



# **Davies Creek Safety Sign Plan**

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Cover photo: Davies Creek Falls Lookout. Copyright Tamara Vallance

## Executive Summary

Davies Creek National Park, North Queensland, is easily accessible from Kuranda and Mareeba. It receives a high number of visitors in the warmer months from September to April when the falls are in full flow and people seek the cool clear waterholes. The creek is popular with local people as a swimming location away from stingers and crocodiles found in coastal waters. Domestic and international visitors come to the park all year round to view the spectacular falls. A marked trail at the site leads to two lookouts. There are barrier fences at both of the lookouts, installed for safety reasons. The track then leads to a sandy creek-side day use and swimming area and returns to the car park up a slope dotted with grass trees. Swimming is permitted but not promoted at the Davies Creek Falls site.

Davies Creek has been identified as a high risk site due to one death that is known to have occurred in the falls area, along with several rescues and other injuries. The fatal incident is the only incident that has occurred when a person accessed the creek from the swimming area used by locals and attempted to climb the fall when intoxicated. Apart from this death, all recorded serious incidents have occurred near lookout 2 at the top of the falls. The incidents mostly involve local and other domestic visitors accessing the hazardous site by using informal tracks, going around the handrail or climbing over the barriers at the lookouts. The offenders tend to be younger males engaging in dangerous activities above the falls.

The current signs do not meet Best Practice Principles and recommended improvements are:

- *Updating the danger signs to Public Health and Safety regulatory notices to meet current QPWS Sign Manual standards.*
- *Additional danger signs to be located before the barriers where people enter the high risk area at the top of the falls and by installing access prohibited pictograms where needed to reinforce the message.*
- *Changing the danger sign in the carpark to a warning sign as it is not directly at the site where the hazards and risks are occurring. Two additional warning signs are needed at locations where visitors may miss the sign at the carpark. Include the following messages: Hazards and risks at the lookout and creek area, slippery surfaces, submerged rocks, steep cliff faces, supervise your children at all times.*

This would be complemented by an interpretive sign taking an alternative approach targeting the demographic practising risky behaviour.

New safety signs should be installed following the guidelines in section 5.1.3 of the QPWS Sign Manual.

Evaluation of the effectiveness of the signage is recommended over the next summer period.

# Introduction

## Background to this report

A number of critical incidents (deaths and serious and permanent injuries) have occurred on QPWS-managed land in recent years. Following an inquest into the drowning death of a visitor at Mossman Gorge in 2014, the State Coroner recommended that a committee of stakeholders consider a number of issues, one of which was the 'the information provided to visitors at the centre including the content of that information and how it is delivered; and the signage in the national park' (Queensland Government, 14/07/2014, p.1). Southern Cross University conducted an expert review of QPWS safety signs and the agency's approach to risk management (Weiler et al, 2015). This review identified Best Practice Principles and reviewed current safety signs at three sites where fatalities had occurred, including Mossman Gorge. Although QPWS signs were found to be closely aligned with best practice, some minor changes were made to the sign guidelines as defined in chapter 5 of the QPWS Sign Manual 2016. As many safety signs are unlikely to be compliant with the new standards, a review of critical sites is being undertaken.

Davies Creek National Park (Figure 1), North Queensland, has been identified as a high risk site due to numerous serious incidents and one recent death that have occurred there. This sign plan has been written to review safety signage at Davies Creek in the light of these incidents, to determine consistency with the QPWS Sign Manual and safety sign best practice, and to recommend upgraded and additional signage.

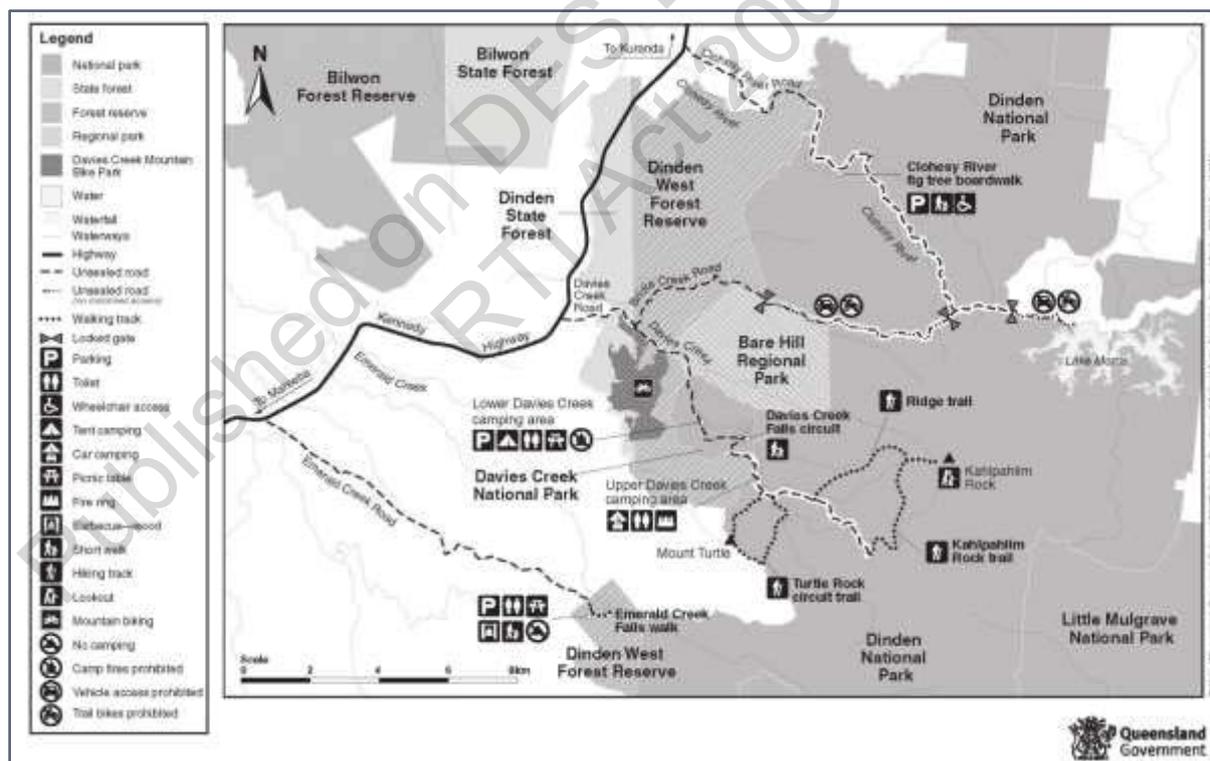


Figure 1: Davies Creek National Park

Source: QPWS

## Davies Creek National Park

Davies Creek National Park is located in Far North Queensland approximately 20km south west of Cairns. The park is located on the Atherton Tableland within the Barron River catchment. It lies within the Einasleigh Uplands and Wet Tropics of Queensland bioregions. It is picturesque with granite outcrops, the Davies Creek Falls and open eucalypt woodland. Davies Creek rises in the Lamb Range and eventually flows into the Barron River. Davies Creek Falls is a magnificent waterfall cascading over huge granite boulders (Photo 1) and is a major feature of this national park.

Camping is available at Lower Davies Creek camping area, and further along Davies Creek Road at Upper Davies Creek camping area in Dinden National Park (Figure 1). Both are e-permit camping areas and all sites must be booked in advance.

A short walking trail leads to the base of Davies Creek Falls (Image 1). This circuit track begins in the car park, 2km past Lower Davies Creek camping area along Davies Creek Road. The marked trail leads to two lookouts. One provides a view back along the valley while the other overlooks Davies Creek Falls as it plunges 75m into the valley below. There are barrier fences at both of the lookouts, installed for safety reasons. Local people often park in a second carpark at Lower Davies Creek and walk up the creek bed to access the falls area.



**Photo 2: A visitor has climbed the barrier at lookout 1 (www.dorje.com, 2016)**

warmers months from September to April when the falls are in full flow and people seek the cool clear waterholes. A large number of international seasonal farm workers in the Mareeba and Kuranda areas also use the area regularly for swimming (these are usually with local people or have



**Photo 1: Davies Creek Falls Lookout. Copyright Tamara Vallance**

From the lookout, the track continues alongside a tranquil section of the creek lined with paperbark trees, pandanus and banksias. The track then leads to a sandy creek-side day use and swimming area and returns to the car park up a slope dotted with grass trees (NPSR website, 2016).

Davies Creek Falls is easily accessible from Kuranda and Mareeba and is popular with local people as a swimming location away from stingers and crocodiles of the coastal waters. Domestic and international visitors come to Davies Creek National Park all year round to view the spectacular falls. The park receives a higher number of visitors in the

been shown the location by local people). The most common seasonal workers are Korean, German, British and French.

## Incidents and Risky Behaviour

Accessible waterfalls in parks are major attractants that draw visitors like moths to a flame. They are heavily publicised by the tourism industry and images are spread on social media/word-of-mouth. Davies Creek Falls has recently been used in a beer advertisement. While the location name is not included, its iconic status will spread throughout social media sites rapidly and visitors will continue to access Davies Falls and seek out those views and opportunities for sharing images and selfies with a wider audience.

Problems at these iconic locations stem from the combination of (i) environmental hazards (sheer cliffs, slippery rocks, fast flowing water, submerged obstacles, changeable conditions); and (ii) behavioural issues (risky behaviours such as jumping/diving; skylarking for peers; and the inexperience or unfamiliarity of visitors with local conditions).

Swimming is permitted but not promoted at the Davies Creek Falls site. Many local people use an unmarked track to the right of the walking track leading to the second lookout. From this unmarked track they access an unofficial swimming area (which we will refer to as the 'locals' swimming spot' near the top of the falls (Image 1). This swimming hole is not marked in any park information, and most other domestic and international tourists do not use this swimming location. They usually walk directly out to the lookouts to see the falls and then continue on from the lookout along the track to a sandy creek-side day use and swimming area (Image 1).



**Image 1: Davies Creek Falls walking track, falls and swimming locations (Source: QPWS)**

One death is known to have occurred in the falls area in the last 10 years, along with several rescues and other injuries. The fatal incident occurred approximately five years ago. A man was swimming and drinking in the locals' swimming area and was thought to be climbing on the falls. A risk assessment was recently carried out at this site and was deemed to be medium to high (the full risk assessment is not included in this report as it was yet to be written up).

Apart from this death, all recorded serious incidents have occurred at the top of the falls area near lookout 2 (Davies Creek Falls Lookout). The incidents mostly involve local and other domestic visitors accessing the top of the falls area and getting into trouble on the cliff face. Access to the top of the falls can be achieved by various means, including walking onto informal tracks, walking around the handrails or climbing over the barriers. It is impractical and impossible to exclude all public access to the top of the falls and much of the area at the top of the falls is safe.

It is thought the main incidents tend to involve younger males aged from their teens to mid-thirties engaging in dangerous activities, including climbing the rocks and skylarking. Anecdotally, young males are more likely to act dangerously near the high risk site, including climbing rock faces, jumping into water from heights and acting up around slippery rocks as a result of being less risk-averse and peer group pressure.

Hazards for visitors to Davies Creek Falls include:

- Slips, trips and falls around rocks/boulders near the falls
- Sheer cliffs
- Shallow, deep or fast-flowing water (depending on the season)
- Jumping or diving into water onto submerged rocks and logs.

There is also a real danger in visitors allowing their children to run ahead on the walking tracks and having them reach the cliff areas and water unsupervised.

Staff do not wish to prohibit swimming across the whole park as there is a long history of use by local people and it would unnecessarily interfere with freedom and enjoyment of the area. There have been no known incidents occurring at the designated day-use area swimming holes. A recent risk assessment of the formal day-use swimming area deemed the site is low risk.

There is very little information provided on the website about the hazards/risks at the falls site and there is no information about swimming safely, apart from the paragraph below:

‘Please enjoy the views from the lookouts but remain behind the barriers at all times—deaths have occurred at this site...From the lookout...the track then leads to a sandy creek-side picnic and swimming area, where platypus may be seen, and returns to the car park up a slope dotted with grass trees.’

There are no park guides for this area and the draft Journey Guide does not address this hazard because this is best addressed onsite.

## Scope and Methodology

Safety signs located at Davies Creek have been reviewed through a desk top exercise, along with photos, maps, reports, risk assessments and incidents related to the site. Local rangers and interpretive staff have also been consulted as part of the review.

Signs have been evaluated against the updated QPWS Sign Manual (2016) and against the Best Practice Principles for safety signs in parks using the four stages of the warning process: ‘notice, encode, comprehend, comply’ (Weiler et al. 2015).

The following documents and information have been considered in preparing this sign plan:

1. NPSR Website information on Davies Creek National Park

2. Social media sites and other travel websites promoting Davies Creek, including Instagram, Tripadvisor and Facebook
3. Findings of Coronial Inquest into death of (6) Personal info July 2014
4. Southern Cross University, A review of safety signage for Queensland Parks and Wildlife Service, June 2015: Report 1—Literature review and Annotated Bibliography citation
5. Crows Nest Safety Sign Review Report, 2015
6. QPWS Sign Manual, 2016
7. NPSR Work Health and Safety Policy, 2012
8. A relevant journal paper ‘ Pete’s story: interpreting the consequences of risk-taking behaviour’ (Applied Environmental Education and Communication, 4:139–150, 2005).

Sign options considered in this review were:

- Orientation signs, which can include safety messages;
- Formal safety signs (Danger signs), which meet internationally recognised standards but are not legally enforceable unless combined with regulatory provisions;
- Regulatory notices, which are legally enforceable and can be used to address safety issues as per section 70 (1) of the *Nature Conservation (Protected Areas Management) Regulation 2006*. (These may be combined with information notices if desired to reduce the amount of text required;
- Interpretive signs : a complementary approach that can present safety messages in a more personal and emotive manner than a formal safety sign and target a specific, at-risk audience; and
- Pictograms, which can be included on other signs or printed as stand-alone signs and placed on site to reassure visitors and should be recognised by children, and English and non-English speaking visitors. These are not enforceable on their own, but can be included on regulatory notices to become enforceable. They are often also used on safety signs.

Different types of signs are appropriate in different landscape settings and for different risk levels. See Table 1 for a complete list of signs considered in this review.

**Table 1: Sign options**

Sign type	Risk		
	High	Med	Low
Orientation sign with safety message			
Complementary interpretation sign			
For your safety sign			
Warning sign			
Danger sign			
Regulatory notice			
Regulatory information notice			
Danger sign including regulatory notice			
Danger sign including regulatory information notice			
Regulatory notice to complement an info notice			
Routed sign (danger or warning or safety)			
Danger totem			
Warning totem			

Pictograms			
Symbols			

## Current Safety Signs and Messages

There are currently three danger signs at this site. The first one is located at the entrance to the walking trail at the car park (see Image 1 and Photo 3). Signs two and three are located directly on site at the lookouts on the barrier fences ( Photo 4 and Photo 5). All three signs are the same design, with the same message, text and images which focus on the risks posed at the falls and lookouts (Photo 6).



Photo 3: Danger sign at car park



Photo 4: Danger sign at lookout 1



Photo 5: Danger sign at lookout 2



Photo 6: Close-up of danger sign

## Assessment of Current Signage

This review finds that the current dangers signs at Davies Creek do not meet Best Practice Principles for safety signs. The danger signs need upgrading to a Public Health and Safety regulatory notice and there are issues associated with the current location of the signs.

### Danger Signs at the Lookouts

The danger signs are located in places where visitors can miss them. Two of the signs are close to the hazards and risks associated with the falls at the lookouts (steep cliff faces, slippery rocks and fast flowing water). However, as people are known to walk around the handrails and use informal tracks

before reaching the barriers, it is recommended that two signs be located at each lookout in locations where people cannot miss them.

At present, a physical safety structure in the form of barrier fencing combined with the danger signs clearly and strongly indicates that people should not enter the area behind the fence, but the problem continues to occur. It is recommended the danger signs be replaced by a Public Health and Safety regulatory notice prohibiting people from crossing or going around the fence. This gives Rangers the ability to fine people if they are found outside the fenced area. Additional standalone access prohibited pictograms can be placed along the barriers or at other problematic locations.

There are issues here that may require further engineering solutions if serious incidents continue to occur at this site, and access to the falls area may be better managed by providing better viewing opportunities of the falls and down the valley. This is outside of the scope of this plan.

### Additional Safety Signs

The third danger sign at the carpark is repeating the messages that are clearly portrayed at the falls site and is not considered necessary here as it is too far away from the hazards. It is also confusing to tell people to remain behind a barrier that they cannot see. Therefore a 'for your safety' sign is recommended to replace the existing Danger sign at the carpark to warn visitors of the hazards ahead.

Risk assessments have been recently carried out at the local's swimming spot and the formal day-use swimming area. There have been no recorded safety incidents at these locations and therefore the risks have deemed to be low (results are currently not available for these risk assessments to include in this report as they are yet to be written up).

The recorded death has been of a person who accessed the bottom of the falls area from the local's swimming hole by following the creek, and then attempted to climb the falls while reportedly intoxicated. This kind of behaviour is unlikely to have been influenced by any type of signage, and is beyond the control of QPWS. Though this incident was fatal, we do not believe that that it needs to be addressed by a separate danger sign. There is a concern that another danger sign with a different message would be confusing and distract from the critical message about remaining behind the barrier. The QPWS Sign Manual states that "Signs should not be used where the degree of risk is normally anticipated and accepted by the park visitor", and this kind of incident appears to be in that category.

However, it is appropriate to install warning signs in locations where the danger signs are not applicable and to cover the risks associated with the swimming areas. Three of these signs are needed to cover all access points, including the carpark, the track intersection to the local's swimming spot and one at the second carpark at Lower Davies Creek. This sign will include multiple safety messages including safe swimming, supervise your children, taking care on slippery rocks, no jumping or diving, and do not mix alcohol with swimming.

### Complementary Interpretive Signs

Best Practice Principles for safety signs are applicable in a wide range of contexts and at a broad level but do not provide for detailed consideration of people-related factors. Some examples of differences among target audiences that may need to be considered in safety signage here include:

- Whether the visitor's behaviour is intentional or unintentional. Persuasive communication is seldom effective on its own for impacting behaviour that is high-risk.

- Whether the visitor is a regular or a first-time visitor. Regular visitors familiar with an area and/or activity are less likely to read signs.
- Cross-cultural factors. They are widely thought to be relevant to risk perception but appear to be not well researched.
- Over-confidence. This has been found to bias individual's risk assessment.
- Males are more likely to engage in high-risk behaviour, and older adolescents appear less risk-averse than younger children and mature adults.
- Those who 'held negative attitudes towards cautionary signs' were more likely to believe signposted high risk areas were not dangerous (Weiler et al 2015,p.20).

A complementary interpretive sign especially targeting the high-risk group (young people aged about 15-35) is recommended to address the issue of people entering the cliff area at the top of the falls. This has been found to be beneficial in locations where danger signs are ignored, especially due to people seeing other people carrying out the dangerous activity. It has been found that when a high number of visitors are doing the wrong thing and engaging in dangerous activities, people's perception of the risk decreases and the activity is seen as acceptable.

Traditional danger signs may not deter all people from engaging in dangerous activities so it has been recommended that a more emotive interpretation sign be developed specifically for this site to reinforce the take home message of 'Is that risk really worth it?—Lives have been lost and people like you have been seriously injured here—Return home safe' and try and change the behaviour of risk taking at this site.

Another idea is installing a sign highlighting the potential cost of climbing over the barrier – something along the lines of 'Is that photo/selfie really worth the cost?' (both physically and financially). An example is provided in Table 2 below. Interpretive signs can present the message in a more personal and emotive manner than a safety sign and target a specific, at-risk audience (QPWS, Sign Plan, 2016 p. 162). The style, design and text for these interpretive signs will be developed specifically for this site at a later date.

While some of the issues associated with this site can be addressed with signs, there is also the problem of risk taking behaviour. Awareness does not necessarily result in preventative behavioural action being adopted. There are factors that determine visitor response that will continue to thwart all efforts of control. Consequently, there is no guarantee that a visitor will heed or act on the information provided. Therefore engineering and design decisions may need to be implemented to better address the problem of cognitive dissonance and risk taking activities and to physically prevent people from accessing this high risk site if incidents occur in the future.

See Table 2 below for recommended sign updates and page 16 for text outline.

## Safety Sign Recommendations

Recommended changes to safety signage at Davies Creek are summarised in Table 2 and sign details including design and text suggestions are outlined on page 16.

**Table 2: Sign recommendations**

Priority	Sign	Action	Location/siting
1	<p><b>Stand Alone Public Health and Safety Regulatory Notice Si1712</b> Current sign:</p>  <p>New sign example only:</p> 	<p><b>REPLACE</b> existing signs with <b>Public Health and Safety Regulatory Notice combined with danger message</b> (600x400mm) (4 copies needed)</p> <p>Under the NCA act, a Public Health and Safety regulatory notice can be erected in a location easily visible to passers-by (QPWS Sign Manual, Section 4.1 2016)</p> <ul style="list-style-type: none"> <li>Develop approved text</li> </ul> <p>See <a href="#">sign #1</a> below for suggested text</p>	<p>Two signs are to be placed on the barriers at each lookout. The additional signs need to be sited in locations where visitors will pass them prior to reaching the barrier fences or so they see them before attempting to access the no-go area at the top of the falls.</p> <p>Need to ensure they are positioned facing oncoming foot traffic for maximum exposure.</p> <p>Sign at carpark should be replaced with 'for your safety' sign.</p>
1	<p><b>Warning to replace existing danger sign in carpark (below) and needed 2 new locations</b> Current sign:</p>	<p><b>PRINT and REPLACE</b> with text changes and <b>2 ADDITIONAL NEW SIGNS</b> (3 copies in total needed) 600x400mm</p> <p>Revise wording and style in line with latest Sign Manual 2016:</p> <ul style="list-style-type: none"> <li>Use warning symbols</li> </ul>	<p>Locate where the current danger sign is in the Davies Creek carpark.</p> <p>The second sign is to go at the intersection off the main track to the falls at Davies Creek where the informal track leads to the local's swimming spot.</p>

	 <p>New sign example only:</p>  <p><small>SI1398—This 750 x 500mm sign warns of a number of specific hazards in a single location and includes a general safety symbol to illustrate desired behaviour.</small></p>	<ul style="list-style-type: none"> <li>• Include safety messages</li> <li>• Include intended behavioral response.</li> </ul> <p>See <a href="#">sign# 2</a> below for suggested text.</p>	<p>The third sign is to go somewhere near the second carpark at Lower Davies Creek where people will pass it when they walk up the creek to access the falls area.</p> <p>Ensure they are positioned facing oncoming foot traffic for maximum exposure.</p>
1		<p><b>ACCESS PROHIBITED PICTOGRAMS (250X250MM) (2 required)</b></p>  <p>PF63 Access prohibited</p>	<p>Use throughout the site where people are climbing around the handrail and along barriers or where informal access tracks are located.</p>
2	<p><b>NEW Complementary Interpretive Sign</b></p> <p>Sign example only provided below – new sign to be developed for this site:</p>	<p><b>NEW SIGN</b></p> <p>Adding a complementary interpretive sign has been found to be beneficial in parks where the danger signs are ignored due to the behaviour being displayed.</p>	<p>At the carpark or start of the access track before people get to the site of activity. It needs to be at a location where people are able to stop and view the sign clearly and take on board the message before reaching the site with their mind made up</p>

 <p><b>Swimming? It will cost you.</b></p> <p>Danger frequently patrol this area. Anyone swimming in unpatrolled areas may not be seen or rescued in time of danger. Signs at the water's edge show the location of the nearest access point.</p> <p><b>Why restrict access?</b> To protect the environment, the swimming hole is not suitable for swimming and safety.</p> <p><b>Not safe for a swim!</b> Davies Park, like most creeks in the area, provides easy access to the Mackenzie River. The river is shallow, fast flowing and open water.</p> <p>Save yourself an unnecessary visit—keep children.</p>	<p>Text needs to appeal to people engaging in risky behavior at this site. Example text would be 'Is that view really worth it—lives have been lost and people like you have been seriously injured here—return home safe' OR 'Selfie? It will cost you'. This has been found to be beneficial in parks where the danger signs are ignored due to the behaviour being displayed.</p> <p><b>A new sign will be developed specifically for this site, depending on the risks and profile of the visitors that are involved in the incidents.</b></p>	<p>they are already entering the falls.</p>
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RTI Act 2009

## Recommended sign details

### SIGN 1– Danger/ Public Health and Safety Regulatory Notice

Sign example only:



Si1712– This stand alone regulatory notice is a public health and safety regulatory notice. The sign is to be used to which the notice is applicable by programs included in the notice.

<insert heading>

**DANGER** <insert German/Korean/Chinese language>

<insert subheading>

**Stay behind the fence!**

<insert body text>

The fence is here to protect you. Natural hazards outside this fence, including sheer cliffs, slippery rocks and fast flowing water, have caused serious **injuries** and **death**.

Enjoy the beautiful view safely:

- Remain on the formed track.
- Stay behind the fence at all times.

Contravention of a requirement of this notice is an offence under the *Nature Conservation Act 1992*.

Maximum penalty: 50 penalty units.

**On-the-spot fines apply.**

<insert Davies Creek Falls map to the right with area marked to which the sign applies and different YAH reference points>

<insert symbols PF63, SW05 and SW03>



<insert Si#>

Si1712

## SIGN 2 – Warning Sign

Sign example only:



SI1398—This 750 x 500mm sign warns of a number of specific hazards in a single location and includes a general safety symbol to illustrate desired behaviour.

<insert heading>

## Warning <insert German/Korean/Chinese language>

<insert subheading>

This is a natural area and hazards include slippery rocks, cliff-faces, objects submerged in the water, and variable water levels. Supervise children at all times.

<insert body text>

People have been injured and died in this area from unsafe behaviour.

Stay safe:

- Stay on the formed tracks and behind the barriers. Follow all danger signs.
- Do not jump or dive into the water.
- Swimming can be dangerous. Only strong swimmers should enter the water.
- Drinking alcohol here is dangerous.

<INSERT SYMBOLS>



SW05 cliff edge



SW03 slippery rocks



SS01 supervise children

<insert illustration of steep falls>

<insert Si#>

<insert Qld Govt banner>

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RTI Act 2009

## Installation

New safety signs should be installed following the guidelines in section 5.1.3 of the QPWS Sign Manual.

## Other communications

While signs at Davies Creek need to be updated to reflect the new Sign manual standards, pre-visit and other communications (available off-site) enhance the effectiveness of on-site safety signage and also need to be reflecting the same safety messages.

Davies Creek is covered in a new journey guide on the Atherton Tableland and the NPSR website contains some safety messages for this site. Messages across all media need to be consistent, and web or printed materials should include appropriate yellow warning symbols if possible. It is important that information presented through other agencies such as tourism bodies does not present conflicting messages, such as by including photographs of people climbing over the barriers or climbing the rock faces.

The concern is that if visitors arrive at Davies Creek and see others apparently enjoying dangerous activities (such as climbing and skylarking at the falls area) this may negate the danger sign messages.

## Evaluation

It is recommended that visitor response to the safety messages is evaluated over the next summer season, through a combination of observation and interviews. The approach to signage may need to be adjusted depending on the feedback received.

## References

NPSR Website. <http://www.npsr.qld.gov.au/parks/davies-dinden-bare-hill/about.html>  
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# Josephine Falls Safety Sign Plan

**14 June 2016**

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Front cover photo: ©Wet Tropics Management Authority

## Executive Summary

Wooroonooran National Park is a premier visitor attraction and is strongly promoted locally, domestically and internationally. Declared in 1988, the World Heritage area contains some of the oldest surviving rainforests in the world and includes the parts of Australia that on average receive the most rainfall each year (Wikipedia website, 2016). Josephine Falls is located in the middle of the park and attracts approximately 120,000 people per year. Most visitors to the site are overseas visitors and backpackers. The busiest time is in the warmer months outside of the wet season and over the holidays when people come to swim in the clear waters away from the stingers and crocodiles on the coast. It would appear that predominately international males aged 18-35 are the main risk takers when visiting the site. Many serious injuries and deaths have occurred at the Josephine Falls site. The main incidents have been caused by:

- Slipping on rocks
- Falling from heights
- Sliding down rock faces
- Jumping into water onto submerged objects (rocks, logs and debris)
- Strandings and drownings as a result of strong currents and flash flooding.

A formal risk assessment for the site as a whole is not available. However, given the numerous fatalities, regulatory and danger signage is needed at Josephine Falls. Signage aims to reduce the incidence of risk-taking behaviour, specifically jumping and diving into the water, and to warn of the risks involved in swimming in an area that has such rapidly changing water conditions. Existing signage at the site provides sound information but does not meet latest standards, and needs upgrading to reduce duplication of messages over a small area.

Two areas are under review for this plan:

### 1) The Restricted Access Area

Access to the top of the falls and the surrounding area in the upper section of the falls was declared a Restricted Access Area in 1992. There had been numerous fatalities and serious injuries as a result of people climbing over waterfalls and on slippery surfaces in the upper falls area prior to this. Visitors still enter the RAA, and incidents are still occurring in this area.

In terms of safety signage, it is recommended that a regulatory approach remain in place at this location—that access is prohibited at the top of the falls through the use of regulatory notices. Notification of this restriction under a ‘danger’ banner should be included, identifying the natural hazards (slippery rocks, rapidly changing water levels, submerged objects) that pose a high risk to visitors. Additionally, it is recommended that the name ‘top pool’ be removed from all communications, including signs, maps and web pages as tourists see this as a reference to a swimming location. It should be replaced with ‘top of the falls’.

These signs need to be located at the RAA, with the exception being the one sign being at the intersection of the walking track to the permitted swimming area. This sign will be large and used to assist in better orientating visitors so it is clearer where they can and can’t swim. The RAA signs will have updated maps with the RAA and permitted swimming areas clearly marked, along with reference to the access prohibited symbol and individual ‘you are here’ reference points. Smaller danger regulatory notices and stand-alone access prohibited pictograms will then be used in the other locations, including creek bed and informal access points to delineate the RAA boundary.

An additional combined police/Queensland Government sign is also recommended to better enforce the RAA and safety messages at this site.

## 2) Designated Swimming Area

Visitors are allowed to swim in the lower rock pools. Staff do not wish to prohibit swimming at this site as there is a long history of use by local people and it would unnecessarily interfere with freedom and enjoyment of the area. During periods of rainfall or flash flooding, rocks are slippery and swimming is dangerous and can be fatal. Rescues occur throughout the year, as water levels rise frequently while people are in the water or on the other side of the river from the access track.

The duplication of danger signs applicable to the swimming area are to be updated and condensed into one sign addressing all hazards. This is deemed necessary to reduce the number of danger signs visitors are encountering in this location. Over-use of the danger messages can reduce its impact, and visitors are likely to ignore it altogether.

These signs would be reinforced by adding strong safety messages on the orientation sign, simple regulatory notices with pictograms at specific problematic locations, and in time an interpretive sign targeting the people practising risky behaviour.

Evaluation of the effectiveness of the signage is recommended over the next summer period.

