



**water safety**  
Scotland



# Water Safety Signage: Research Report

**2024**

Written by C McAvoy (RoSPA) and J Sullivan (SFRS)

Version: 1

# Executive Summary

**A previous signage audit was carried out by Water Safety Scotland (WSS)<sup>1</sup> which identified inconsistencies with water safety signage in Scotland. To help address some of the issues highlighted in the audit, WSS, along with key partners, undertook a research project over 2023 and 2024 on water safety signage.**

The contents of this report aim to address several aspects of the audit report as well as provide insight into an improved design for water safety signs. The report details the three phases of the research which aimed to examine, scrutinise and improve water safety signage by expert consensus. This signage was then tested with members of the public to ascertain their understanding of the signs as well as overall clarity.



## Background

On average, 96 people lose their life each year due to a water-related fatality in Scotland<sup>2</sup>. 50 of these are classified as accidental, which gives an accidental drowning rate of 0.93 per 100,000 population. This rate is almost double the drowning rate of the UK as a whole<sup>2</sup>.

WSS works to prevent water-related fatalities through the implementation of Scotland's Drowning Prevention Strategy (SDPS)<sup>2</sup> which has two overall targets:

- reduce accidental drowning deaths in Scotland by 50 per cent by 2026 and reduce risk among the highest-risk populations, groups and communities
- contribute to the reduction of water-related suicide.

Additionally, WSS works to implement the Minister's Action Plan (MAP) on Water Safety<sup>3</sup> which was released to complement SDPS after a number of high-profile water-related fatalities in the summer of 2021. Within the MAP, there is a key focus on water safety signage which is believed to be a useful resource to help alert the public to non-obvious dangers in and around the water. Action 3.4 states WSS and its partners should

---

**“** Undertake an audit of existing water safety signage in Scotland to facilitate the delivery of a consistent, effective approach.<sup>3</sup> **”**

---

This action was completed in 2022 and the published report found that water safety signage in Scotland is far from uniform and lacks clarity and consistency which could undermine prevention efforts.<sup>1</sup>

In particular, the audit found the following:

- water safety signs had little consistency in terms of font size, sign size, colouring and amount of written information
- 63% of the signs were not specific to water safety
- 69% of the signs included the correct use of British Standard symbols
- 19% of the signs did not include information on what to do in an emergency
- Only 44% of the signs included a location code, although there was little consistency in terms of the type of location code.

To coincide with this audit, Loch Lomond & The Trossachs National Park (LLTNP), through action 3.7 of the MAP, were also asked to erect signage at popular hotspots<sup>3</sup>. LLTNP, in conjunction with their work on a water safety policy, created new signage incorporating ISO standard signs as recommended by the Royal National Lifeboat Institution (RNLI) and the Royal Society for the Prevention of Accidents (RoSPA).<sup>4</sup> LLTNP uses two types of sign: one as a general water safety sign and a second smaller sign that is specific to emergency information for Public Rescue Equipment (PRE).

A three-phase project was subsequently undertaken in order to examine, scrutinize and improve the LLTNP signage, through expert consensus, and subsequent testing of the agreed water safety signage with members of the public to ascertain their understanding and awareness of the signs.

---

## Aims of the research project

The overall aims of the project were twofold:

- To gain consensus on what signage in Scotland should look like and what information it should include
- To test the agreed water safety signage with members of the public to ascertain their understanding of the signs and their awareness of specific aspects of the sign.

The second aim of the project focussed on answering three specific questions:

- 1.** Is the final signage easily understood by members of the public?
- 2.** Are the pictorial hazards easily understood by the public?
- 3.** Are the instructions on what to do in an emergency clear and understood by the public?

# Methods

The project was completed in the following three phases:

## PHASE ONE

A pilot survey was conducted between June and October 2023 within LLTNP with members of the public. This was to ascertain initial insights into the public's understanding and awareness of the signs. LLTNP rangers engaged with visitors to the park (n=99) to complete a short online Microsoft Form that focused on questions related to the signage as well as awareness of general water safety.

