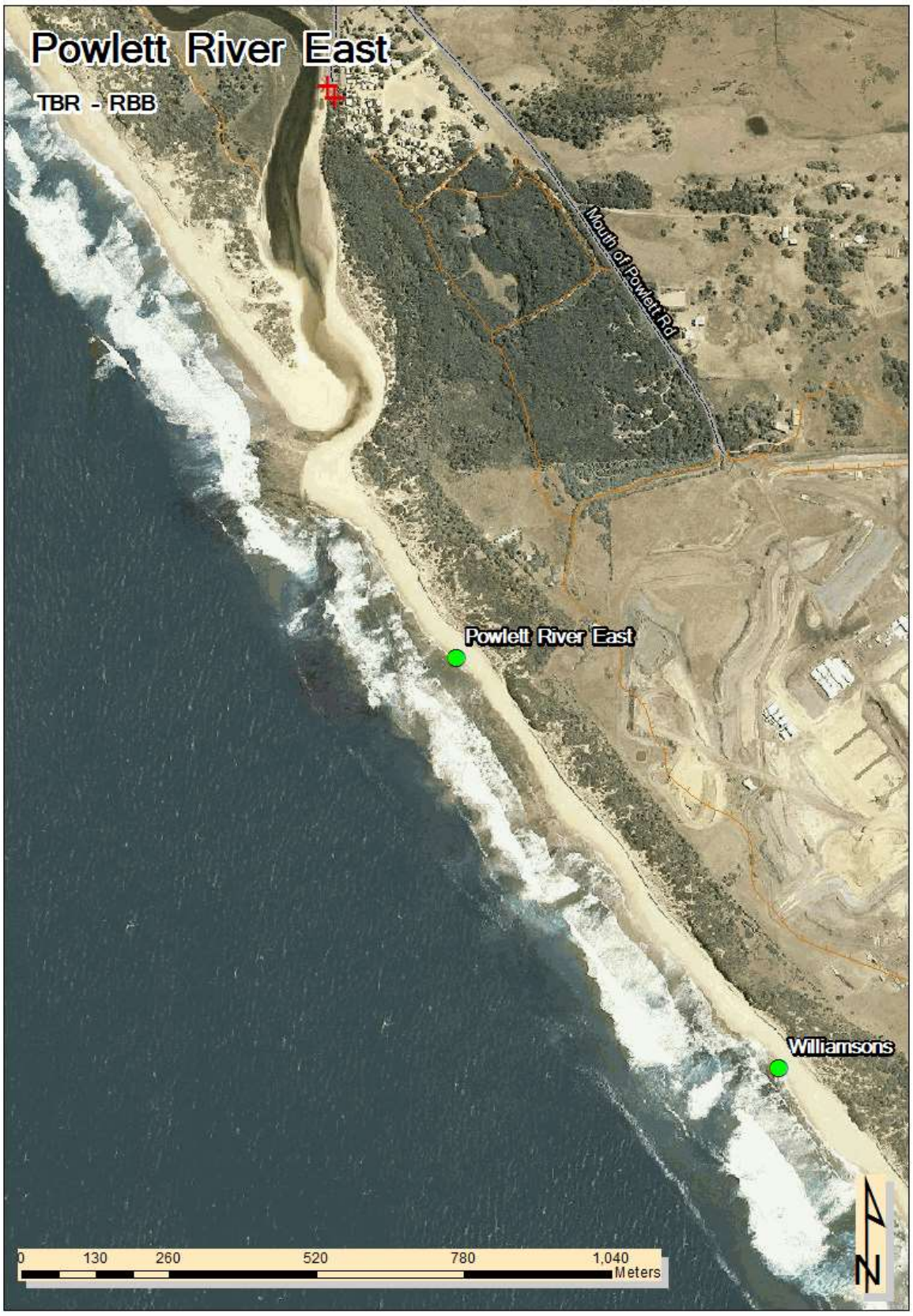
### 8.37.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.3 | 0.15 | 6 | 0.6 | 0.3 | 0.18 | 7 | 0.33 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 4 | 0.6 | 0.6 | 0.36 | 4 | 0.66 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 6 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.5 | 0.7 | 0.35 | 5 | 0.77 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.84 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.6 | 0.42 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.84 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 6 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 5 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.20** | | | | **2.59** | | **4.79** | |
| **Control Effectiveness** | | | | | | | | | **0.17** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.98** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present, providing arrival information. Parks Victoria stylised arrival signage noted. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.5 | 0.5 | Barriers used in area. Post and wire fencing noted along backing dunes. |
| **Defined access** | 1 | 0.4 | 0.4 | Multiple car park access points leading onto beach. Some defined sand and soil path access to beach and river. One access point not signposted. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.5 | 0.5 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. Maintenance required on signs. |
| **Regulations** | 1 | 0.6 | 0.6 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions. Not all access points noted as being signposted. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.17** | |

## 8.38 Powlett River East



### 8.38.1 Site Observations

Obs 1 – View of the sandy beachface and extensive intertidal rock platforms.

Obs 2 – In addition to the extensive rock platforms, Powlett River East is characterised by a high energy surf zone.

Obs 3 – Elevated sandy backing dunes along the backshore areas of Powlett River East beach.

Obs 4 – View of Powlett River discharging across the sandy shoreline areas and intersecting Powlett River East and West beaches.

Obs 5 – Stylised waypoint signage used in proximity to beach.

Obs 6 – Wide crushed rock/ gravel pathways providing access to the beach.

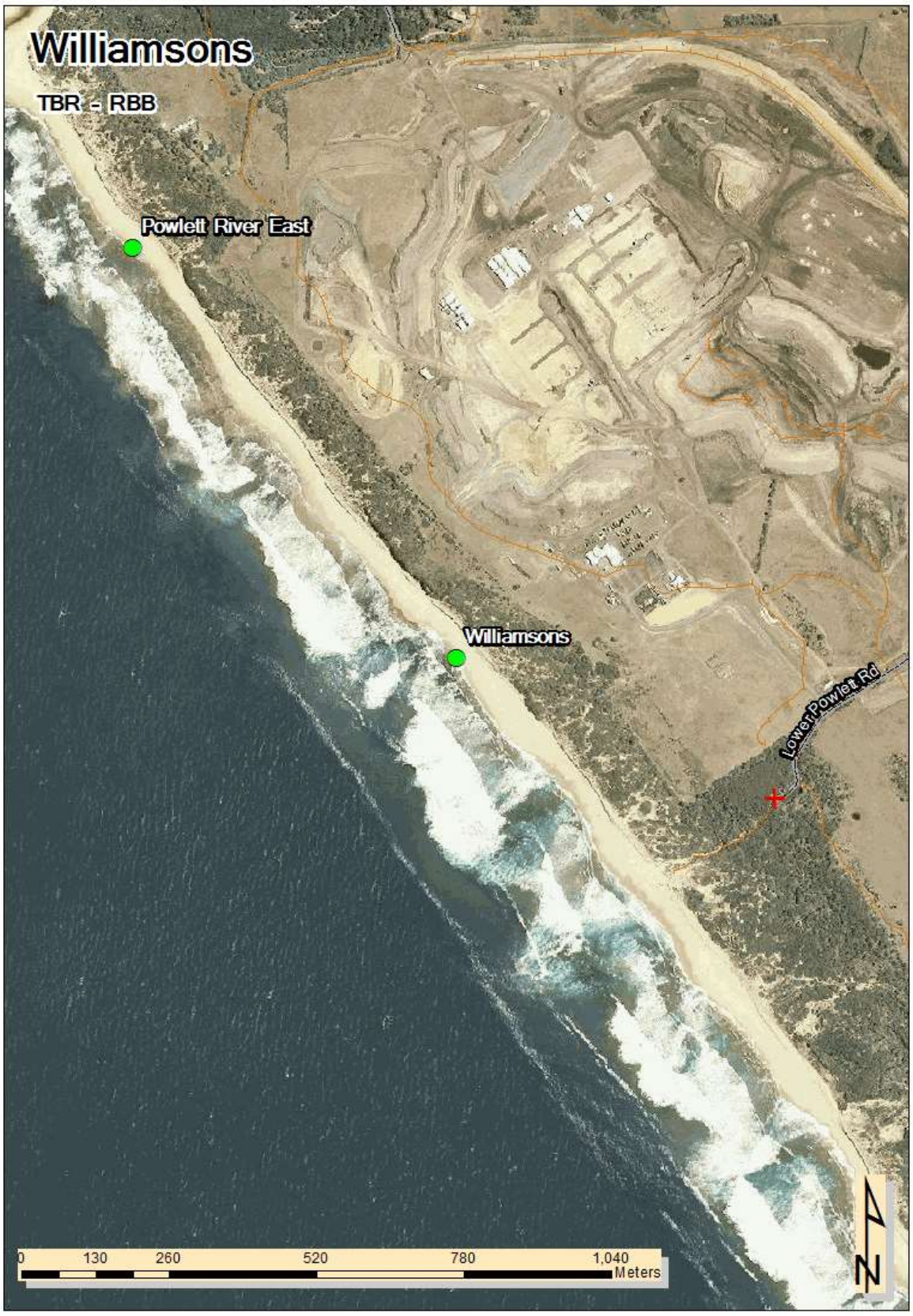
### 8.38.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.3 | 0.15 | 6 | 0.6 | 0.3 | 0.18 | 7 | 0.33 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 4 | 0.6 | 0.6 | 0.36 | 4 | 0.66 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 6 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.5 | 0.7 | 0.35 | 5 | 0.77 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.84 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.6 | 0.42 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.84 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 6 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 5 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.20** | | | | **2.59** | | **4.79** | |
| **Control Effectiveness** | | | | | | | | | **0.13** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.19** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.4 | 0.4 | Access signage present, providing arrival information. Stylised waypoint signage used in the area. |
| **On-site education** | 1 | 0.2 | 0.2 | Limited on-site education permissible using access signs. Some educational content on waypoint/ interpretive signage board. |
| **Barriers** | 1 | 0.4 | 0.4 | Limited use of barriers. Planting acts as a barrier in parts but is not impenetrable. |
| **Defined access** | 1 | 0.4 | 0.4 | Various standard materials and surface terrain used in the area. Some steep and sandy access areas with exposed edges. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 0 | 0 | 0 | No water safety signs in the area consistent with AS/NZS 2416. |
| **Regulations** | 1 | 0.4 | 0.4 | Site-specific regulations noted on stylised waypoint/ interpretive signage. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Site-specific regulations noted on stylised waypoint/ interpretive signage. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.13** | |

## 8.39 Williamsons



### 8.39.1 Site Observations

Obs 1 – Defined access sign with reduced visibility with nearby overhanging foliage. Review sign content, size and placement.