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## Introduction

### Background to this Report

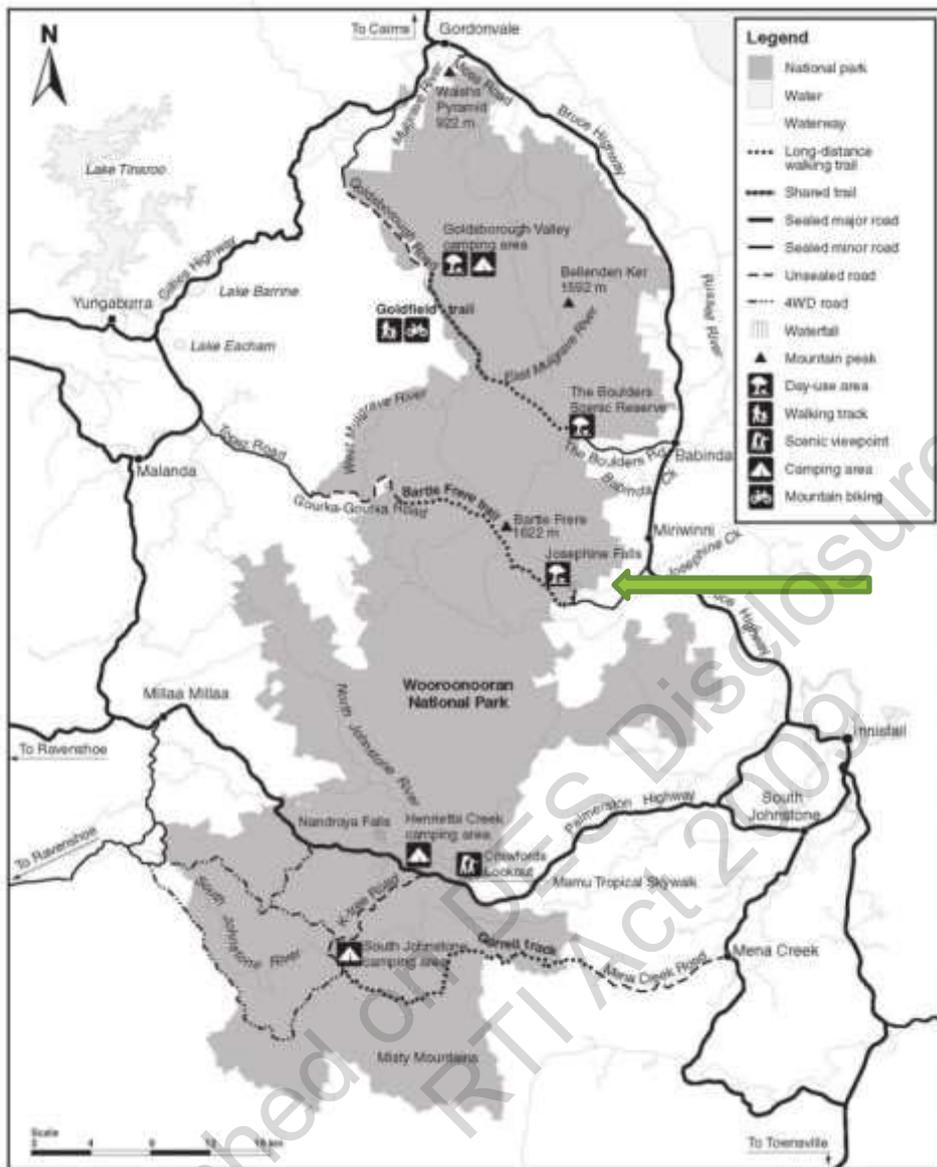
A number of critical incidents (deaths and serious and permanent injuries) have occurred on QPWS-managed land in recent years. Following an inquest into the drowning death of a visitor at Mossman Gorge in 2014, the State Coroner recommended that a committee of stakeholders consider a number of issues, one of which was the 'the information provided to visitors at the centre including the content of that information and how it is delivered; and the signage in the national park' (Queensland Government, 14/07/2014, p.1). Southern Cross University conducted an expert review of QPWS safety signs and the agency's approach to risk management (Weiler et al, 2015). This review identified Best Practice Principles and reviewed current safety signs at three sites where fatalities had occurred, including Mossman Gorge. Although QPWS signs were found to be closely aligned with best practice, some minor changes were made to the sign guidelines as defined in chapter 5 of the QPWS Sign Manual, 2016. As many safety signs are unlikely to be compliant with the new standards, a review of critical sites is being undertaken.

Josephine Falls in Wooroonooran National Park (Figure 1), North Queensland, has been identified as a high risk site due to numerous serious incidents that have occurred there. This sign plan has been written to review safety signage at Josephine Falls in light of these incidents, to determine consistency with the QPWS Sign Manual and safety sign Best Practice Principles, and to recommend upgraded and additional signage.

sch4p4( 6) Personal information

**Photo 1: Josephine Falls. Photo taken from the designated swimming area looking up towards the top of the falls (TripAdvisor website, 2016)**

## Josephine Falls, Wooroonooran NP



**Figure1: Josephine Falls, Wooroonooran National Park (Source: QPWS)**

Josephine Falls is on the eastern edge of the central part of Wooroonooran NP, 75 kilometres south of Cairns and is accessible by conventional vehicle. Josephine Creek starts as a trickle high on the south-east side of the summit of Bartle Frere and ends as a substantial creek flowing into the Russell River. Approximately 7.5 kilometres from the summit of Bartle Frere, the waters of Josephine Creek tumble over granite boulders, forming the picturesque Josephine Falls.

People have long been drawn to the natural beauty of the falls. It is not known whether or how the Noongyanbudda Ngadjon-jii people used Josephine Falls, but early European settlers visited and enjoyed this area, and local people as well as tourists continue to do so today (Photo 1).

A short walk from the car park enables visitors to view Josephine Falls (Figure 2). Josephine Falls walking track (Grade: easy) is 1.2 kilometres return and about 30 minutes walking time. From the car park the track leads through tropical rainforest to viewing decks overlooking Josephine Creek and falls. Viewing platforms offer excellent views and opportunities for photography. Wheelchair access

is available to the viewing platform at the top of the falls. For the more adventurous, Josephine Falls provides a gateway to the Bartle Frere trail (NPSR website 2016).

Wooroonooran National Park is a premier visitor attraction and is strongly promoted locally, domestically and internationally. Most visitors to the site are overseas tourists including many backpackers.

Visitation is approximately 120,000 people per year. The busiest time is in the warmer months and over the holidays when people come to swim in the clear waters away from the stingers and crocodiles present in coastal waters. Most domestic and locals visitors tend not to swim during the coldest months of the year. International tourists tend to swim all year round.

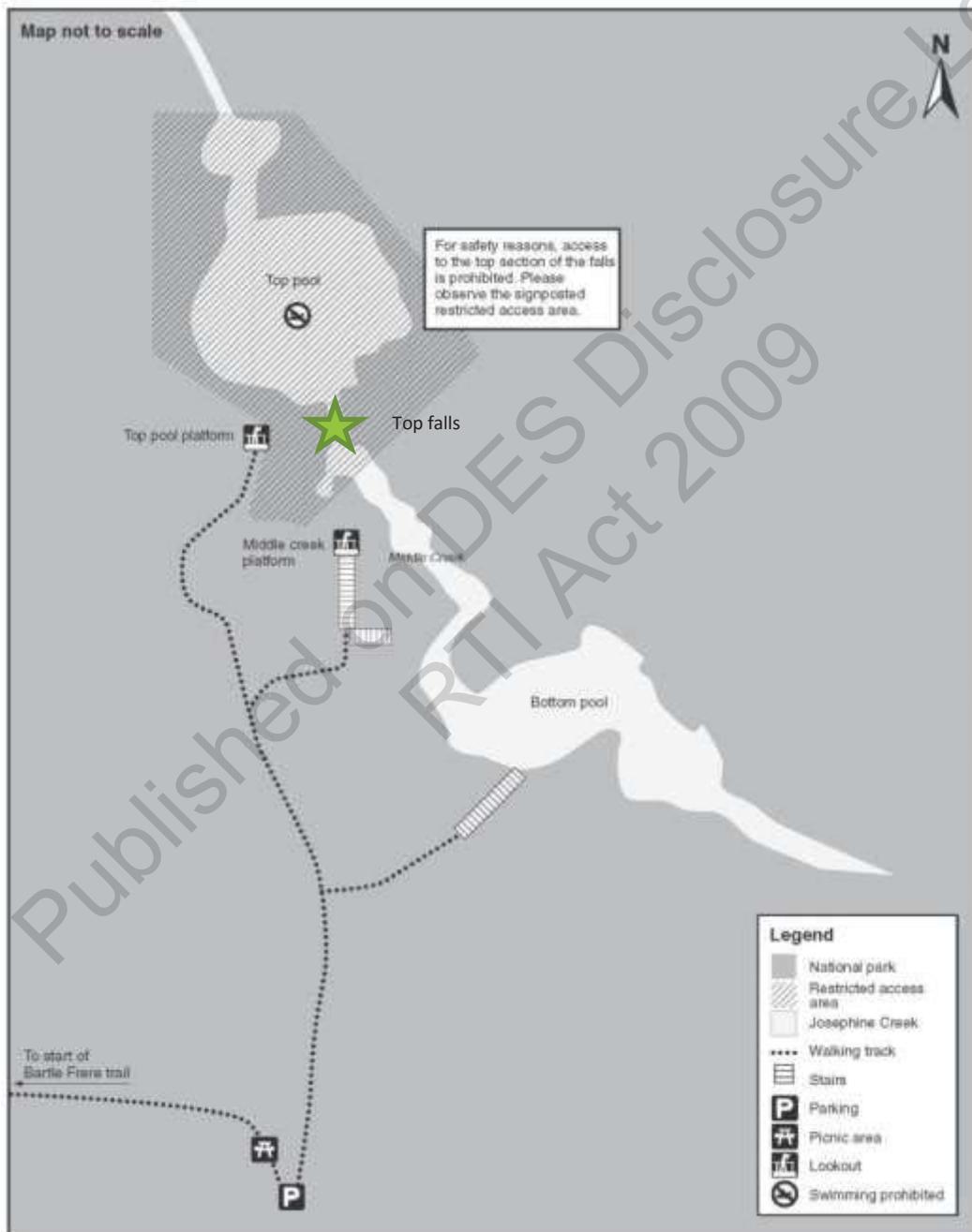


Figure 1: Josephine Falls site and the RAA (Source: QPWS)

## Management of Incidents and Risky Behaviour

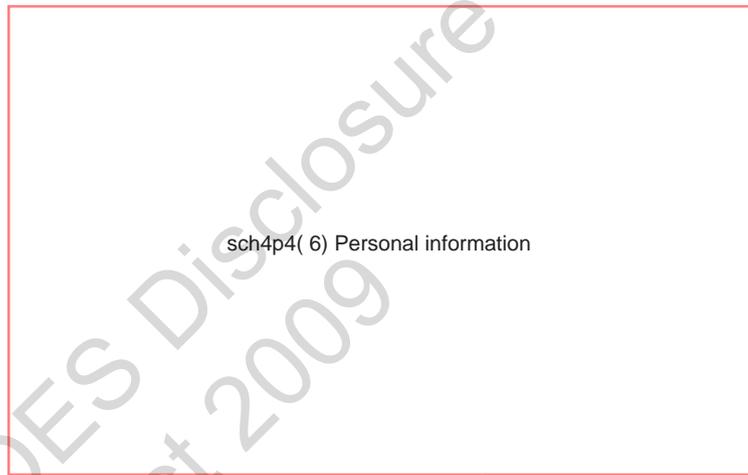
Josephine Falls can be a hazardous place to visit any time of the year due to the river's unpredictable conditions. Regardless of the weather at this site, the river can rise rapidly even if it is sunny, as rain upstream can cause flash flooding. In addition to floods, other hazards include slippery rocks, submerged boulders and debris, and strong currents.

Many serious injuries and deaths have occurred at the Josephine Falls site (Appendix 1). It would appear that international males aged 18-35 are most frequent risk takers. Local people who visit the area regularly and are familiar with the weather and water conditions here are better at judging when it is safe to enter the water.

Incidents have been caused by:

- Slipping on rocks
- Falling from heights
- Sliding down rock faces
- Jumping into water onto submerged objects (rocks, logs and debris)
- Strandings and drownings as a result of strong currents and flash flooding.

Many incidents occur outside the wet season, as the water looks too treacherous when in full flow and people tend not to go swimming. International tourists are more likely to swim all year round as they do not consider the water to be cold.



**Photo 2: The slide located within the RAA (Australphotography blog, 2016)**

A formal risk assessment for the site as a whole is not available. However, given the numerous fatalities, the contractors were advised that the level of risk has been deemed to be high and the safety signage needed to be reviewed.

Staff do not wish to prohibit swimming at this site as there is a long history of use by local people and it would unnecessarily interfere with freedom and enjoyment of the area.

There are two main sites of concern at Josephine Falls:

### 1. Restricted Access Area

The whole area above the rockslide (Photo 2) and as far as the upper falls was declared a Restricted Access Area (RAA) in 1992 (Figure 2). The upper falls area contains sheer cliffs and slippery rocks. At the time, local people opposed the closure as there had been a long history of swimming at this site. There was an intention to include the slide area in the RAA due to the number of incidents occurring here, including head injuries, spinal injuries and near drowning incidents, but this was met with great opposition and this area was excluded.

Current signage and enforcement is believed to have lowered the rate of incidents occurring in the RAA, but incidents still occur. The level of risk is higher in the RAA than in the designated swimming area due to the high cliffs, slippery rocks and weather impacts.

Enforcement is carried out at peak periods to reinforce the safety messages for this site. A combined effort between QPWS and Police is being implemented. Enforcement however is complicated, as international visitors often do not carry identification and may leave the country without paying fines. A strong police presence assists in reinforcing the RAA signs and safety messages for the site, but police and Rangers cannot be present all the time.

## 2. Designated Swimming Area

The lower rock pool area, including the rocky slide above the swimming area, remains a designated swimming area. Water levels can rise quickly here and frequently while people are in the water or on the other side of the river from the access track resulting in strandings. There are often submerged hazards and debris in the water, particularly after heavy rain. The rocks around the waterholes are slippery due to algae that grow in the moist environment.

### Management of Risks

A meeting was held between QPWS, Queensland Fire and Rescue Service (QFRS) and Queensland Police Service (QPS) on 1 July 2014 to improve visitor safety and to determine if any improvements could be made in relation to the management of people becoming injured, stranded or dying at Josephine Falls. The minutes acknowledged the work that had already occurred at the site including:

- dialogue between Agencies
- relevant specific signage, located at numerous locations along the path and at entrances to the water bodies
- formalised pathways reducing multiple entry points to the water
- declaration of a Restricted Access Area (RAA) at a portion of the swimming area
- formalised enclosed (barrier) 'point of arrival': at the Restricted Access Area viewing platform to discourage entry into the water
- increased working relationship and patrols by QPWS and QPS
- management of a QPWS-designated quad bike accessed by QFRS and QPS to assist all in ferrying equipment required to aid in rescue activities
- emergency phone located at the near-by ranger base.

The meeting also noted that all rescues in the last few years have been within a 20m section of the designated swimming area, which includes locations within the RAA. Anecdotal opinions from those present reveal that most rescues and incidents in recent times are of non-local tourists, with very few exceptions. There are two separate issues at this swimming site: (1) Reducing the number of people putting themselves at risk; and (2) Managing the situation once someone is in difficulty and requires rescuing. The discussion notes are provided in Appendix 2.

Many engineering and design mechanisms have been implemented to help manage incidents at this site, including a pool-style gate with a danger sign. This was installed on the access track in 2016, reinforcing the warning to all who open the gate about the risks associated with accessing the creek area and swimming. It is not possible to provide up-to-date warnings about the creek level, as changes can happen rapidly and Rangers cannot always be present to erect such warnings. It is thus necessary to encourage people to take responsibility for themselves and to be aware of both water and weather conditions.

The hazards at this location are consistent with a natural environment and in most cases the incidents were a result of poor judgement or visitors engaging in risky behaviour.

The following information is provided on the QPWS Website:

‘Josephine Falls is an extremely refreshing place to visit—but it is also potentially dangerous. Flash flooding (rapidly rising water) is common during wetter months. Rapid and unpredictable water level rises have isolated people on the far bank requiring their rescue. The rocks are also exceptionally slippery; the water cold and submerged objects may be in the creek. For safety reasons, access to the top section of the falls is prohibited. Please observe the signposted Restricted Access Area. Never jump or dive into water—there may be submerged objects. Leave the water immediately if it changes colour or the water levels rise—these are signs of flash flooding. Take care around steep slopes and rock faces along the track, and at lookouts. Supervise children closely. Stay on the track and take care on uneven surfaces, especially in wet conditions. Protect yourself from the sun. Wear sunscreen, a hat and a long sleeved shirt, even on cloudy days. Treat all water before drinking.’

Josephine Falls is included in the Wet tropics coast Cardwell to Cairns National Parks A Visitor Guide is available on-line), which contains safety messages for both the RAA and the swimming holes. There are no park guides for this area and the draft Journey Guide has a general warning stating ‘Water conditions here are hazardous and unpredictable. Obey all safety signs and swim only in the designated swimming area’.

## Scope and Methodology

Safety signs located at Josephine Falls, Wooroonooran National Park have been reviewed, along with photos, maps, reports, risk assessments and incidents related to the site. Local rangers and interpretive staff have also been consulted as part of the review.

Signs have been evaluated against the updated QPWS Sign Manual (2016) and against the Best Practice Principles for safety signs in parks using the four stages of the warning process: ‘notice, encode, comprehend, comply’ (Weiler et al. 2015).

The following documents and information have been considered in preparing this sign plan:

1. NPSR Website information on Josephine Falls, Wooroonooran National Park
2. Social media sites and other travel websites promoting Josephine Falls, including Instagram, Tripadvisor and Facebook
3. Findings of Coronial Inquest into death of (6) Personal info July 2014
4. Southern Cross University, A review of safety signage for Queensland Parks and Wildlife Service, June 2015: Report 1—Literature review and Annotated Bibliography citation
5. Crows Nest Safety Sign Review Report, 2015
6. QPWS Sign Manual, 2016
7. NPSR Work Health and Safety Policy, 2012
8. Minutes from a meeting held between QPWS, Queensland Fire and Rescue Service (QFRS) and Queensland Police Service (QPS) on 1 July 2014 to improve visitor safety
9. A relevant journal paper ‘Pete’s story: interpreting the consequences of risk-taking behaviour’ (Applied Environmental Education and Communication, 4:139–150, 2005).

Sign options considered in this review were:

- Orientation signs, which can include safety messages;
- Formal safety signs (danger signs), which meet internationally recognised standards but are not legally enforceable unless combined with regulatory provisions;
- Regulatory notices, which are legally enforceable and can be used to address safety issues as per section 70 (1) of the *Nature Conservation (Protected Areas Management) Regulation 2006*. (These may be combined with information notices if desired to reduce the amount of text required;

- Interpretive signs: a complementary approach that can present safety messages in a more personal and emotive manner than a formal safety sign and target a specific, at-risk audience; and
- Pictograms, which can be included on other signs or printed as stand-alone signs and placed on site to reassure visitors and should be recognised by children, and English and non-English speaking visitors. These are not enforceable on their own, but can be included on regulatory notices to become enforceable. They are often also used on safety signs.

Different types of signs are appropriate in different landscape settings and for different risk levels. See Table 1 for a complete list of signs considered in this review.

**Table 1: Sign options**

Sign type	Risk		
	High	Med	Low
Orientation sign with safety message			
Complementary interpretation sign			
For your safety sign			
Warning sign			
Danger sign			
Regulatory notice			
Regulatory information notice			
Danger sign including regulatory notice			
Danger sign including regulatory information notice			
Regulatory notice to complement an info notice			
Routed sign (danger or warning or safety)			
Danger totem			
Warning totem			
Pictograms			
Symbols			

## Current Safety Signs and Messages

Upon entering the car park at Josephine Falls, visitors are orientated by routed signs directing them to the entrance of the Josephine Falls walk. At the start of the walk a shelter displaying three interpretive signs gives visitors an introduction to the site, including the natural and cultural values of the park, recreational opportunities, and a map with the walking track and facilities labelled. This map includes the Restricted Access Area highlighted over the 'top pool' of the falls. There are additional directional signs at this site, and all signs and maps label the area at the top of the falls the 'top pool'.

There are a total of 12 danger signs at Josephine Falls (see Figure 3 and corresponding photos below).



Figure 2: Sign locations at Josephine Falls

### Restricted Access Area

There are three identical Restricted Access Area (RAA) notices with the danger heading (750x500mm) at this site. One is located at the start of the walking track (DS01), one at the turn-off to the swimming area at the bottom pool (DS04) and the third one is on the track beside the prohibited area at the top of the falls (DS09). All three signs are the same design, with the same message, text and images.



Photo 3: Restricted Access Area notice (Map location; DS01/DS04/DS09)

Other signs located within the RAA at the top of the falls are the smaller RAA notices currently in two locations (Figure 3, Photos 4 and 5).



Photo 4: Small Restricted Access Area notice (Map location; DS10)

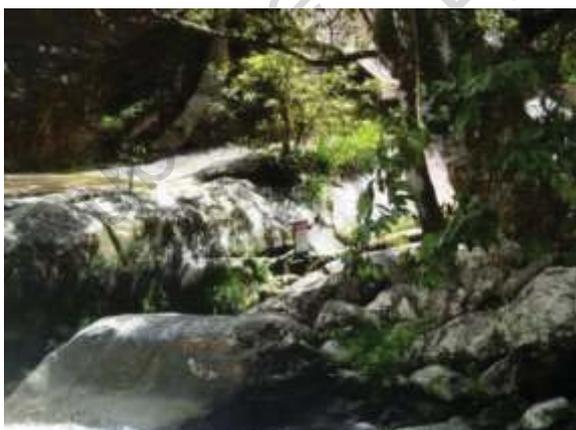


Photo 5: Small Restricted Access Area notice (Map location; DS11)

### Designated Swimming Area

Additional danger signs highlight the risks of natural hazards in the area where swimming is allowed, such as the rapidly rising water levels, slippery rocks and submerged objects. Currently there are two locations of these danger signs where one sign is located directly above the other—the first one being roughly 20 metres after the first RAA sign at the start of the track (DS05/06) and the other

location being the swimming area in the bottom pool (DS05/06; Figure 3 and Photo 6). Another two stand-alone danger signs are further along the track at the swimming area (Photo 7).



Photo 6: Double up of danger signs for natural hazards (Map location; DS02/DS03/DS05/DS06)



Photo 7: Danger sign on its own (Map location; DS07/DS08)

## Assessment of Current Signage

### Restricted Access Area Signs

Overall, the review found that the current RAA notices at Josephine Falls meet some of the Best Practice Principles for safety signs. However, their locations are not appropriate as some are too far away from the actual RAA, which causes confusion. The signs also do not have the 'you are here' reference point and require text updates and size changes in line with the current QPWS Sign Manual, 2016.

The RAA notices are all located in places where they cannot be missed— they are passed when accessing the creek edge at three locations and at the start of the walking track. All RAA signs throughout the park are large (750x500mm) and obvious with sufficient information to inform visitors of the hazards and risks associated with entering the RAA. The 600x400mm size is normally used for a track-side location. It is thought the larger size might have been needed so the map could be read. Recommendation is to use the larger size (750x500mm) for the first two RAA signs at the intersection to the swimming area and at the entrance to the top viewing platform (see Figure locations DS04 and DS09) so visitors can easily orientate themselves with the 'you are here'

reference point and shaded areas delineating the RAA and the permitted swimming area. The remaining sign will be 600x400mm and will be located on the barrier at the top viewing platform in the corner overlooking the falls (replacing the smaller regulatory notice danger sign DS10).

To ensure they are oriented correctly and know exactly where the RAA boundaries are, all RAA signs will be revised to include the 'you are here' point on the map and shading for both the RAA area and the permitted swimming area.

There will be two smaller simple regulatory danger signs located in the creek bed (DS11 and new location to be determined).

Recommendations for the RAA signs include:

- Remove sign DS01 at the start of track and replace with QPS/QPWS enforcement sign (see NS04, Table 2). Message to include:
  - Police patrol this area for your safety
  - Observe all signs and regulations
  - People have been seriously injured and died here.
- DS04 and DS09 sign to be large (750x500mm) to assist visitors in better understanding the boundary between unauthorised and authorised access areas. This will incorporate a map with improved colour/shading of the RAA and permitted swimming areas and the addition of a 'you are here' point.
- A RAA danger sign (600x400mm) will replace the current small regulatory notice at the top viewing platform (DS10).
- It is recommended the 'top pool' be renamed 'top of the falls' so visitors do not think this is a 'swimming pool' when they read the directional signs or maps. This message needs to be changed across all communications, including signs, publications and website material. All signage and communications will now focus on the 'falls viewing platform' and 'top of the falls' rather than the 'top pool'. Remove all reference to 'top pool'.
- Remove routed timber sign referring to 'top pool' and mover lower boards up.
- The RAA footprint for the site needs to be confirmed and the stylised map removed and replaced with map standards from the Sign Manual (similar to the web map in Figure 2).
- Review potential for additional reinforcement of appropriate use of the site/messages within the toilet amenities (e.g. back of toilet door).
- Use signs on the back of toilet doors to provide advice on the \$ value of fines. The RAA signs say the maximum penalty is 80 penalty units which loses impact as it is not converted to a \$ amount. Value of a penalty unit changes annually so back-of-toilet door poster is needed to communicate this.

### Designated Swimming Area Signs

The risk of slips and falls when accessing waterholes, the dangers of jumping in and submerged rocks or objects, and risk of flash flooding are all addressed on danger signs. These messages are currently across two signs, one mounted above the other. One addresses the natural hazards of slippery rocks, submerged objects and changing water levels; the other flash flooding.

At the lower pool there are three danger signs in the one small area—two of these signs are identical. There is a risk that danger signs lose their impact as visitors no longer pay attention to the signs or read the content when they pass so many signs that look so similar. The appropriate visitor behaviour (take extreme care when in or near the water) is appropriately identified, but its power to change the hazardous behaviour is lost due to over-signing in two locations—bottom pool and middle creek.

The danger signs that are located one above the other look unwieldy and are better replaced with a single sign. The other two danger signs addressing the natural hazards that are individually mounted are also located at the designated swimming area. One is located on the pool gate at the entrance to the swimming area. These signs need to be installed in a location so that they can be viewed from all angles upon entry into the swimming area.

Recommendations for the danger signs relating to natural hazards in the swimming area include:

- Remove signs DS02 & DS03 entirely as they are located too far away from the hazards.
- Remove sign DS08 from the pool gate and place on the mounting currently along the fence line (Photo 7 and 8) and block adjacent access with rail so all visitors must enter swimming area through the gate.



Photo 8: Too many signs at the gate entrance and gap next to gate where people walk through.

### Additional Messages

Best Practice Principles for safety signs are applicable in a wide range of contexts and at a broad level but do not provide for detailed consideration of people-related factors. Some examples of differences among target audiences that may need to be considered in safety signage here include (from Weiler et al 2015,p.19):

- Whether the visitor's behaviour is intentional or unintentional. Persuasive communication is seldom effective on its own for impacting behaviour that is high-risk.
- Over-confidence. This has been found to bias individuals' risk assessment.
- Males are more likely to engage in high-risk behaviour, and older adolescents appear less risk-averse than younger children.
- Those who 'held negative attitudes towards cautionary signs' were more likely to believe sign-posted high risk areas were not dangerous.

A complementary interpretive sign especially targeting the high-risk group (men aged about 18-25) is recommended to address the high level of incidents involving this group at this site. This has been found to be beneficial in locations where danger signs are ignored, especially due to people seeing other people carrying out the dangerous activity. It has been found that when a high number of

visitors are doing the wrong thing and engaging in dangerous activities, such as climbing and jumping into the water, people's perception of the risk decreases and the activity is seen as acceptable.

Traditional danger signs may not deter all people from engaging in dangerous activities so it has been recommended that a more emotive interpretation sign be developed to reinforce the take home message of 'lives have been lost and people like you have been seriously injured here—return home safe' and try and change the behaviour of risk taking at the site. Interpretive signs can present the message in a more personal and emotive manner than a safety sign and target a specific, at-risk audience (QPWS, Sign Plan, 2016 p. 162).

In order to reinforce the RAA and safety messages, it is recommended a combined police and QPWS sign with a police banner be installed in the car park or along the track. This would assist in relaying the message that police are often present and may have a stronger meaning, particularly for international visitors.

See Table 2 below for recommended sign updates and page 22 for text outline.

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## Sign Recommendations

Recommended changes to safety signage at Josephine Falls are summarised in Table 2. Sign details including design and text suggestions are outlined on page 22. A regulatory approach combining the use of RAA danger signs and simple regulatory notices with the danger heading are recommended, including:

- Strong wording and a formal appearance is necessary for a regulatory notice where the level of risk has been assessed as 'high'.
- The group of people who are most likely to engage in risky behaviour (young international visitors) are also likely to ignore safety sign warnings, so an ability to enforce the RAA is needed.
- By adding a reference on the full size RAA danger signs to the access prohibited symbols marking the boundary of the RAA, simple regulatory notices and standalone access prohibited pictograms can be placed on site anywhere there is evidence of visitors leaving the formed walking tracks or carrying out the prohibited activity (eg. climbing the rock face).
- Simple regulatory notices signs can then be used at swimming places to indicate RAA boundary—either pictograms on their own OR a simple notice with pictograms and some text indicating RAA boundary and are still enforceable.
- Removal of the reference to the 'top pool' from all signs and maps and replacing it with 'Falls viewing platform' and 'top of the falls' (including the routed directional signs).

It is also recommended to install a combined police/QG sign with the police banner to better identify the police presence at this location. While police and QPWS carry out enforcement here, they are not able to be present all day, every day so this sign will alert tourists that they may turn up any time.

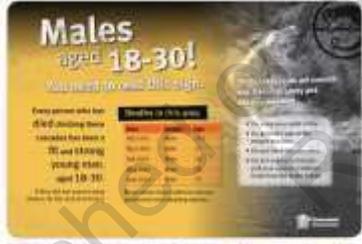
A complementary interpretive sign targeting the high risk group at this site is also recommended. These can be placed at the site of the falls and on toilet doors/walls.

All new safety signs should be installed following the guidelines in section 5.1.3 of the QPWS sign manual. It is recommended that park management units keep good records of safety signs in-situ. Photos should be taken when installed and uploaded onto SAMS database and inspection regimes set to monitor their condition over time.

