

White water features and hazards

This document will provide you with useful information and examples of the hazards and features that you may come across on white water. It is important to recognise that this document will not give you everything you need to know about what these features feel like and how to paddle them and safely navigate them. You will gain this understanding of the environment as your experience grows, which will help you develop your knowledge of why these features occur and how to manage them as a paddler. There is no substitute for first hand experience when it comes to engaging with the flow, speed and feel of a white water environment and it may be beneficial to seek the guidance of a coach, leader or club to help you gain this.

The attributes of white water

The following attributes contribute to the characteristics of white water and will affect the grade, challenge and risks associated with it.

Gradient - As the environment becomes steeper, the water flows faster;



Volume - As more or less water flows downstream, the features will change and often the difficulty and grade changes;



Width - This affects the speed of the water and when a wide section of water is focused into a narrow constriction the speed and force increases. When a narrow constriction becomes wider again the speed slows down.



Depth - Shallow white water generates lots of features such as rocks, boulders and slabs/slides. Deeper white water typically has less physical obstacles, but more pronounced white water features.



Direction - As the water changes direction around a corner, it creates faster flow on the outside of the bend.



Physical features - Boulders or rock formations in the river and blocks on an artificial course create the features that we navigate on white water.



Hazards - Trees, weirs, bridges, artificial structures and debris can all create risks in white water.



White water features

A paddler on white water is presented with a range of features that they can use to navigate downstream. Bear in mind that these features will change with different water levels and something that is friendly in lower water, you may wish to avoid in higher water.

The white water environment contains a range of different features which can be enjoyable and challenging in equal measures, this includes:

The flow - The majority of the water which is moving downstream;



Eddies - At the side of the main flow we find eddies. These can be still or slow moving sections of water and in other circumstances they can be fast moving and return a paddler back into the main flow moving downstream;



Eddy lines - This is the line of water that separates the main flow from the eddy often creating some turbulence in the water due to the changes in flow and direction;



Rocks - As the water flows around the rock in some way it creates changes in direction of the flow and turbulence in the water;



Waves - When the environment changes in gradient and flows over a submerged rock or slope in the water it can create a standing wave;



Stoppers - a white water feature which creates a recirculation of water moving back upstream.



White water hazards

There can also be hazards on a white water river, which we would typically aim to avoid such as:

Rocks - These can create places where we could be flipped upside down or knocked into the water. They can also create situation where we could become pinned to the rock in our craft.



Trees - as the water flows round and/or through the tree, it creates a serious hazard that we can become stuck on either in or out of our craft. Trees may have fallen into the river from the side, or could be still rooted to the river bank. We often call a tree that has fallen into the river a strainer.



Weirs - A structure used to control the flow of the water in the river. These can create deep recirculating sections of water that can be hazardous to a paddler.



Bridges - A bridge stanchion in the river can create a powerful hazard as the water is diverted around it.



Artificial Structures - Any structure that has been added to moving water should be treated with caution. On an artificial course, the flow of the water is directed by submerged blocks which in some instances could be a hazard.



Debris - Often associated with current or previous higher water conditions. This could create additional complications when added to any other whitewater feature or hazard.



Understanding and recognising white water features and hazards is something that you will develop as your experience grows. Often speaking to more experienced paddlers can be a great way to learn about these features and which could pose greater challenges to you.

Other helpful resources

There are many more resources which may be helpful to you, available at the British Canoeing Awarding Body Website

[Safety Resources](#)

[Leadership & Raft Guide Resources](#)

[Digital Library](#)