## PHASE TWO

This phase sought to scrutinise and alter the LLTNP signs, via expert consensus and input. An expert panel was set up using a stakeholder analysis completed by WSS. Inclusion criteria included: (1) Scotland or UK based organisation or landowner; (2) practitioner active in water safety and drowning prevention; (3) individual or organisation with remit for the management of water safety.

The project sought consensus via two tasks:

- An online survey to gather initial consensus on several aspects of the signage. This was completed between the 13th and 20th November 2023. Informed consent was provided by each participant. Participants were asked to fill in an online Microsoft Forms survey and were asked to vote 'agree', 'neither agree nor disagree' or 'disagree' on 18 statements relevant to the water safety signage. Statements were accepted as having reached consensus when the statement had the same response at  $\geq 75\%$ . This percentage has been considered a median threshold in academic research.<sup>5</sup>
- An online workshop to reach consensus on any aspects not reached in task one. The workshop took place on 14th December, 12pm – 2pm. Anonymity was waived by attending the workshop but voting, via Microsoft Forms during the workshop, remained anonymous. Participants were presented with the results of the statements that did not reach consensus, discussions were held and participants were then asked to vote on the statement again. Any statement that did not reach consensus in this second round were opened to further discussion with the option to vote in a third round, eliminate or change the statement.

**PHASE THREE**

This phase took the agreed water safety signs, as reached by consensus in phase two, and tested the signage with members of the public. A quantitative descriptive design was undertaken to achieve this.

The self-administered questionnaire was created to assess and evaluate the target audience’s understanding of the signs as well as their recognition of the icons and emergency information advice. Consistent with the approach agreed by consensus, two signs were used to test this: one general water safety sign (including hazard information) and a specific sign for use on only PRE stations.

The survey included 17 questions and used convenience sampling via adverts on social media platforms: X (formerly twitter), and Facebook. The survey was live between 11th and 24th January 2024.

## Results

### PHASE ONE

99 members of the public completed the pre-pilot survey in LLTNP\*. The findings include:

- 39% of those surveyed intended to use the water during their visit, with a further 17% stating they intended to do so on a future visit
- 70% of respondents noticed the water safety signage at the Park (figure 1)
- 65% of respondents took time to read the sign (figure 2)
- The most common reaction to the signage was reassurance (56%), followed by no reaction (31%) (figure 3)

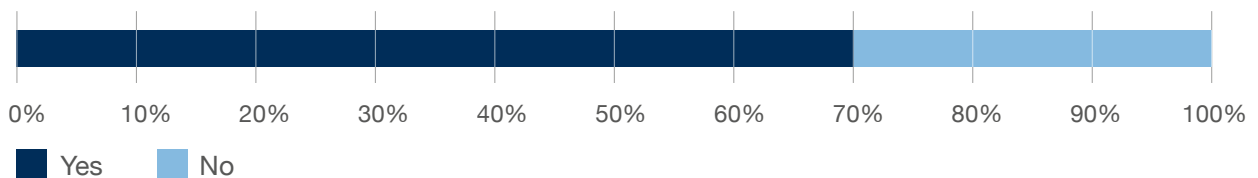


Figure 1: Awareness of water safety signage during the visit, n = 97

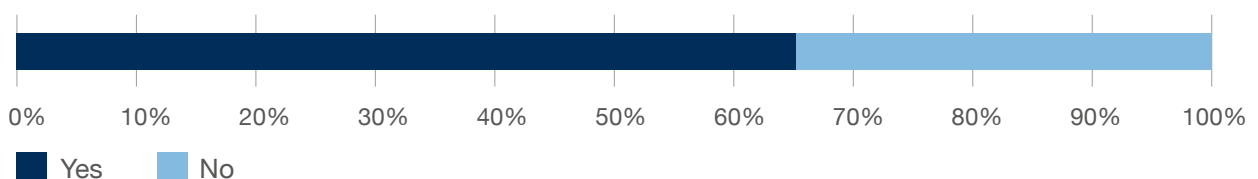


Figure 2: Percentage of those that read the sign, n = 69

\* Not all participants chose to answer the full set of questions. Please see figures for further information.