Table 2: Sign Recommendations

Priority	Current Sign	New Signs	Action / Justification	Location/siting
1	<p><b>Restricted Access Area (RAA) notice</b></p>  <p>(refer to DS01/04/09 on the sign location map above)</p>	<p><b>NS01</b> <b>REPLACE</b> existing signs <b>RAA notice with danger banner (with locations reviewed)</b></p> <p>The stand-alone RAA notices are required as they are used to restrict or prohibit access and give force to the smaller simple regulatory notices and stand-alone access and swimming prohibited pictograms.</p> <p>Under the NCA, a Restricted Access Area is declared by erecting a restricted access area notice in a location easily visible to passers-by. (QPWS Sign Manual, Section 4.8.3 2016)</p>	<p><b>REPRINT SIGN</b> with text changes and resize (3 copies needed all with individual YAH locations) (2@750x500mm, 1@600x400mm)</p> <p>Revise wording and style in line with Sign Manual 2016;</p> <ul style="list-style-type: none"> <li>heading</li> <li>add the access prohibited symbol and related text (this will allow simple regulatory notices and stand-alone symbols to be used on-ground to mark the boundary and show where access is prohibited)</li> <li>add 'you are here' mark to the map</li> <li>update map style</li> <li>add shading to identify where swimming is permitted.</li> </ul> <p><i>See Sign #1 below for suggested text</i></p>	<p>Three identical signs apart from size and 'you are here' point.</p> <ul style="list-style-type: none"> <li>1 at the intersection on the track to swimming area (750x500)</li> <li>1 on track beside the prohibited area on approach to the top viewing platform (750x500)</li> <li>1 at the lookout on the barrier (600x400).</li> </ul> <p>These locations mean signs are in positions where, regardless of which viewing platform or swimming area visitors go to, they will pass at least one sign. The signs are angled correctly beside the walking track so they are clearly visible to oncoming foot traffic.</p>
1	<p><b>Simple Restricted Access Area (RAA) notice</b></p>  <p>(refer to DS10/11 on the sign location map above)</p>	<p><b>NS02</b> <b>REPLACE</b> existing signs <b>Simple RAA notice</b></p> <p>The stand-alone smaller RAA notices can remain in place as they are used to restrict or prohibit access.</p> <p>Under the NCA, a Restricted Access Area is declared by erecting a Restricted Access Area notice in a location easily visible to passers-by. (QPWS Sign Manual, Section 4.8.3, 2016)</p>	<p><b>NEW</b> with text changes (310x500mm)</p> <p>Maintain current size to reuse mountings (2 copies needed)</p> <p>Revise wording and style in line with Sign Manual, 2016 and design as a small RAA Regulatory notice;</p> <ul style="list-style-type: none"> <li>Update heading to read; Unauthorised entry prohibited</li> </ul> <p>(Refer to sign manual Chapter 5)</p>	<p>These current RAA notices are located within the RAA area and not on the boundary. They have been installed to inform visitors that they are within a Restricted Access Area if they have gone beyond the viewing platform.</p> <p>They are an enforceable sign and should be placed in known problem areas.</p> <p>Two small signs to be located in the creek bed for people who attempt to access the RAA by walking up the creek.</p>

			See sign #2 below for suggested text	
1	<p><b>Danger signs</b></p>  <p>(refer to DS02/03/05/06/07/08 on the sign location map above)</p>	<p><b>NS03</b>  <b>REPLACE two DANGER Signs with a single sign covering all hazards</b></p> 	<p><b>NEW</b> with text changes (750x500mm); (4 copies needed)</p> <p>Revise wording and style in line with Best Practice Principles:</p> <ul style="list-style-type: none"> <li>• All hazards/issues have been addressed;</li> <li>• Use yellow and teal triangle warning symbols, not teal, square warning symbols;</li> <li>• Include appropriate safe behaviour;</li> <li>• Remove the wording – ‘Your safety is our concern, but your responsibility’ no longer used on danger signs.</li> </ul> <p>See sign #3 below for suggested text</p>	<p>These signs are to be placed in the same location as they are currently mounted, but mounting will need to be changed at the two sites; the first one being roughly 20 m after the first RAA notice at the start of the track and the other location at the swimming area in the bottom pool. At these two places, the two old danger signs are mounted one above the other. These will need to be removed and replaced with the NEW proposed single danger sign.</p>
1		<p><b>NEW SIGN - Stand-alone Access Prohibited Pictogram</b></p>  <p>Access prohibited</p>	<p><b>PRINT STAND ALONE PICTOGRAMS</b> (250x250mm) (3 copies required)</p> <p>Pictogram only – no text</p>	<p>These can be used in problem areas where there is evidence of shortcutting or people are seen climbing the rock face to access the RAA.</p>
1		<p><b>NS04</b>  <b>NEW SIGN – Combined Police and QG Safety Sign</b></p>	<p><b>NEW sign (1 copy needed) (750x500mm)</b></p> <p>Sign to include:</p> <ul style="list-style-type: none"> <li>• Police blue and white banner</li> <li>• Message to include: <ul style="list-style-type: none"> <li>○ Police patrol this area for your safety</li> </ul> </li> </ul>	<p>Locate near the entrance along the track on the way to the swimming area.</p>

			<ul style="list-style-type: none"> <li>○ Observe all signs and regulations</li> <li>○ People have been seriously injured and died here.</li> </ul> <p>See sign #4 below for suggested text</p>	
3	<b>Interpretive shelter signs</b>	<b>UPDATE</b> existing signs when they need replacing to include new map	In time when these signs need to be replaced, update to include new map design and ensure all safety information is in line with Sign Manual. Ensure sign incorporates the prohibited access and no swimming symbols as these are widely recognised and helpful with international visitors who do not understand English.	The shelter display is positioned well at the entrance of the park at the start of the walking track.
3		<b>NEW Complementary interpretive sign</b> 	<b>NEW SIGN</b> Adding a complementary interpretive sign communicating the story of a victim's family or specifically targeting the at risk target group. This has been found to be beneficial in parks where the danger signs are ignored due to the behaviour being displayed.  It is found that when a high number of visitors are doing the wrong thing and entering the site of the falls, engaging in dangerous activities such as climbing the falls and jumping into the water, people's perception of the risk decreases and the activity is seen as acceptable.	At the site of the falls or at the start of the river boardwalk before people get to the site of activity. It needs to be at a location along the walk where people are able to stop and view the sign clearly and absorb the message before reaching the site.

## Recommendations

### SIGN 1 (NS01)

#### Restricted Access Area Regulatory Notice

Sign example:



<insert heading>

**DANGER** <insert German/Japanese/Chinese language>

<insert subheading>

**Access prohibited. Do not enter.**

<insert body text>

Entry to the top of Josephine Falls and the area shown in red on the map is prohibited without a permit or written approval.

Natural hazards including sheer cliffs, slippery rocks, submerged objects and water of variable depths have caused serious injuries and death.

Access is permitted to the swimming area as shown in blue. Do not climb the rock faces or go beyond markers showing these symbols.

Access to the swimming area is by formal walking track only. Stay on the formal tracks and behind the barrier fences at all times.

Contravention of a requirement of this notice is an offence under the Nature Conservation Act 1992.

Maximum penalty: 80 penalty units.

On-the-spot fines apply.

<insert NEW Josephine Falls RAA map to the right with RAA marked and YAH and blue areas marked for 'permitted swimming zones'>

<insert prohibited access picto PF63 and no swimming PR32>



PF63  
Access prohibited



PR32  
Swimming prohibited

<insert Si#>

SiXXXX

<insert Qld Govt banner>

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## SIGN 2 (NS02) - Simple Restricted Access Area Regulatory Notice

Sign example:



Sign text:

<insert heading>

**DANGER** <insert German/Japanese/Chinese language>

<insert subheading>

**Access prohibited beyond this point. Do not enter!**

<insert symbol PF63 and PR32>



<insert body text>

Serious **injuries** and **deaths** have occurred here.

**On-the-spot fines apply.**

Queensland Government

<insert Si#>

Sixxxx

## SIGN 3 (NS03) - Danger Sign

Sign example:



<insert heading>

# DANGER <insert German/Japanese/Chinese language>

<subheading>

### Slippery rocks, submerged objects and unpredictable water conditions

<insert body text>

Conditions here can change quickly and become dangerous. Water levels can rise rapidly without warning, creating strong currents (flash flooding).

**People have been seriously injured and died here.**

Swim safe:

- Swimming here can be dangerous. Only enter the water if you are an experienced swimmer.
- Do not jump or dive into the creek.
- Take care around the water's edge – rocks can be slippery.
- Supervise children at all times.

<insert yellow and teal WARNING symbols on RHS>



<insert Si#>

Sixxxx

<insert Qld Govt banner>

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## SIGN 4 (NS04) – Combined Police/QG Sign

Sign example:



<insert police banner>

<insert heading>

### Take warnings here seriously.

<subheading>

**Your life might depend on it.**

<body text>

**People have died and been seriously injured here. Swim safely:**

- Keep out of the area at the top of the falls—the area is patrolled by police and rangers.
- Observe all signs and regulations.
- Be aware that creek conditions can change suddenly.
- Take care around the water's edge.
- Supervise children at all times.

<insert police and QG logos>



SW01  
Warning (unspecified)

<insert Si#>

Sixxxx

<insert Qld Govt banner>

## Other Communications

While signs at Josephine Falls need to be updated to reflect the new Sign manual standards, pre-visit and other communications (available off-site) enhance the effectiveness of on-site safety signage and also need to be reflecting the same safety messages.

While brochures are in production for Wooroonooran National Park, the NPSR website contains some limited safety messages for this site. Messages across all media need to be consistent, and web or printed materials should include appropriate yellow warning symbols if possible. It is important that information presented through other agencies such as tourism bodies and backpacker's accommodation do not present conflicting messages, such as by including photographs of people jumping or diving.

The concern is that if visitors arrive at Josephine Falls and see others apparently enjoying dangerous activities (such as climbing and jumping into the waterholes) this may negate the danger sign messages.

The meeting on 1 July 2014 reviewing safety at this site resulted in the following action: 'Annual or biannual discussions with the local backpacker/tourist information places to provide advice to those recommending swimming at Josephine Falls. All Agencies represented advised they would assist. Program to target pre backpacker peak visiting periods.'

Given the main incidents at this site involves international tourists, this approach is highly recommended.

## Evaluation

It is recommended that visitor response to the safety messages is evaluated over the next summer season, through a combination of observation and interviews. The approach to signage may need to be adjusted depending on the feedback received.

## Appendix 1: Incidents at Josephine Falls

Date of Incident	Injury sustained	Cause	Other details
2007	Drowned		Male visitor from Sydney
2008	No injury or damage	Rising water	Person stranded due to rising water
2008	Shoulder injury		German backpacker
2010			Asian male
2012	Back injury	Slipped on rocks	Italian tourist
2013	No injury or damage	Rising water	Two people stranded, they tried to find a way back across further downstream and became lost.
2013	No injury or damage recorded	Slipped on rocks	
2014	No injury or damage recorded		Girl, 15, and two brothers swam across top waterhole in RAA. Brothers swam back and girl was stranded.
2014	No injury or damage recorded	stranded by rising water	
2014	No injury or damage recorded	Slipped on rocks	
2015	Major injury	Slipped on rocks	Male, 44, was getting out of water and slipped on rocks.
2016	Head injury	Slipped on rocks	
2016	Near drowning		Male, born 1981
2016	Injury	Fall	
2016	Missing/drowned	Recently rained.	Male, 22,
2016	Trapped		
2016	Injured	Fell from height	Male fell from height in to water.
2016	Near drowning		Male
2016	Minor head injuries	Fell	Male swimmer
2016	Fatality	Jumped into the water at Josephine Falls and was swept away by the current.	25year old male. The incident was reported to Police and a search involving Police and emergency services was undertaken but failed to locate him. A search & rescue helicopter using night vision and heat sensors also failed to locate

			him.
2016	Major Injury	Slipped on rocks	Larger male was getting out of water and slipped on rocks. He was standing on a rock and went to jump to another one or the bank, slipped and landed on the same rock on his back. He was getting out of the river just above the 'slide'. He was taken to Babinda hospital but later transferred to Cairns base hospital.

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## Appendix 2: Discussion notes from meeting between QPWS, QFRS and QPS on for safety at Josephine Falls 1 July 2014

	Suggestion / Discussion	Comments
1	Review current swimming locations and reasoning.	<p>Agreed that current swimming locations are fine. Confirmed the RAA is helpful in managing safe swimming.</p> <p>Confirmed that those rescued in recent times were in the correct swimming area (e.g. not the RAA) undertaking a permitted activity.</p>
2	Closing the falls at predetermined times of the year e.g. every January, February, March, irrelevant if a wet season occurs or not.	<p>Consulted a rain chart and discussed peak times of rain. QFRS advised that they have rescued people throughout the year, rescues can happen any time of the year. General feeling in the meeting therefore this initiative unlikely to assist.</p>
3	Closing of the falls once a predetermined height has been reached and keeping them closed for a period of time after that point is reached.	<p>Again, rescues occurred throughout the year confirming levels come up regularly and that this initiative would be hard to manage.</p>
4	Colour coded pole in the water indicating safe swimming levels	<p>QFRS informed that in discussing the rescue with stranded people that they were advised that the water levels came up quickly while people were in the water, or on the other side. Therefore a marker indicating 'safe' water levels would not aid those that have been rescued as they are in the water already.</p> <p>In addition participants believed that it was not so much the 'height' of the water but rather the 'rate of the flow' that was the concern. Flow rate would not be captured by a colour coded water marker.</p>
5	Review signage placement and text/icons, including considering adding the Police blue and white banner to signage to make it carry more weight	<p>Current signage believed to be mostly working, as an example; there is the occasional person swimming in the RAA however nowhere near the number that swam there historically.</p> <p>Suggestion put forward to build a pool fence type gate that has the warning signage on it – this reinforcing the warning to all whom open the gate.</p> <p>QPS advised that they would be happy to work with QPWS to determine if the blue and white banner could be included when the signs come up for replacement.</p>
6	Placement of a box of rations, jumpers etc on the opposite side of the creek	<p>This initiative was likely to become vandalised if in the immediate area. QFRS experience indicated that, considering the welfare of the person(s) requiring rescue, it not always a suitable option to send a cold person with no shoes walking into dense forest to locate a box of items. Even then it is still likely that the person would require rescuing.</p>
7	Creation of a track to a helicopter evacuation point	<p>QFRS &amp; QPS explained the difficulty of relying on a helicopter and even then, the difficulty in it being able</p>

		to enact a rescue in the rain (most rescues have occurred in the rain).
8	Creation of a track to enable stranded individuals to walk out safely	<p>This option would require the formalisation of a walking track and for stranded people to walk for a number of hours, and still be required to cross the creek somewhere.</p> <p>Again QPS &amp; QFRS advised that their previous experience indicates that it would not be sound management to promote a potentially cold person without appropriate footwear to attempt walk out, especially late in the day.</p>
9	Erecting a zip line to send 'things' to the other side of the creek	A possible option, however assessing previous rescues it was advised that this option would still necessitate the rescue of individuals.
10	Erecting a zip line to enable physical rescue of individuals	<p>QFRS advised technically difficult for two way travel and would require regular safety and engineering inspections.</p> <p>A quote of between \$30k to \$40k was sourced in 2011 to install a wire cable secure enough for x2 people. Extra funding required to assess the geology of the of the anchor points.</p> <p>Concern also raised on how to keep general public off the wire.</p>
11	Place rated, anchor points in strategic locations on the falls and opposite bank to assist rescue teams with setting up tether lines and ropes to affect a rescue	<p>Could be of assistance still need to work out how it would work and how to get lines over and secure them in place.</p> <p>Like the previous idea, need to confirm geology of anchoring points and would require ongoing engineers inspections to remain usable.</p>
12	Building a bridge over the creek	<p>Easily the most favoured option. Would negate the need for most, if not all rescues.</p> <p>Could be built in a downstream location above 'average' flooding in such a manner that it was an asset for the tourism experience - viewing the falls from mid-stream.</p> <p>Early indicative figures indicate that bridge could be installed for under \$150k. Funding sources and options discussed.</p>
13	Discussions with the local backpacker/tourist information places to provide advice to those recommending swimming at Josephine Falls.	Seen as a very do-able imitative that all parties were happy to enact.
14	Identifying alternative places to swim to reduce need/desire to swim at times of danger	Discussion revealed that no other immediate alternatives exist. Downstream crocodiles have been reported and a permanent Crocodile Warning sign is in place.
15	The need to rescue people at all, with alternative being to wait it out like at road locations	QFRS advised not an option, as it is unknown how long before water flow rates reduce enough for safe swimming back, could be days.
16	Develop an education program to	QFRS suggested this could be investigated further and

	be delivered through schools and local community groups, outlining dangers and outcomes of flooded waterways, creeks etc.	that they would consider adding this to the other topics/programs they already have in place.
17	Placement of sandwich notice boards advising against swimming when rangers observe it is dangerous.	<p>QPWS local staff advised that this practise was trialled however now stopped. It was not possible to be 'on site' every time the water became dangerous.</p> <p>It was learnt that regulars like tour groups were not using their initiative and were using the sandwich boards as approval for entering the water. As an example, the reason given for entering the water when it was dangerous was that there were no sandwich boards out advising the water was dangerous.</p>

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## References

Minutes from the Josephine Falls Safety Discussion, 1 July 2014.

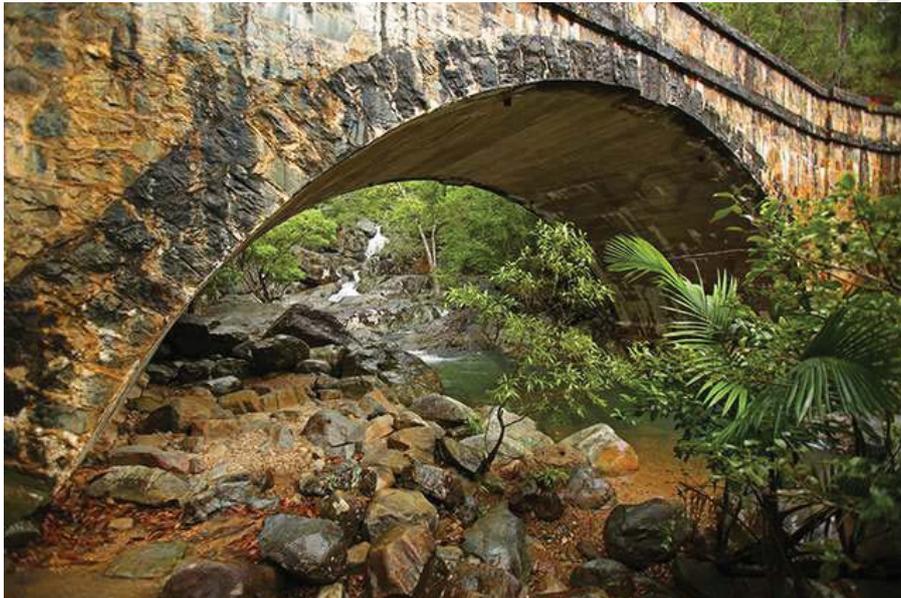
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# Little Crystal Creek Safety Sign Plan

14 June 2016

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## Executive Summary

Both local people and tourists visit Little Crystal Creek, Paluma Range National Park, to enjoy creekside scenery and to swim during the warmer months. Risky behaviour including jumping and diving has been common, especially among young males, and this has resulted in a number of injuries. A recent death occurred at the location: the drowning of an international visitor who could not swim on 22 December 2015.

Safety signage is needed at Little Crystal Creek to reduce the incidence of risk-taking behaviour, specifically jumping and diving into the water, and to warn of the risks involved in swimming. Current safety signage at the site has provided good information but does not meet current standards, and needs to be upgraded to advisory danger signs with appropriate safety messages (taking care near creek edges, watching children and only swimming if visitors are competent). Recommendations about the location and wording of the signs are also included in this review. This would be complemented by strong safety messages on the orientation sign and in time an interpretive sign taking an alternative approach targeting the demographic practising risky behaviour.

Evaluation of the effectiveness of the signage is recommended over the next summer period.

## Introduction

### Background to this report

A number of critical incidents (deaths and serious and permanent injuries) have occurred on QPWS-managed land in recent years. Following an inquest into the drowning death of a visitor at Mossman Gorge in 2014, the State Coroner recommended that a committee of stakeholders consider a number of issues, one of which was the “the information provided to visitors at the centre including the content of that information and how it is delivered; and the signage in the national park” (Queensland Government, 14/07/2014, p.1). Southern Cross University conducted an expert review of QPWS safety signs and the agency’s approach to risk management (Weiler et al, 2015). This review identified best practice principles and reviewed current safety signs at three sites where fatalities had occurred, including Mossman Gorge. Although QPWS signs were found to be closely aligned with best practice, some minor changes were made to the sign guidelines as defined in chapter 5 of the QPWS Sign Manual 2016. As many safety signs are unlikely to be compliant with the new standards, a review of critical sites is being undertaken.

Little Crystal Creek in the Mount Spec section of Paluma Range National Park, North Queensland (Figure 1), has been identified as a high risk site due to a recent death and numerous injuries relating to swimming and diving in the creek. This sign plan has been written to review safety signage at Little Crystal Creek in the light of these incidents, to determine consistency with the QPWS sign manual and safety sign best practice, and to recommend upgraded and additional signage.

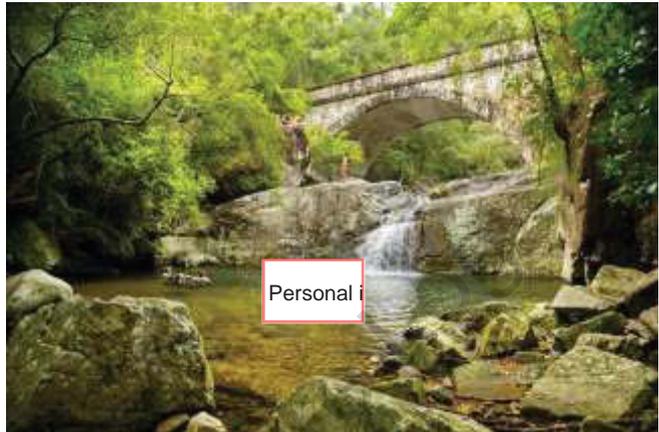


Photo 1: Little Crystal Creek (Owen Wilson Photography website, 2016)

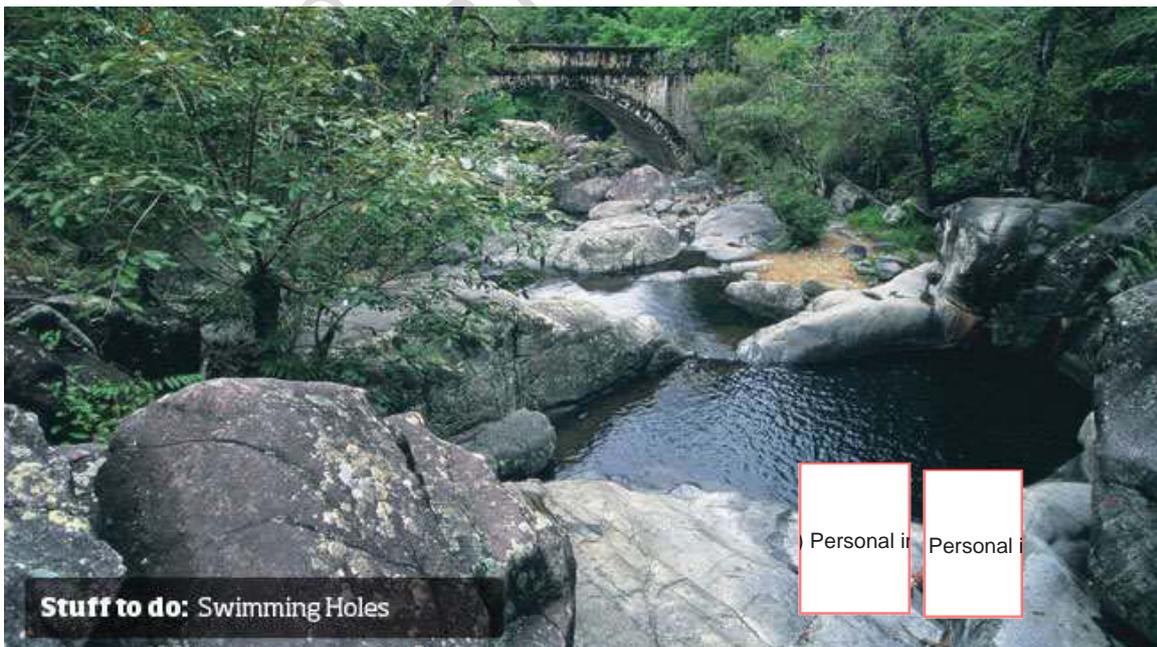


Photo 2: Swimming holes at Little Crystal Creek (Courier Mail website, 14/02/2012)

## Mt Spec section, Paluma Range National Park

Paluma Range National Park is the most southerly national park in the Wet Tropics World Heritage Area and is a highly significant conservation area. The Paluma Range is made up of exposed rock and huge boulders, waterfalls and chasms. An average annual rainfall of almost 3m is received on Paluma National Park. Much of this rain comes from moisture-laden air from the sea cooling as it rises over the range. Mists are common and, in summer, the area is often cloaked in low cloud (NPSR website, 2016). The Mount Spec section straddles the summit and escarpment of the Paluma Range, rising 1000 m above the Big Crystal Creek floodplain. This section is a maze of streams and cascades (Photo 2).

The Mt Spec section is easily accessible from the Pacific Highway, and is within an hour's drive from both Townsville and Ingham. This area provides an opportunity for both local residents and tourists to visit rainforest and waterholes in an undeveloped setting close to Townsville (Figure 1).

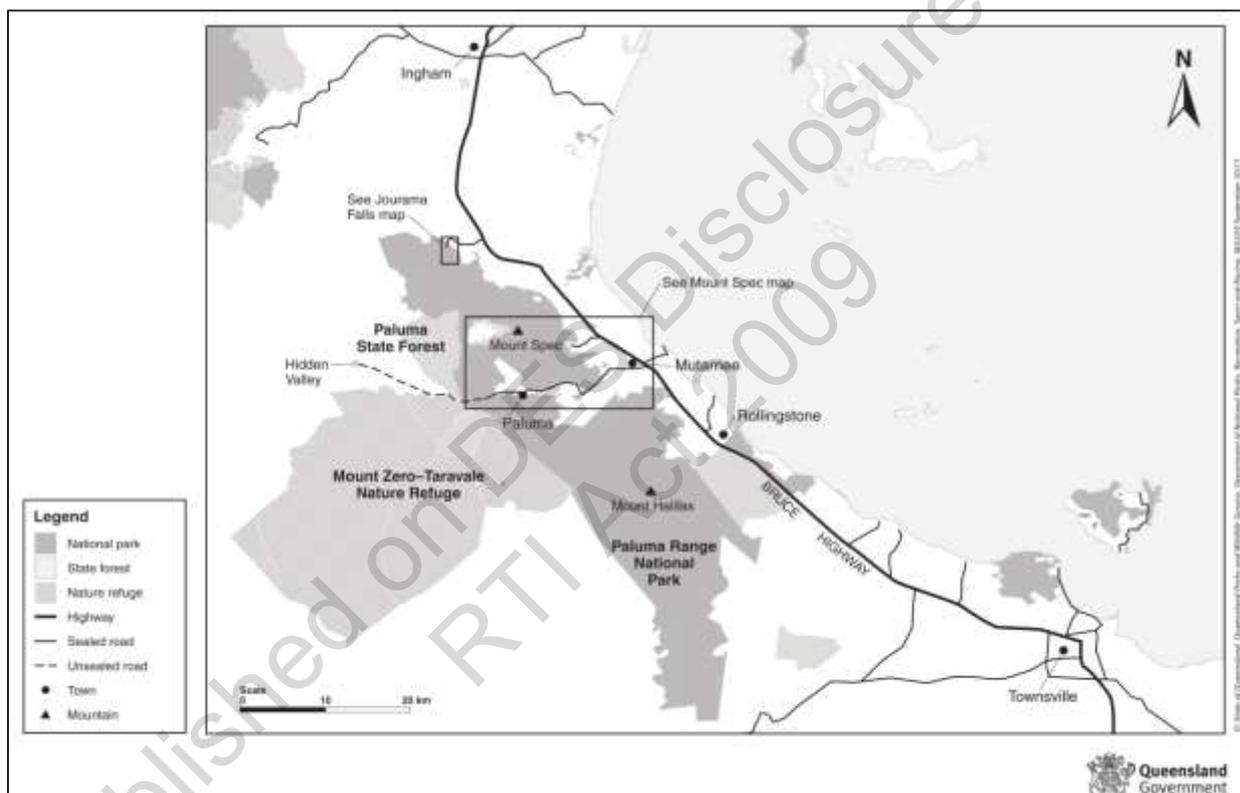


Figure 1: Paluma Range National Park

Source: QPWS

There is a camping area at Big Crystal Creek at the bottom of the range with associated facilities, where there are nearby rockslides, cool pools and cascades. A day-use area and adjacent carpark are located at Little Crystal Creek.

During the warmer months, Little Crystal Creek is popular for day visits and swimming as it has clear water, is in close proximity to Townsville and is a place to swim away from stingers and crocodiles present in coastal waters. Visitors park in the carpark and then walk 100m down the road to three formal access points that lead into the waterholes.

Visitors come all year to the area but swimming mostly occurs in the warmer months and over peak periods, including holidays and long weekends. Most visitors stay for only a few hours, but some stay overnight in the camping areas at Big Crystal Creek.

There are some domestic and international visitors but most are locals coming out to swim in Little Crystal Creek.



### Incidents and risky behaviour

A death occurred recently at this site and there have been numerous injuries in the past. An international visitor died at Little Crystal Creek on 22 December 2015. The deceased person was visiting rock pools with friends and separated from the group and was later located drowned at the bottom of a rock pool. The deceased person could not swim, was by himself at the top swimming hole and there were no significant head injuries. A risk assessment was carried out for this incident and the risk was deemed to be low (Table 1).

**Photo 3: Risky behaviour at Little Crystal Creek (Gypsy Life website, 2016)**

**Table 1: Risk assessment for incident at Little Crystal Creek (Incident report for Little Crystal Creek, Paluma Range National Park, 14/01/2014)**

<b>Brief description of hazard</b>	Natural uneven rock surfaces around rock pools
<b>Type of hazard identified</b>	Force - moving object
<b>Estimate the risk of this hazard</b>	Likelihood: Possible Consequences: Minor Risk score and level: Low (1-7)
<b>List further details, including other methods to control the risk</b>	All approaches are clearly signposted with BE CAREFUL SIGNAGE. Signage is in good condition and has pictograms showing underwater obstacles and slippery surfaces.

A formal risk assessment for the site as a whole was not available. However, the contractors were advised that the level of risk has been deemed to be high due to the recent death and danger signs should be installed.

Hazards for visitors to Little Crystal Creek include:

- Slips, trips and falls around rocks/boulders near the creek
- Shallow, deep or fast-flowing water (depending on the season)
- Jumping or diving into water from height onto submerged rocks and logs.

There have been numerous injuries at this site, most of which are thought to be younger males behaving dangerously and jumping from heights (Photo 3).

- Incidents generally occur below the bridge where people are jumping off and hitting rocks below.
- Jumping and diving into the rock pool is the main cause of serious injuries at this site. However, places where visitors jump or dive are on a road reserve outside the park boundary, so prohibiting these actions is technically not possible.
- Visitors who climb or jump into the waterholes are generally aged in their mid-teens to early twenties.
- Anecdotally young males are more likely to act dangerously in and near the rock pools, including jumping in and acting up around slippery rocks as a result of peer group pressure and being less risk-averse.

There are three formal access points into the creek from the road. Visitors must use these points to reach the creek and therefore have to pass the signs.

Due to repeated incidents involving broken glass, taking glass on to the rocky creek area has been forbidden by regulatory notice.

The NPSR website provides the following advice: “Swim at Little Crystal Creek and at Paradise Waterhole and the Rockslides along Big Crystal Creek. Never jump or dive into water and be careful at the water’s edge. Rocks can be extremely slippery and submerged timber can appear after flooding. Injuries have occurred.”

There are no park guides for this area and the draft Journey Guide does not address the hazards at this site.

## Scope and Methodology

Safety signs located at Little Crystal Creek, Paluma Range National Park have been reviewed, along with photos, maps, reports, risk assessments and incidents related to the site. Local rangers and interpretive staff have also been consulted as part of the review.

