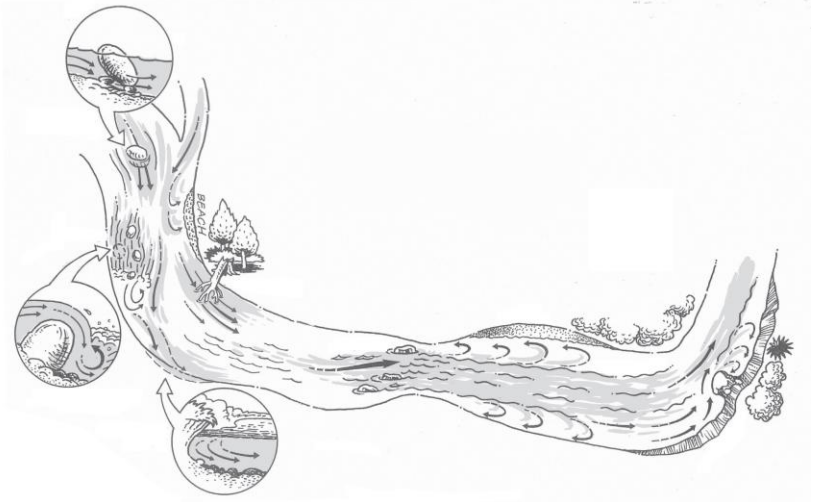


# C V M F

Christopher Vang Memorial Fund



# BEING RIVER SAFE

## **About the Christopher Vang Memorial Fund**

*On September 12th, 2011 Christopher Vang, 24, and two friends set out to Peg Leg, Chilliwack, for an evening of fishing. Whilst fishing, Chris was caught in a current and unforgivably whisked out into the Fraser River. After eight days of relentless search efforts by family, friends and the RCMP, Christopher's body was finally recovered.*

Our main goal is to raise awareness towards river safety. Too many lives have been claimed by the tumultuous Fraser River. As it currently stands, there are not any enforcements with regards to the usage of life preservers on a river.

**Help us make this a possibility, so that we can give someone the chance that Chris never had.**

**At the CVMF, we believe that bringing awareness about the importance of educating the public on water safety is a fundamental task.**

Education is proven as the most effective and efficient way to promote and improve water safety. Inherent within education is behaviour modification - this promotes appropriate actions and behaviours that will enhance safety.

Rivers, lakes, oceans, streams, and ponds can be fun places to swim, boat, and fish; however, these bodies of water are a part of nature and are always changing. Remember that safety should be your first concern when near waterways.

**Safety is a personal responsibility.**

## **Focus on the Fraser River**

The Fraser River is such a prominent feature of the Lower Mainland of B.C. that many people take it for granted. It is common for people to end up in the river when they are not prepared for it. Having a healthy respect for the Fraser River provides a broader understanding of the environment and perhaps gives someone a chance to stop and think before taking risks.

### **The best way to survive is to not fall in at all.**

- Avoid riverbanks in flood
- Watch out for undercut riverbanks
- Do not mix alcohol or drugs and rivers

## **About Rivers**

Rivers present a completely different range of potential dangers compared to the ocean and swimming pools. The pressure of moving water is constant and can be powerful even if the river looks slow moving and calm.

Rivers, unlike surf beaches and off-shore waters have no agencies responsible for rescues (i.e., lifeguards) so it is easily understood why the need for river safety education is vital.

Being in a river is different from being in a pool or in the sea. People often underestimate the power of the river or overestimate their own abilities. The river bottom is irregular and can change from day to day and it is often difficult to tell how deep a certain part of the river is.

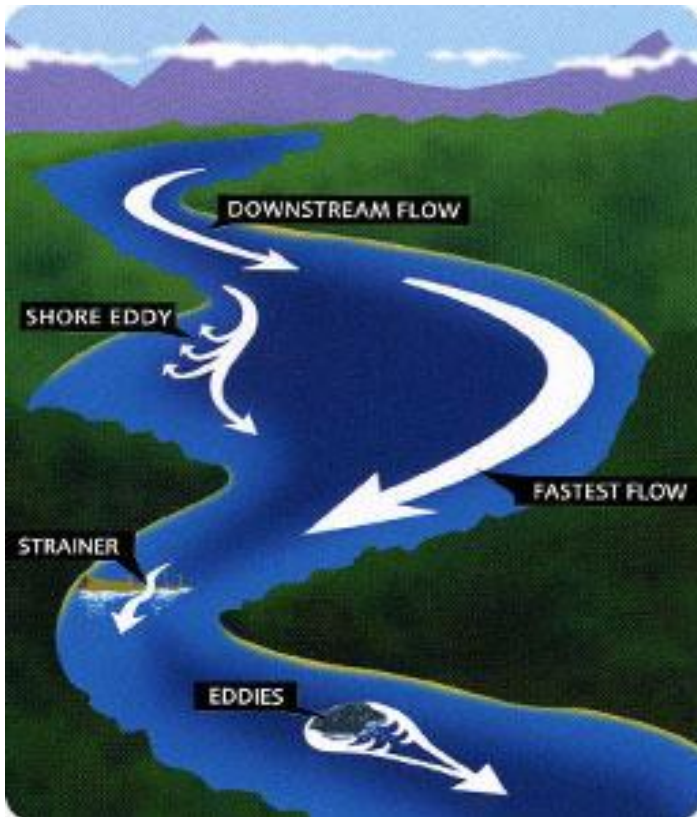
**Prior to setting out to do an activity, an initial assessment of the river and the weather should be conducted.**