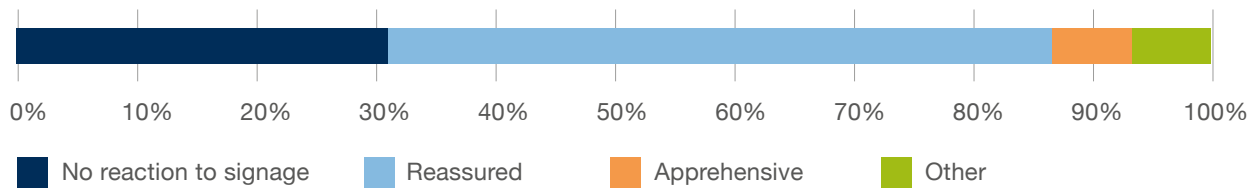


Figure 3: Reactions to the sign, n = 45

## PHASE TWO

The online survey was completed by 14 participants and eight of the 18 statements reached consensus  $\geq 75\%$  in this first round.

The online workshop was attended by 11 participants. The 10 remaining statements were voted on again. Eight of the remaining 10 statements reached consensus  $\geq 75\%$  in round 2.

Two statements did not reach consensus in round 2. They were discussed again. One was eliminated and the other entered a third round of voting but did not reach consensus and was eliminated.

An itemised list of all statements reaching consensus is displayed in Table 1.

No	Statement	Decision	Round achieved
1	Water safety signs should include hazard warning icons	Agree	1
2	Hazard icons should be yellow and black and follow icons as per the ISO standard	Agree	1
3	Mandatory actions, as per the ISO standard, should be blue	Agree	1
4	Emergency information should be green as per the ISO standard	Agree	1
5	What to do an emergency should be clear on the sign e.g. call 999	Agree	1
6	The emergency agency responsible for coordination should be included e.g. In an emergency, call 999, and ask for Police/HMCG	Agree	1
7	The emergency information should include a Unique Location Code, such as Water Safety Scotland’s guidance	Agree	2
8	The emergency information should include OS Grid reference	Agree	2

No	Statement	Decision	Round achieved
9	The emergency information should include a Location Name	Agree	1
10	Only one location code is needed on the water safety sign	Disagree	2
11	Two location codes are needed on the water safety sign	Disagree	2
12	Three location codes are needed on the water safety sign	Agree	1
13	The sign should include a link to the water safety code (e.g. as QR code)	Agree	2
14	Other information should be included on a water safety sign e.g. first aid locations or defib locations	Disagree	2
15	The park also uses a dedicated PRE sign on PRE equipment. This is a valuable asset where hazard warning is not needed*	Agree	1
16	The design aspects agreed for the hazard water safety sign (e.g. colour green) should be the same for PRE signs	Agree	2

Table 1: Items reaching consensus



### PHASE THREE

Based on the information gathered in phase two, the signage was altered into new mock up signs for use in the online public facing survey. These mock ups can be seen in Appendix 1.

The online survey was live from the 11th January until the 24th January. An incentive was used, one participant could win a £30 amazon voucher. 471 participants responded and completed the survey\*.

The findings include:

- 84% of those surveyed believed the sign was a clear water safety sign (figure 4)
- 75% agreed that the location information on the signs was clear (figure 5)
- We tested understandings of the different parts of the signs (figure 6):
  - 93% understood where the emergency information on the sign was located
  - 76% understood where the mandatory information on the sign was located
  - 93% understood where the hazard information on the sign was located
- We also tested understanding of the specifics of hazard information (see figure 7)
  - 99% were aware that the hazard information was in yellow
  - 98% correctly identified steep drop hazard information
  - 99% correctly identified cold water hazard information
  - 92% correctly identified deep water hazard information