Obs 2 – Use of Parks Victoria stylised totems along access paths.

Obs 3 – Warning signs advising of large unexpected waves and strong currents. The 'Strong Currents' symbol is not consistent with the Standard.

Obs 4 – Sandy, uneven and narrow access paths leading down to the beach. There is a balance between maintaining the natural environmental setting and need to transverse the terrain safely.

Obs 5 – Williamsons beach is characterised by a high energy surf zone. A bar runs along the beach, which is often detached and cut by strong rips. The emergency marker is visible in the background.


Obs 6 – Parks Victoria stylised signage near the entrance to Williamsons beach.

### 8.39.2 Hazard Summary and Treatment Observations

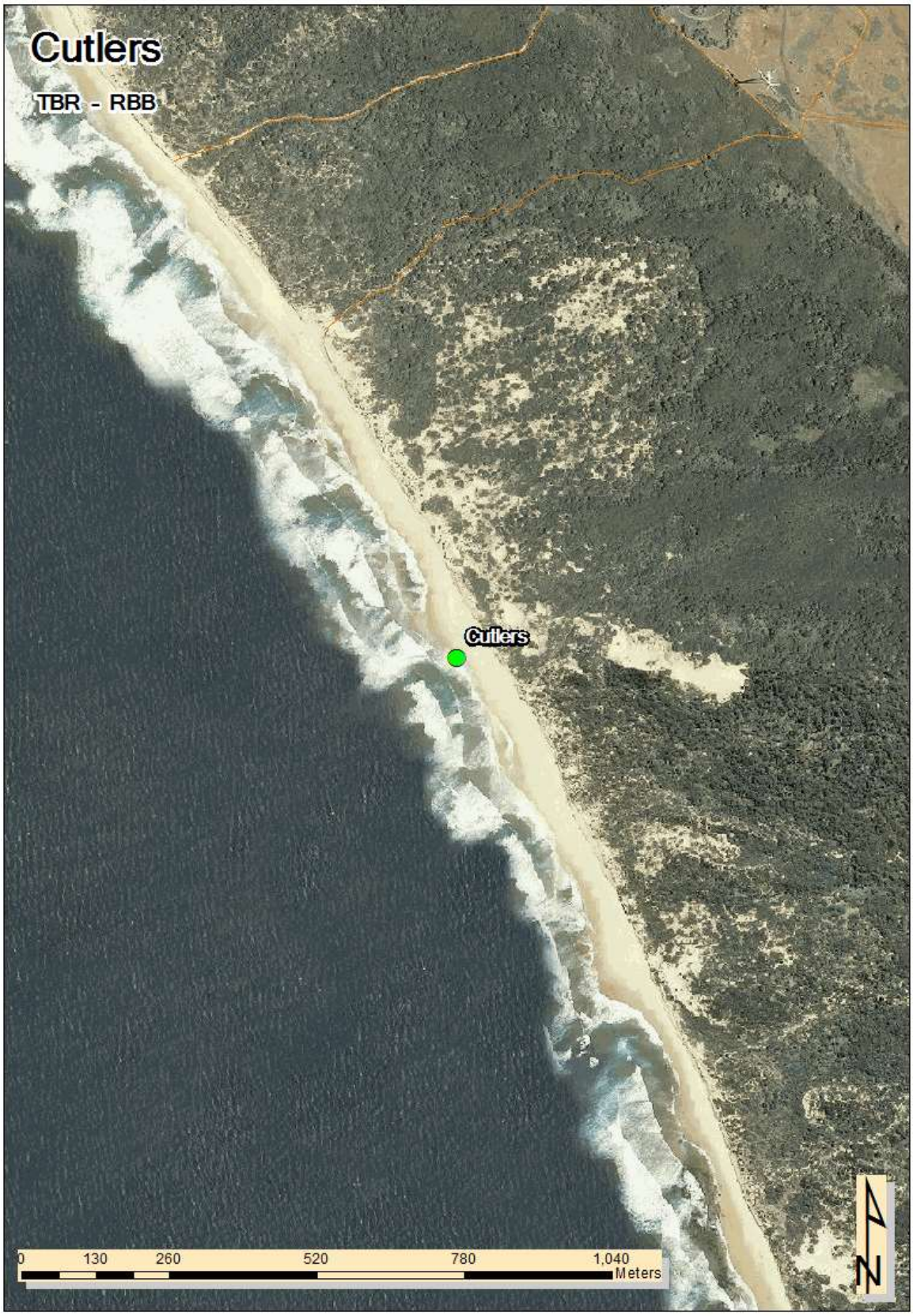
| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.4 | 0.2 | 6 | 0.6 | 0.4 | 0.24 | 6 | 0.44 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 4 | 0.6 | 0.6 | 0.36 | 4 | 0.66 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 7 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.5 | 0.7 | 0.35 | 5 | 0.77 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.84 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.6 | 0.42 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.84 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 5 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.25** | | | | **2.65** | | **4.90** | |
| **Control Effectiveness** | | | | | | | | | **0.18** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.01** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present, providing arrival information. Parks Victoria stylised arrival signage noted. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.5 | 0.5 | Barriers used in area. Post and wire fencing used in some areas such as in the car park. |
| **Defined access** | 1 | 0.4 | 0.4 | Some defined sand and soil path access to beach and river. One access point not signposted. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. The 'No lifesaving service' symbol is not contained in AS/NZS 2416.1. Some secondary hazards signs used along path to beach. |
| **Regulations** | 1 | 0.7 | 0.7 | Site-specific regulations noted. Totems used in addition to defined access aquatic safety signs. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |

0.18

## 8.40 Cutlers



### 8.40.1 Site Observations

Obs 1 – Northern section of Cutlers beach. Beach accessed from southern section of Williamsons beach.

Obs 2 – Backing bluffs within the northwest section of Cutlers abutting Williamsons beach.

Obs 3 – A high energy surf zone characterises this beach. A bar runs along the beach, which is often detached and cut by strong rips.

Obs 4 – Intertidal rock outcrops are visible during lower tides. These can be problematic when obscured during high tides for unsuspecting swimmers.

Obs 5 – One of the many larger rock platforms found along Cutlers beach.

Obs 6 – Although the sign is consistent with the design principles of AS/NZS 2416.3 the 'No Lifesaving Service' symbol is not part of the standard.