Signs have been evaluated against the updated QPWS Sign Manual (2016) and against the Best Practice Principles for safety signs in parks using the four stages of the warning process: ‘notice, encode, comprehend, comply’ (Weiler et al. 2015).

The following documents and information have been considered in preparing this sign plan:

1. NPSR Website information on Little Crystal Creek, Paluma National Park
2. Social media sites and other travel websites promoting Little Crystal Creek, including Instagram, Tripadvisor and Facebook
3. Findings of Coronial Inquest into death of (6) Personal info July 2014
4. Southern Cross University, A review of safety signage for Queensland Parks and Wildlife Service, June 2015: Report 1—Literature review and Annotated Bibliography citation
5. Crows Nest Safety Sign Review Report, 2015
6. QPWS Sign manual, 2016
7. NPSR Work Health and Safety Policy, 2012
8. A relevant journal paper ‘Pete’s story: interpreting the consequences of risk-taking behaviour’ (Applied Environmental Education and Communication, 4:139–150, 2005).

Sign options considered in this review were:

- Orientation signs, which can include safety messages;
- Formal safety signs (danger signs), which meet internationally recognised standards but are not legally enforceable unless combined with regulatory provisions;
- Regulatory notices, which are legally enforceable and can be used to address safety issues as per section 70 (1) of the *Nature Conservation (Protected Areas Management) Regulation 2006*. (These may be combined with information notices if desired to reduce the amount of text required;
- Interpretive signs : a complementary approach that can present safety messages in a more personal and emotive manner than a formal safety sign and target a specific, at-risk audience; and
- Pictograms, which can be included on other signs or printed as stand-alone signs and placed on site to reassure visitors and should be recognised by children, and English and non-English speaking visitors. These are not enforceable on their own, but can be included on regulatory notices to become enforceable. They are often also used on safety signs.

Different types of signs are appropriate in different landscape settings and for different risk levels. See Table 2 for a complete list of signs considered in this review.

**Table 2: Sign options**

Sign type	Risk		
	High	Med	Low
Orientation sign with safety message			
Complementary interpretation sign			
For your safety sign			
Warning sign			
Danger sign			
Regulatory notice			
Regulatory information notice			
Danger sign including regulatory notice			
Danger sign including regulatory information notice			
Regulatory notice to complement an info notice			
Routed sign (danger or warning or safety)			
Danger totem			
Warning totem			
Pictograms			
Symbols			

## Current Safety Signs and Messages

There are currently three 'for your safety' signs at this site. The locations are marked on the map below (Image 1). All three signs are the same design, with the same message, text and pictograms (Photo 4).



Image 1: Current safety sign locations, Little Crystal Creek



Photo 4: Current signs located throughout the site

The signs are all located in appropriate places at the formed entrances to the creek where visitors have to pass by when walking down from the road to enter the swimming areas.

An additional orientation sign is located in the day-use area. This sign does not include safety messages about swimming in the creek.

Three other signs located in this area are for the prohibition of glass containers (Photo 5). These are regulatory notices, enforceable under the *Nature Conservation Act 1992*. These are all located at the top of the stairs at the entrances to the formal access points.



Photo 5: Glass prohibited sign

## Assessment of Current Signage

This review finds that the current signs at Little Crystal Creek do not meet best practice principles for safety signs.

The 'for your safety' signs are all appropriately located, in places where visitors can not miss them. However, the signs need to be upgraded to danger signs, as the identified hazard has caused serious injuries and death. The risk of slips and falls when accessing waterholes is addressed in part, along with the dangers of jumping in and submerged rocks or objects. However, the message must also contain information that this activity has caused serious injuries and death (ie. the possible consequences of being exposed to the hazard). The appropriate visitor behaviour (take care when walking or climbing over the rocks, and never jump or dive in) is currently identified.

Recommended improvements to current 'for your safety' signs are (refer to Table 3):

- *Updating the signs to meet current QPWS sign manual standards*
- *Changing the 'for your safety' signs to danger signs*
- *Including a message about these activities causing serious injuries and death*
- *Signs will encourage visitors not to dive or jump into the rockpool but will not be enforceable.*

The use of a regulatory sign to prohibit jumping and diving was considered. However, as the location where people jump from is on a road reserve and outside the park tenure, this was not an option. A total ban on swimming was also considered but was deemed to be inappropriate as most incidents involve jumping or diving from a height. Locals frequent this area especially in summer and enjoy swimming here with very few incidents, so banning swimming is unnecessarily restrictive.

Additionally, the best practice study found that a regulatory approach works best at sites that are regularly patrolled to encourage compliance. This is not the case at this location.

Best Practice Principles for safety signs are applicable in a wide range of contexts and at a broad level but do not provide for detailed consideration of people-related factors. Some examples of differences among target audiences that may need to be considered in safety signage here include:

- Whether the visitor's behaviour is intentional or unintentional. Persuasive communication is seldom effective on its own for impacting behaviour that is high-risk.
- Whether the visitor is a regular or a first-time visitor. Regular visitors familiar with an area and/or activity are less likely to read signs.
- Over-confidence. This has been found to bias individuals' risk assessment.
- Males are more likely to engage in high-risk behaviour, and older adolescents appear less risk-averse than younger children.
- Those who "held negative attitudes towards cautionary signs" were more likely to believe sign-posted high risk areas were not dangerous (Weiler et al 2015,p.20).

A complementary interpretive sign targeting the high-risk group (men aged about 18-25) is recommended to address the high level of incidents involving this group at this site. This has been found to be beneficial in locations where danger signs are ignored, especially due to people seeing other people carrying out the dangerous activity. It has been found that when a high number of visitors are doing the wrong thing and engaging in dangerous activities, such as climbing and jumping into the water, people's perception of the risk decreases and the activity is seen as acceptable.

Traditional danger signs may not deter all people from engaging in dangerous activities so it has been recommended that a more emotive interpretation sign be developed to reinforce the take home message of 'lives have been lost and people like you have been seriously injured here—return home safe' and try and change the behaviour of risk taking at the site. Interpretive signs can present the message in a more personal and emotive manner than a safety sign and target a specific, at-risk audience (QPWS, Sign Plan p. 162).

See Table 3 below for recommended sign updates and page 14 for text outline.

## Sign Recommendations

Recommended changes to safety signage at Little Crystal Creek are summarised in Table 3 and sign details including design and text suggestions are outlined on page 14.

Table 3: Sign recommendations

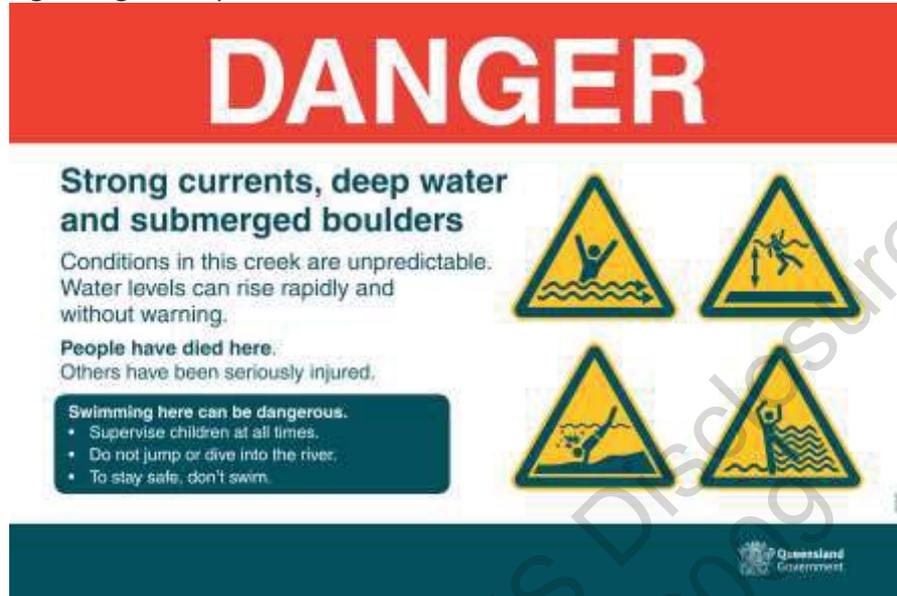
Priority	Sign	Action/Justification	Location/siting	Approximate printing cost
1	<p><b>Danger signs to replace existing safety signs (below)</b></p> 	<p><b>REPLACE</b> with <b>DANGER with red banner</b> (4 copies needed)            Revise wording and style in line with latest Sign Manual 2016:            -Use yellow and red, not teal, warning symbols;            -Include how to avoid the hazard;            -Include intended behavioural response.</p> <p>See <a href="#">Sign 1</a> below for suggested text.</p>	<p>Existing locations are good. Ensure they are positioned facing oncoming foot traffic for maximum exposure.</p> <p>Where located next to the glass prohibited signs, relocate the glass prohibited signs so they are not directly side-by-side.</p>	<p>For 600 x 400mm landscape orientation (no mounting, sign only)            \$150 each            (mountings not required)</p>
1	<p><b>Jumping prohibited pictograms</b></p>	<p><b>Stand-alone jumping prohibited pictograms</b> to be placed around site (6 needed).</p>	<p>Locate at sites where most activities are occurring, including locations where people are climbing up to access jumping point.</p>	<p>250x250mm</p>
2	<p><b>Orientation sign</b></p>	<p><b>REPLACE</b> current orientation sign with design and text changes.</p> <p>Add messages about swimming safely. When updating sign, use yellow, not teal warning symbols and update in line with current Sign Plan.</p> <p>Redesign sign to have safety information in a</p>	<p>Located in the day use area – current location is appropriate.</p>	

Priority	Sign	Action/Justification	Location/siting	Approximate printing cost
		prominent reading position with red background so it stands out.		
3	<p><b>Complementary interpretive sign</b></p> 	<p><b>NEW SIGN AS AN ADDITION when funds permit</b></p> <p><b>ADD</b> a complementary interpretive sign communicating the story of a victim's family or specifically targeting the at risk target group.</p>	<p>At the swimming site below the bridge where most of the incidents are occurring. Alternative location would be somewhere most visitors pass to reach the site of activity. It needs to be at a location where people are able to stop and view the sign clearly and take on board the message before reaching the site with their mind made up they are already going carry out the dangerous activity.</p>	
3	<p><b>Glass prohibited sign</b></p> 	<p><b>RETAIN SIGN</b> Replace with new version if damaged.</p>	<p>Current locations are appropriate except where they are sited too close to the danger signs. Relocate glass prohibited signs away from danger signs (alternative location is at the bottom of the access point if appropriate).</p>	

## Recommended Sign Details

### SIGN 1: Danger sign

Sign design example:



<insert heading>

**DANGER** <include German and Chinese/Japanese headings>

<insert subheading>

Slippery surfaces, deep water and submerged rocks.

<insert body text>

People have been **seriously injured** and **died** here.

- Never jump or dive into the water.
- Swimming can be dangerous. Only strong swimmers should enter the water.
- Beware of slippery rocks around the water's edge.
- Supervise children at all times.

<insert symbols>



<insert Si#>  
Sixxxx  
<insert Qld Govt banner>

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## Installation

New safety signs should be installed following the guidelines in section 5.1.3 of the QPWS sign manual.

## Other communications

While signs at Mount Spec need to be updated to reflect the new Sign Manual standards, pre-visit and other communications (available off-site) enhance the effectiveness of on-site safety signage and also need to be reflecting the same safety messages.

While brochures are not available for Little Crystal Creek, the NPSR website contains some limited safety messages for this site. It is recommended that the website be updated to include the same safety messages as recommended in this plan. Messages across all media need to be consistent, and web or printed materials should include appropriate yellow warning symbols if possible. It is important that information presented through other agencies such as tourism bodies do not present conflicting messages, such as by including photographs of people jumping or diving.

The concern is that if visitors arrive at Little Crystal Creek and see others apparently enjoying dangerous activities (such as climbing and jumping into the waterholes) this may negate the danger sign messages.

## Evaluation

It is recommended that visitor response to the safety messages is evaluated over the next summer season, through a combination of observation and interviews. The approach to signage may need to be adjusted depending on the feedback received

## References

NPSR Website. <http://www.nprsr.qld.gov.au/parks/paluma-mount-spec/about.html>  
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Parkin, D and K. Morris (2005) Pete's story: interpreting the consequences of risk-taking behaviour, *Applied Environmental Education and Communication*, 4:139–150.

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Weiler, B, Zeppel, H, Saunders, R, & Scherrer. 2015. *A review of safety signage for Queensland Parks and Wildlife Service: report 1: literature review, report to the Queensland Parks and Wildlife Service.*, School of Business and Tourism, Southern Cross University, Coolangatta, Qld.

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protected area  
solutions



# Murray Falls Safety Sign Plan

8 June 2016

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## Executive Summary

Murray Falls in Girramay National Park has a high level of visitation by local, Queensland, interstate and international people. Visitors come all year round to see the spectacular falls and the Murray River is a popular destination in the warmer months for swimming due to its ease of access and because swimming in the ocean and estuaries is risky due to the presence of crocodiles and marine stingers.

Swimming is prohibited at the site of the falls and only allowed further downstream. Access to the river upstream of the day-use area and at the site of the falls, beyond the river boardwalk, is not permitted. Natural hazards including sheer cliffs, slippery rocks, submerged rocks, and water of variable depths make it dangerous and serious injuries and deaths have occurred. During the summer months green algae grows on rock surfaces below the water line making the falls very dangerous. A Restricted Access Area was declared over this site in 2005.

Twelve deaths are known to have occurred in the last 25 years at Murray Falls, along with several rescues and other injuries. More recently, there has been an increase in formal incident reports and the increased rate of incidents is believed to be a result of social media and sharing images and information about how to access the falls from downstream and from the top of the falls.

A significant percentage of the visitors to the falls are international tourists: many may not have English as their first language. Tourists, as opposed to local people, are more likely to get into trouble in the water.

The review found that the current legislative Restricted Access Area notices at Murray Falls meet the Best Practice Principles for safety signs. However, they require text updates and size changes in line with the current QPWS Sign Manual, 2016. It is also recommended to continue the use of the access prohibited pictograms throughout the Restricted Access Area in order for it to be clearer to depict the boundaries on the ground. The use of these pictograms with the two sizes of restricted access area regulatory notices on the border of the prohibited area assists Rangers enforcing the restriction, as the prohibited area is clearly marked. The presence of a regulatory notice does not oblige the Rangers to fine offenders, but they can warn them and fine offenders if considered appropriate.

A complementary interpretive sign especially targeting the high-risk group (18-25 year olds) is recommended to address the high level of incidents involving this group at this site. This has been found to be beneficial in locations where danger signs are ignored, especially due to people seeing other people carrying out the dangerous activity. Traditional danger signs may not deter all people from engaging in dangerous activities so it has been recommended that a more emotive interpretation sign be developed to reinforce the take home message of 'lives have been lost and people like you have been seriously injured here—return home safe' and try and change the risk taking behaviour at the site. Interpretive signs can present the message in a more personal and emotive manner than a safety sign and target a specific, at-risk audience (QPWS, Sign Plan, 2016 p. 162).

Evaluation of the effectiveness of the signage is recommended over the next summer period.

## Introduction

### Background to this report

A number of critical incidents (deaths and serious and permanent injuries) have occurred on QPWS-managed land in recent years. Following an inquest into the drowning death of a visitor at Mossman Gorge in 2014, the State Coroner recommended that a committee of stakeholders consider a number of issues, one of which was the 'the information provided to visitors at the centre including the content of that information and how it is delivered; and the signage in the national park' (Queensland Government, 14/07/2014, p.1). Southern Cross University conducted an expert review of QPWS safety signs and the agency's approach to risk management (Weiler et al, 2015). This review identified best practice principles and reviewed current safety signs at three sites where fatalities had occurred, including Mossman Gorge. Although QPWS signs were found to be closely aligned with best practice, some minor changes were made to the sign guidelines as defined in chapter 5 of the QPWS Sign Manual, 2016. As many safety signs are unlikely to be compliant with the new standards, a review of critical sites is being undertaken.

Murray Falls at Girramay National Park (Figure 1) has been identified as a high risk site due to numerous serious incidents that have occurred there in recent years and 12 known deaths in the past 25 years. This sign plan has been written to review safety signage at Murray Falls in light of these incidents, to determine consistency with the QPWS Sign Manual, 2016 and safety sign best practice, and to recommend upgraded and additional signage. The aim of this sign plan is to enhance visitor safety at Girramay National Park, particularly with regards to entering the Restricted Access Area at the top of Murray Falls where serious safety incidents have occurred, including five deaths in one year in the early 1990s and the most recent death occurring in December 2015.

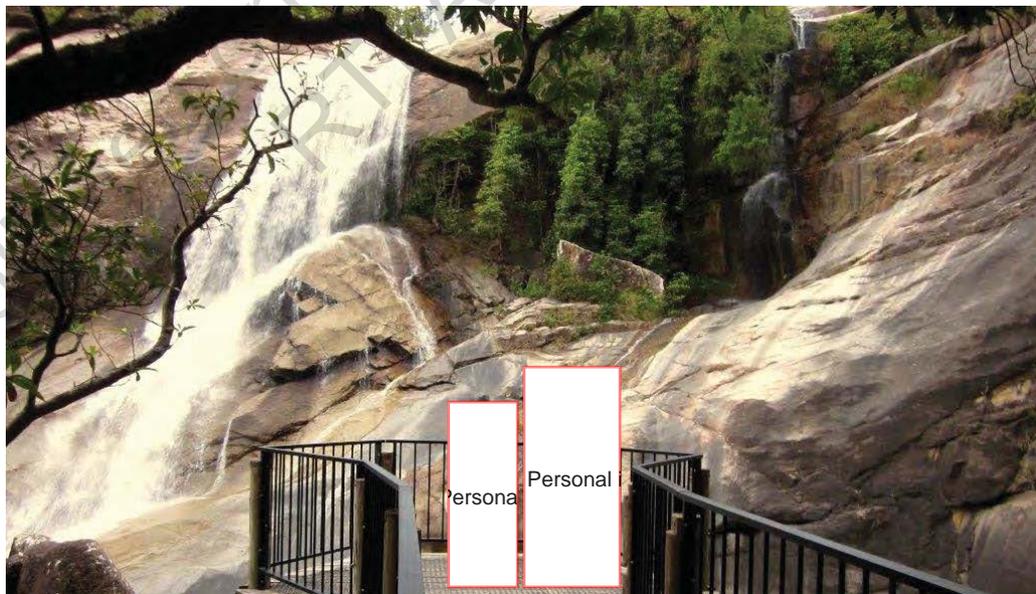
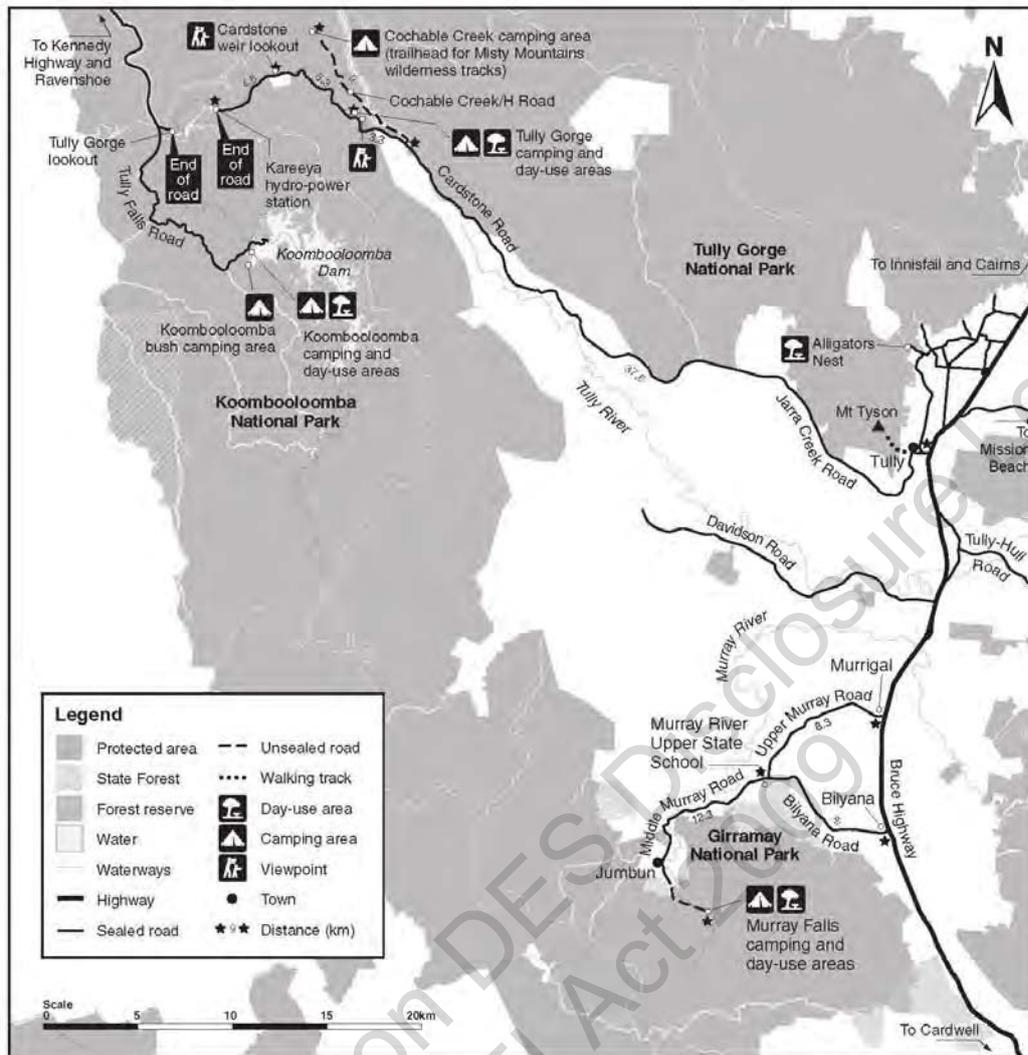


Photo 1: Lookout at top of Murray Falls (Tripadvisor website, 2016)



**Figure 1: Giramay National Park**  
 Source: QPWS

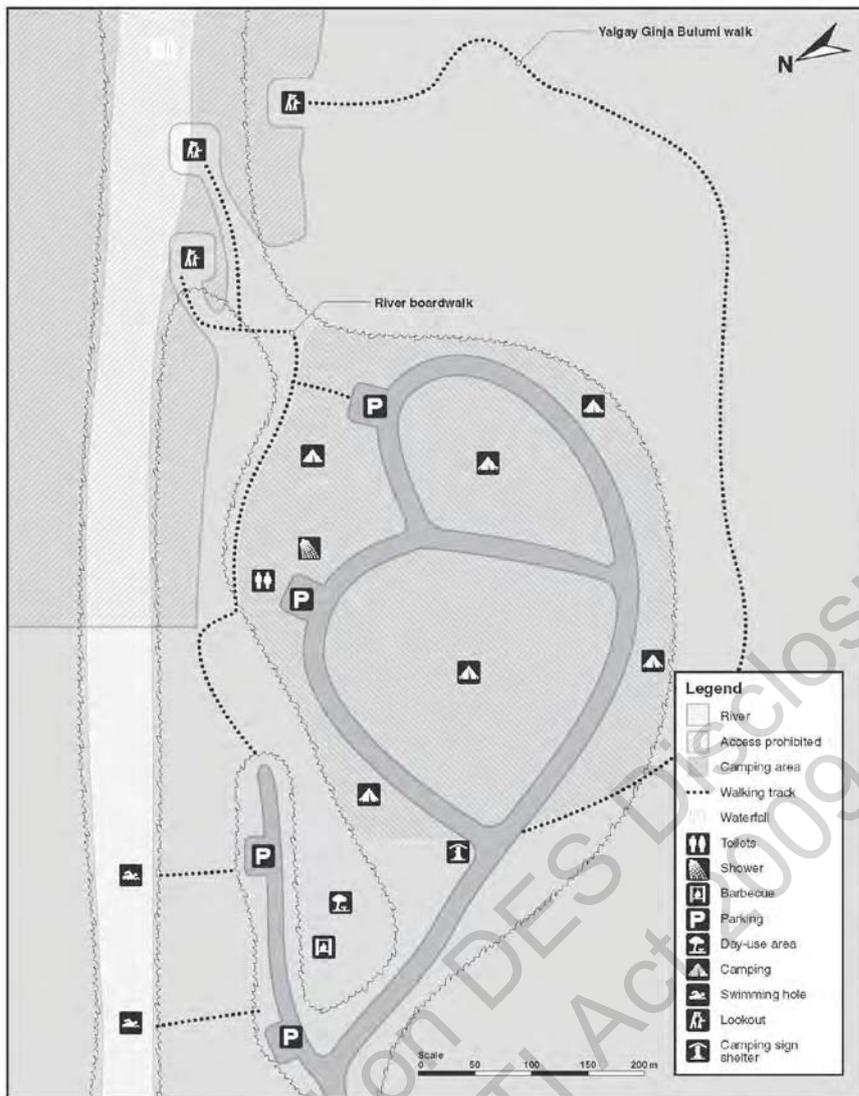
## Murray Falls, Giramay NP

Murray Falls, Giramay National Park is located 41 kilometres north-west of Cardwell or 36 kilometres south-west of Tully (Figure 1). The park is nestled in the foothills of the Kirrama Range and is part of the Wet Tropics World Heritage Area.

Murray Falls is a popular tourist spot in North Queensland, where people come to see the clear waters of the Murray River cascade over granite boulders into crystal clear rock pools (Photo 1).

Camping is available at Murray Falls camping area (Figure 2). The large open grassy area, adjacent to the day-use area is suitable for tent camping, caravans, motorhomes and large groups. It is an e-permit camping area and all sites must be booked in advance.

The day-use area is a popular location for a picnic for day-trippers wishing to explore the park. The falls can be viewed from the boardwalk and viewing platform. A short 300 metre return river boardwalk begins at the top end of the camping area and provides a safe way to view Murray Falls from several angles. The first 75 metres of the boardwalk is wheelchair-accessible.



**Figure 2: Murray Falls camping area, lookouts and swimming holes**

Source: QPWS

Yalgay Ginja Bulumi walk, 1.8 kilometres return is for the more adventurous and leads you through open forest and rainforest to a lookout for a view over the top of the falls and the Murray Valley. This walk provides interpretive signs along the way to give you an insight in the culture of the Girramay people.

There are two swimming holes for visitors to enjoy, which can be accessed from the day-use area. The water here is generally calm except after heavy rain. Care is needed when entering the swimming hole as the water is often fast-flowing and the rocks are slippery. The first two car parking areas are beside the swimming hole while the campground parking is closer to the falls walking tracks.

Access to the falls, beyond the river boardwalk, is not permitted. Figure 2 shows the location of Murray Falls and the surrounding Restricted Access Area (RAA).



Photo 2: Murray Falls and RAA (Source: Wikipedia website, 2016)

Murray Falls has a high level of visitation year round by domestic and international visitors who come to view the falls (Photo 2). It is a popular swimming spot in the warmer months for local people and other domestic and international visitors due to its ease of access and as swimming in the ocean and estuaries is risky due to the presence of crocodiles and marine stingers. The winter season is popular with interstate travellers.

### Incidents and risky behaviour

Swimming is prohibited at the site of the falls and only allowed further downstream. Slippery rocks, sheer cliffs and fast-flowing water make this site dangerous and serious injuries have occurred from slipping and falling into the falls. During the summer months green algae grows on rock surfaces below the waterline making the falls very dangerous for adventure seekers.

Twelve known deaths have occurred in the past 25 years, along with several rescues and other injuries. After a series of five fatal incidents in one year in the early 1990s, engineering works were carried out in 2000. The boardwalk was diverted from the lower viewing platform up through the rocks to the now existing falls viewing platform. Prior to this, the platform continued on through the creek from the lower viewing platform. These changes decreased the number of incidents occurring at the time.

A Restricted Access Area was declared and implemented in 2005 to prohibit entry to the top of the falls.

More recently, there has been an increase in formal incident reports recorded at the top of the falls within the Restricted Access Area.

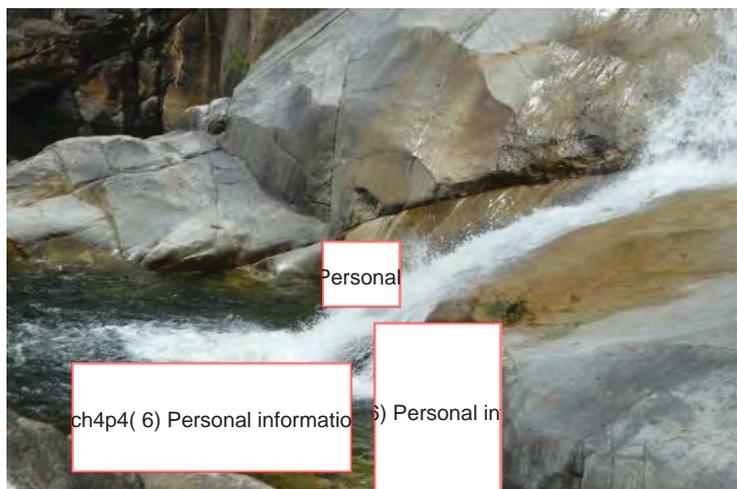


Photo 3: Risky behaviour within the Restricted Access Area; natural waterslides at Murray Creek (Tripadvisor website, 2016)

The increase in incidents is believed to be a result of social media and the sharing of images and information about how to access the falls and the top of the falls.

Cameras have been installed on the walking tracks and at the falls to monitor where visitors are going and they have seen a correlation between the increase in busloads of tourists coming from the backpackers' accommodation and the timing of incidents.

A significant percentage of the visitors to the falls are international tourists; many may not have English as their first language or be able to understand English at all.

Anecdotally:

- Tourists (as opposed to locals) are more likely to get into trouble in the water.
- Young males are more likely to act dangerously in and near the rock pools, including jumping in and acting up around slippery rocks as a result of peer group pressure and being less risk-averse.
- Some visitors experience difficulties and are rescued by other swimmers.

A risk assessment was carried out at the site after the most recent fatality in December 2015 and the risk was deemed to be high (Table 1).

**Table 1: Risk assessment for incident at Murray Falls (Incident report for Murray Falls, Girramay National Park, 26/12/2015)**

<b>Brief description of hazard</b>	Slippery surface at top of the falls
<b>Type of hazard identified</b>	Gravity falling object
<b>Estimate the risk of this hazard</b>	Likelihood: Likely Consequences: Loss of life Risk score and level: High (17-22)
<b>List further details, including other methods to control the risk</b>	Rangers undertook public contact with the visitors to the park explaining about the hazards associated with slippery surfaces and not the enter the RAA

A formal risk assessment for the site as a whole was not available. However, the contractors were advised that the level of risk has been deemed to be high and that danger signs should be reviewed.

Identified hazards in or near the river for visitors to the Murray Falls recreation area include:

- Sheer cliffs
- Slippery rocks
- Submerged rocks, and
- Water of variable depths.

NPSR does not wish to prohibit swimming at the day-use area as the risks are considered to be low, there is a long history of use, and doing so would unnecessarily interfere with the recreation opportunities at the site as a whole.

The NPSR website provides the following information: 'In the day-use area there are a number of access points to the Murray River. The water is often fast flowing and the rocks slippery. Access to the river upstream of the day-use area is not permitted. Slippery rocks make it dangerous and serious injuries have occurred. Observe the sign posted restricted access area.'