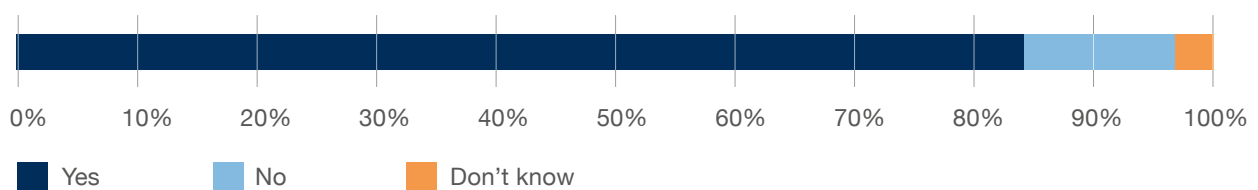


Figure 4: Clarity of the sign as a water safety sign, n = 466

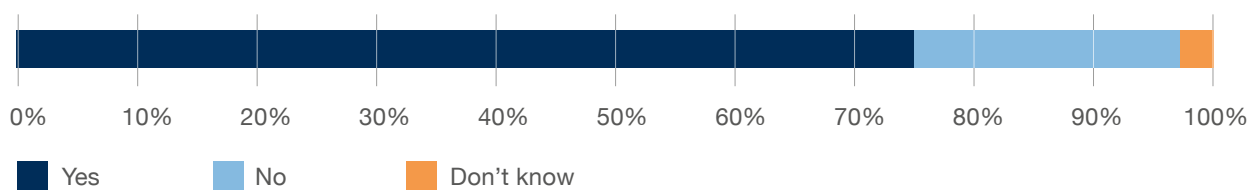


Figure 5: Clarity of the location information e.g. the location name and code, n = 467

\* Not all participants chose to answer the full set of questions. Please see figures for further information.