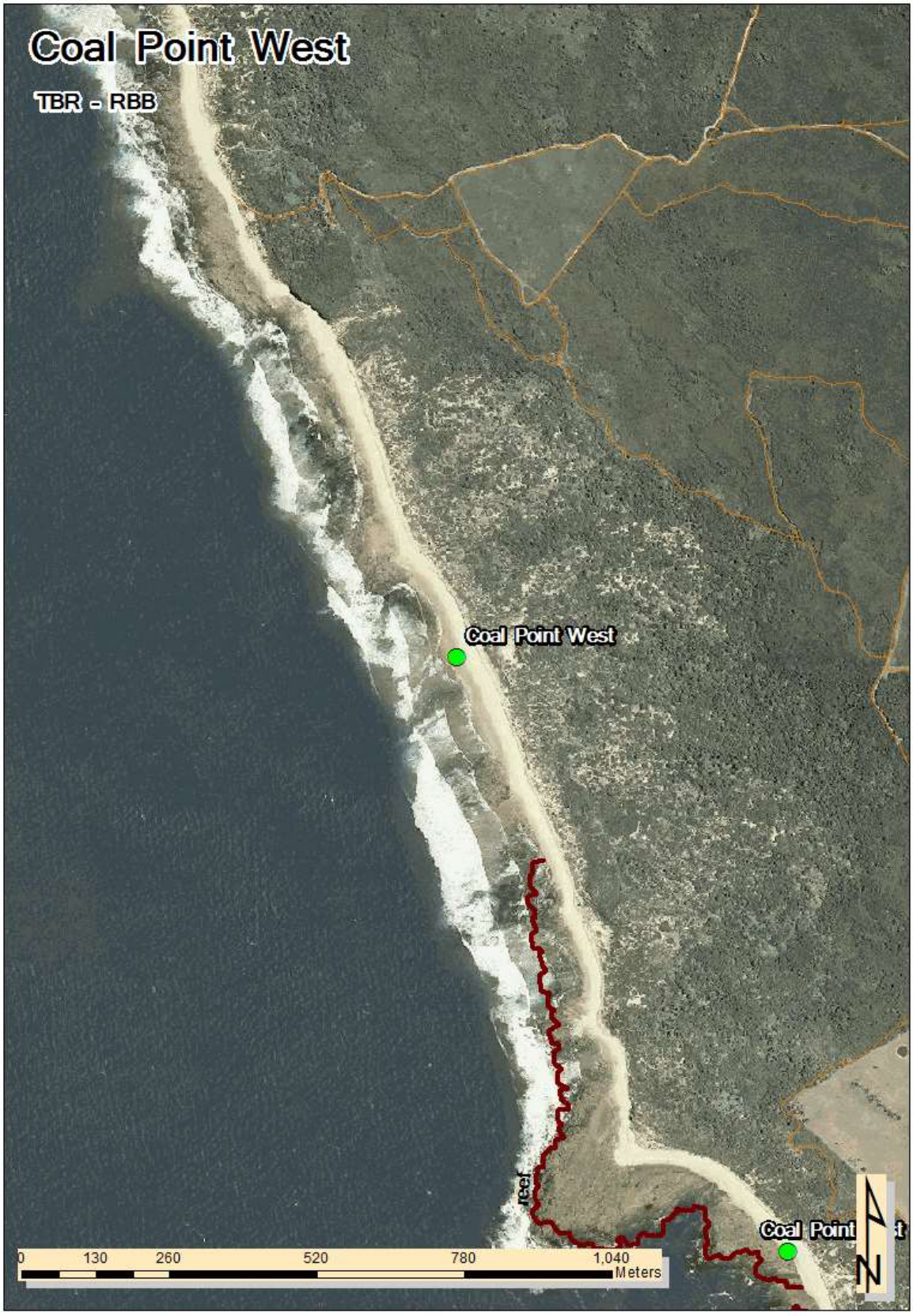
### 8.40.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.5 | 0.25 | 5 | 0.6 | 0.5 | 0.3 | 6 | 0.55 | 6 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 4 | 0.6 | 0.6 | 0.36 | 4 | 0.66 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 7 | 0.45 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.5 | 0.7 | 0.35 | 5 | 0.77 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.84 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.6 | 0.42 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.84 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 5 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.30** | | | | **2.71** | | **5.01** | |
| **Control Effectiveness** | | | | | | | | | **0.14** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.29** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present, providing arrival information. |
| **On-site education** | 1 | 0.1 | 0.1 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.2 | 0.2 | Barriers not used to any notable extent. Elevated cliff and dune areas exposed. |
| **Defined access** | 1 | 0.5 | 0.5 | Defined sand and soil path access and stairwell access onto the beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.5 | 0.5 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. The 'No lifesaving service' symbol is not contained in AS/NZS 2416.1. |
| **Regulations** | 1 | 0.4 | 0.4 | Site-specific regulations noted on aquatic safety sign |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions on aquatic safety signs. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.14** | |

## 8.41 Coal Point West



### 8.41.1 Site Observations

Obs 1 – Profile view of the more isolated Coal Point West beach.

Obs 2 – The beach is dominated by rock and reef areas with more sandy shorelines toward the backing dunes areas of the beach.

Obs 3 – Rocky outcrop with sandy backshore/ intertidal zone.

Obs 4 – The beachface has an obvious slope elevating from the swash zone up to the base of the backing bluffs.

Obs 5 – View of the rocky backing bluff that would be difficult to pass during higher tides.

Obs 6 – Rocky outcrop areas along Coal Point West beach. While passive beach goers like to explore these outcrop areas they can be hazardous.

### 8.41.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.6 | 0.3 | 4 | 0.6 | 0.6 | 0.36 | 4 | 0.66 | 4 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 4 | 0.6 | 0.6 | 0.36 | 4 | 0.66 | 4 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 6 | 0.4 | 0.5 | 0.2 | 7 | 0.45 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.7 | 0.42 | 1 | 0.5 | 0.7 | 0.35 | 6 | 0.77 | 3 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.7 | 0.42 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.84 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.7 | 0.6 | 0.42 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.84 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 6 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.35** | | | | **2.77** | | **5.12** | |
| **Control Effectiveness** | | | | | | | | | **0.01** | |
| **Revised Beach Hazard Score** | | | | | | | | | **5.06** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 0 | 0 | 0 | Arrival information not noted at time of assessment. |
| **On-site education** | 0 | 0 | 0 | No localised on-site education noted at time of assessment. |
| **Barriers** | 0 | 0 | 0 | Use of barriers not noted at time of assessment. |
| **Defined access** | 1 | 0.2 | 0.2 | Defined access limited with access from the north and south of the beach off a larger walking track network. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 0 | 0 | 0 | No water safety signs in the area consistent with AS/NZS 2416. |
| **Regulations** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.01** | |

## 8.42 Coal Point East

### 8.42.1 Site Observations

Obs 1 – Number of signs used at one access point. The access path is narrow and uneven in sections.

Obs 2 – Rocky headland area with rock platform at the base. Areas will tend to be slippery and uneven in areas.

Obs 3 – Wooded boardwalk and stairs providing access to the beach.


Obs 4 – Stylised etched wood waypoint sign.

Obs 5 – Another defined access point with multiples sign with different design/ application objectives. These signs are all competing for attention.

Obs 6 – Defined access with ether plants used as barriers or simply overgrown and narrowing the access path. The path itself is uneven. This is expected as an artefact of soil-based pathways.

### 8.42.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.4 | 0.2 | 6 | 0.6 | 0.4 | 0.24 | 5 | 0.44 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 7 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 2 | 0.4 | 0.6 | 0.24 | 5 | 0.54 | 5 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.8 | 0.6 | 0.48 | 1 | 0.8 | 0.6 | 0.48 | 1 | 0.96 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.07** | | | | **2.54** | | **4.61** | |
| **Control Effectiveness** | | | | | | | | | **0.16** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.86** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present, providing arrival information. Parks Victoria stylised arrival signage noted. |
| **On-site education** | 1 | 0.3 | 0.3 | On-site interpretive and safety signs noted at time of assessment. |
| **Barriers** | 1 | 0.3 | 0.3 | Limited use of barrier. Planting acts as a pseudo barrier. |
| **Defined access** | 1 | 0.3 | 0.3 | Some defined sand and soil path access to beach. Narrow and overgrown in areas. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.5 | 0.5 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. The 'No lifesaving service' symbol is not contained in AS/NZS 2416.1. |
| **Regulations** | 1 | 0.6 | 0.6 | Site-specific regulations noted. Totems used in addition to defined access aquatic safety signs. Signs are clustered competing for reader attention. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions. Totems used to communicate activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |

| | | | | |
|---|---|---|---|---|
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.16** | |

## 8.43 Wreck Bay

### 8.43.1 Site Observations

Obs 1 – Although access is defined with post and wire fencing, the safety sign is some distance away from the controlled entry point. Consider moving the sign forward.

Obs 2 – Aquatic safety signage at site consistent with the design intention and placement application of AS/NZS 2416, however the 'No Lifesaving Service' symbol should not be used.


Obs 3 – Information signage regarding local birds.


Obs 4 – Presence of an EBAN sign at the beach site under assessment.

Obs 5 – Profile view of Wreck Bay beach with a sandy shoreline, however during lower tides the intertidal rock flats are exposed.

Obs 6 – Small inland waterway running parallel to beach and back dune areas. The waterway periodically inundates the sandy beach face area.