The website does not provide any further information about the swimming opportunities at the site, only the following broader 'for your safety' information:

- Access to the falls, beyond the river boardwalk, is not permitted. Observe the signposted restricted access area.
- Take care around cliffs, steep slopes and rock faces along tracks and at lookouts.
- Stay on the track and take care on uneven surfaces, especially in wet conditions.
- Supervise children closely.
- Never jump or dive into the water.
- Take care when walking near the creek—the rocks can be slippery.

There are no park guides for this area but the draft Journey Guide will address this hazard.

## Scope and Methodology

Safety signs located at Murray Falls, Girramay National Park have been reviewed, along with photos, maps, reports, risk assessments and incidents related to the site. Local rangers and interpretive staff have also been consulted as part of the review.

Signs have been evaluated against the updated QPWS Sign Manual (2016) and against the Best Practice Principles for safety signs in parks using the four stages of the warning process: ‘notice, encode, comprehend, comply’ (Weiler et al. 2015).

The following documents and information have been considered in preparing this sign plan:

1. NPSR Website information on Murray Falls, Girramay National Park
2. Social media sites and other travel websites promoting Murray Falls, including Instagram, Tripadvisor and Facebook
3. Findings of Coronial Inquest into death of 6) Personal info July 2014
4. Southern Cross University, A review of safety signage for Queensland Parks and Wildlife Service, June 2015: Report 1—Literature review and Annotated Bibliography citation
5. Crows Nest Safety Sign Review Report, 2015
6. QPWS Sign Manual, 2016
7. NPSR Work Health and Safety Policy, 2012
8. A relevant journal paper ‘Pete’s story: interpreting the consequences of risk-taking behaviour’ (Applied Environmental Education and Communication, 4:139–150, 2005).

Sign options considered in this review were:

- Orientation signs, which can include safety messages;
- Formal safety signs (danger signs), which meet internationally recognised standards but are not legally enforceable unless combined with regulatory provisions;
- Regulatory notices, which are legally enforceable and can be used to address safety issues as per section 70 (1) of the *Nature Conservation (Protected Areas Management) Regulation 2006*. (These may be combined with information notices if desired to reduce the amount of text required);
- Interpretive signs: a complementary approach that can present safety messages in a more personal and emotive manner than a formal safety sign and target a specific, at-risk audience; and
- Pictograms, which can be included on other signs or printed as stand-alone signs and placed on site to reassure visitors and should be recognised by children, and English and non-English speaking visitors. These are not enforceable on their own, but can be included on

regulatory notices to become enforceable. They are often also used on safety signs.

Different types of signs are appropriate in different landscape settings and for different risk levels.

See Table 2 for a complete list of signs considered in this review.

**Table 2: Sign options**

Sign type	Risk		
	High	Med	Low
Orientation sign with safety message			
Complementary interpretation sign			
For your safety sign			
Warning sign			
Danger sign			
Regulatory notice			
Regulatory information notice			
Danger sign including regulatory notice			
Danger sign including regulatory information notice			
Regulatory notice to complement an info notice			
Routed sign (danger or warning or safety)			
Danger totem			
Warning totem			
Pictograms			
Symbols			

## Current Safety Signs and Messages

The park has a variety of signs including orientation signage in the day-use area, e-permit camping signs in the campground and a mix of legislative safety and interpretive signs along the walks and at the swimming hole.

There are currently three Restricted Access Area notices (size 750 x 500) located along the river boardwalk and at the top viewing site of Murray Falls. The first one is located at the entrance to the walking trail at the car park. Signs two and three are located directly on site at the lookouts (See Figure 3 for sign locations and Photo 4 and Photo 5 for examples of the sign).



Figure 3: Location of signs at Murray Falls



Photo 4: Restricted Access Area notice – river boardwalk entrance (750x500)



Photo 5: Restricted Access Area notice top viewing platform (750x500)

There are three smaller Restricted Access Area regulatory notices (300 x 450); one is located at the base of the stairs on the viewing platform; one at the base of the falls and the third one is sited further along the creek (Photo 6 and Photo 7).



Photo 6: Smaller Restricted Access Area notice (300x450)



**Photo 7: Restricted Access Area notice – located at the base of the stairs (300x450)**

There are three small access prohibited pictogram signs (200 x 300). One is located behind the RAA notice at the base of the stairs; one is on the second set of stairs at the top viewing platform; and the third is on the rocks adjacent to the boardwalk lower viewing platform (see Figure 3 for locations and Photo 8 and 9 for examples of the sign).



**Photo 8: Access prohibited pictogram totem - adjacent to the bottom of the stairs on the river boardwalk (200x300)**



Photo 9: Access prohibited pictogram totem - mounted on rocks in front of lower viewing platform (200x300)

## Assessment of Current Signage

Overall, the review found that the current legislative Restricted Access Areas notices at Murray Falls meet the Best Practice Principles for safety signs. However, they require text updates and size changes in line with the current QPWS Sign Manual, 2016.

The Restricted Access Area notices are legislative signs and need to be upgraded to reflect the latest amendments to the QPWS Sign Manual, 2016. In recent incident review reports, all signage and barrier fencing were found to be well placed and in good condition, and a recommendation included using personalised signage to increase update of danger messages (Email dated 14 Jan 2016 3:19pm, from Senior Ranger, Ingham to Ranger (Safety) Fred Pittorino).

Swimming in the lower river section is considered a low risk activity and only minor incidents associated with the expected hazards of a natural swimming hole have occurred, including slipping on rocks. Signs present at the lower part of the river are safety pictograms warning against slippery surfaces and prohibiting fishing. Recommendations below outline an option for a 'for your safety' signs if incidents associated with swimming occur here.

Best Practice Principles for safety signs are applicable in a wide range of contexts and at a broad level but do not provide for detailed consideration of human factors. Some examples of differences among target audiences that may need to be considered in safety signage here include (Weiler et al 2015, p.20:

- Whether the visitor's behaviour is intentional or unintentional. Persuasive communication is seldom effective on its own for impacting behaviour that is high-risk.
- Whether the visitor is a regular or a first-time visitor. Regular visitors familiar with an area and/or activity are less likely to read signs.

- Cross-cultural factors. They are widely thought to be relevant to risk perception but appear to be not well researched.
- Over-confidence. This has been found to bias individuals' risk assessment.
- Males are more likely to engage in high-risk behaviour, and older adolescents appear less risk-averse than younger children.
- Those who 'held negative attitudes towards cautionary signs' were more likely to believe sign-posted high risk areas were not dangerous.

A complementary interpretive sign especially targeting the high-risk group (18-25 year olds) is recommended to address the high level of incidents involving this group at this site. This has been found to be beneficial in locations where danger signs are ignored, especially due to people seeing other people carrying out the dangerous activity. It has been found that when a high number of visitors are doing the wrong thing and engaging in dangerous activities, such as climbing and jumping into the water, people's perception of the risk decreases and the activity is seen as acceptable.

Traditional danger signs may not deter all people from engaging in dangerous activities so it has been recommended that a more emotive interpretation sign be developed to reinforce the take home message of 'lives have been lost and people like you have been seriously injured here—return home safe' and try and change the risk taking behaviour at the site. Interpretive signs can present the message in a more personal and emotive manner than a safety sign and target a specific, at-risk audience (QPWS, Sign Plan, 2016 p. 162).

See Table 3 below for recommended sign updates and page 19 for text outline.

## Sign Recommendations

Recommended changes to safety signage at Murray Falls are summarised in Table 3 and sign details including design and text suggestions are outlined on page 19. A regulatory approach combined with the use of prohibited access pictograms/totem signs is recommended for the following reasons:

- Strong wording and a formal appearance is necessary for a regulatory notice where the level of risk has been assessed as 'high'.
- If the danger heading is used on Restricted Access Area notices the sign text should clearly describe the hazard, the actions required to minimise the risk and the consequences of not taking those actions. Currently the RAA sign in place uses the subheading 'restricted access area'. By updating this to 'unauthorised entry prohibited' we are addressing the action required to minimise the risk.
- The group of people who are most likely to engage in risky behaviour are also likely to ignore safety warnings.

It is also recommended to continue the use of the prohibited access pictograms throughout the RAA site in order for it to be clearer to depict the RAA on the ground. The use of these pictograms with the two sizes of Restricted Access Area regulatory notices on the border of the prohibited area, assists Rangers enforcing the RAA, as the physical boundary and prohibited area are both clearly marked. The presence of a regulatory notice does not oblige the Rangers to fine offenders, but they can warn them and fine offenders if considered appropriate.

The current sign locations have also been reviewed (Table 3). All new safety signs should be installed following the guidelines in section 5.1.3 of the QPWS sign manual. It is recommended that park management units keep good records of safety signs in-situ. Photos should be taken when installed and uploaded onto SAMS database and inspection regimes set to monitor their condition over time.

Table 3: Sign recommendations

Priority	Current Sign	New Sign	Action / Justification	Location/siting
1	<p><b>Stand Alone Restricted Access Area (RAA) Regulatory Notice Si1712</b></p> 	<p><b>REPLACE</b> existing signs with <b>RAA Regulatory Notice Combined With Danger Message</b></p> <p>The stand-alone RAA notices are required to remain in place as they are used to restrict or prohibit access.</p> <p>Under the NCA Act, a Restricted Access Area is declared by erecting a restricted access area notice in a</p>	<p><b>REPRINT SIGN</b></p> <p>Requires text changes (750x500mm) (3 copies needed with individual YAH locations)</p> <p>Revise wording and style in line with sign manual 2016;</p> <ul style="list-style-type: none"> <li>• Heading</li> <li>• Add the access prohibited picto and related text (this will allow stand-alone pictos to be used on-ground to mark the</li> </ul>	<p>Existing locations are good.</p> <p>Rangers have ensured they are positioned facing oncoming foot traffic for maximum exposure along the river boardwalk and at the top of viewing platform entrance.</p>

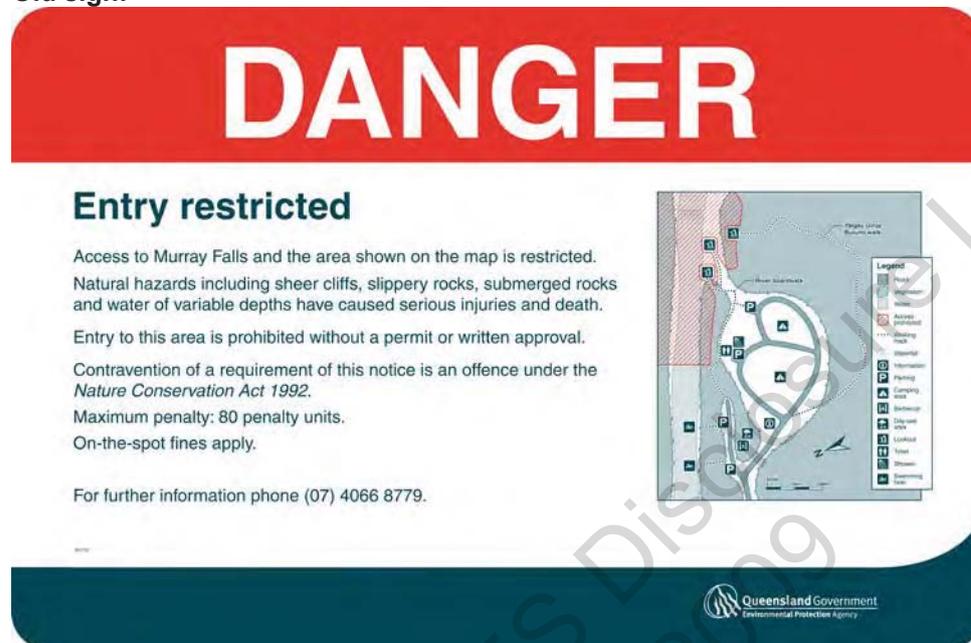
		location easily visible to passers-by. (QPWS Sign Manual, Section 4.8.3, 2016)	<p>boundary and show where access is prohibited)</p> <ul style="list-style-type: none"> <li>• Add appropriate behaviour</li> <li>• Further contact details</li> <li>• Add YAH mark to the map.</li> </ul> <p>See <a href="#">sign #1</a> below for suggested text</p>	
1	<p><b>Restricted Access Area Regulatory Notice</b></p> 	<p><b>REPLACE</b> existing signs with <b>RAA Simple Regulatory Notice Combined With Danger Message</b></p> <p>The stand-alone smaller RAA notices can remain in place as they are used to restrict or prohibit access.</p> <p>Under the NCA act, a RAA is declared by erecting a RAA notice in a location easily visible to passers-by. (QPWS Sign Manual, Section 4.8.3, 2016)</p>	<p><b>REPRINT SIGN</b> Requires text changes (300x450mm) (3 copies required)</p> <p>Revise wording and style in line with Sign Manual 2016 and design as a small RAA regulatory notice;</p> <ul style="list-style-type: none"> <li>• Update heading to read; Unauthorised entry prohibited</li> </ul> <p>(Refer to sign manual Chapter 5)</p> <p>See <a href="#">sign #2</a> below for suggested text</p>	<p>These smaller RAA notices are being used in problem areas where people are gaining access to the river.</p> <p>Suggest a review of locations to ensure they are at all key entry points and extras printed if there has been seen to be an increase in informal tracks into the Restricted Access Area from the boardwalk before the viewing platform.</p>
2	<p><b>Stand Alone Access Prohibited Pictogram</b></p> 	<p><b>UPDATE</b> existing signs when they need replacing to <b>Stand-alone Access Prohibited and Swimming Prohibited Pictograms</b></p>	<p><b>PRINT STAND ALONE PICTOS</b> (250x250mm) (4 copies each required)</p> <p>Picto only – no text</p>	<p>Existing locations are good.</p> <p>Rangers have ensured they can be seen from the boardwalk and viewing platforms. If entrance beyond the Restricted Access Area keeps occurring and unmarked entrance points can be seen then suggest adding further pictos to problem areas.</p>

2		<p><b>NEW Complementary Interpretive Sign</b></p>  <p><b>Males aged 18-30!</b> You need to read this sign.</p> <p>Every person who has died climbing these cascades has been a fit and strong young man, aged 18-30.</p> <p>11 have all our rescue what (check death notice on back)</p> <p><b>Deaths in this area</b></p> <table border="1"> <thead> <tr> <th>Date</th> <th>Gender</th> <th>Age</th> </tr> </thead> <tbody> <tr> <td>Feb 1 1974</td> <td>Male</td> <td>29</td> </tr> <tr> <td>May 1 1991</td> <td>Male</td> <td>27</td> </tr> <tr> <td>Feb 1992</td> <td>Male</td> <td>28</td> </tr> <tr> <td>May 2011</td> <td>Male</td> <td>28</td> </tr> <tr> <td>June 2011</td> <td>Male</td> <td>25</td> </tr> </tbody> </table> <p>Many others have suffered serious, permanent and crippling injuries.</p> <p>• To enjoy your water safely:    • Do not drink alcohol before or during your climb.    • Do not climb the cascades.    • Do not use your gear loosely.    • Do not climb at Murray Falls from the water below.</p> <p>Public use of rocks are smooth and slippery and safety gear is not available.</p> <p>© 2014 QPWS. This sign is for the Murray Falls area. It is a work of the Queensland Government. Please do not copy.</p>	Date	Gender	Age	Feb 1 1974	Male	29	May 1 1991	Male	27	Feb 1992	Male	28	May 2011	Male	28	June 2011	Male	25	<p><b>NEW SIGN</b></p> <p>Adding a complementary interpretive sign communicating the story of a victim’s family or specifically targeting the at risk target group. This has been found to be beneficial in parks where the danger signs are ignored due to the behaviour being displayed.</p> <p>It is found that when a high number of visitors are doing the wrong thing and entering the site of the falls, engaging in dangerous activities such as climbing the falls and jumping into the water, people’s perception of the risk decreases and the activity is seen as acceptable.</p>	<p>At the site of the falls or at the start of the river boardwalk before people get to the site of activity. It needs to be at a location along the walk where people are able to stop and view the sign clearly and take on board the message before reaching the site with their mind made up they are already entering the falls.</p>
Date	Gender	Age																				
Feb 1 1974	Male	29																				
May 1 1991	Male	27																				
Feb 1992	Male	28																				
May 2011	Male	28																				
June 2011	Male	25																				
3		<p><b>NEW ‘For Your Safety’ Sign</b></p>  <p><b>For your safety</b></p> <p>Take care near cliff edges and on slippery uneven surfaces.</p> <p>© 2014 QPWS. This sign is for the Murray Falls area. It is a work of the Queensland Government. Please do not copy.</p>	<p><b>OPTIONAL NEW SIGN</b></p> <p>Addition of a ‘for your safety’ is optional at the swimming area.</p> <p>If incidents occur here then there is an option to add a ‘for your safety sign’.</p> <p>Develop effective text for signs (and other communication media), in regards to the approach to swimming at Murray Falls. It needs to be consistently conveyed by QPWS and other stakeholders. QPWS has a duty of care to ensure visitors are aware of the risk inherent of swimming in the swimming areas in the lower part of the river when on site and pre-visit.</p>	<p>These signs would be located at the swimming hole entrance points. These signs would replace current warning picto – slippery rocks.</p>																		

## Recommended sign details

### SIGN 1 - Restricted Access Area Regulatory Notice

Old sign:



Sign text:

<insert heading>

**DANGER** <insert German/Japanese/Chinese language>

<insert subheading>

**Unauthorised entry prohibited**

<insert body text>

Entry to Murray Falls as shown on the map and marked by these symbols is prohibited without a permit or written approval.

Natural hazards including sheer cliffs, slippery rocks, submerged rocks and water of variable depths have caused serious **injuries** and **death**.

Remain behind the barrier and on formed tracks at all times.

Contravention of a requirement of this notice is an offence under the *Nature Conservation Act 1992*.

Maximum penalty: 80 penalty units.

**On-the-spot fines apply.**

For further information phone 13 QGOV (13 74 68)

<insert Murray Falls camping area map to the right with RAA marked and YAH>

<insert symbols PF63 and PR32>



PF63  
Access prohibited



PR32  
Swimming prohibited

<insert Si#>

Si1712

<insert Qld Govt banner>

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RTI Act 2009

## SIGN 2 - Restricted Access Area Simple Regulatory Notice

Example:



Sign text:

<insert heading>

**DANGER** <insert German/Japanese/Chinese language>

<insert subheading>

**Access prohibited beyond this point.**

<insert symbol PF63 and PR32>



PF63  
Access prohibited



PR32  
Swimming prohibited

<insert body text>

Serious **injuries** and **deaths** have occurred here.

**On-the-spot fines apply.**

Queensland Government

<insert Si#>

Sixxxx

## Other communications

While signs in the ground are recommended to be updated to reflect the Best Practice Principles, pre-visit and other communications (available off-site) can enhance the effectiveness of on-site safety signage and also needs to be reflecting the same warning messages.

Brochures are not available at Murray Falls; however, the NPSR website contains prominent safety messages for this park. Messages across all media need to be consistent, and web or printed materials should include appropriate yellow warning symbols if possible. All maps and PDFs of Restricted Access signs need to be updated on the QPWS park page at the same time they are installed in ground.

The concern is that if visitors arrive at the top viewing platform at Murray Falls and see others apparently enjoying prohibited activities (such as entering the Restricted Access Area, swimming and diving into the waterhole below the falls) this may negate safety sign messages. Legislative signage should continue to be enforced where possible through ranger patrols. Operational response and agency support for compliance monitoring and processes to support investigations and reporting is essential to ensure the Restricted Access Area is effective in delivering public health and safety outcomes.

The support of other agencies (police, emergency services, health services and local tourism industry) to reinforce the 'no entry' and 'no diving and jumping' and personal responsibility messages should be encouraged whenever possible. Information placed in backpacker accommodation may be effective, especially if it features people who have died or become disabled.

The site has increased camera monitoring of the Restricted Access Area and road into the park to help determine the usage numbers for the site, timing of incidents and to identify and target any user groups such as local bus companies, backpackers etc. so that these companies can be informed to advise their patrons of the risks at the site. Safety signs alone have not deterred people from entering the Restricted Access Area and accessing the top of the falls so it has been suggested that a more emotive interpretation sign be used in addition to enforcement and regulations to reinforce the take home message of 'lives have been lost—return home safe' and try and change the behaviour of risk taking at the site.

## Evaluation

It is recommended that visitor response to the safety messages is evaluated over the next summer season, through a combination of observation and interviews. The approach to signage may need to be adjusted depending on the feedback received.

## References

NPSR Website. <http://www.npsr.qld.gov.au/parks/murray-falls/about.html> Accessed 10<sup>th</sup> May 2016.

Parkin, D and K. Morris (2005) Pete's story: interpreting the consequences of risk-taking behaviour, *Applied Environmental Education and Communication*, 4:139–150.

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Weiler, B, Zeppel, H, Saunders, R, & Scherrer. 2015. *A review of safety signage for Queensland Parks and Wildlife Service: report 1: literature review, report to the Queensland Parks and Wildlife Service.*, School of Business and Tourism, Southern Cross University, Coolangatta, Qld.



# **Purling Brook Falls Safety Sign Plan**

**10 June 2016**

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Front cover photo: Maxime Coquard © Queensland Government

## Executive Summary

Springbrook National Park's cool forests and mountain streams offer views of spectacular waterfalls, cascades and tumbling creeks. Purling Brook and Tanninaba Falls are special features of the park. Purling Brook Falls is one of the highest falls in South East Queensland and is an iconic image that promotes the park and Springbrook as a tourist destination. The top area of the Purling Brook Falls appeals to those visitors who are not bushwalkers as it is easily accessible.

Purling Brook Falls is a very popular location all year round, but visitation peaks in summer when rainfall is at its highest and there are spectacular opportunities to view the falls in full flow and take photos. Most visitors are domestic and international tourists. The Purling Brook circuit and other longer walks receive a lower level of visitation and are for more experienced and prepared bush walkers.

The naturalness of this area adds to its attraction and is maintained by the minimal level of development and infrastructure, including the walking tracks. Given the history of access and the high number of natural hazards, this site has a relatively low level of recorded incidents (one fatality and two incidents).

However, safety management of this site is complex due to:

- The multiple natural hazards (steep cliff faces, slippery surfaces, fast flowing water, trips/falls and rock falls/landslips);
- The relatively ease of access to these hazardous sites;
- The high risk that has been identified through a formal risk assessment in relation to potential accidents from the top of the Purling Brook Falls (Appendix 2); and
- The recent increase in people entering the RAA and accessing the top of the Purling Brook Falls as a result of internet and social media publicity about people accessing the edge of the cliff face at the top of the falls to take photos/selfies.

Overall, the review found that the current safety signs at Purling Brook Falls meet some Best Practice Principles for safety signs. However, the following issues need to be addressed:

- Many signs are dated and need to be brought into line with the new QPWS Sign Manual and BPPs;
- The large number of signs may cause confusion and make visitors 'switch off' and not read the safety messages;
- Some sign locations need review and relocation;
- Some risks have not been identified and communicated anywhere (trips and falls on the tracks);
- Some directional signage is needed;
- The legislative and prescriptive nature of the Restricted Access Area (RAA) signs makes them difficult to understand and cannot be easily understood by the general public, particularly younger people, and the signs may not be reaching their intended target audience.

Overall, consolidating and updating the signs and the messages contained within them, and adding a 'for your safety' sign will help to alleviate the confusion and hopefully make the signage easier to understand. Complementary interpretive signs, particularly aimed at younger audiences and international visitors identifying the potential costs — physical and financial — may assist in conveying the safety messages.

While some of these issues can be addressed with signs, there is also the problem of risk-taking behaviour. Awareness does not necessarily result in sensible behaviour being adopted. Therefore engineering and design decisions may need to be implemented to physically prevent people from accessing this high risk site if incidents occur in the future. These decisions are outside the scope of this plan.

QPWS has a duty of care to ensure visitors are aware of the risk inherent in accessing this site. However, QPWS cannot be responsible for visitors who ignore both safety warnings and physical barriers.

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## Introduction

### Background to this Report

A number of critical incidents (deaths and serious and permanent injuries) have occurred on QPWS-managed land in recent years. Following an inquest into the drowning death of a visitor at Mossman Gorge in 2014, the State Coroner recommended that a committee of stakeholders consider a number of issues, one of which was the 'the information provided to visitors at the centre including the content of that information and how it is delivered; and the signage in the national park' (Queensland Government, 14/07/2014, p.1). Southern Cross University conducted an expert review of QPWS safety signs and the agency's approach to risk management (Weiler et al, 2015). This review identified Best Practice Principles and reviewed current safety signs at three sites where fatalities had occurred, including Mossman Gorge. Although QPWS signs were found to be closely aligned with best practice, some minor changes were made to the sign guidelines as defined in chapter 5 of the QPWS Sign Manual, 2016. As many safety signs are unlikely to be compliant with the new standards, a review of critical sites is being undertaken.

Purling Brook Falls at Springbrook National Park has been identified as a high risk for those visitors who choose to ignore the restricted access area declared at the top and base of the falls because of natural and hazards and the potential for:

- People to be swept over the top of the waterfall at Purling Brook Falls or slipping on rocks near the cliff edge; and
- People to be struck by a rock fall or landslip while traversing the decommissioned walking track below Purling Brook Falls or stray off track walking at the base of the falls.

This sign plan has been written to review safety signage at Purling Brook Falls in light of these risks, to determine consistency with the QPWS Sign Manual and safety sign best practice, and to recommend upgraded and additional signage.

Unfortunately there have been a number of deaths from suicide in this area, These are not included in the consideration of risks and signage in this report.

### Purling Brook Falls, Springbrook National Park

Springbrook National Park is recognised as part of one of the world's most outstanding and valuable places for its natural and cultural values. In December 1994, the UNESCO World Heritage Committee officially declared the Gondwana Rainforests of Australia World Heritage Area over the Scenic Rim (including nearly all of Springbrook National Park) and rainforests of northern and central New South Wales.

Springbrook National Park is located about 100km south of Brisbane and comprises four sections on and around the plateau: Springbrook section extends along the crest of the plateau, Mount Coughal section to the south east and Natural Bridge and Numinbah sections to the west (Figure 1). Springbrook's cool forests and mountain streams offer views of impressive landscapes, and walks among subtropical and

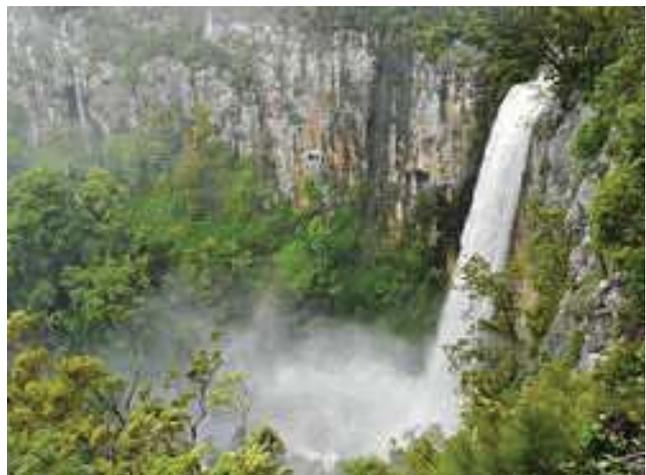


Photo 1: Purling Brook Falls (Source: Wikipedia website, 2016)

temperate rainforest, open eucalypt forest and montane heath. Spectacular waterfalls, cascades and tumbling creeks are dominant features. Purling Brook and Tanninaba Falls are special features of the park (Figure 2). Purling Brook Falls (Photo 1) is one of the highest falls in South East Queensland and is an iconic image that promotes the park and Springbrook as a tourist destination. The top area of the Purling Brook Falls appeals to those visitors who are not bushwalkers as it is located within an easy stroll from the Gwongorella car park.

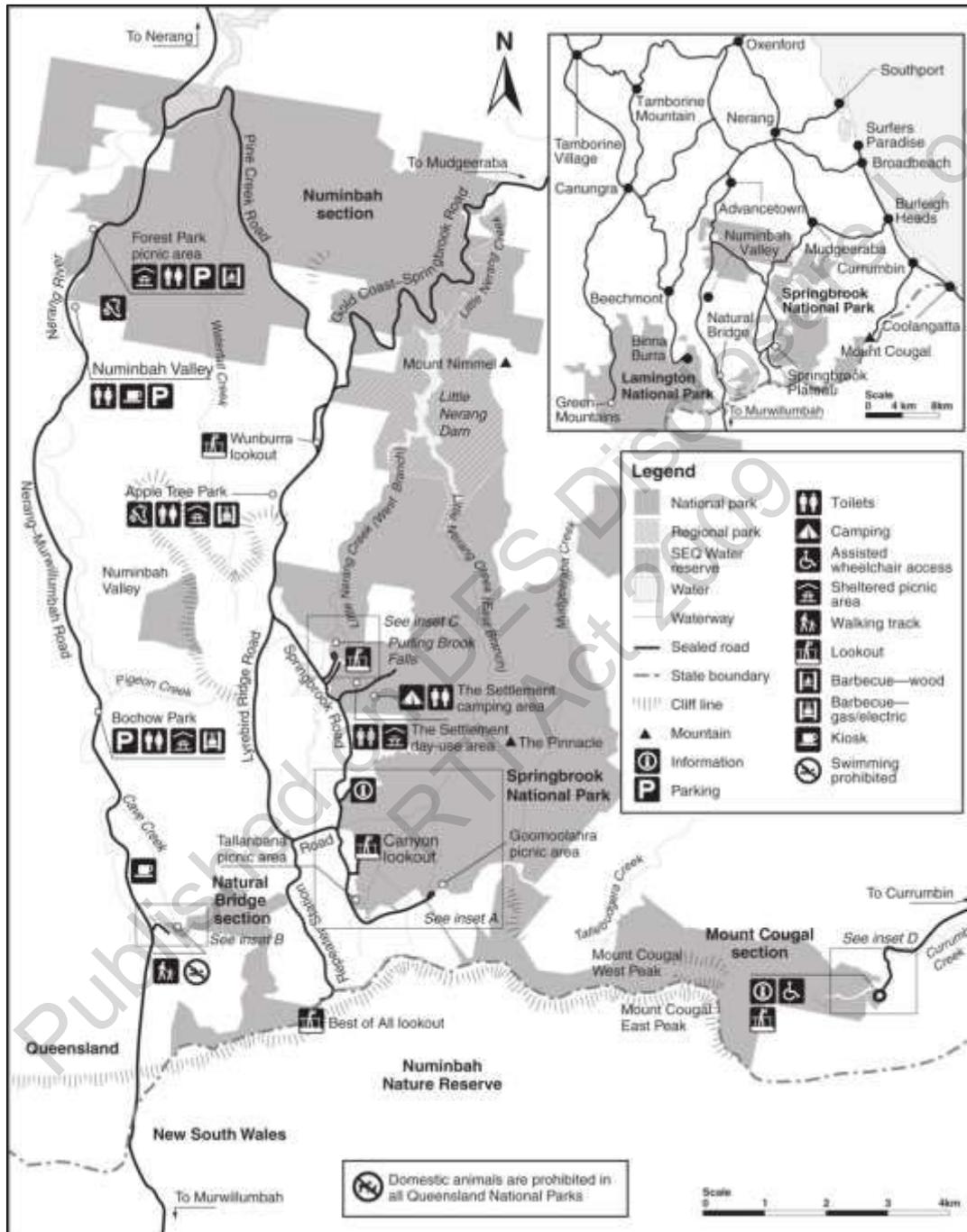


Figure 1: Springbrook National Park

Camping is available at The Settlement camping area on Springbrook plateau. There is easy access to the falls from both The Settlement camping and day-use area and Gwongorella day-use area (Figure 2). The Settlement camping area is the end of the Gold Coast Hinterland Great Walk. A permit is required to camp in the national park and camping bookings must be made in advance. There are

also several privately-run campgrounds, guesthouse, lodges and cottages within a short distance of Springbrook National Park.