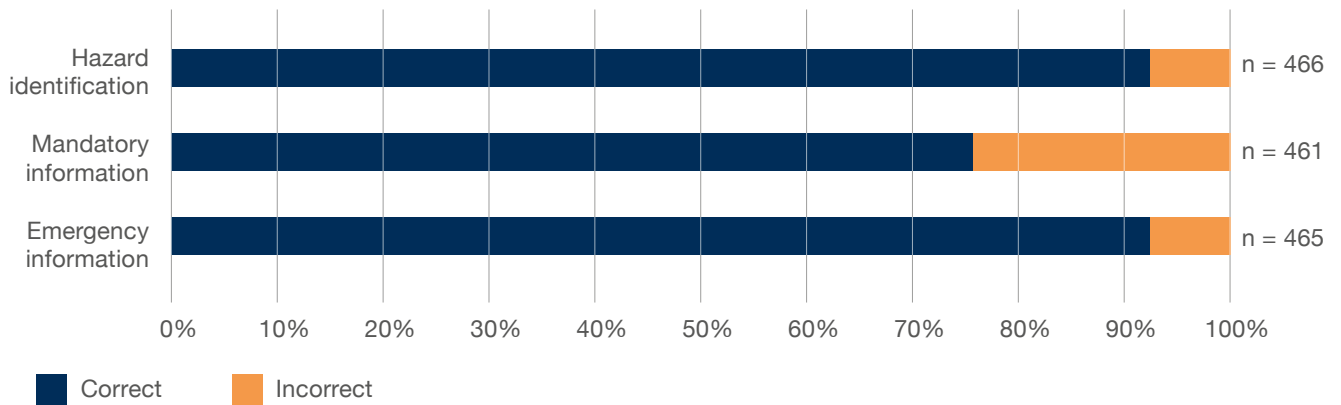


Figure 6: Understanding of the the signs

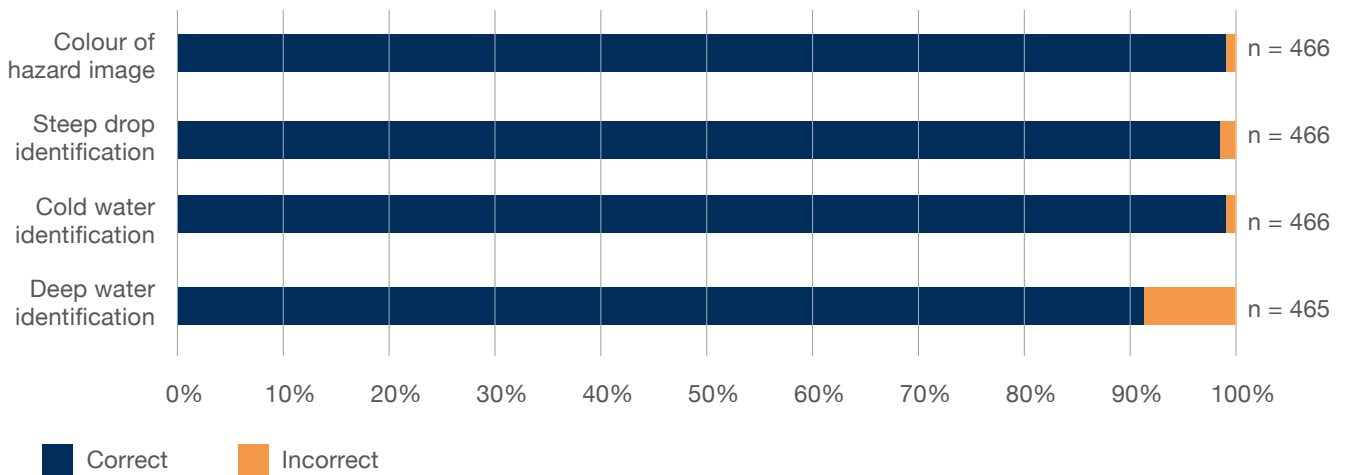


Figure 7: Understanding of hazard identification

The survey also considered specific PRE signage, which complements the main signs. The key findings are:

- 92% of those surveyed believed the PRE sign was clear (see figure 8)
- 88% correctly identified what to do in an emergency (see figure 9)

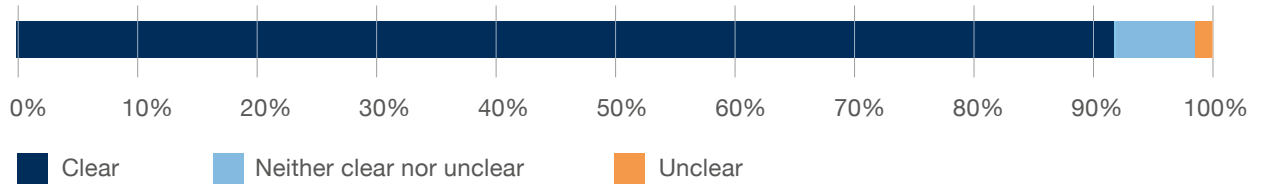


Figure 8: Clarity of the PRE sign. n = 467

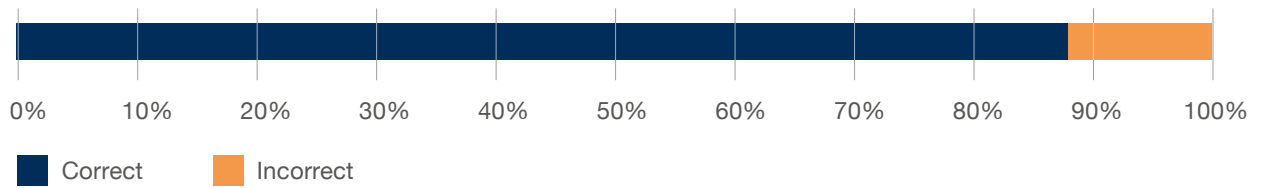


Figure 9: Correct emergency response, n = 467



## Discussion

This three-phased project has provided extremely important insight into water safety signage in Scotland.

Using original signage from LLTNP, an expert panel was utilised to reach consensus on different aspects of the signs that a previous water safety signage audit highlighted as key issues. From this expert panel, key aspects of the sign were agreed upon. This included the use of British ISO standard hazard symbols and the use of green, blue and yellow in the design.

The expert panel also showed that location codes were considered extremely important to help with emergency response to an incident. The group agreed that three specific codes should be utilised on signs: A unique location code, OS grid reference and a location name. The inclusion of what3words did not reach consensus for various reasons and was not included in the final design.

The inclusion of a QR code linked to the WSS water safety code was also considered necessary as well as the specification of which emergency service to call e.g. Police for inland, HMCG for coastal.

Having reached consensus, the signs were altered and tested with members of the Scottish public. It is promising to note that participants believed the sign was a clear water safety sign (84%) and that the location information on the signs was clear (75%).