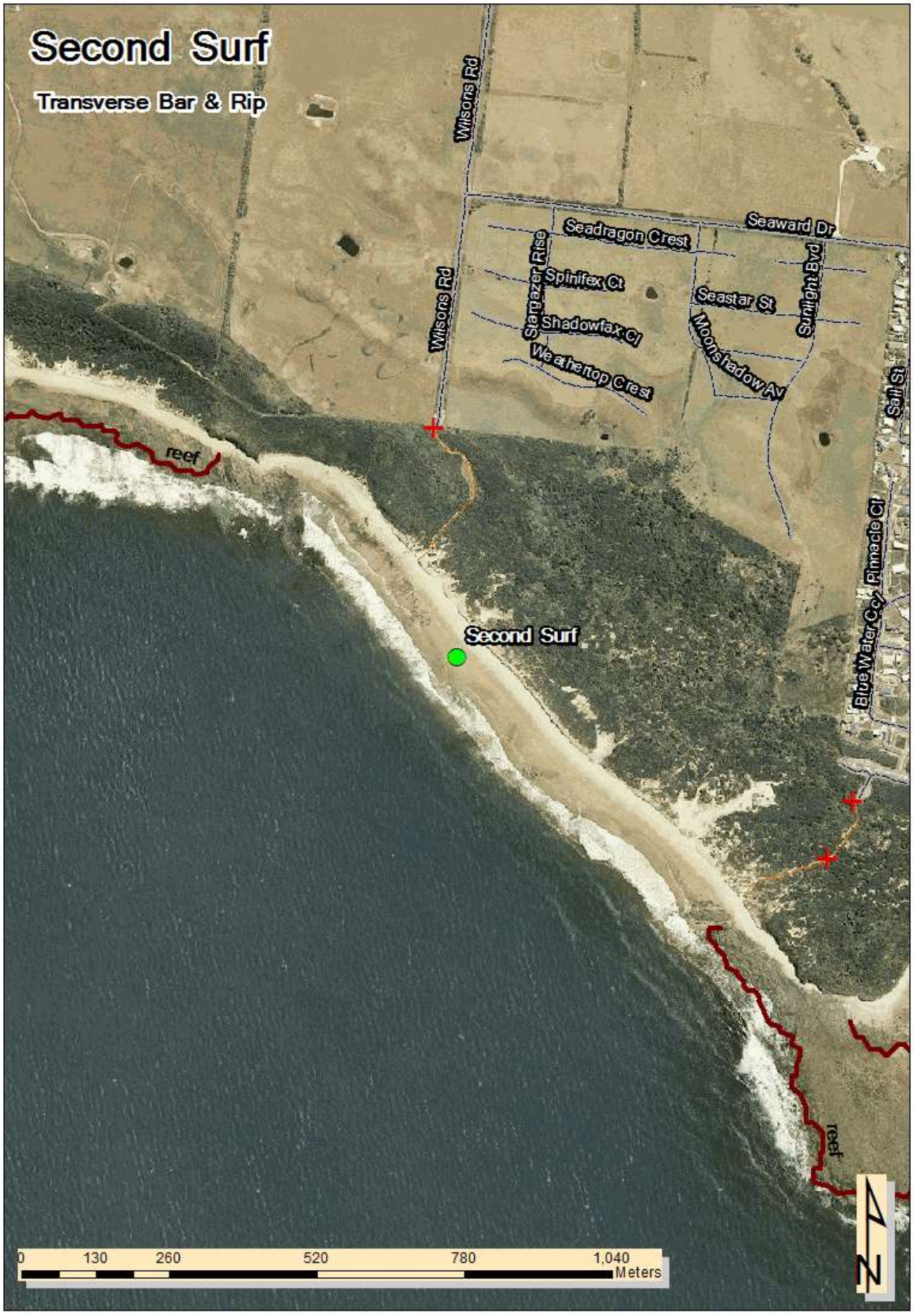
### 8.43.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.3 | 0.15 | 6 | 0.6 | 0.3 | 0.18 | 7 | 0.33 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 6 | 0.45 | 6 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 2 | 0.4 | 0.6 | 0.24 | 5 | 0.54 | 5 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.8 | 0.6 | 0.48 | 1 | 0.8 | 0.6 | 0.48 | 1 | 0.96 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 6 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.02** | | | | **2.48** | | **4.50** | |
| **Control Effectiveness** | | | | | | | | | **0.19** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.63** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present at time of assessment. Review positioning. |
| **On-site education** | 1 | 0.2 | 0.2 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.5 | 0.5 | Barriers used in area. Post and wire fencing used in some areas such as in the car park and water crossings. |
| **Defined access** | 1 | 0.6 | 0.6 | Defined path access to beach and river. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. The 'No lifesaving service' symbol is not contained in AS/NZS 2416.1. |
| **Regulations** | 1 | 0.6 | 0.6 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.19** | |

## 8.44 Second Surf



### 8.44.1 Site Observations

Obs 1 - Car park area provided at the end of Wilsons Road. Alternative access is provided off Surf Beach Road to the south.

Obs 2 – Defined aquatic safety signage at site consistent with the design intention and placement application of AS/NZS 2416. Access is soil based and uneven in areas.

Obs 3 – EBAN marker at Second Surf beach.

Obs 4 – Sandy, moderately steep and uneven access surface onto the beach. There are numerous rocky outcrops along the beach.

Obs 5 – Soil based defined access path leading down to the beach.

Obs 6 – View of one of the rocky outcrop areas at Second Surf beach. These rocky outcrops can influence presence and behaviour of rips.

### 8.44.2 Hazard Summary and Treatment Observations

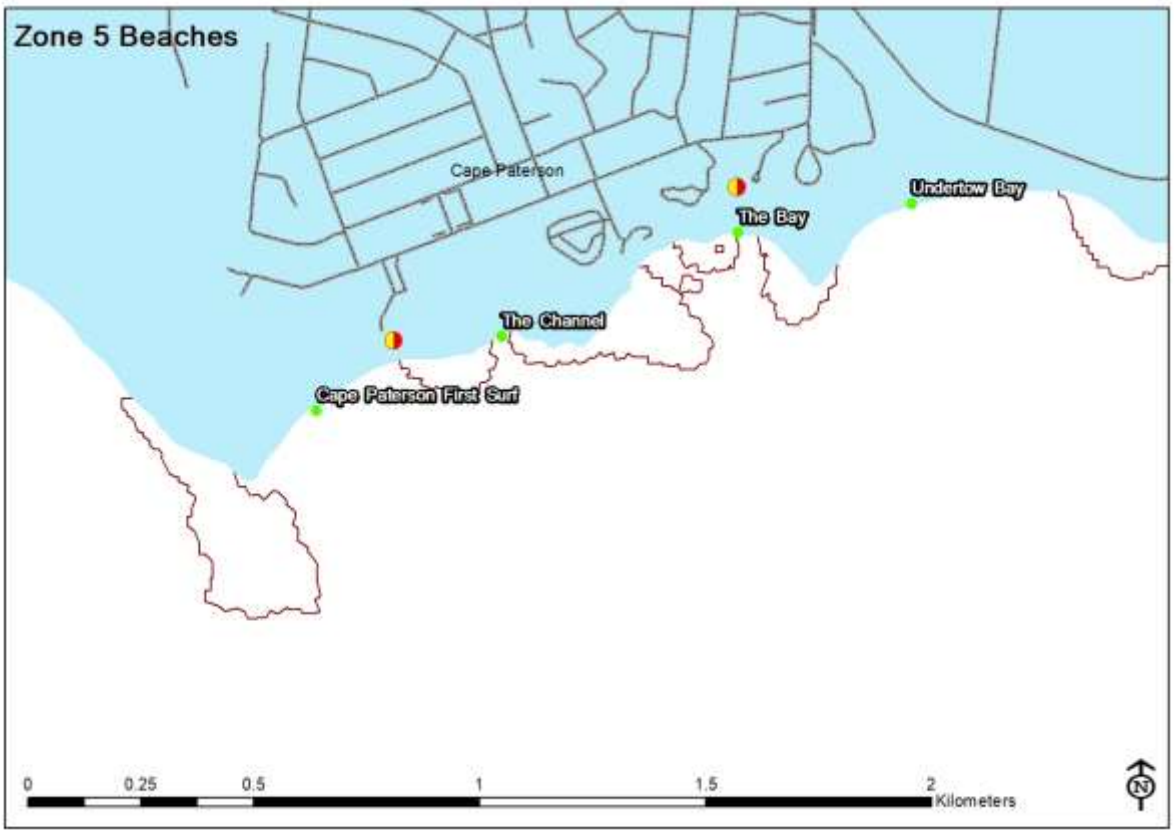
| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.4 | 0.2 | 6 | 0.6 | 0.4 | 0.24 | 5 | 0.44 | 7 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Currents (rips)** | 0.5 | 0.6 | 0.3 | 2 | 0.4 | 0.6 | 0.24 | 5 | 0.54 | 5 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 2 | 0.4 | 0.6 | 0.24 | 5 | 0.54 | 5 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.3 | 0.2 | 0.06 | 8 | 0.3 | 0.2 | 0.06 | 9 | 0.12 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.8 | 0.6 | 0.48 | 1 | 0.8 | 0.6 | 0.48 | 1 | 0.96 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.12** | | | | **2.58** | | **4.70** | |
| **Control Effectiveness** | | | | | | | | | **0.17** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.91** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