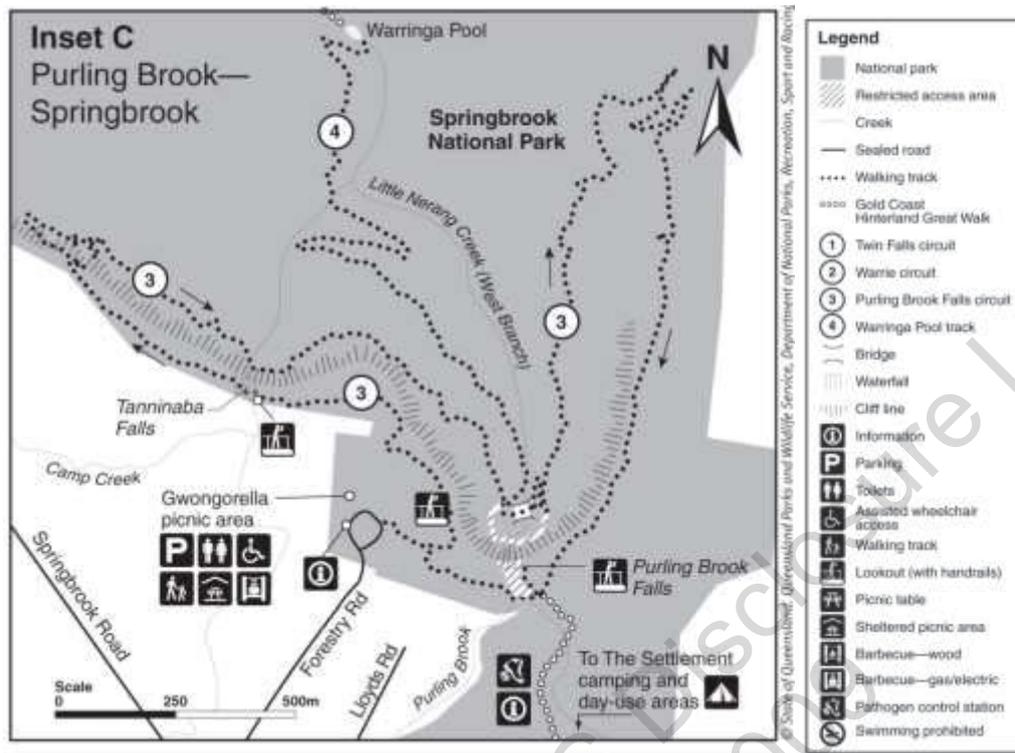


Figure 2: Purling Brook and Tanninaba Falls, Springbrook National Park

The NPSR website contains the following information about Purling Brook Falls walking track.



**Purling Brook Falls circuit (Class 3)**

**DANGER:** Sheer cliffs and waterfalls. One slip could be fatal—serious injury or death may result from walking near the edge. Keep to the track. Supervise children closely.

**Important!** For visitor safety Purling Brook Falls has two restricted access areas at the top and bottom of the waterfall area. Access to the areas indicated is prohibited. Penalties apply.

**Distance:** 4km return

**Time:** Allow about 2hrs walking time. Note: it is easier to walk the track in a clockwise direction. If including the Warringa Pool track, which leads downstream from the base of the falls, add another 2km and allow another 40mins to return.

**Caution:** Sections of the Purling Brook Falls circuit and Warringa Pool track are part of Gold Coast Hinterland Great Walk: arrow markers indicate the walk. This is an arduous walk. Please do not attempt it unless you are a Great Walker and have a copy of the Gold Coast Hinterland Great Walk topographic map.

**Details:** Pass through open eucalypt forest of New England ash *Eucalyptus campanulata*, where fire-adapted species such as lepidozamias, hakeas and various wildflowers grow, before descending into the gorge to view the falls from below. After crossing the suspension bridge a steady climb through forest brings the walker back to the picnic area. Water flowing over Purling Brook Falls is high quality because its catchment is protected in the Gondwana Rainforests of Australia World Heritage Area. Walking in this area is a privilege. Be responsible for keeping the catchment clean—practice minimal impact bushwalking.

**Note:** After significant rainfall, parts of the Purling Brook walking track may be closed for public safety. Access is generally still available to the western lookout during these closures. Please ensure you check the Park alerts before you visit this park.

## Visitation

Purling Brook Falls is a very popular location all year round – in summer people come to see the falls when rainfall is at its highest, and in winter visitors come for the walking tracks and to experience cold mountain air. Visitation peaks after heavy rainfall as people are keen to view the falls in full flow and take photos of the waterfall. Approximately 90,626 visitors accessed Purling Brook Falls during 2014. In the first four months of 2016, 47,316 visitors to the falls had been recorded. Most visitors are domestic and international tourists. Some Commercial Tour Operators use the site, but most visitors are free and independent travellers.

The Purling Brook circuit and other longer walks receive a lower level of visitation and are for more experienced and prepared bush walkers.

On hot days there is an influx of visitors, mostly 18-25 year olds, seeking to swim in the closest waterbody. Most swim in Purling Brook or at Warringa pool at the base of the falls. Swimming is discouraged in the plunge pool at the bottom of the falls for safety, visual amenity, and ecological reasons, but during the warmer seasons, visitors continue to swim there regardless of the risks.

## Landscape Setting

The landscape classification system (LCS) is a standard classification system used by QPWS to characterise the biophysical, social and management attributes of sites to assist in visitor management and the design of facilities. A 'setting' is a measure of naturalness from 1 (totally natural) to 9 (fully urban) based on the physical, social and managerial characteristics of a site. QPWS uses settings to make decisions about the appropriate type and scale of visitor use for a particular site. The setting is determined using the *Landscape classification system for visitor management operational policy and procedural guide* (available on the intranet).

The top of the Purling Brook Falls has a LCS score of 6.4, while the Purling Brook Falls circuit (East and West) has a more natural setting of 4.3 (See Figure 2 for circuit location). All the sites have a natural appearance, except the Gwongorella picnic area, which has been developed to cope with the high number of visitors. There is little difference in the physical setting of the lookouts (Physical LCS 4.2) and the walking tracks (Physical LCS 3.2). The social setting scores are a lot higher for the lookouts (Social LCS 6.4) than the lower Purling Brook circuit tracks (Social LCS 3.9) due to the ease of access to the lookouts and high visitation levels here. The distance, steepness and high number of stairs of the circuit track (Figure 2) means fewer people are likely to venture past the lookouts, so mostly more self-reliant, experienced bush walking visitors use these tracks. The sites at the top of the falls are being managed according to the social setting rather than the physical setting. This is something to be mindful of, if retaining a relatively natural setting is the aim when placing signs at this site (QPWS, 2012) (Springbrook Interim LCS Report, 2012 – written as part of the Draft Management Plan, 2012).

## Hazards, Incidents and Risky Behaviour

The Springbrook plateau has been a tourist destination since the 1920s and visitors have been accessing the Purling Brook Falls and walking tracks since the 1940s. Given the history of access and the high number of natural hazards, this site has a relatively low level of incidents (Table 1).

However, safety management of this site is complex due to:

- The multiple hazards (steep cliff faces, slippery surfaces, fast flowing water, trips/falls and rock falls/landslips);
- The relatively ease of access to these hazardous sites;
- The low number and type of incidents recorded, mainly associated with trips and falls on walking tracks (Table 1), weighed against the high risk that has been identified through a formal risk

assessment in relation to potential accidents from the top of the Purling Brook Falls (Appendix 2); and

- The recent increase in people entering the RAA and accessing the top of the Purling Brook Falls as a result of internet and social media publicity about people taking photos/selfies on the edge of the cliff face and at the top of the falls.

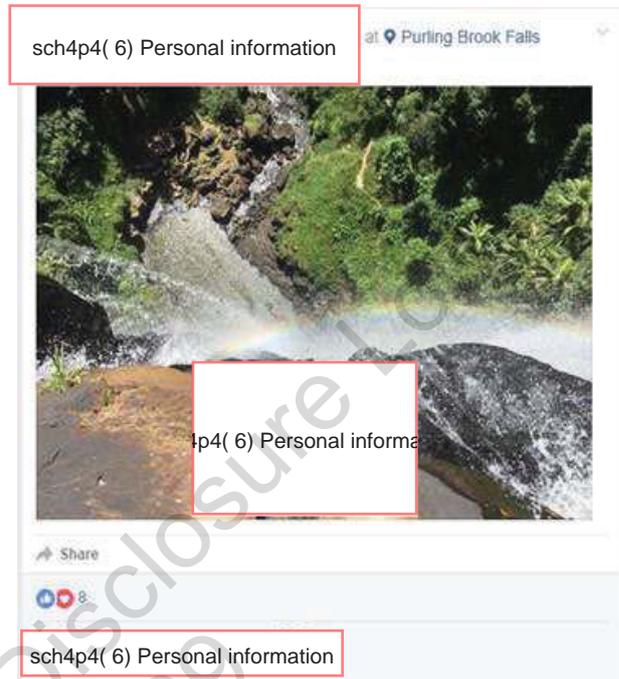
**Table 1: Incident record for Purling Brook Falls area**

<b>Date</b>	<b>Injury</b>	<b>Reason</b>	<b>Other details</b>
1 July 2001	Death	Climbed over fence, tripped on root, tumbled and fell over cliff at Tanninaba Falls	Female – middle aged to elderly
30 July 2003	Minor injuries	Tripped over speed bump in Purling Brook car park	Elderly female
18 October 2006	No injuries	Male left track on PB Falls circuit and became lost for 3 days. Eventually walked out onto a farm.	Male
4 April 2007	Major wrist injury and minor head injury	Visitor slipped on piccabeen palm fruits on PB Falls circuit and fell backwards, breaking her wrist and hitting her head, passing out for 10 minutes	Female, 70 years old
29 January 2008	Minor injury	Visitor had an epileptic attack and fell while walking on PB Falls circuit	Male
24 March 2008	Major leg injury	Tripped while going down stairs on PB Falls circuit. Steps in good condition.	Male
16 March 2010		Bushwalker suffered breathing difficulties while doing PB Falls circuit. The ambulance was called and the bushwalker walked out with the aid of oxygen	Male
25 April 2014	Unknown	Fell on walking track	Helicopter rescue of 70yr
10 January 2016	Minor head injury	Clothing caught on log causing fall	First-aid administered to male
18 May 2016	Minor leg injury	Fell on PB Falls circuit walking track	Female was helicoptered out

## Risks: RAA Top of Purling Brook Falls

A risk assessment was carried out for the RAA at the top of the falls in relation to people potentially falling over the edge of the cliff. This risk was deemed to be high (Appendix 1).

There has been a recent rise in visitation to the falls and in infringement notices being issued to people accessing the RAA. This increase is believed to be due to social media (sharing of selfies and photos in particular) and additional media attention on visitors taking risks to take photos from the edge of the cliff (Photo 2 and Appendix 3). On Fri 9 Oct 2015, Senior Ranger Sergio Norambuena, participated in a live media segment with a national morning television program about the topic of 'selfies' resulting in risky behaviour, particularly at Purling Brook Falls, Springbrook NP. (For additional images of people endangering their lives at Purling Brook Falls see link — <http://www.dailymail.co.uk/news/article-3264265/Tourists-posephotos-dangerously-close-edge-100m-waterfall.html> )



**Photo 2: Example of images being shared on social media sites (Source: Facebook, 2016)**

Visitors enter the RAA, which encompasses the top of the falls and creek area, without authority via the causeway, ignoring the RAA signs and crossing the pedestrian barrier.

Anecdotally, mostly younger people aged 18-25 and international tourists are taking these risks in order to take 'selfies' on the cliff edge to impress their friends on social media forums.

## Risks: RAA Below Purling Brook Falls

A risk assessment was carried out for the RAA at the bottom of Purling Brook Falls in relation to people potentially being struck by falling debris and landslips. This risk was deemed to be medium (Appendix 1).

The site below the falls has been closed off to the public and RAA signs erected. As the gates above the falls are closed off in periods of high rainfall and wind, this should also minimise the risk of visitors being at the site when the risk of rock falls would be highest.

Visitors also often arrive in inappropriate attire for bushwalking, such as high heels and dresses or bare feet and swim wear, but walk the whole Purling Brook Falls circuit to view the bottom of the falls and swim. This is a two hour circuit with steep sections and many stairs. It is a more natural landscape setting where visitors need to be more self-reliant and prepared and should expect fewer visitors and less management presence, including signs. Signs at the top of the Purling Brook circuit east advise this but visitors still complain upon return.

There are 10 recorded incidents for this site (Table 1) mainly being from trips and falls. These incidents, combined with the high risks associated with the natural hazards here (see risk

assessments, Appendix 1), and the recent increase in prohibited access to the top of Purling Brook Falls, warrant this review of safety signage.

## Scope and Methodology

Safety signs located at Purling Brook Falls have been reviewed, along with photos, maps, reports, risk assessments and incidents related to the site. Local rangers and interpretive staff have been consulted as part of the review.

Signs have been evaluated against the updated QPWS Sign Manual (2016) and against the Best Practice Principles for safety signs in parks using the four stages of the warning process: 'notice, encode, comprehend, comply' (Weiler et al. 2015).

The following documents and information have been considered in preparing this sign plan:

1. NPSR Website information on Purling Brook Falls, Springbrook National Park
2. Social media sites and other travel websites promoting Purling Brook Falls, including Instagram, Tripadvisor and Facebook
3. Findings of Coronial Inquest into death of (b) Personal inf July 2014
4. Southern Cross University, A review of safety signage for Queensland Parks and Wildlife Service, June 2015: Report 1—Literature review and Annotated Bibliography citation
5. Crows Nest Safety Sign Review Report, 2015
6. QPWS Sign Manual, 2016
7. NPSR Work Health and Safety Policy, 2012
8. A relevant journal paper 'Pete's story: interpreting the consequences of risk-taking behaviour' (Applied Environmental Education and Communication, 4:139–150, 2005).
9. Springbrook Area Draft Management Plan, 2012.

The aim of this sign plan is to enhance visitor safety at Purling Brook Falls, particularly with regards to behaviour near the top of the falls and the clifftop area, where the potential for accidents and associated risk level is high (Appendix 1). The risk associated with people being struck by rockfall while traversing the decommissioned walking track below the falls is medium (Appendix 1). Therefore this is also covered in this plan.

Sign options considered in this review were:

- Orientation signs, which can include safety messages;
- Formal safety signs (danger signs), which meet internationally recognised standards but are not legally enforceable unless combined with regulatory provisions;
- Regulatory notices, which are legally enforceable and can be used to address safety issues as per section 70 (1) of the Nature Conservation (Protected Areas Management) Regulation 2006. (These may be combined with information notices if desired to reduce the amount of text required;
- Interpretive signs: a complementary approach that can present safety messages in a more personal and emotive manner than a formal safety sign and target a specific, at-risk audience; and
- Pictograms, which can be included on other signs or printed as stand-alone signs and placed on site to reassure visitors and should be recognised by children, and English and non-English speaking visitors. These are not enforceable on their own, but can be included on regulatory notices to become enforceable. They are often also used on safety signs.

Different types of signs are appropriate in different landscape settings and for different risk levels. See Table 2 for a complete list of signs considered in this review.

**Table 2: Sign options**

Sign type	Risk		
	High	Med	Low
Orientation sign with safety message			
Complementary interpretation sign			
For your safety sign			
Warning sign			
Danger sign			
Regulatory notice			
Regulatory information notice			
Danger sign including regulatory notice			
Danger sign including regulatory information notice			
Regulatory notice to complement an info notice			
Routed sign (danger or warning or safety)			
Danger totem			
Warning totem			
Pictograms			
Symbols			

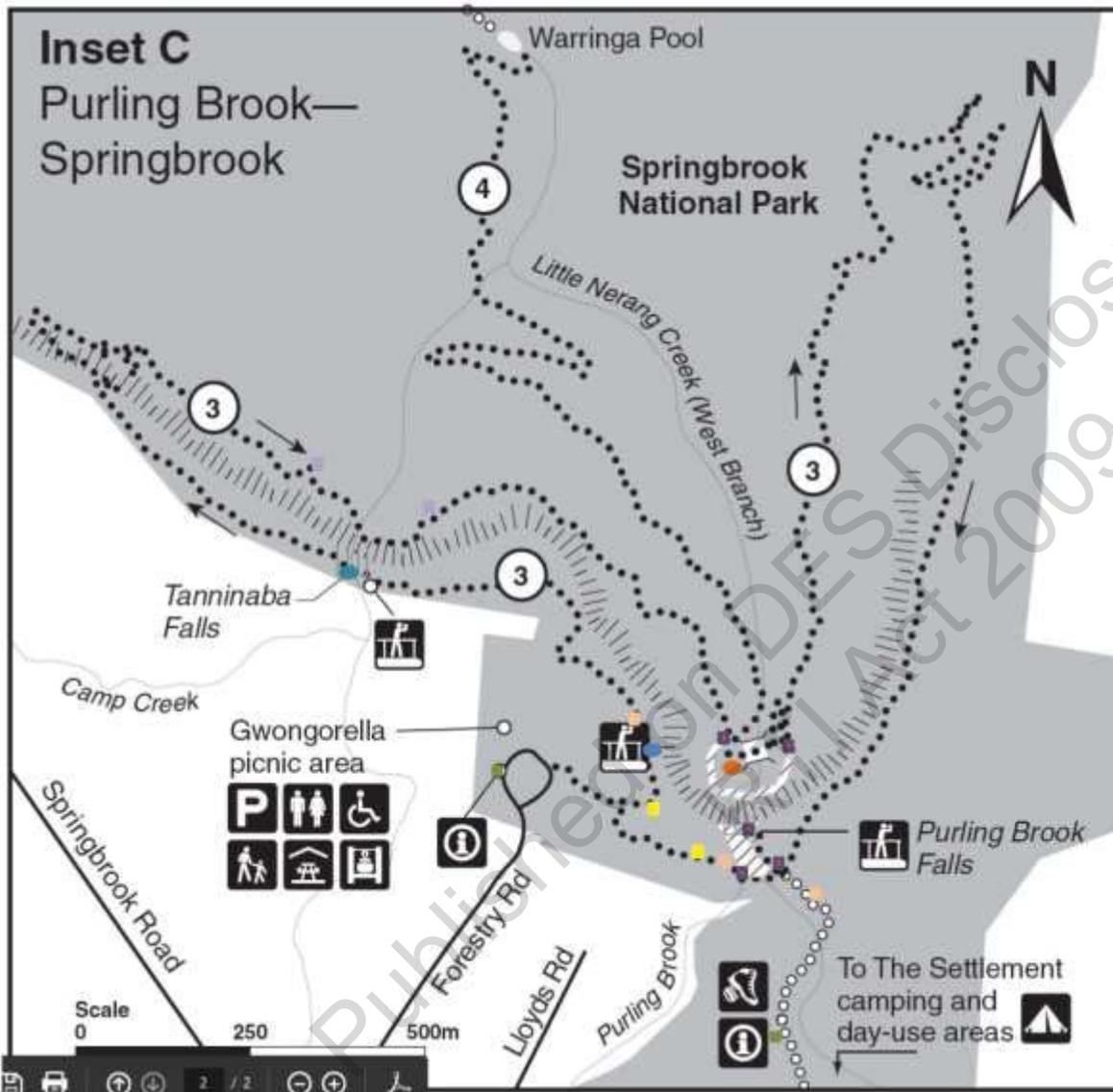
## Current Safety Signs and Messages

There are currently 14 signs at this site (See Figure 3 and Table 3 for sign images):

-  Two warning totems are located below Tanninaba Falls advising visitors to be aware of rock falls over a 350m section of the track and not to stop.
-  Three 'for your safety' signs, located on the start of Purling Brook Falls circuit on gates that can be closed off during high rainfall and fires to stop visitors accessing the high risk areas.
-  Five Restricted Access Area (RAA) signs – three are located at the top of the Purling Brook Falls around the perimeter of the RAA and two are located below the falls at the entry points to the decommissioned walking track.
-  Two warning signs on the tracks at the top of the falls advising sheer cliffs ahead, keep control of children, do not to cross when floodwater is over the walking track or bridge.
-  One interpretive sign at Tanninaba Falls lookout.
-  One interpretive sign at Purling Brook east lookout.
-  One interpretive sign located along the walking track near the plunge pool at the base of Purling Brook falls, which discourages swimming in the plunge pool.
-  One orientation sign at Gwongorella day-use area.

The Springbrook Discovery Guide and the Gold Coast and Scenic Rim Journey Guide cover this area and address basic safety information and hazards at this site.

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Si1663	
Si4874	
FYS	
Si5171	
Si5173	
Si5173	
Si3427 Si3429	

Figure 3: Location of signs at the Purling Brook Falls site

## Assessment of Current Signage

Overall, the review found that the current safety signs at Purling Brook Falls meet some Best Practice Principles (BPPs) for safety signs. However, the following issues need to be addressed:

- Many signs are dated and need to be brought into line with the new QPWS Sign Manual and BPPs;
- The large number of signs may cause confusion and make visitors 'switch off' and not read the safety messages;
- Some sign locations need review and re-siting;
- Some risks have not been identified and communicated anywhere (trips and falls on the tracks);
- Some directional signage is needed;
- The legislative and prescriptive nature of the Restricted Access Area (RAA) signs makes them difficult for people to understand— some visitors who have been caught in the RAA have advised they could not understand the sign.

Overall, consolidating and updating the signs and the messages contained within them will help to alleviate the confusion and make them easier to understand, particularly for younger audiences and international visitors.

To develop effective text for signs (and other communication media), the hazards and risks associated with the site need to be consistently conveyed. QPWS has a duty of care to ensure visitors are aware of the risk inherent in accessing this site. However, QPWS cannot be responsible for visitors who ignore both safety warning and physical barriers.

### Restricted Access Area Top of Purling Brook Falls

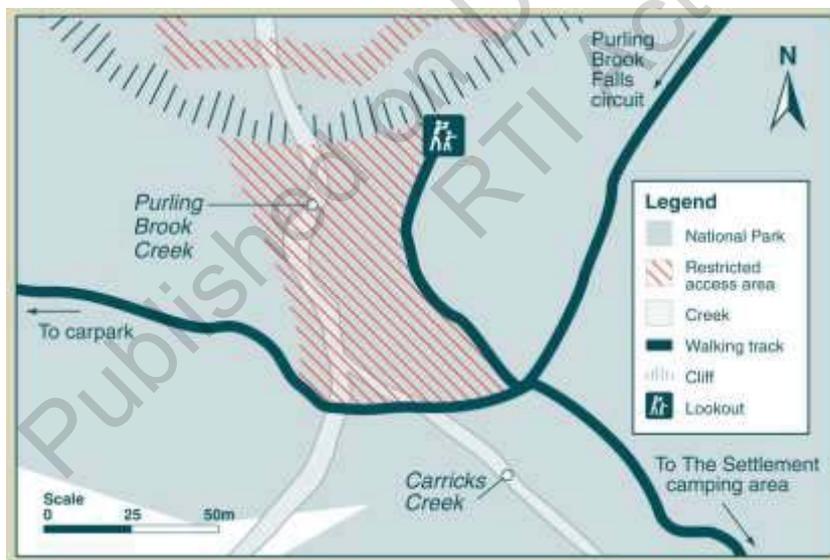


Figure 4: Restricted Access Area, top of Purling Brook Falls

The RAA and hand rails at the top of the falls (Figure 4) were implemented between 2001 and 2003 to discourage people from accessing the cliff area, where there is a high risk of slipping and falling over the steep edge, particularly after heavy rain (Appendix 1).

In spite of this, the top of the Purling Brook Falls remains easy to reach for those who choose to ignore the regulation and the warning and to climb through the barrier. The walkway crossing the causeway allows direct access to the rocky platform above the falls if people climb through the

barrier. From the causeway, people can see that the view from the top of the falls looks amazing – it is very tempting to try and get a closer look.

The park is regularly closed due to flooding over the causeway, when many people want to visit the falls to see them at their best. The hand rail along the causeway is regularly damaged by heavy water flows and debris, and the causeway becomes slippery after rain. The gate at the western end of the causeway and another one on the access track from the Settlement camping area are closed during heavy rain events and visitors can only reach the Purling Brook Falls West and Tanninaba Falls Lookouts. The emergency response procedure for Springbrook states that the gates must remain closed if there is any water over the concrete causeway. Staff need to remove any debris on the track and be satisfied that it is safe before they re-open the gates.

It is recommended the signs on the gates be replaced with smaller danger signs that are only applicable when the gate is closed. Additional 'for your safety' signs are recommended to advise of slippery surfaces.

While the RAA signs may serve the purpose of being a legislative sign for staff to be able to issue infringement notices or fines, they may not reach their intended target audience (visitors and young people accessing the falls) due to their appearance (current signs do not have the red danger banner and look more like an advisory sign). Visitors caught in the RAA have said the signs are hard to understand and do not make sense. There has recently been an increase in the number of infringements being issued mainly to younger people accessing the RAA. This is thought to be a result of the rise in 'selfies' and the use of social media for sharing images of the falls and the recent media attention in relation to this (Appendix 2).

There is also the problem of 'cognitive dissonance'. This is the mental discomfort experienced by an individual when processing two or more conflicting ideas. When visitors read the signs here saying access prohibited, but see the opposite behaviour occurring of people being inside the restricted area, it causes confusion. The behaviour of other visitors is often a more powerful influence than a sign (QPWS, 2015, Mossman Gorge Sign Plan, p. 3). It has been found that when a high number of visitors are doing the wrong thing and engaging in dangerous activities, people's perception of the risk decreases and the activity is seen as acceptable.

Three RAA signs are located in the Purling Brook Falls area, one at each end of the causeway and one at the lookout itself (Refer to Figure 3 and Table 3). Overall, the review found that these RAA notices meet Best Practice Principles for safety signs. However, they require text updates and size changes in line with the current QPWS Sign Manual, 2016. While the signs meet best practice standards, they would be more effective if replaced with RAA danger signs, with the red banner to make them stand out more. Some minor text changes would also assist in making them more easily understood. By adding a reference to the access prohibited symbols marking the boundary of the RAA, these symbols can then be used along the hand rail of the causeway and in other areas where people are short-cutting to the top of the falls. The signs also need to be located so they are facing oncoming foot traffic, rather than being parallel to the walkway.

Best Practice Principles for safety signs are applicable in a wide range of contexts and at a broad level but do not provide for detailed consideration of people-related factors. Some examples of differences among target audiences that may need to be considered in safety signage here include (from Weiler et al 2015, p.20):

- Whether the visitor's behaviour is intentional or unintentional. Persuasive communication is seldom effective on its own for impacting behaviour that is high-risk.

- Whether the visitor is a regular or a first-time visitor. Regular visitors familiar with an area and/or activity are less likely to read signs.
- Over-confidence. This has been found to bias individuals' risk assessment.
- Males are more likely to engage in high-risk behaviour, and older adolescents appear less risk-averse than younger children.
- Those who 'held negative attitudes towards cautionary signs' were more likely to believe sign-posted high risk areas were not dangerous.

A complementary interpretive sign especially targeting the high-risk group (young men and women aged about 15-25) is recommended to better reach people entering the RAA at the top of the falls. This has been found to be beneficial in locations where danger signs are ignored, especially due to people seeing other people carrying out the dangerous activity.

Traditional danger signs may not deter all people from engaging in dangerous activities so it has been recommended that a more emotive interpretation sign be developed to reinforce the take home message of 'is that photo really worth it—lives have been lost and people like you have been seriously injured here—return home safe' and try and change the behaviour of risk taking at this site.

An alternative approach would be installing a sign highlighting the potential cost of entering the RAA – something along the lines of 'Is that photo/selfie really worth the cost?' (both physical and financial). An example is provided in Table 3 below. Interpretive signs can present the message in a more personal and emotive manner than a safety sign and target a specific, at-risk audience (QPWS, Sign Plan, 2016 p. 162).

While some of these issues can be addressed with signs, there is also the problem of risk-taking behaviour. Awareness does not necessarily result in preventative behavioural action being adopted. There are factors that determine visitor response that will continue to thwart all efforts of control. Consequently, there is no guarantee that a protected area visitor will heed or act on the information provided. In most instances, people are misled by their experience because that experience was limited, biased or deceptive and evoked a betraying sense of safety. In addition, an individual's perception of the hazard (magnitude, likelihood and recency of any personal experience of the hazard) will be influenced by their awareness of the hazard, their risk-taking propensity and their perception of control over their fate. Therefore, it is quite likely that the person concerned would have ignored any warning because they were able to form their own view (possibly erroneously) that all was safe for them, at that particular time and place (Parkin, D., 2005, p.11).

Therefore engineering and design decisions may need to be implemented to better address the problem of cognitive dissonance and risk taking activities and to physically prevent people from accessing this high risk site if incidents occur in the future.

### **Restricted Access Area, Base of Purling Brook Falls**

In 2000 the track behind the base of the falls was upgraded to include concrete and steel fencing to protect visitors. At the same time, a geotechnical company assessed the cliff above the track at Purling Brook Falls and a monitoring program was implemented. Warning totems were located at either end of the track entrance under the falls at Warringa Pool. Due to track maintenance requirements, risks to visitors and landslides around the base of Purling Brook Falls, the RAA was implemented in 2014 and the track was diverted away from behind the falls onto a suspension bridge in front of the falls. The warning totems were removed once the track was decommissioned and the suspension bridge built and the geotechnical monitoring was discontinued. Two RAA signs and fencing are now located on either side of the falls where the original track was decommissioned (Figure 3).

There is evidence that visitors have been accessing this section of the track. The risk assessment for this area is medium for the risk of people being struck by a rock fall or falling debris while traversing the track below the falls (Appendix 2). The current LCS setting for this track is 4.3 – reflecting the lower level of development and visitation and the need to be more self-reliant being further away from the nearest place of safety. There is minimal management presence with limited enforcement at this site.

The intention is to maintain this location as a more natural setting away from the main falls area. As the gates above the falls are closed off in periods of high rainfall and wind and the site of risk has been closed off to the public at the base of the falls, this should mitigate the risk of visitors being at the site when the risk of rock falls would be highest. It is therefore considered that current signage is adequate for this area.

### Tanninaba Falls

Small warning totems were put in place at the base of Tanninaba Falls at the same time as the warning totems were installed at the base of Purling Brook Falls. These are still in place identifying the potential hazard of rock falls in a 350m section of track (Figure 3). The current LCS for this track is 4.3 – reflecting the lower level of development and visitation and the need to be more self-reliant being two hours away from the nearest place of safety.

Given the LCS for this site is much lower, and no rockfall activity has been recorded for this site, a risk assessment is needed to determine whether these warning totem signs are still required in this location. There are many other locations where rock falls could still occur but these are not signed.

### Trips and Hazards on Walking Tracks

Aside from the one fatality, the two incidents that have been recorded at Purling Brook Falls have been related to trips and falls over natural features. The tracks for this site are all Class 3 Australian Standard tracks (Figure below).