The breakdown of information on the sign into emergency information, hazard identification and mandatory information was well understood (>75%). Hazard identification was particularly good. Over 90% of the participants were able to correctly identify the meaning of the three specific hazard symbols. Similarly, 83% were able to understand the emergency information on the sign.

The separate PRE signs were also well understood with 82% believing the sign was clear.

This provides a good basis from which WSS can create and develop guidance for Scotland on water safety signage. Key limitations of the study however should be noted. The expert panel was based on a WSS stakeholder analysis, and it is possible that some key organisations were missing from the panel. With regards to the public facing survey (phase 3), the sample size was small (<500) and not representative. Additionally, the three hazard symbols tested were chosen at random. It may be that these symbols were easy to identify and it is possible that other symbols could have been more difficult to identify which could impact the results of the study.

# Conclusion

In conclusion, this three-stage project aimed to examine, scrutinise and improve the LLTNP signage by expert consensus and test the agreed water safety signage with members of the public to ascertain their understanding and awareness of the signs.

Expert consensus was reached on a number of important elements of the sign including the design aspects and the information to be included. The public facing survey showed promising results with the majority finding the sign and its emergency information clear. Additionally, identification of hazards and what to do in an emergency was correctly identified by the majority.

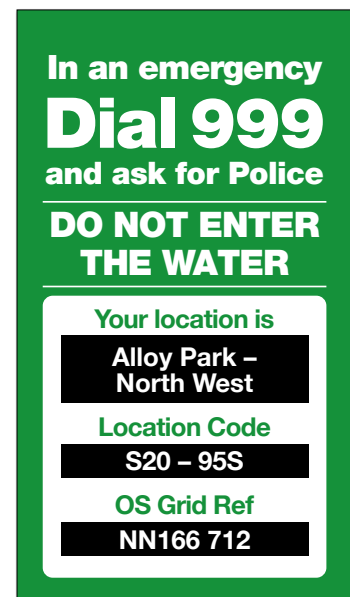
It is recommended that WSS and partners consider creating guidance based on this research for use across Scotland as well as a pilot project to trial the new signs.

---

# Appendix 1



Core water safety signage



Public Rescue Equipment (PRE) signage

## References

- 1 Water Safety Scotland, 2022. Water Safety Signage: Audit Report [online]. WATER SAFETY SCOTLAND. [viewed 30 November 2023]. Available from: [watersafetyscotland.org.uk/practitioners-hub/water-safety-signage](https://watersafetyscotland.org.uk/practitioners-hub/water-safety-signage)
- 2 Water Safety Scotland, 2018. *Scotland's Drowning Prevention Strategy* [online]. WATER SAFETY SCOTLAND. [viewed 30 November 2023]. Available from: [watersafetyscotland.org.uk/media/1213/scotlands-drowning-prevention-strategy.pdf](https://watersafetyscotland.org.uk/media/1213/scotlands-drowning-prevention-strategy.pdf)
- 3 Scottish Government, 2023. Water Safety Stakeholder Group annual report: action plan [online]. SCOTTISH GOVERNMENT. [viewed 30 November 2023]. Available from: <https://www.gov.scot/publications/water-safety-stakeholder-group-actionplan/#:~:text=Following%20a%20tragic%20spate%20of%20drowning%20incidents%20in,Scotland%20and%20reach%20agreement%20on%20appropriate%20next%20steps>
- 4 The Royal Society for the Prevention of Accidents, 2011. National Water Safety signs [online]. ROYAL SOCIETY FOR THE PREVENTION OF ACCIDENTS. [viewed 09 August 2023]. Available from: [www.rospa.com/media/images/water-leisure/RoSPA-National-Water-Safety-Signs.jpg](http://www.rospa.com/media/images/water-leisure/RoSPA-National-Water-Safety-Signs.jpg)
- 5 Diamond, I., Grant, R., Feldman, B., Pencharz, P., Ling, S., Moore, A & Wales, P., 2014. Defining consensus: A systematic review recommends methodologic criteria for reporting of Delphi studies, *Journal of Clinical Epidemiology*, 67 (4). [viewed 09 August 2023]. Available from: ([www.sciencedirect.com/science/article/pii/S0895435613005076](https://www.sciencedirect.com/science/article/pii/S0895435613005076))