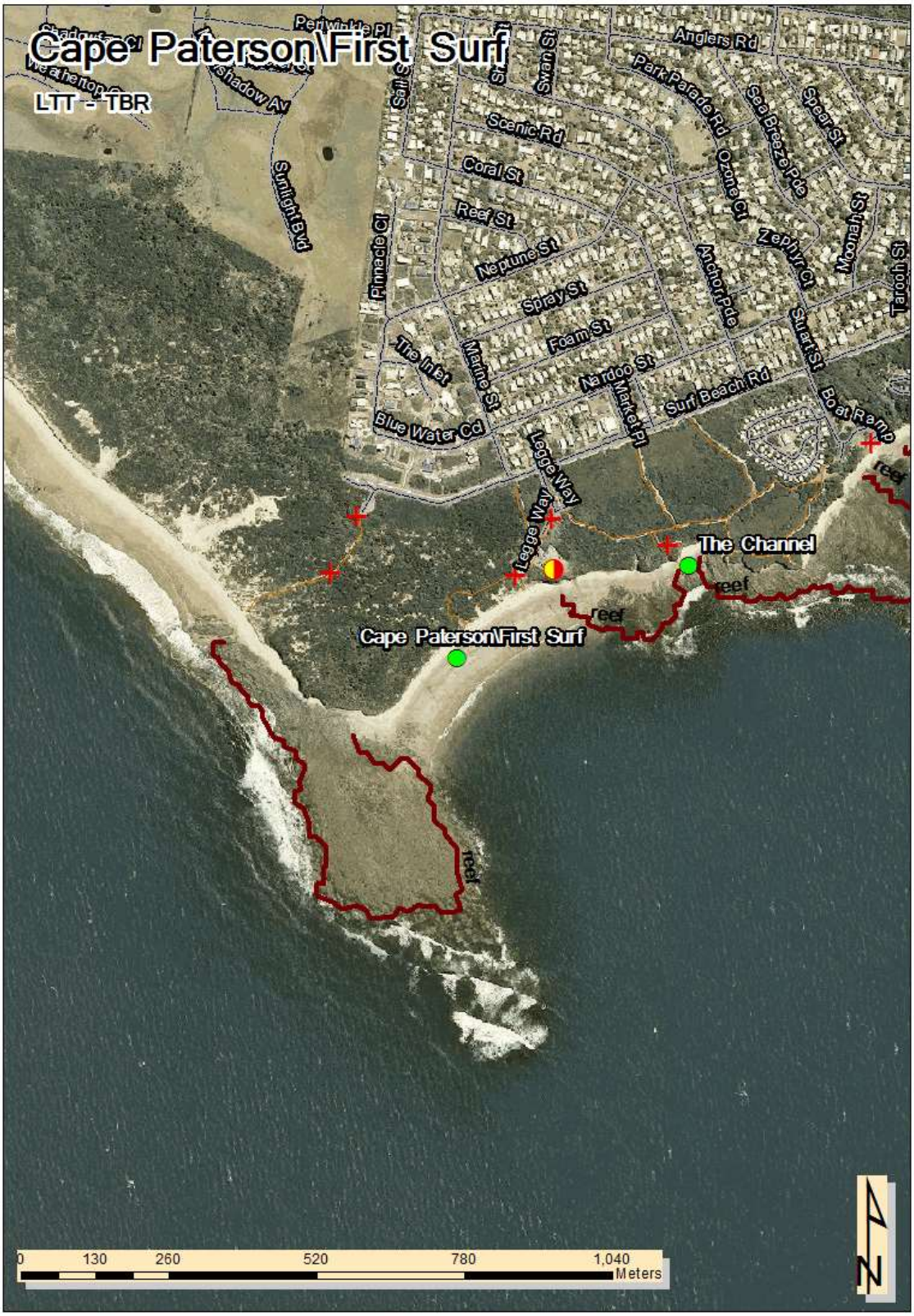
| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present at time of assessment. |
| **On-site education** | 1 | 0.2 | 0.2 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.4 | 0.4 | Limited use of barriers. Planting used as pseudo barriers. |
| **Defined access** | 1 | 0.4 | 0.4 | Defined path access to beach. Some sections are crushed rock/ compacted soil while closer to the beach the terrain is uneven, sloped and sandy. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. The 'No lifesaving service' symbol is not contained in AS/NZS 2416.1. |
| **Regulations** | 1 | 0.6 | 0.6 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Some signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.17** | |

# Zone 5 – Beach Risk Assessment Summary

| Zone profile | Zone 5 |
|---|---|
| Westernmost beach | Cape Paterson (First Surf) |
| Easternmost beach | Undertow Bay |
| Number of beaches | 4 |
| Location | Mainland |
| Common characteristics | Discrete beaches separated by headlands; extensive rock platforms; SSE-facing |
| Common beach types | • LTT/TBR<br>• R |
| Fatal drowning probability (1 or more over 12 months) | 18% |
| Relative risk of a fatal drowning event occurring within a 12-month period | 4.46 |
| Non-fatal drowning probability (1 or more over 12 months) | 9.50% |
| Overall hazard rank | 4 |



## 8.45 Cape Paterson (First Surf)



### 8.45.1 Site Observations

Obs 1 - Public amenities provided at Cape Paterson beach.


Obs 2 – Aquatic safety signage at site consistent with the design intention and placement application of AS/NZS 2416.

Obs 3 – Location of Cape Paterson Surf Life Saving Club.


Obs 4 – Large service sign providing direction to patrol site.

Obs 5 – Lookout platform provided in the backing reserve dune areas at Cape Paterson beach.

Obs 6 - Remedial works to a defined access path at the time of assessment.

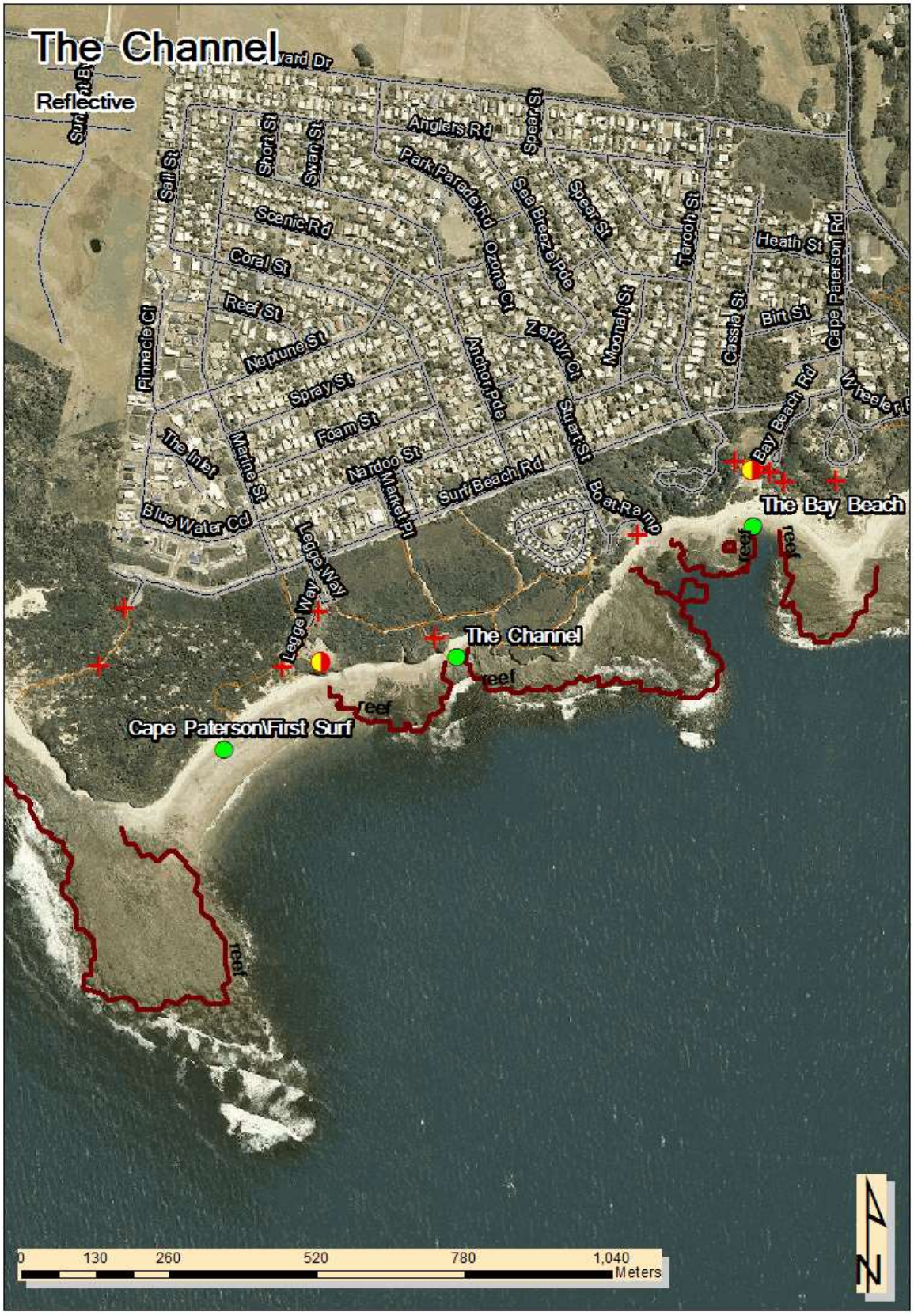
### 8.45.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.4 | 0.24 | 6 | 0.6 | 0.4 | 0.24 | 7 | 0.48 | 8 |
| **Topological and man-made hazards** | 0.6 | 0.3 | 0.18 | 7 | 0.7 | 0.6 | 0.42 | 1 | 0.60 | 4 |
| **Currents (rips)** | 0.6 | 0.5 | 0.3 | 4 | 0.4 | 0.5 | 0.2 | 8 | 0.50 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.6 | 0.36 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.78 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.6 | 0.36 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.78 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.5 | 0.5 | 0.25 | 5 | 0.5 | 0.6 | 0.3 | 6 | 0.55 | 6 |
| **Slippery surfaces and uneven ground (terrain)** | 0.6 | 0.6 | 0.36 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.78 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 5 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.23** | | | | **3.02** | | **5.25** | |
| **Control Effectiveness** | | | | | | | | | **0.48** | |
| **Revised Beach Hazard Score** | | | | | | | | | **2.76** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.6 | 0.6 | Arrival signage directing beach-goers to patrols noted. |
| **On-site education** | 1 | 0.5 | 0.5 | Site is patrolled and serviced with lifeguards. An assumption is made that local education programs are provided formally and informally. |
| **Barriers** | 1 | 0.7 | 0.7 | Barriers provided. |
| **Defined access** | 1 | 0.8 | 0.8 | Good defined access. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.7 | 0.7 | Aquatic safety signage in place at time of assessment. Review viewing distance, placement and sign symbology. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations noted. |
| **Activity management** | 1 | 0.5 | 0.5 | Activities managed by lifesaving club for lifesaving club sanctioned activities and events. |
| **Trained observers** | 1 | 0.5 | 0.5 | Activities managed by lifesaving club for lifesaving club sanctioned activities and events. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision needs not noted at time of assessment. |
| **First aid facilities** | 1 | 0.7 | 0.7 | During lifesaving patrol times and periods. |
| **Lifeguard services** | 1 | 0.8 | 0.8 | During lifesaving patrol times and periods. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Activity restrictions signposted. |
| **Community education** | 1 | 0.5 | 0.5 | During lifesaving patrol times and periods. |
| **Public rescue equipment** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Floatation devices** | 1 | 0.3 | 0.3 | During lifesaving patrol times and periods. |
| | | | **0.48** | |

## 8.46 The Channel



### 8.46.1 Site Observations

Obs 1 - Etched wood signage with individual regulations appended to the sign.