#### Class 3 track (Australian Standards)

Distinct tracks with junctions signposted. Rough track surfaces with some exposed roots and rocks. Variable in width. Muddy sections, steep grades and steps may be encountered. May be partially overgrown; hazards such as fallen trees and rockfalls may be present. Caution needed at creek crossings, cliff edges and naturally occurring lookouts. Reasonable level of fitness and ankle-supporting footwear recommended. The hazards are consistent with a natural environment and in most cases the incidents were mainly a result of poor judgement or visitors engaging in risky behaviour.

The naturalness of this area is an attraction in itself and is maintained by the minimal level of development and infrastructure, including on the walking tracks. Therefore some risk of tripping and falling is always going to be present. This hazard is one that should normally be anticipated and accepted by visitors to a park of this landscape setting, but many people are not adequately prepared for a bushwalk and set off on the longer walk in flimsy footwear and swimming gear. It is therefore appropriate to convey the message on an advisory 'for your safety' sign. It is recommended that a 'for your safety' sign be placed at the start of each track from the Gwongorella day-use area and The Settlement camping area covering all safety messages, including steep cliff faces, slippery surfaces and trip hazards.

These messages need to be prominent and consistently conveyed across all forms of communication, including signage and website. Replacing the current warning signs with 'for your safety' signs covering all messages will assist in communicating these hazards to visitors (See Table 3 and page 23). A 'for your safety sign' is preferred as there is already a high level of regulatory and danger signs here and there can be multiple messages incorporated onto the 'for your safety sign' covering several hazards.

### **Four Way Junction at Eastern Side of Causeway (Directional Signage Requirement)**

There is a four way junction at the eastern end of the causeway above the falls leading to the eastern lookout, the Purling Brook Falls circuit, Settlement camping area and across the causeway. (Figure 4). There is directional signage here but it is not clear and some people become disorientated. It is recommended that directional signage be improved at this location (Table 3). An overall site orientation sign near the track entrance including safety messages would also be helpful, to complement the existing whole-of-park orientation signs.

See Table 3 below for recommended sign updates and page 24 for text outline.

## Safety Sign Recommendations

Table 3: Sign Recommendations

Priority	Current Sign	New Sign (examples are format only)	Action / Justification	Location/siting
1	<p><b>Restricted Access Area (RAA) Regulatory Notice (top of PB Falls)</b></p> 	<p><b>REPLACE</b> existing signs with <b>RAA Notice Danger Sign</b></p> <p>Example:</p>  <p>The stand-alone RAA notices are required to remain in place as they are used to restrict or prohibit access.</p> <p>Under the NCA act, a RAA is declared by erecting a restricted access area notice in a location easily visible to passers-by. (QPWS Sign Manual 2016, Section 4.8.3)</p>	<p><b>REPRINT SIGN</b> with text changes and correct size (600x400mm) (3 copies needed all with individual 'You are here' locations)</p> <p>Revise wording and style in line with Sign Manual 2016;</p> <ul style="list-style-type: none"> <li>• heading with other languages</li> <li>• add the access prohibited symbol and related text (this will allow stand-alone symbols to be used on-ground to mark the boundary and show where access is prohibited)</li> <li>• add 'You are here' mark to each map.</li> </ul> <p><i>See Sign #1 below for suggested text</i></p>	<p>Three identical signs.</p> <ul style="list-style-type: none"> <li>• 1 at the western end of the causeway</li> <li>• 1 at the eastern end of the causeway</li> <li>• 1 at the Purling Brook Lookout East</li> </ul> <p>Current locations are good- they are in positions where visitors will pass at least one sign when they enter the area. The signs on the causeway need to be better oriented as they currently do not face oncoming foot traffic. This will require core drilling and pre-fabrication as the signs are mounted into rock and cannot use standard mountings.</p>
1		<p><b>NEW SIGN - Stand-alone access prohibited pictogram</b></p>  <p>PF63 Access prohibited</p>	<p><b>PRINT STAND ALONE PICTOGRAMS 250x250mm</b> (4 copies required)</p> <p>Pictogram only – no text.</p> <p><i>See sign #2 below for suggested text</i></p>	<p>To be placed along the handrail on the causeway and in other locations where there is evidence of access.</p> <p>These signs will need frames constructed to mount to steel handle rails.</p>

1	<p><b>Restricted Access Area (RAA) Notice (base of PB Falls)</b></p> 	<p><b>Maintain</b> current signs. The RAA was justification and prerequisite to ceasing the geotechnical monitoring for the cliff line above the decommissioned track, so therefore should remain in place.</p>		
1	<p><b>For Your Safety Signs</b></p> 	<p><b>REPLACE</b> existing signs with <b>NEW small danger signs on the gates</b>  Example (format only):</p> 	<p><b>REPRINT SIGN</b> with text changes. Maintain current size (450x300mm) (3 copies needed)</p> <p>Revise wording and style in line with Sign Manual 2016;</p> <ul style="list-style-type: none"> <li>• heading</li> <li>• colours</li> <li>• pictos.</li> </ul> <p><i>See Sign # 3 below for suggested text</i></p>	<p>Current locations are good- they are located on the gates which are closed at times of high risk. Signs are very damaged and need to be replaced.</p> <p>Maintain current signs to reuse current mountings. Avoid overhang on gates which leads to the signs being damaged.</p>
2	<p><b>Warning Sign (large)</b></p> 	<p><b>REPLACE</b> existing signs with new <b>'for your safety' signs</b>.  Example:</p> 	<p><b>NEW SIGN</b> with text changes and correct size (600x400mm) (2 copies needed)</p> <p>Revise wording and style in line with Sign Manual 2016;</p> <ul style="list-style-type: none"> <li>• heading</li> <li>• colours</li> <li>• pictos</li> <li>• add message about trips and fall hazards</li> </ul> <p><i>See Sign #4 below for suggested text</i></p>	<p>Locate one at each entrance to the walking tracks from Gwongorella day-use area and The Settlement camping area. The signs need to be in positions where visitors will see them when they enter from Gwongorella day-use area leading out to both PB Falls lookouts. An additional sign is needed along the track from the Settlement Camping Area. Check signs are oriented to face oncoming foot traffic.</p>

2	<p><b>Warning Totem</b></p>	<p><b>MAINTAIN</b> current signs until a risk assessment of this site is carried out to determine whether they are still required at this location. Maintain signs if still required, or remove. May need to maintain after rockfall catch fence is removed if rockfalls occur at this site.</p>		
3	<p><b>Orientation and Interpretive Signs</b></p>	<p><b>MAINTAIN</b> current signs</p>	<p>In time when these signs need to be replaced, update to include ensure all safety information is in line with Sign Manual. Ensure sign incorporates the prohibited access symbols as these are widely recognised and helpful with international visitors who do not understand English.</p>	<p>The signs are in good locations.</p>
3		<p><b>NEW Complementary Interpretive Sign (example of format only)</b></p>	<p><b>NEW SIGN</b></p> <p>Adding a complementary interpretive sign has been found to be beneficial in parks where the danger signs are ignored due to the behaviour being displayed.</p> <p>Text needs to appeal to young people. Example text would be 'Is that photo really worth it—lives have been lost and people like you have been seriously injured here—return home safe' OR 'Selfie? It will cost you'.</p>	<p>At the top of the falls adjacent to the RAA. It needs to be at a location along the walking track where people are able to stop and view the sign clearly and absorb the message before reaching the site. Do not locate along the center of the causeway where it is likely to be damaged and washed away in the next flood event.</p>

3		New directional signage	<b>NEW SIGN</b> Directional signage is needed at the four way junction east of the causeway. Totem style is preferred.	
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## Recommendations

### SIGN 1 - Restricted Access Area Danger Sign

Sign example:



<insert heading>

**DANGER** < insert German/Japanese/Chinese language>

<insert subheading>

**Unauthorised entry prohibited**

<insert body text>

Entry to the top of Purling Brook Falls and surrounding rock platform as identified on the map and marked by these symbols <insert access prohibited symbol> is prohibited. Stay on the formed track and behind the barriers.

Sheer cliffs, slippery surfaces and an unstable rock face make this site hazardous. Serious injuries and deaths have occurred here.

Entry is prohibited without a permit or written approval.

Contravention of a requirement of this notice is an offence under the *Nature Conservation Act 1992*.

Maximum penalty: 80 penalty units.

On-the-spot fines apply.

<insert RAA map to the right with RAA marked and You are here>

<insert prohibited access picto PF63, SW05 cliff edge and SW03 (if space)>



<insert Si#>

SiXXXX

<insert Qld Govt banner>

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## SIGN 2 - Stand Alone Access Prohibited Pictogram

<insert symbol PF63>



<insert Si#>

Sixxxx

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## SIGN 3 – Danger Sign

Sign example only:



DANGER < insert German/Japanese/Chinese language >

<insert heading>

Purling Brook Falls circuit closed.

<insert body text>

For your safety, these gates will be closed during periods of:

- High fire risk, or
- Flooding.

**Do not proceed past these gates when they are closed!**

<insert symbols>



<insert QGlogo; herbie watermark>

## SIGN 4 – For Your Safety Sign

Sign example only:



<insert heading>

## For your safety

<subheading>

### Sheer cliffs, slippery rocks and uneven surfaces ahead.

Serious injury or death could result from a trip, tumble or fall here.

To stay safe:

- Supervise children at all times.
- Watch for trip hazards.
- Beware of slippery surfaces, including the causeway.
- Pay attention to all warning signs and access restrictions.

<insert yellow and teal WARNING symbols on RHS>



<insert Si#>

Sixxxx

<insert Qld Govt banner>

## Installation

All new safety signs should be installed following the guidelines in section 5.1.3 of the QPWS Sign Manual. It is recommended that park management units keep good records of safety signs in-situ. Photos should be taken when installed and uploaded onto SAMS database and inspection regimes set to monitor their condition over time.

## Other Communications

While signs at Purling Brook Falls need to be updated to reflect the new Sign Manual standards, pre-visit and other communications (available off-site) enhance the effectiveness of on-site safety signage and also need to be reflecting the same safety messages.

The brochures and the NPSR website contain some safety messages for this site. Messages across all media need to be consistent, and web or printed materials should include appropriate yellow warning symbols if possible. It is important that information presented through other agencies such as tourism bodies and backpacker's accommodation do not present conflicting messages, such as by including photographs of people accessing the RAA at the top of Purling Brook Falls. Managing this however is often outside the agency's control and therefore messages need to be clear once visitors arrive on-site. The concern is that if visitors arrive at Purling Brook Falls and see others apparently enjoying dangerous activities (such as accessing the RAA and taking photos at the top of the falls) this may negate the danger sign messages. Ranger presence, particularly at peak periods and on weekends is most helpful in relaying these messages, being friendly but authoritative.

QPWS needs to further investigate the increasing risk across the State relating to the taking of selfies at dangerous sites and the impact of social media. This should include writing statements on publications and webpages that deters this risky behaviour before it becomes an epidemic problem. There is also scope for the Agency to further investigate ways of relaying these safety messages through social media forums.

## Evaluation

It is recommended that visitor response to the safety messages is evaluated over the next summer season, through a combination of observation and interviews. The approach to signage may need to be adjusted depending on the feedback received.

## References

NPSR Website. <http://www.nprsr.qld.gov.au/parks/springbrook/about.html>  
Accessed 9 May 2016.

Parkin, D and K. Morris (2005) Pete's story: interpreting the consequences of risk-taking behaviour, *Applied Environmental Education and Communication*, 4:139–150.

Queensland Government, 2014, Inquest into the death of 4(6) Personal inform

QPWS. 2016. *Sign Plan*. Queensland Government. Department of National Parks, Sport and Racing.

Weiler, B, Zeppel, H, Saunders, R, & Scherrer. 2015. *A review of safety signage for Queensland Parks and Wildlife Service: report 1: literature review, report to the Queensland Parks and Wildlife Service.*, School of Business and Tourism, Southern Cross University, Coolangatta, Qld.

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## Appendix 1: Risk Assessment for Purling Brook Falls Area

### Scenario 1, Restricted Access Area at base of falls

Risk ID	Risk description What can happen and how can it happen?	Current risk controls How is the risk currently managed?	Risk assessment Bearing in mind existing control measures			Risk priority
			Consequence	Likelihood	Level of risk	
1	Risk of people being struck by a rock fall/landslip while traversing the walking track below the Purling Brook escarpment and Purling Brook Falls.	<p>Closure of the walking track during high rainfall events when the water in Purling Brook Creek goes over the top of the causeway at the top of Purling Brook Falls.</p> <p>Three gates and signage are in place and these are closed to prevent public access to the walking track during high rainfall events as identified above.</p> <p>RAA sign in place at bottom of waterfall to ensure exclusion area in likely fall zone.</p>	Catastrophic	Rare	Medium (15)	1

### Scenario 2, Restricted Access Area at top of falls

Risk ID	Risk description What can happen and how can it	Current risk controls How is the risk currently managed?	Risk assessment Bearing in mind existing control measures	Risk priority

	happen?		Consequence	Likelihood	Level of risk	
2	Risk of people being swept over the top of the waterfall when swimming in the creek or slipping on rocks on/near cliff edge.	<p>Closure of the top walking track during high rainfall events when the water in Purling Brook Creek goes over the top of the causeway at the top of Purling Brook Falls.</p> <p>RAA in place at top of falls</p> <p>Three gates and signage are in place and these are closed to prevent public access to the walking track during high rainfall events as identified above.</p>	Major	Possible	High (18)	1

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**Gold Coast Bulletin** f Twitter G+ Envelope

Gold Coast

# Tourists risk death to take the best holiday photo or 'selfie' at Purlingbrook Falls in Gold Coast Hinterland

January 28, 2015 8:22am  
Paul Weston - Gold Coast Bulletin



Tourists Climbing down Purling Brook Falls cliff face at Springbrook.

TOURISTS in pursuit of the best holiday photograph are risking their lives taking selfies on the edge of the Purlingbrook Falls.

The Bulletin has obtained numerous photographs of visitors in recent weeks who have deliberately ignored restricted access signs put up by rangers to the World Heritage area in Springbrook.

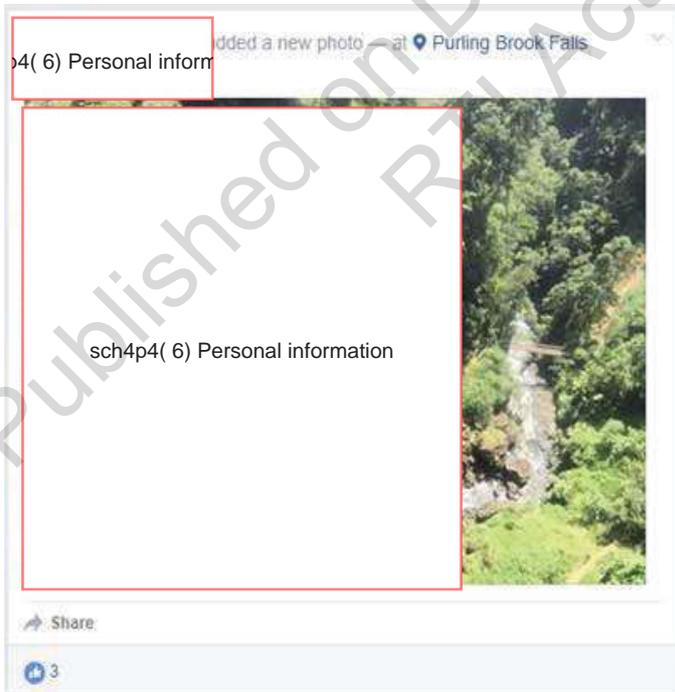
They show a family with toddlers swimming and eating their lunch in the water just metres away from the top of the fall.

**MORE NEWS AND GALLERIES**



Tourists risk their lives at Purling Brook Falls at Springbrook.

In other shots, teenagers are sitting on the tiny edge of a cliff face opposite the falls, having jumped fences and gates to get to the vantage point.



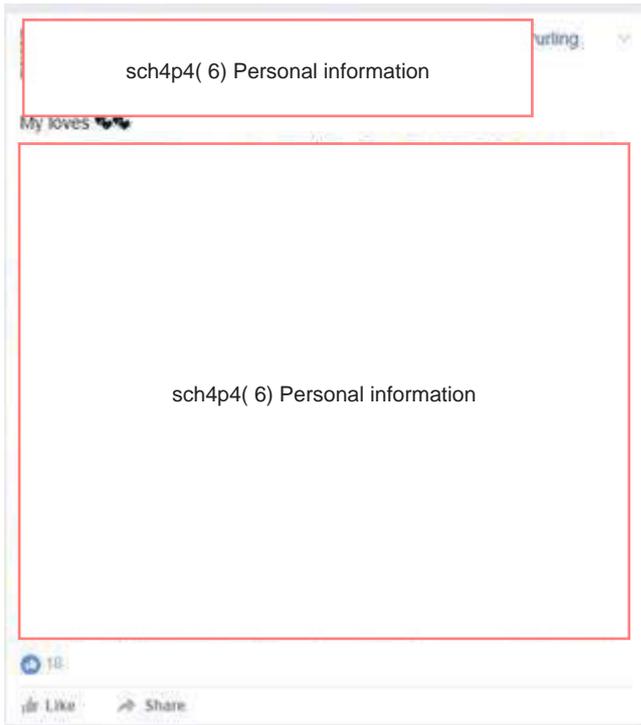


Photo 3: Images of Purling Brook Falls shared on social media forums (Facebook, 2016)

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Date : 9/08/2016 3:52:12 PM  
From : "HARMON-PRICE Pamela"  
To : "FULLER David"  
Cc : "DOMIN Ross" , "RYAN Tony" , "HOLT Jennifer" , "PITTORINO Fred"  
Subject : RE: Wallaman Falls draft Safety Sign Plan FOR REVIEW and production brief FOR APPROVAL please  
Attachment : Prodbrief\_Wallaman Falls\_Safety\_Signs\_22 July 2106.docx;Wallaman Falls Safety Sign Plan draft 210716.docx;image001.png;image005.png;image004.png;image008.png;image009.png;

Thanks, Dave.

Please plug the information gaps in the attached draft Safety Sign Plan.

Will I proceed with sign design on the basis of the attached brief? Please advise any mountings/installation requirements.

Best regards

Pamela



**Pamela Harmon-Price**  
Manager, Interpretation, Visitor and Community Programs  
Queensland Parks & Wildlife Service  
Department of National Parks, Sport and Racing

E [pamela.harmon-price@npsr.qld.gov.au](mailto:pamela.harmon-price@npsr.qld.gov.au)  
P 07 3199 7602  
[www.npsr.qld.gov.au](http://www.npsr.qld.gov.au)

---

**From:** FULLER David  
**Sent:** Tuesday, 9 August 2016 1:44 PM  
**To:** HARMON-PRICE Pamela <Pamela.Harmon-Price@npsr.qld.gov.au>  
**Cc:** DOMIN Ross <Ross.Domin@npsr.qld.gov.au>; RYAN Tony <Tony.Ryan@npsr.qld.gov.au>; HOLT Jennifer <Jennifer.Holt@npsr.qld.gov.au>; PITTORINO Fred <Fred.Pittorino@npsr.qld.gov.au>; FULLER David <David.Fuller@npsr.qld.gov.au>  
**Subject:** RE: Wallaman Falls draft Safety Sign Plan FOR REVIEW and production brief FOR APPROVAL please

No worries thanks.

If I can get an email with all the signage that requires approval I shall check it and get it off to James for approval.

Cheers Dave.

---

**From:** HARMON-PRICE Pamela  
**Sent:** Monday, 25 July 2016 4:02 PM  
**To:** FULLER David  
**Cc:** DOMIN Ross; DEAN Craig; RYAN Tony; HOLT Jennifer; PITTORINO Fred  
**Subject:** RE: Wallaman Falls draft Safety Sign Plan FOR REVIEW and production brief FOR APPROVAL please

Hi Dave

Towards the very end of the recent Safety sign contract, the contractors drafted a Safety sign Plan for an additional site chosen by your region, Wallaman Falls.

Craig, Tony and Ross provided feedback on the version I amended. I've taken their feedback on board but still need to fill in a few gaps before this can be finalised. (Copy of Safety Sign Plan attached.)

**Please check the attached draft Safety sign Plan for Wallaman falls, fill in any gaps and let me know any changes** so it can be finalised and approved.

I've also made the assumption the overall plan is close to meeting your needs so we have drafted a Production brief to get the required signs produced if we have any remaining funds under this Capital works project.

**Please check and amend the attached production brief.** Let me know if:

- the specifications are correct in terms of mounting and installation and delivery address.
- you're happy for us to have these signs designed on this basis.

The final Safety Sign Plan and sign artwork will be sent to you for approval.

Best regards

Pamela



**Pamela Harmon-Price**  
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Queensland Parks & Wildlife Service  
Department of National Parks, Sport and Racing

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---

**From:** DEAN Craig  
**Sent:** Wednesday, 29 June 2016 7:12 PM  
**To:** HARMON-PRICE Pamela <[Pamela.Harmon-Price@npsr.qld.gov.au](mailto:Pamela.Harmon-Price@npsr.qld.gov.au)>  
**Cc:** DOMIN Ross <[Ross.Domin@npsr.qld.gov.au](mailto:Ross.Domin@npsr.qld.gov.au)>; RYAN Tony <[Tony.Ryan@npsr.qld.gov.au](mailto:Tony.Ryan@npsr.qld.gov.au)>  
**Subject:** FW: Wallaman Falls draft Safety sign plan FOR REVIEW please

Hello Pamela

Comments from Ross and Tony below are endorsed. I have included their comments with further comments from me in the attached draft sign plan document for your review.

Thanks

Craig Dean  
A/Principal Ranger, Coastal Tropics  
Ph 4047 9664  
Mob 6) Personal info

---

**From:** DOMIN Ross  
**Sent:** Wednesday, 29 June 2016 11:29 AM  
**To:** DEAN Craig  
**Cc:** RYAN Tony  
**Subject:** RE: Wallaman Falls draft Safety sign plan FOR REVIEW please

Craig,  
Tony & I have reviewed the sign plan and are happy with it in general with the minor changes below.

Page 2 Second Paragraph

Most visitors to the site are ~~locals with some other~~ domestic and overseas visitors [\[A1\]](#) domestic and overseas visitors with some locals. The busiest time is in the ~~warm~~ cooler months and over the holidays when people come to view the falls in full flow, picnic and swim in the clear waters. It would appear that males aged 18-35 [\[A2\]](#) are the main risk-takers ~~who visit the site~~.

There have been ~~many~~ serious injuries and two fatalities at the Wallaman Falls site. The main incidents have been caused by:

Heat stress and trips on the Djynda walking track to the base of the falls

Slipping on rocks at the base of the falls

Accidents associated with abseiling and base jumping.

Page 3 Third Paragraph

An extra warning sign for the Djynda walk is warranted given the high number of incidents occurring here, including slips and trips and people suffering from heat stress and heart conditions. These hazards and risks are not adequately covered in current signage.

Page 6

Wallaman Falls lookout & its associated infrastructure is easy to access and receives a high level of visitation. Peak visitation is in the ~~wet~~ season cooler months when visitors come to see the falls in full flow. A smaller number of visitors walk to the bottom of the falls and some swimming occurs here in the warmer months. Swimming here is not encouraged but is allowed. The walk down is long and steep so most visitors swim in the swimming hole located at the day use area.

Page 7 Paragraph 6

Once at the base of the falls, visitors climb onto the rocks and walk up the creek bed. The rocks here are large and slippery and there have been ~~many~~ incidents associated with slips on the rocks. Rescue access to this area is very difficult due to the steep terrain. There is a barrier and a danger sign at the base of the falls.

Page 21 Last Paragraph

**Warning** < insert title in German & Japanese /Chinese languages >

<subheading>

## Slippery rocks

<insert body text>

Rocks around the base of the falls are wet and covered in algae, making them extremely slippery. **People have been seriously injured here.**

Stay safe:

- Never climb the rocks around the falls. *Not required people not climbing around the falls.*
- Do not dive or jump into the rockpool. [\[A3\]](#) *Not required jumping into the pool not an issue*
- Cross the rocks carefully. [\[A4\]](#) *OK but covered above*
- Remain behind the safety barrier [\[A5\]](#) and on the formed track. *Not required. No defined track to get to the pool. People free walk.*
- Supervise children at all times. *OK but I have never seen parents with kids using the waterfall pool.*

regards



**Ross Domin**

Senior Ranger Ingham

Northern Region | Coastal Tropics

Department of National Parks, Sport and Racing

P 07 4777 2822 [\[6\] Personal info](#)  
58 Fulton Drive Ingham QLD 4850  
PO Box 1293 Ingham QLD 4850

---

**From:** DEAN Craig  
**Sent:** Wednesday, 29 June 2016 8:43 AM  
**To:** DOMIN Ross  
**Subject:** FW: Wallaman Falls draft Safety sign plan FOR REVIEW please  
**Importance:** High

Morning Ross – FYI also and comments please.

Thanks

Craig Dean  
A/Principal Ranger, Coastal Tropics  
Ph 4047 9664  
Mob [\[6\] Personal info](#)

---

**From:** HARMON-PRICE Pamela  
**Sent:** Tuesday, 28 June 2016 5:54 PM  
**To:** DEAN Craig; PITTORINO Fred; RYAN Tony  
**Cc:** HOLT Jennifer  
**Subject:** Wallaman Falls draft Safety sign plan FOR REVIEW please  
**Importance:** High

Hi Craig, Fred and Tony

Here is the draft Safety Sign Plan for Wallaman Falls in Girringun National Park.

The contractors drafted this plan based on information you supplied and I have made some slight changes.

Please read and review this plan and let me know:

- Answers to questions raised by the contractor who drafted it
- Any changes you would like to anything in this draft
- Whether you think the generic *For your Safety* sign is still required when 2 new warning signs will explain the main hazards for visitors.

I think the current For your safety sign is located at the lookout and in the day-use area. Mentioning a lot of hazards away from the sites where they occur is not best practice but I don't actually know this site so will take your advice on whether they are integral to keeping park visitors safe.

The other issue is the current Danger sign at the bottom of the Falls. Strictly speaking, it should be a Warning sign, not a Danger sign because no serious injuries or fatalities have occurred. However, Melitta said staff feel strongly it should be a Danger sign. Think **you should make the final call on this, Craig.**

Thanks for your advice. I assume this will need another version before it can be finalised.

Best regards

Pamela



**Pamela Harmon-Price**  
Manager, Interpretation, Visitor and Community Programs  
Queensland Parks & Wildlife Service  
Department of National Parks, Sport and Racing

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P 07 3199 7602  
[www.npsr.qld.gov.au](http://www.npsr.qld.gov.au)

---

Check with the region if this is right

Check with region

Ask region if people access here to swim and if we need swimming safety messages on this sign too?

Do we want to encourage this or swimming here? This may not be appropriate – ask the region. If they are letting people swim down here then may need safety messages instead of ignoring it.

Where is the safety barrier?

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## Production Brief

This form must be completed and approved prior to being submitted for publication/design.

Email to: [Parks.Communication@nprsr.qld.gov.au](mailto:Parks.Communication@nprsr.qld.gov.au)

<b>Job name</b>	<b>Wallaman Falls (Girringun National Park) Safety Signs</b>
<b>Specifications</b>	Danger and warning signs

<b>Priority</b>  <b>2</b>	1= urgent	<b>Anticipated completion date:</b>	<b>End of August 2016</b>
	2= Important	<b>Other deadlines (if needed):</b>	
	3= Necessary	• design complete by:	<b>30/7/16</b>
	4= Desirable	• print by	<b>Mid August 2016</b>

<b>Contacts</b>	Project leader:	<a href="#">Craig Dean, A/PR Coastal Tropics</a>
	Support:	<a href="#">Pamela Harmon-Price</a>
	Job requested by:	<a href="#">Jen Holt</a>

<b>Background information</b>	
<b>Reason for project</b>	<a href="#">Height of drop, previous deaths, and existing Restricted Access Area</a>
<b>Date</b>	<a href="#">22/7/2016</a>
<b>Target audience</b>	<a href="#">Visitors to Wallaman Falls</a>
<b>Location</b>	<a href="#">Girringun National Park</a>
<b>Special notes</b>	<a href="#">Part of QPWS Safety Sign project 2016</a>

<b>Funding</b>	
<b>WBSE</b>	<a href="#">Pamela to advise</a>
<b>Other funding</b>	

<b>Text</b>
-------------

Production brief: Wallaman Falls safety signs

## Sign 1: Revision of Si3998—Restricted Access Area notice

Print size: 900 x 600m Qty: 1 copy Colours: 3 colours on white background  
Print size: 750 x 500mm Qty: 3 copies

**TEXT** (including instructions to designers)

<heading>

DANGER

<also insert title in German and Japanese/Chinese languages>

<subheading>

Unauthorised entry prohibited

<body text>

Entry to the top of Wallaman Falls and surrounding escarpment (as shown in red on the map) is prohibited without a permit or written approval.

Natural hazards including sheer cliffs and an unstable rock face make this area unsafe to visit. Serious injuries and deaths have occurred here.

Do not climb the barriers or go beyond markers showing this symbol <Insert PF63>. Stay on the formed tracks and behind the barrier fences at all times.

Contravention of a requirement of this notice is an offence under the Nature Conservation Act 1992.

Maximum penalty: 80 penalty units.

On-the-spot fines apply.

<insert NEW Wallaman Falls RAA map to the right with RAA marked and 4 versions of YAH points>

<insert symbols PF63, SW05>



PF63  
Access prohibited



SW05  
Cliff edge

<insert Si#>

Si3998

<insert Qld Govt logo>

Layout instructions – as per section 5.5 QPWS Sign Manual

---

Production brief: Wallaman Falls safety signs

## Sign 2: new WARNING sign (to replace an existing DANGER sign)

Print size: 600 x 400mm Qty: 1 copy Colours: 3 colours on white background

TEXT (including instructions to designers)

<heading>

WARNING

<also insert heading in German & Japanese/Chinese languages>

<subheading>

**Slippery rocks**

<body text>

Rocks around the base of the falls are wet and covered in algae, making them extremely slippery.

**People have been seriously injured here.**

Stay safe:

- Cross the rocks carefully to avoid falling.
- Supervise children at all times.

<insert symbols SW03, SW25 and SS01, in this order>



SW03  
Slippery rocks



SW25  
Tripping hazard,  
uneven ground



SS01  
Supervise children

<underneath SS01, insert> Supervise children

<insert Si#>

Sixxxx <sign number to be allocated>

<insert Qld Govt logo>

Layout instructions – as per section 5.5 QPWS Sign Manual

Production brief: Wallaman Falls safety signs

### Sign 3: New WARNING sign

Print size: 600 x 400mm Qty: 1 copy Colours: 3 colours on white background

TEXT (including instructions to designers)

<heading>

WARNING

<also insert heading in German & Japanese/Chinese languages>

<subheading>

Be prepared for a difficult walk.

<body text>

**Djyinda walk—3.2km return (allow 2 hrs)**

Only fit walkers should attempt this walk. **People have died here. Others have suffered heat stress and heart conditions walking this track.** It might look easy but it becomes steep and rough halfway down.

Enjoy the view and walk safely:

- Be prepared for the long, hot walk back up the steep hill.
- Take care not to trip on the track's rough, uneven surface.
- Supervise children at all times.

<insert symbols SW01, SW25 and SS01, in this order>



SW01  
Warning (unspecified)



SW25  
Tripping hazard,  
uneven ground



SS01  
Supervise children

<Insert beneath SS01> Supervise children

<insert Si#>

Sixxxx

<insert Qld Govt banner>

Layout instructions – as per section 5.4 QPWS Sign Manual

Production brief: Wallaman Falls safety signs

Approvals or endorsements			
✓ Final text has been approved through the appropriate levels			
Note: Text approval has been given for the use of this text on this particular product and any associated products relating to this topic.			
Position	Name	Date	Comments
Text development	Melitta Marr	June 2016	Text drafted
Senior Ranger	Ross Domin		
Principal Ranger	Craig Dean		
Manager IVCP	Pamela Harmon-Price		

Design instructions	
Product title	Wallaman Falls Safety signs
Overview and content	Updates to: 1 danger/RAA sign (4 copies, each with diff YAH); 2 new warning signs; Reprint FYS sign??
Additional files provided with this job	

Commented [HJ1]: To be decided

Map brief checklist	<input type="checkbox"/> Use PDF with design instructions to create map using the ai file
	<input type="checkbox"/> Map is also provided in EPS and Adobe Illustrator (AI) file versions.
	<input type="checkbox"/> North point and scale included <input type="checkbox"/> Other

Photo/illustrations etc checklist	<input type="checkbox"/> Any other logos needed? Please supply to Parks Comm as either EPS or HiRes Jpegs (300dpi for best reproduction quality)
	<input type="checkbox"/> Appropriate photo consent forms supplied. NB: Images that contain people <b>must have a completed photo consent form(s)</b> .
	<input type="checkbox"/> All images checked & correct? Extra Comments:
	<input type="checkbox"/> Images are all supplied. NB: HiRes (300dpi) at finished size or larger than required
	<input type="checkbox"/> Any copyright issues checked and correct. Content sourced from outside NPRSR <b>must have copyright clearance</b> in writing and if possible a copy of the approval attached.

Sign print specifications			
(This information can be sent to your chosen printer. Delete any content that is not relevant)			
Job Title	Wallaman Falls safety signs		
Design ref no.	<input checked="" type="checkbox"/> New <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Reprint	<input checked="" type="checkbox"/> Existing job no. (if revision or reprint)	SI3998
Date required	August 2016		
Quantity	6 signs in total		
Specs and materials	Colour	3 colours on white background	
	Stock	1.6mm marine grade aluminium	
	Size	1@900 x 600mm; 3@750 x 500mm; 2@600 x 400mm; ???	
	Finishing	All signs with rounded corners.	
	Sides		

Commented [HJ2]: 7 with FYS reprint

Commented [HJ3]: FYS reprint?

Production brief: Wallaman Falls safety signs

	Mounting	TBA			
<b>Guarantee</b>					
<b>Artwork files</b>	Provided by:	<input type="checkbox"/> Email	<input type="checkbox"/> Drop Box	<input type="checkbox"/> Post	<input type="checkbox"/>
	File type:				
<b>Delivery details</b>	QPWS				
	Attention:				
	Address:				
	Delivery instructions: Best delivery days: Contact ph:				

Commented [HJ4]: Need information from region on mounting requirements

Commented [HJ5]: Need delivery details from the region

<b>Printer details</b>	Supplier name:		Printer's job number:	
	Contact details:			

<b>Funding and administration</b>				
<b>WBSE or other funding</b>	Pamela to confirm			
<b>Print administration (quoting, payment)</b>				
<b>Quotes</b>	<b>Design</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Comments:
	<b>Printing</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Comments:
<b>Corporate card payment?</b>	<input type="checkbox"/> Yes	<b>Card in the name of:</b>		
<b>Purchase order details</b>	PO Number:			

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Production brief: Wallaman Falls safety signs



# Wallaman Falls Safety Sign Plan

6 August 2019

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Front cover photo: Jodie Bray © Queensland Government

## Executive Summary

Wallaman Falls, Girringun National Park is a popular visitor attraction promoted locally, domestically and internationally. Wallaman Falls, a cascade and horsetail waterfall on Stony Creek is located in the Wet Tropics of north Queensland World Heritage Area. The waterfall is notable for its main drop of 268m, which reputedly makes it the country's tallest single-drop waterfall. The pool at the bottom of the waterfall is 20m deep. An estimated 100,000 people visit the waterfall annually (Wikipedia website, 2016).

Most visitors to the site are domestic and overseas visitors. The busiest time is in the cooler months and over the holidays when people come to view the falls picnic and swim in the clear waters.

There have been serious injuries and two fatalities at the Wallaman Falls site. The main incidents have been caused by:

- Heat stress and trips on the Djynda walking track to the base of the falls
- Slipping on rocks at the base of the falls
- Accidents associated with abseiling and base jumping.

A formal risk assessment for the site as a whole is not available. However, given the fatalities, a review of signage is required. Signage aims to reduce the incidence of risks associated with the top of the falls and the escarpment, and the slippery rocks at the base of the falls. Existing signage at the site provides sound information but does not meet latest standards, and needs upgrading to meet current Sign Manual standards and to cover additional safety messages relating to the Djynda walk.

For the RAA signs, it is recommended that a regulatory approach remain in place at this location—prohibiting access to the top of the falls through the use of regulatory notices. Notification of this restriction under a 'danger' banner should be included, identifying the natural hazards that pose a high risk to visitors. These signs need to be located at the RAA and in locations where visitors are accessing the area, so an additional sign is recommended in the gorge in Stony Creek where there is evidence of people accessing the top of the falls.

The RAA signs will have updated maps with the RAA boundary clearly marked, along with reference to the access prohibited symbol and individual 'you are here' reference points.

The danger sign at the base of the falls will be replaced with a warning sign and be updated with minor text and design changes. This sign is required as there have

been incidents at this location in the past and the effort required to rescue people at the base of the falls justifies a warning sign.

An extra warning sign for the Djynda walk is warranted given the number of incidents occurring here, including slips and trips and people suffering from heat stress and heart conditions. These hazards and risks are not adequately covered in current signage.

These signs would be reinforced by adding stronger safety messages on the Djynda walk information sign, along with appropriate hazard symbols and a coloured background so the safety messages are more prominent.

Evaluation of the effectiveness of the signage is recommended over the next summer period.

## Introduction

### Background to this Report

A number of critical incidents (deaths and serious and permanent injuries) have occurred on QPWS-managed land in recent years. Following an inquest into the drowning death of a visitor at Mossman Gorge in 2014, the State Coroner recommended that a committee of stakeholders consider a number of issues, one of which was the 'the information provided to visitors at the centre including the content of that information and how it is delivered; and the signage in the national park' (Queensland Government, 14/07/2014, p.1). Southern Cross University conducted an expert review of QPWS safety signs and the agency's approach to risk management (Weiler et al, 2015). This review identified Best Practice Principles and reviewed current safety signs at three sites where fatalities had occurred, including Mossman Gorge. Although QPWS signs were found to be closely aligned with best practice, some minor changes were made to the sign guidelines as defined in chapter 5 of the QPWS Sign Manual, 2016. As many safety signs are unlikely to be compliant with the new standards, a review of critical sites is being undertaken.

### Wallaman Falls, Girringun NP

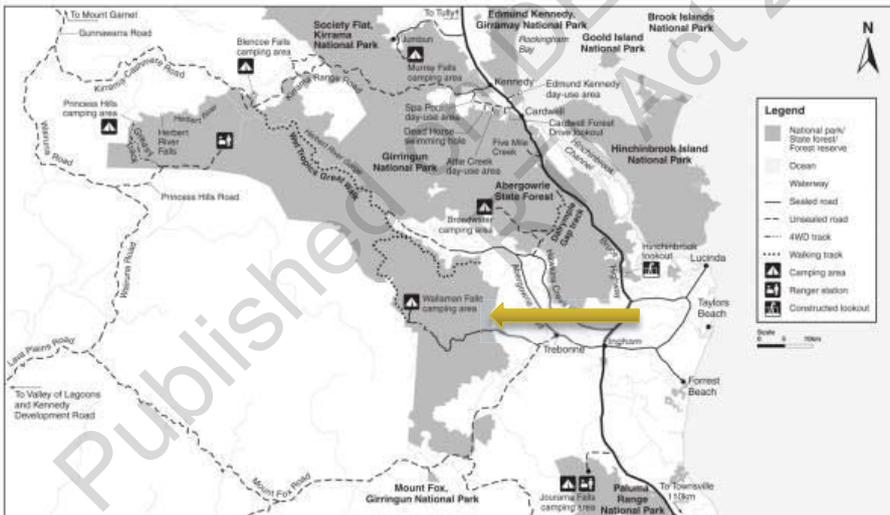


Figure 1: Wallaman Falls, Girringun National Park (Source: QPWS)

Wallaman Falls in Girringun National Park (Figure 1), North Queensland, has been identified as a high risk site due to numerous incidents that have occurred there.

This sign plan has been written to review safety signage at Wallaman Falls in light of these incidents, to determine consistency with the QPWS Sign Manual and safety sign Best Practice Principles, and to recommend upgraded and additional signage.

Wallaman Falls is located about an hour's drive through rural properties from Ingham. The Wallaman Falls section of Girringun National Park forms part of the Wet Tropics World Heritage Area. It boasts spectacular scenery and an array of plant and animal life. Wallaman Falls camping area is adjacent to Stony Creek and there is a range of holiday accommodation in and around the towns between Townsville and Cairns.

Two short walks are available from Wallaman Falls, which have been given language names by the Traditional Owners—the Warrgamaygan Aboriginal people (Figure 2). Banggurru walk is 800m return and provides an opportunity for the whole family to experience some of the beauty of the Wet Tropics World Heritage rainforest along the banks of Stony Creek. The Djyinda walk is 3.2km return, beginning 300m from Wallaman Falls lookout and ending at the base of the falls. Walkers need a moderate level of fitness and need to be prepared for a steep descent and ascent on unstable surfaces.

The main lookout at Wallaman Falls provides a view of Stony Creek as it plunges 268m in a clear single drop, often through a rainbow-fringed cloud of mist. Wallaman Falls is reputedly the highest, permanent, single-drop waterfall in Australia. A second lookout provides stunning views of the gorge and the Herbert River Valley. Picnic tables, toilets and water are provided at two day-use areas near the camping area and near the falls lookout (Figure 2).



Another base jumping incident occurred in June 2008 when a 32-year-old jumper broke his pelvis and a leg and suffered internal injuries.

Most other incidents have been caused by:

- Heat stress and trips on the Djynda walking track to the base of the falls
- Slipping on rocks at the base of the falls
- Accidents associated with abseiling and base jumping.

As a result of the base jumping fatality, a Restricted Access Area (RAA) was implemented in 2010 encompassing the falls and surrounding escarpment, and signs were erected. Staff have intercepted a small number of base jumpers & abseilers since 2010, but there have been no recorded incidents since the RAA was declared.

The first half of the Djynda walking track is formed and relatively easy. About halfway down this track steepens and the surface becomes uneven. By the time people reach this section they are already committed and tend to proceed only to find it more challenging than anticipated. Older visitors with children often find the children run on ahead so by the time they reach this more difficult section they are too far ahead to stop.

Once at the base of the falls, visitors climb onto the rocks and walk up the creek bed. The rocks here are large and slippery and there have been incidents associated with slips on the rocks. Rescue access to this area is very difficult due to the steep terrain. There is a barrier and a danger sign at the base of the falls.

## Scope and Methodology

Safety signs located at Wallaman Falls, Girringun National Park have been reviewed through a desktop exercise, along with photos, maps, reports and incidents related to the site. Local rangers have also been consulted as part of the review.

Signs have been evaluated against the updated QPWS Sign Manual (2016) and against the Best Practice Principles for safety signs in parks using the four stages of the warning process: 'notice, encode, comprehend, comply' (Weiler et al. 2015).

The following documents and information have been considered in preparing this sign plan:

1. NPSR Website information on Wallaman Falls, Girringun National Park
2. Social media sites and other travel websites promoting Wallaman Falls, including Instagram, TripAdvisor and Facebook
3. Findings of Coronial Inquest into death of 6) Personal inf July 2014
4. Southern Cross University, A review of safety signage for Queensland Parks and Wildlife Service, June 2015: Report 1—Literature review and Annotated Bibliography citation
5. QPWS Sign Manual, 2016
6. NPSR Work Health and Safety Policy, 2012.

Sign options considered in this review were:

- Orientation signs, which can include safety messages;
- Formal safety signs (danger signs), which meet internationally recognised standards but are not legally enforceable unless combined with regulatory provisions;
- Regulatory notices, which are legally enforceable and can be used to address safety issues as per section 70 (1) of the *Nature Conservation (Protected Areas Management) Regulation 2006*. (These may be combined with information notices if desired to reduce the amount of text required;
- Interpretive signs: a complementary approach that can present safety messages in a more personal and emotive manner than a formal safety sign and target a specific, at-risk audience; and
- Pictograms, which can be included on other signs or printed as stand-alone signs and placed on site to reassure visitors and should be recognised by children, and English and non-English speaking visitors. These are not enforceable on their own, but can be included on regulatory notices to become enforceable. They are often also used on safety signs.

Different types of signs are appropriate in different landscape settings and for different risk levels. See Table 1 for a complete list of signs considered in this review.

**Table 1: Sign options**

Sign type	Risk		
	High	Med	Low
Orientation sign with safety message			
Complementary interpretation sign			
For your safety sign			
Warning sign			
Danger sign			
Regulatory notice			
Regulatory information notice			
Danger sign including regulatory notice			
Danger sign including regulatory information notice			
Regulatory notice to complement an info notice			
Routed sign (danger or warning or safety)			
Danger totem			
Warning totem			
Pictograms			
Symbols			

## Current Safety Signs and Messages

There are three identical Restricted Access Area (RAA) regulatory notices at Wallaman Falls (see Figure 3 and photo 1 below). One is located at the camping area, one at the Stony Creek bridge, and the third one is at the Wallaman Falls carpark. All three signs are the same design, with the same message, text and images.

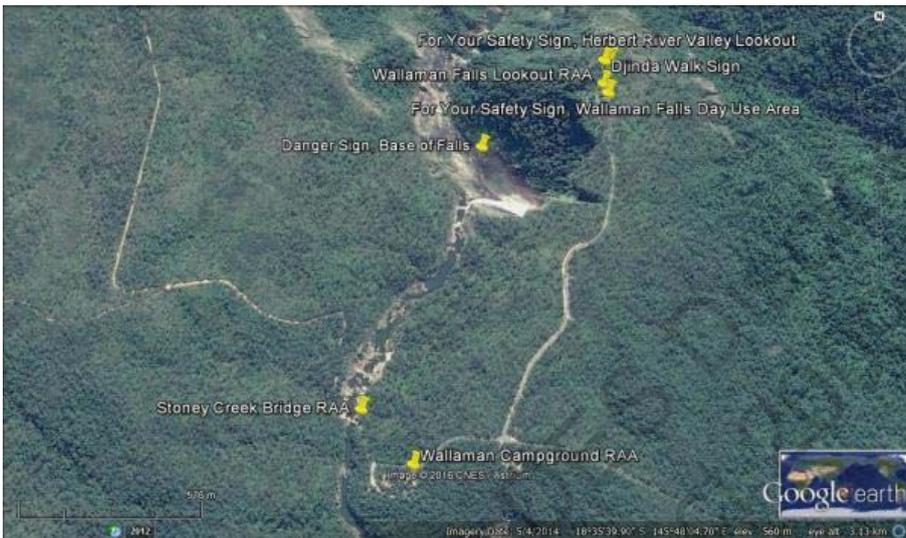


Figure 3: Safety signs at Wallaman Falls



Photo 1: RAA regulatory notice currently in place

Newer signs were developed and printed in 2012 but have not been installed. The new RAA sign appears on the website (Image 1).

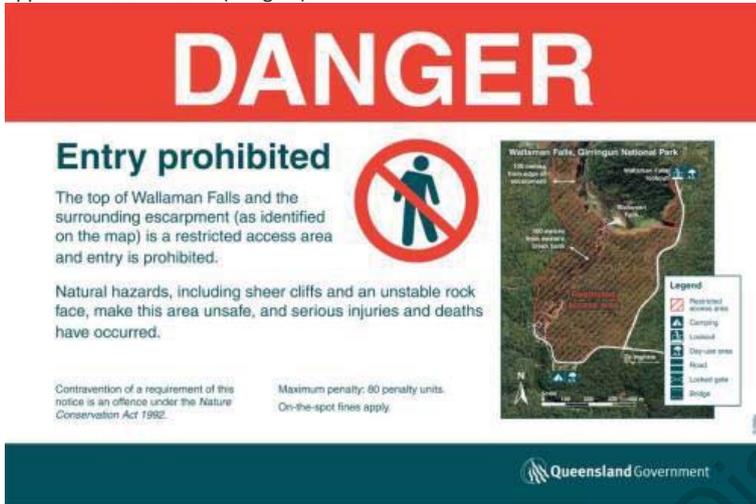


Image 1: RAA danger sign on the website only

A danger sign is located at the base of the falls and outlines the hazards and risks of the slippery rocks (Photo 2 and Figure 3).



Photo 2: Danger sign at the base of the falls

Other safety signs located in this area include two ‘for your safety’ signs covering messages associated with the high cliff edges (see Photo 3 and Figure 3). These signs are located at the Herbert River Valley lookout and at the Wallaman Falls day use area.



Photo 3: For your safety sign

An additional sign containing safety messages is located at the Herbert River Valley lookout and provides information on the Djynda walk (Photos 4 and 5). It provides messages relating to the walk down to the base of the falls. It contains limited information about the steepness of the track and the uneven surface.

**Commented [A1]:** Close-up photo of this interpretive sign or a copy of the text to be provided by region



Photo 4: Djynda walk information sign at Herbert River Valley lookout



Photo 5: Herbert River Valley lookout signs

### Assessment of Current Signage

This review finds that current safety signs at Wallaman Falls meet many Best Practice Principles for safety signs.

However signage could be improved by:

- *Alterations to the RAA notices: The current design of the RAA notices on the park does not stand out and requires the addition of the red danger banner to reflect the high level of risk associated with this site.*
- *Changing the danger sign at the base of the falls to a warning sign to reflect the incident history.*
- *Updating the signs to meet current QPWS Sign Manual standards and/or to remove ambiguity.*
- *Installing signs at additional locations to inform visitors of potential hazards and risks.*
- *Identifying and communicating other risks not covered well in current material (the level of difficulty of the Djynda walk to the falls and the potential for trips and heat and physical stress).*

### RAA Signs

The RAA signs mostly meet Best Practice Principles for safety signs. They identify the hazards present (sheer cliffs and unstable rock face) and also state that serious injuries and deaths have occurred here. However, the signs require changes in line with the current QPWS Sign Manual, 2016, including the addition of the red danger banner and text updates to reflect the high risk associated with this site.

Their locations require review to ensure they are close to the boundary of the RAA, are facing oncoming foot traffic and include the 'you are here' reference point. The sign located at the Wallaman Falls carpark needs relocating to the left hand side of the walking track so it is facing over the actual RAA. An additional sign is needed in the creek bed further along the road from the Stony Creek bridge where people have entered the RAA in the past.

### Other Safety Signs

The safety sign at the base of the falls is warranted even though there have been only a few incidents associated with the hazards there. However, it should be a warning sign consistent with the Sign Manual. The potential for incidents is high given the slippery hard surfaces and the numbers of people accessing this area (photo 6). If a rescue was required it would be a major task and difficult to get people back safely. The sign also requires some minor text changes (see Table 3 below).



**Photo 6: Steep slippery surfaces at the bottom of Wallaman Falls**

The 'for your safety' sign located at the Herbert River Valley lookout and Wallaman Falls day-use area (advising of the cliff hazard) is adequate if the recommended warning sign (advising of the long and difficult walk down to the falls) is adopted.

When the Djynda walk information sign needs updating, the safety messages need to be made more prominent by placing this text on a different coloured background. Safety messages need to include the risks associated with the long

walk to the base of the falls and the appropriate behavioural messages, along with appropriate hazards symbols.

As many people do not stop to read this sign and the safety messages do not stand out, it is recommended that an additional warning sign specifically relating to the Djynda walk be installed near the start of the track. As there has been one fatality and many serious incidents on the track it is recommended a warning sign be used instead of a 'for your safety' sign to reflect the high level of risk. The sign needs to identify all hazards and risks associated with the walk, including the steep descent/ascent, the uneven surface and the long hard walk back up. An emphasis on the change in track condition halfway down is also required, so people anticipate this and can avoid beginning the walk if they are not sufficiently fit or prepared. The sign also needs to emphasise that children should stay with their parents.

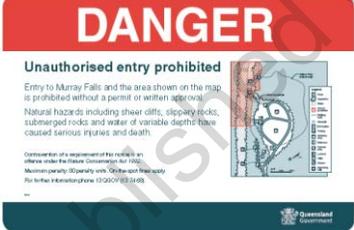
See Table 2 below for recommended sign updates and page 19 for text outline.

## Sign Recommendations

Recommended changes to safety signage at Wallaman Falls are summarised in Table 2. Sign details including design and text suggestions are outlined on page 19.

All new safety signs should be installed following the guidelines in section 5.1.3 of the QPWS sign manual. It is recommended that park management units keep good records of safety signs in-situ. Photos should be taken when installed and uploaded onto SAMS database and inspection regimes set to monitor their condition over time.

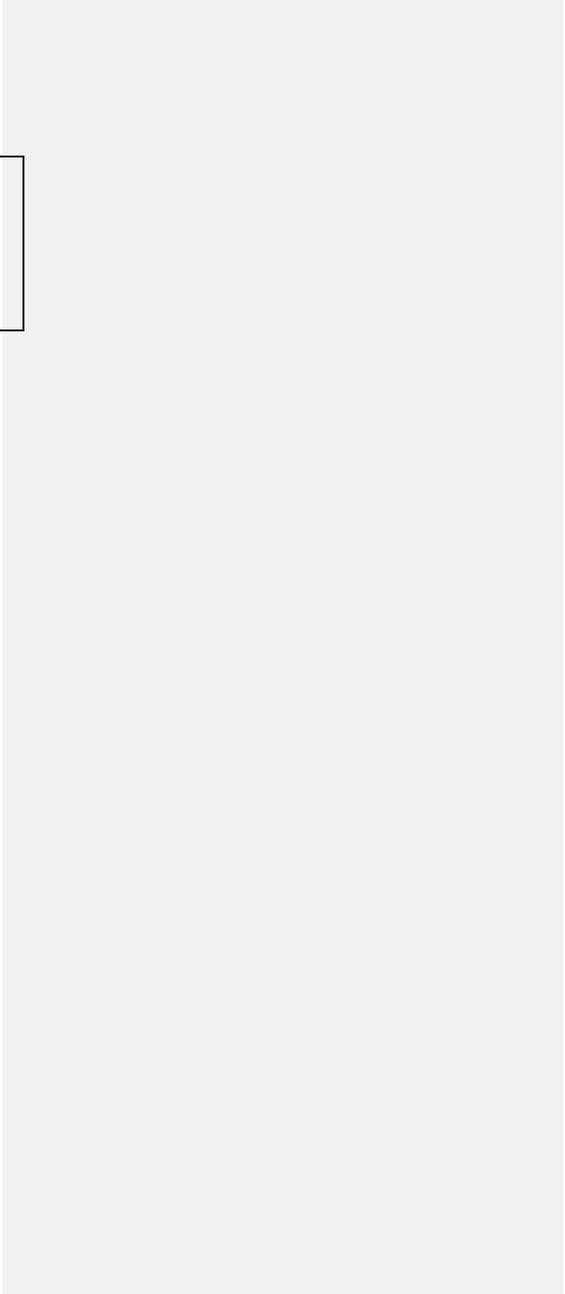
**Table 2: Sign Recommendations**

Priority	Current Sign	New Signs	Action / Justification	Location/siting
1	<p><b>Restricted Access Area (RAA) notice</b></p> 	<p><b>REPLACE</b> existing signs with <b>RAA notice with danger banner (with locations reviewed)</b></p> <p>Under the NCA, a Restricted Access Area is declared by erecting a restricted access area notice in a location easily visible to passers-by. (QPWS Sign Manual, Section 4.8.3 2016)</p> <p><b>Sign example:</b></p> 	<p><b>REPRINT SIGN</b> with text changes and resize (4 copies needed all with individual YAH locations) (1 @ 900x600mm; 3 @ 750x500mm).</p> <p>Revise wording and style in line with Sign Manual 2016;</p> <ul style="list-style-type: none"> <li>• danger heading</li> <li>• add 'you are here' mark to the map</li> <li>• update map style</li> <li>• add the access prohibited symbol</li> <li>• add text stating 'do not enter without permit'.</li> </ul> <p><i>See Sign #1 below for suggested text</i></p>	<p>Three identical signs apart from size and 'you are here' point.</p> <ul style="list-style-type: none"> <li>• 1 at the Stoney Creek bridge (900x600)</li> <li>• 1 at the camp ground (750x500)</li> <li>• 1 at the Wallaman Falls car park (750x500) (relocate to the left hand side of the walking track)</li> <li>• 1 further up the road from Stoney Creek bridge near the small gorge (750x500).</li> </ul> <p>Signs need to be angled correctly beside the walking track so they are clearly visible to oncoming foot traffic.</p>

1	<p><b>Danger sign</b></p> 	<p><b>NEW WARNING SIGN</b> to replace existing danger sign</p> <p><b>Sign example:</b></p> 	<p><b>NEW SIGN</b> (600x400mm); (1 copy needed)</p> <p>Revise wording and style in line with Best Practice Principles:</p> <ul style="list-style-type: none"> <li>• All hazards/issues have been addressed;</li> <li>• Use warning symbols;</li> <li>• Include appropriate safe behavior of remaining behind the barrier and on formed tracks.</li> </ul> <p><i>See sign #2 below for suggested text</i></p>	<p>Current location is appropriate.</p>
1		<p><b>NEW WARNING SIGN</b> for Djynda walking track</p> <p><b>Sign example:</b></p> 	<p><b>NEW SIGN</b> (600x400mm); (1 copy needed)</p> <p>Safety messages not prominent on existing interpretive sign. New sign needed to warn visitors about the level of difficulty of the track and associated risks.</p>	<p>Locate the new sign at beginning of the walking track where visitors have a chance to decide whether to proceed.</p>
3	<p><b>Djynda walk interpretation sign</b></p>	<p><b>UPDATE</b> existing signs when they need replacing to include appropriate safety messages</p>	<p>In time when these signs need to be replaced, update to ensure all safety information is in line with Sign Manual. Ensure safety information is on a different coloured background and that hazard and/or warning symbols are incorporated as these are widely recognised and helpful with</p>	<p>The sign is positioned well at the entrance to the walking track.</p>

			international visitors who do not understand English.	
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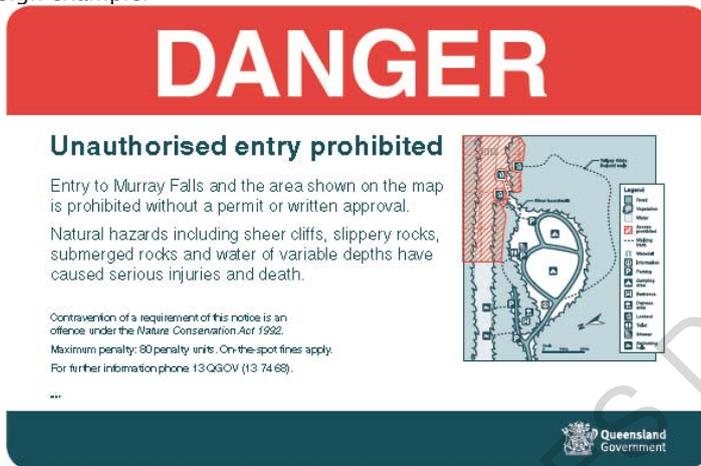
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## Recommendations

### SIGN 1: Revision of Si3998—Restricted Access Area Notice

Sign example:



<insert heading>

**DANGER** < insert title in German & Japanese/Chinese languages >

<insert subheading>

**Unauthorised entry prohibited.**

<insert body text>

Entry to the top of Wallaman Falls and surrounding escarpment (as shown in red on the map) is prohibited without a permit or written approval.

Natural hazards including sheer cliffs and an unstable rock face make this area unsafe to visit. Serious injuries and deaths have occurred here.

Do not climb the barriers or go beyond markers showing this symbol.

<Insert PF63> Stay on the formed tracks and behind the barrier fences at all times.

Contravention of a requirement of this notice is an offence under the Nature Conservation Act 1992.

Maximum penalty: 80 penalty units.  
On-the-spot fines apply.

<insert NEW Wallaman Falls RAA map to the right with RAA marked and 4 versions of YAH points>

<insert pictos>



<insert Si#>

SiXXXX <sign number to be allocated>

<insert Qld Govt logo>

## SIGN 2: New Warning Sign to Replace Danger Sign

Sign example:



<insert heading>

**Warning** < insert title in German & Japanese/Chinese languages >

<subheading>

**Slippery rocks**

<insert body text>

Rocks around the base of the falls are wet and covered in algae, making them extremely slippery. **People have been seriously injured here.**

Stay safe:

- Cross the rocks carefully to avoid falling.
- Supervise children at all times.

<insert warning symbols in this order>



SW03  
Slippery rocks



SW05  
Tripping hazard,  
uneven ground



SS01  
Supervise children

**Commented [A2]:** Do we need this one? I think the slipping symbol covers everything

<insert Si#>

Sixxxx <sign number to be allocated>

<insert Qld Govt logo>

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### SIGN 3: New Warning Sign (Djynda walk)

Sign example:



<insert heading>

**Warning** < insert title in German & Japanese/Chinese languages>

<subheading>

Be prepared for a difficult walk.

<insert body text>

**Djynda walk—3.2 km return (allow 2 hrs)**

Only fit walkers should attempt this walk. **People have died here.**

**Others have suffered heat stress and heart conditions walking this track.** It might look easy but it becomes steep and rough halfway down.

Enjoy the view and walk safely:

- Be prepared for the long, hot walk back up the steep hill.
- Take care not to trip on the track's rough uneven surface.
- Supervise children at all times.

<insert warning symbols >



SW01  
Warning (unspecified)



SW25  
Tripping hazard,  
uneven ground



SS01  
Supervise children

<Insert beneath SS01> Supervise children

<insert Si#>

Sixxxx

<insert Qld Govt banner>

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## Other Communications

While signs at Wallaman Falls need to be updated to reflect the new sign manual standards, pre-visit and other communications (available off-site) enhance the effectiveness of on-site safety signage and also need to be reflecting the same safety messages.

Basic safety messages are provided for Girringun National Park in the new Tropical Coast Journey Guide and the NPSR website contains some safety messages for this site. The website needs to be updated to reflect the recommendations in this plan, including more detailed information on the Djynda walking track and the slippery rocks at the base of the falls. Messages across all media need to be consistent, and web or printed materials should include appropriate prohibition and yellow warning symbols if possible. It is important that information presented through other agencies such as tourism bodies and backpacker's accommodation do not present conflicting messages, such as by including photographs of people base jumping or abseiling.

## Evaluation

It is recommended that visitor response to the safety messages is evaluated over the next summer season, through a combination of observation and interviews. The approach to signage may need to be adjusted depending on the feedback received.

## References

NPSR Website. <http://www.npsr.qld.gov.au/parks/girringun-wallaman/about.html> Accessed 14 June 2016.

Parkin, D and K. Morris (2005) Pete's story: interpreting the consequences of risk-taking behaviour, *Applied Environmental Education and Communication*, 4:139-150.

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