Obs 2 – Aquatic safety sign reflective of the design and application intent of AS/NZS 2416.

Obs 3 – Defined stepped boardwalk access provided to the beach.

Obs 4 – Stepped boardwalk leads onto an uneven and slippery beach entry surface.

Obs 5 – Elevated rocky backing bluffs and headlands at The Channel.

Obs 6 – View of 'The Channel' itself. There are hazards associated with this narrow, seaward-flowing channel.

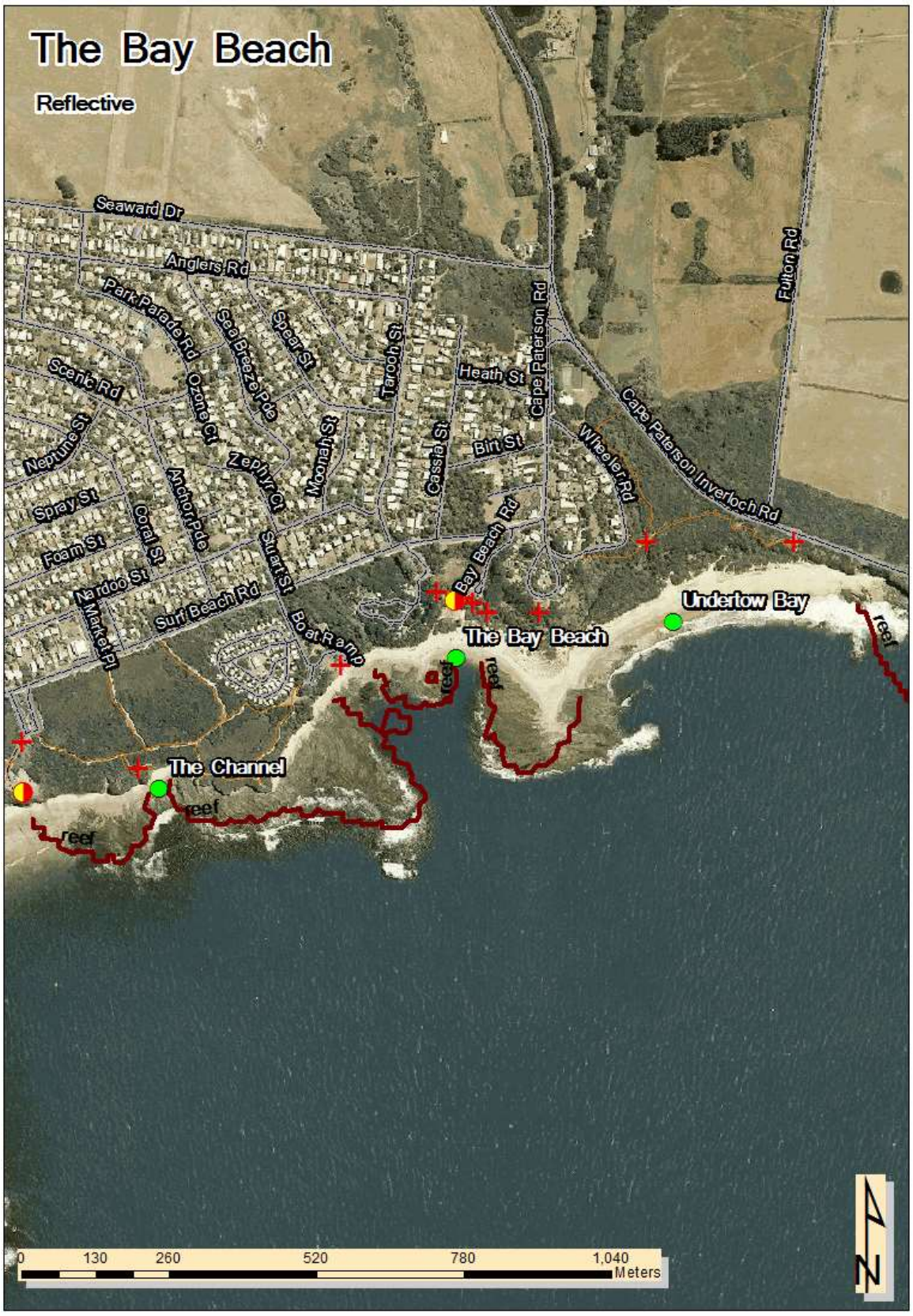
### 8.46.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.5 | 0.4 | 0.2 | 6 | 0.6 | 0.5 | 0.3 | 5 | 0.50 | 6 |
| **Topological and man-made hazards** | 0.6 | 0.5 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Currents (rips)** | 0.5 | 0.5 | 0.25 | 5 | 0.4 | 0.5 | 0.2 | 7 | 0.45 | 7 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.5 | 0.6 | 0.3 | 2 | 0.4 | 0.6 | 0.24 | 6 | 0.54 | 5 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.6 | 0.3 | 2 | 0.6 | 0.6 | 0.36 | 3 | 0.66 | 2 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.2 | 0.2 | 0.04 | 8 | 0.2 | 0.2 | 0.04 | 9 | 0.08 | 9 |
| **Slippery surfaces and uneven ground (terrain)** | 0.8 | 0.6 | 0.48 | 1 | 0.8 | 0.6 | 0.48 | 1 | 0.96 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 7 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 8 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.05** | | | | **2.58** | | **4.63** | |
| **Control Effectiveness** | | | | | | | | | **0.21** | |
| **Revised Beach Hazard Score** | | | | | | | | | **3.65** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.3 | 0.3 | Access signage present at time of assessment. Etched wood and individual symbols appended to arrival signs. |
| **On-site education** | 1 | 0.2 | 0.2 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.6 | 0.6 | Handrails and post barriers used on boardwalks and steps. |
| **Defined access** | 1 | 0.6 | 0.6 | Defined path access to beach noted. Access does however lead onto uneven ground and rocks on the beach. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.7 | 0.7 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.7 | 0.7 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.21** | |

## 8.47 The Bay (Bay Beach)



### 8.47.1 Site Observations

Obs 1 - Aquatic safety sign reflective of the design and application intent of AS/NZS 2416.

Obs 2 – Uneven sandy beach access point across the backing dunes. The site has several small pseudo defined access paths.

Obs 3 – Profile view of the beach with sandy beachface sections and rock platform areas evident.

Obs 4 – While each of these safety signs may have a different communication need, there is lots of information for the reader to digest. The signs may well be competing for reader interest.

Obs 5 – View of the man-made rockpool at The Bay (Bay Beach) beach. While a good concept there are slip, trip and fall hazards associated with activity around this rockpool.

Obs 6 – View of the Wonthaggi Life Saving Club building off Bay Beach Road.

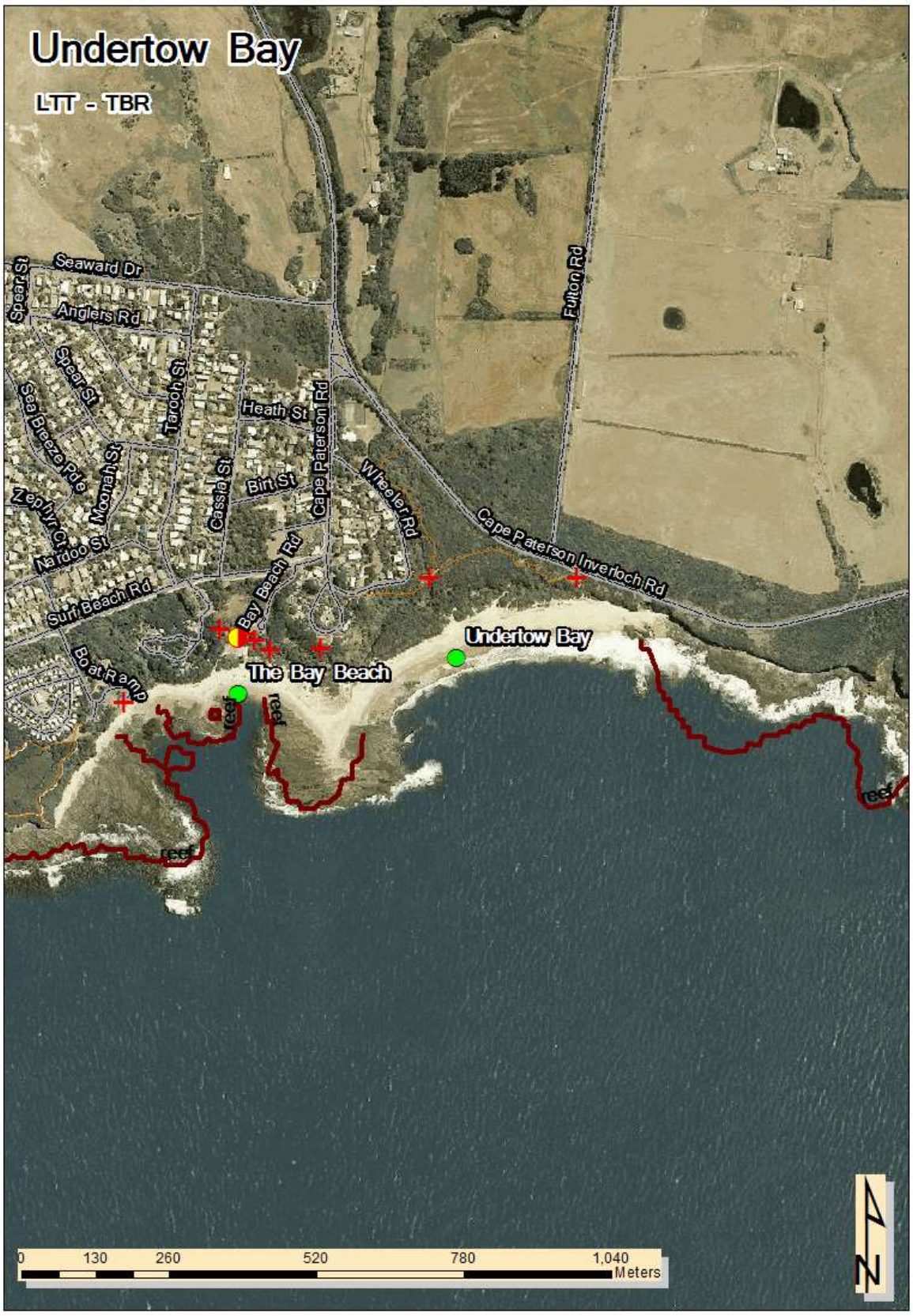
### 8.47.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.5 | 0.3 | 3 | 0.7 | 0.5 | 0.35 | 4 | 0.65 | 3 |
| **Topological and man-made hazards** | 0.7 | 0.6 | 0.42 | 1 | 0.6 | 0.6 | 0.36 | 3 | 0.78 | 2 |
| **Currents (rips)** | 0.6 | 0.4 | 0.24 | 5 | 0.2 | 0.4 | 0.08 | 9 | 0.32 | 8 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.4 | 0.24 | 5 | 0.4 | 0.4 | 0.16 | 7 | 0.40 | 7 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.5 | 0.4 | 0.2 | 7 | 0.8 | 0.4 | 0.32 | 5 | 0.52 | 6 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.5 | 0.5 | 0.25 | 4 | 0.5 | 0.6 | 0.3 | 6 | 0.55 | 5 |
| **Slippery surfaces and uneven ground (terrain)** | 0.5 | 0.7 | 0.35 | 2 | 0.7 | 0.7 | 0.49 | 1 | 0.84 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 2 | 0.57 | 4 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 8 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 9 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.18** | | | | **2.66** | | **4.84** | |
| **Control Effectiveness** | | | | | | | | | **0.48** | |
| **Revised Beach Hazard Score** | | | | | | | | | **2.54** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.6 | 0.6 | Arrival signage directing beach-goers to patrols noted. |
| **On-site education** | 1 | 0.5 | 0.5 | Site is patrolled and serviced with lifeguards. An assumption is made that local education programs are provided formally and informally. |
| **Barriers** | 1 | 0.7 | 0.7 | Barriers provided. |
| **Defined access** | 1 | 0.8 | 0.8 | Good defined access. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.7 | 0.7 | Aquatic safety signage in place at time of assessment. Review viewing distance, placement and sign symbology. |
| **Regulations** | 1 | 0.7 | 0.7 | Regulations noted. |
| **Activity management** | 1 | 0.5 | 0.5 | Activities managed by lifesaving club for lifesaving club sanctioned activities and events. |
| **Trained observers** | 1 | 0.5 | 0.5 | Activities managed by lifesaving club for lifesaving club sanctioned activities and events. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 1 | 0.7 | 0.7 | During lifesaving patrol times and periods. |
| **Lifeguard services** | 1 | 0.8 | 0.8 | During lifesaving patrol times and periods. |
| **Activity restrictions** | 1 | 0.3 | 0.3 | Activity restrictions signposted. |
| **Community education** | 1 | 0.5 | 0.5 | During lifesaving patrol times and periods. |
| **Public rescue equipment** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Floatation devices** | 1 | 0.3 | 0.3 | During lifesaving patrol times and periods. |
| | | | **0.48** | |

## 8.48 Undertow Bay



### 8.48.1 Site Observations

Obs 1 - Aquatic safety sign reflective of the design and application intent of AS/NZS 2416.

Obs 2 – Access path with low hanging branches and an uneven, soft, sandy base.

Obs 3 – Access point onto the initially sandy beachface with intermittent rocky outcrop and platform areas.

Obs 4 – View of the headland with broad rock base at Undertow Bay.

Obs 5 – Symbols on the hazard sign may need to be reviewed in addition to the placement, given the shifting dunes.

Obs 6 – Inland waterway intersecting the beach and discharging at Undertow Bay beach.

### 8.48.2 Hazard Summary and Treatment Observations

| Hazard Category | Fatal or Non-Fatal Event | | | | Injury Event (Varying Injury Consequence) | | | | Outcome | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HC | RHD | IHS | IHR | HC | RHD | IHS | IHR | CHS | CHR |
| **Uncontrolled/ undefined access** | 0.6 | 0.6 | 0.36 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.78 | 1 |
| **Topological and man-made hazards** | 0.6 | 0.3 | 0.18 | 6 | 0.7 | 0.6 | 0.42 | 1 | 0.60 | 5 |
| **Currents (rips)** | 0.6 | 0.6 | 0.36 | 1 | 0.4 | 0.6 | 0.24 | 7 | 0.60 | 5 |
| **Variable intertidal and surf zone depths (deep, shallow, drop off)** | 0.6 | 0.6 | 0.36 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.78 | 1 |
| **Submerged/ intertidal rocks and objects (swash and surf zone)** | 0.6 | 0.6 | 0.36 | 1 | 0.6 | 0.7 | 0.42 | 1 | 0.78 | 1 |
| **Aquatic activity zoning (for example craft and swimming exclusion zones)** | 0.4 | 0.4 | 0.16 | 7 | 0.4 | 0.5 | 0.2 | 8 | 0.36 | 8 |
| **Slippery surfaces and uneven ground (terrain)** | 0.6 | 0.6 | 0.36 | 1 | 0.7 | 0.6 | 0.42 | 1 | 0.78 | 1 |
| **Exposure to sun, heat and cold (land and water)** | 0.3 | 0.5 | 0.15 | 8 | 0.7 | 0.6 | 0.42 | 1 | 0.57 | 7 |
| **Land based animals** | 0 | 0 | 0 | 10 | 0.3 | 0.5 | 0.15 | 9 | 0.15 | 9 |
| **Dangerous aquatic organisms & marine life** | 0.3 | 0.1 | 0.03 | 9 | 0.3 | 0.1 | 0.03 | 10 | 0.06 | 10 |
| **Initial Beach Hazard Score** | | | **2.32** | | | | **3.14** | | **5.46** | |
| **Control Effectiveness** | | | | | | | | | **0.14** | |
| **Revised Beach Hazard Score** | | | | | | | | | **4.68** | |

**Key:** HC = Hazard Contribution; RHD = Relative Hazard Distribution; IHS = Individual Hazard Score; IHR = Individual Hazard Rank; CHS = Composite Hazard Score; CHR = Composite Hazard Rank

| Control Measures | Present? 0 = No 1 = Yes | Effectiveness | Score | Notes |
|---|---|---|---|---|
| **Arrival information** | 1 | 0.2 | 0.2 | Access signage present at time of assessment. |
| **On-site education** | 1 | 0.2 | 0.2 | Limited on-site education permissible using access signs. |
| **Barriers** | 1 | 0.2 | 0.2 | Limited use of barriers, with open access along foreshore. |
| **Defined access** | 1 | 0.3 | 0.3 | Network of dune paths that are steep and nondescript. Defined access leading from caravan park. |
| **Aquatic safety signage as per AS/NZS 2416 Standard** | 1 | 0.6 | 0.6 | Some signage consistent with elements of AS/NZS 2416. Review sign content, size and placement. |
| **Regulations** | 1 | 0.6 | 0.6 | Site-specific regulations noted. |
| **Activity management** | 0 | 0 | 0 | Not noted at time of assessment. |
| **Trained observers** | 0 | 0 | 0 | Beyond signposted regulations no trained observers noted at the time of assessment. |
| **Parental/ carer supervision** | 0 | 0 | 0 | Parental/ carer supervision not noted at the time of assessment. |
| **First aid facilities** | 0 | 0 | 0 | No site-specific first aid facilities noted at the time of assessment. |
| **Lifeguard services** | 0 | 0 | 0 | No site-specific lifeguard/ supervision services noted at the time of assessment. |
| **Activity restrictions** | 1 | 0.2 | 0.2 | Signposted activity restrictions. |
| **Community education** | 0 | 0 | 0 | No site-specific community education programs noted at site at time of assessment. |
| **Public rescue equipment** | 0 | 0 | 0 | No public rescue equipment noted at site at time of assessment. |
| **Floatation devices** | 0 | 0 | 0 | No floatation devices noted at site at time of assessment. |
| | | | **0.14** | |

# 9 Recommended Action

The recommended treatment options provided here are based on expert opinion and international best practice outlined in the *Drowning Prevention Strategies: A framework to reduce drowning deaths in the aquatic environment for nations/ regions engaged in lifesaving* (ILS, 2015). Given that the recommendations are provided as aggregated recommendations specific to most beach locations within each Zone, land managers should endeavour to adopt the most appropriate hazard treatments specific to the organisational capabilities and in consultation with relevant stakeholders – including other land managers. Treatment options that are selected and implemented strategically and uniformly by all land managers are likely to be more effective.

One key risk treatment strategy proposed for all sites is signage and this report strongly recommends a Shire-wide uniform signage strategy. Used on public land specific to aquatic recreation drowning and injury event minimisation; it should be implemented in a coordinated and consistent manner. One way to ensure consistency is to implement signage using a baseline standard or framework. The AS/NZS 2416 – *Water safety signs and beach safety flags* Standard is considered the baseline reference document specific to aquatic safety signs.

The current approach to signage within the BCS is not consistent. There are sections of the BCS coastline without signage, and where there is signage in place, its application is not always consistent with the design intentions of the AS/NZS 2416 Standard. Often, several important sign elements are not consistent within immediate or adjacent areas. This includes aspects such as colours, use of non-standard symbols and variation in design of the same symbol.

The basis for all sign design, sizing and placement decisions should be based on a clear and concise communication objective. It would be advantageous for all BCS land managers to agree on a LGA-wide communication objective first and foremost, then develop subset objectives and design requirements for smaller areas or individual beaches. This would facilitate development of a hierarchical signage approach for the whole BCS that then offers land managers flexibility in installing site specific signage consistent with the wider application objective.

Finally, it is recommended that the land managers within BCS commit to a systematic monitoring and review process. Continuous monitoring and review of hazards ensures that new hazards are detected and managed and linked to modification or maintenance of existing action plans. Ongoing reporting will communicate the activities and outcomes, provide information to inform decision-making, improve risk management activities and facilitate interaction with stakeholders.

Table 9-1 below outlines the recommended treatment options for BCS beaches by factor and assessment Zone. For each application (e.g. School education, Electronic & digital media, Leaflets/ brochures) and each Zone, a treatment score is provided. The treatment scores range from 0 to 1 and are assigned according to the following criteria:

- A score of 0 indicates that a control measure application is not suitable for that Zone.
- A score of 0.25 or 0.5 provides indication of a conditionally suitable control measure application for that Zone or beaches within a Zone. It may be conditional based on

requiring other control measures to be implemented concurrently or prior to the adoption of the suggested control measure.
An example of 'conditional suitability' is on-site education applications such as public address and/or face-to-face messaging. These on-site education measures require trained personnel such as lifesavers/ lifeguards and/or park rangers to be on-site to deliver the on-site messaging/ education.

- A score of 1 suggests that the control measure application is already in place or should be adopted. It is not a mandatory action; however, land managers should consider the measure given resourcing capacities and relationships with other vested parties that can help implement the control measure. Where control measure applications are already in place, the land manager, under a risk management philosophy, should monitor and review these controls at least annually. From time to time amendments to existing control measure and application may be needed. Other times control measures may need to be abandoned altogether and/or substituted with other or combination of other control measures and applications.

**Table 9-1 – Recommended treatment options for BCS beaches by factor and assessment zone**

| Factor One: Lack of knowledge, disregard for or misunderstanding of the hazard<br>Counter Measure: Educate and inform | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Control Measures** | **Applications** | **Zone 1** | **Zone 2** | **Zone 3** | **Zone 4** | **Zone 5** | **Frequency** | **Notes** |
| **Community education** | School education | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Not recommended for higher wave energy beaches. Programs could be conducted at beaches abutting Western Port Bay or at those beaches protected by headlands and land masses. |
| | Electronic & digital media | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Currently in place with BeachSafe App. |
| | Leaflets/ brochures | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | Lifesaving sites are in best position to hand out flyers and explain content and take questions. |
| | Awareness programs | 1 | 1 | 1 | 1 | 1 | **5** | BCS/ state-wide education programs. |
| **Arrival information** | Information signage | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Needs to be standardised and/ or at least localised in its consistency. |
| **On-site education** | Public address systems | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | Could be utilised at lifesaving service sites. |
| | Face-to-face | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | Lifesaving sites are in the best position to hand out flyers and explain content and take questions. Could present an opportunity for PV or PINP Rangers to provide localised hazard warnings. |

| Factor Two: Uninformed or unrestricted access to the hazard<br>Counter Measure: Provide warning and deny access | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Control Measures** | **Applications** | **Zone 1** | **Zone 2** | **Zone 3** | **Zone 4** | **Zone 5** | **Frequency** | **Notes** |
| **Barriers** | Access barriers | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Barriers are useful where vehicle access to beaches is required. Several sites already use barriers to restrict beach access. |
| | Booms | 0 | 0 | 0 | 0 | 0 | **0** | |
| | Buoy lines | 0 | 0 | 0 | 0 | 0 | **0** | |
| **Signage** | Information signage | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Ideally be standardised into a composite sign design. Signs can be designed to incorporate land manager branding and information needs. |
| | Warning signage | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Ideally be standardised into a composite sign design. Signs can be designed to incorporate land manager branding and information needs. |
| | Prohibition signage | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Ideally be standardised into a composite sign design. Signs can be designed to incorporate land manager branding and information needs. |
| | Flags | 0.25 | 0.5 | 0.5 | 0.25 | 0.5 | **2** | Monitor and review at current lifesaving service sites. Land managers could consider additional lifesaving service sites in the future. |
| **Regulations** | Formal regulatory arrangements | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Land managers to review access and use arrangements with user groups. |
| | Improvement of infrastructure | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Review infrastructure arrangements. Includes amenities, access and barriers. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Recognition of Life Saving Services | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | Promote existing lifesaving service sites. |
| **Activity management** | Group registration | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | More suited where lifesaving services and amenities are in proximity to offer support. |
| | Self-regulation programs | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | More suited where lifesaving services and amenities are in proximity to offer support. |
| | Permit systems | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Land managers should periodically review permit systems specific to land use by various user groups. |

**Factor Three: Lack of supervision or surveillance**

**Counter Measure: Extend lifesaving services**

| Control Measures | Applications | Zone 1 | Zone 2 | Zone 3 | Zone 4 | Zone 5 | Frequency | Notes |
|---|---|---|---|---|---|---|---|---|
| **Trained observers** | Trained activity supervisors | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | More suited to lifesaving service sites with supporting infrastructure. |
| | Coaches & instructors | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | More suited to lifesaving service sites with supporting infrastructure. |
| **Parent/ guardian supervision** | Promotion of importance of parental/ guardian supervision of children in all aquatic environments | 1 | 1 | 1 | 1 | 1 | **5** | All areas should promote supervision in and around aquatic areas. Treatment could be as simple as appending supervision symbol on composite signs. |
| **First aid facilities** | Portable first aid kits | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | More suited at lifesaving service sites. Review current operation and supplies. |
| | Permanent/ fixed facilities | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | More suited at lifesaving service sites. Review current operation and supplies. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lifeguard services** | Paid lifeguards | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | Review existing lifesaving service provisions. |
| | Volunteer lifeguard systems | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | Review existing lifesaving service provisions. |
| | Intermittent (roving) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Consider open beach or roving patrol setup. Should be supported with appropriate water craft and accessibility provisions. |
| | Surveillance | 1 | 1 | 1 | 1 | 1 | **5** | State-wide aerial surveillance already in place. |
| | Full service between flags or open beach | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | Consider open beach or roving patrol setup. Should be support with appropriate water craft. Should be considered given the specifics of each beach in terms of operational support and localised hazards. |
| | After hours call-out | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Review ability to respond to out of hours aquatic emergencies and operational support networks. |
| | Operational support | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Review ability to respond to out of hours aquatic emergencies and operational support networks. |
| **Activity restrictions** | Zoning | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Review zoning in areas with conflicting activities such as swimming and boating. |
| | Beach/ water closures | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Land managers to review ability to close/ restrict beach access. |

**Factor Four: Inability to cope once in difficulty**

**Counter Measure: Increase survival skills**

| Control Measure | Applications | Zone 1 | Zone 2 | Zone 3 | Zone 4 | Zone 5 | Frequency | Notes |
|---|---|---|---|---|---|---|---|---|
| **Community education** | Survival skills | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Not recommended for higher wave energy beaches without supporting lifesaving services. Could incorporate sessions at calmer Western Port Bay abutting beaches. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Self-rescue skills | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Not recommended for higher wave energy beaches without supporting lifesaving services. Could incorporate sessions at calmer Western Port Bay abutting beaches. |
| | Rescue skills | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Not recommended for higher wave energy beaches without supporting lifesaving services. Could incorporate sessions at calmer Western Port Bay abutting beaches. |
| **Emergency communications** | Public telephone/ mobile phone antenna booster kiosks | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Review mobile phone reception at all locations. |
| | Outpost alarms | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Consider use of outpost alarms, especially at rock fishing sites. |
| | Dedicated emergency telephone | 0 | 0 | 0 | 0 | 0 | **0** | Not required. Reinforce use of '000' and referencing local emergency markers or EBAN. |
| | Radios | 0.5 | 0.5 | 0 | 0 | 0.5 | **1.5** | Recommended for lifesaving service sites. |
| **Public rescue equipment** | Lifebuoys | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Review in areas where rock fishing is permissible. |
| | Throw lines | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Review in areas where rock fishing is permissible. |
| | Other extraction equipment and fixtures | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **2.5** | Review in areas where rock fishing is permissible. |
| **Flotation devices** | Lifejackets | 0 | 0.5 | 0.5 | 0.5 | 0.5 | **2** | Reinforce need to use lifejackets along rocky outcrop areas where rock fishing is undertaken. |
| | **Total** | **21.75** | **22.5** | **15.5** | **15.25** | **22.5** | **97.5** | |

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