**Consider the following questions:**

- 1) What is the weather forecast?
- 2) Will the weather be suitable for the activity planned?
- 3) What is the condition of the river?
- 4) What is the river flow like?
- 5) What is the river level or depth of water?
- 6) What is the colour of the water?
- 7) What is the nature of the river bottom?
- 8) Is there any debris on the bottom of the river?
- 9) How will recent weather have affected the river level and flow of water?
- 10) Is the river level and flow likely to be suitable for the planned activity?
- 11) Are there any visible features, like rapids, strainers, or obstacles like boulders we need to consider?
- 12) Can you enter and exit the river safely?

## River features

Learning to recognize river features and the dangers they represent for a range of river users is a life-long learning process. People get into difficult situations in rivers because they either underestimate the force of water and the strength of the current or they cannot recognize the danger specific river features present.



## 1) Rapids

- Rapids are stretches of water where the water flow has been disrupted and becomes turbulent.
  - The size and turbulence of the rapid depends on:
    - The steepness of the river.
    - The number and size of objects like rocks that block the flow of water.
    - The volume of water flowing down the river.
  - The white water in the rapids is aerated or full of bubbles and is not very buoyant as it does not support a swimmer as well as normal water
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## 2) Obstacles

- An obstacle is an object that stands in the flow of the river, forcing the water to flow around it.
- Obstacles can be man-made constructions like bridge supports, or things like boulders, tree trunks, and projecting land masses like bluffs.
- Swimmers can be pushed or carried into obstacles by the flow of the water. They can be injured by the force of the collision with the obstacle.

### 3) Eddies

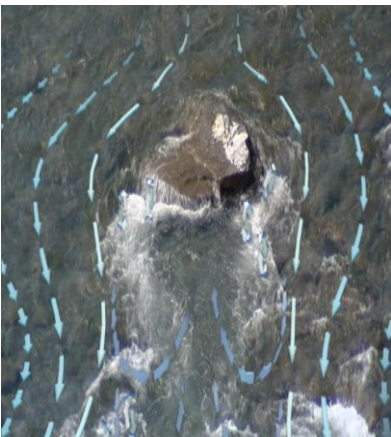
- An eddy is an area of swirling water that forms behind an obstacle like a boulder in a river. Often the water in the eddy will reverse the direction of flow and will flow upstream.
- Eddies are almost always formed on the inside of the corner when a river turns a corner.
- The area where the downstream meets the eddy is called an eddy line. The eddy line mixes the water flow in an unpredictable way.

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### 4) Re-circulating waves

- Re-circulating waves are formed immediately downstream of large objects like rocks.
  - A re-circulating wave is where the water continually flows back over itself. Objects including people can be held or trapped in re-circulating waves.
  - Re-circulating waves are created when the downstream drop in water level is of a significant size.
  - Re-circulating waves are always breaking and contain white, aerated water.
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**Eddies: Animation of water flow around the rock**



**Re-circulation waves: Cross-section diagram showing re-circulating wave**





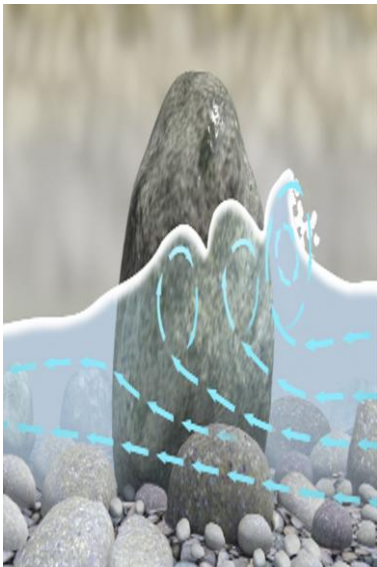
## 5) Buffer waves

- Buffer waves are formed when the river flows into an obstacle.
  - The buffer wave is upstream of the obstacle.
  - The more water hitting the obstacle, the bigger the buffer wave.
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## 6) Standing waves

- A standing wave is formed downstream of a submerged obstacle like a rock, or downstream from where a river narrows abruptly. Depending on the size of the obstacle or rock, there is usually more than one of these waves. They are called standing waves.
  - Waves can break over swimmers, pushing them under the surface.
  - Standing waves may be breaking or smooth.
  - Standing waves stay at the same place in the river.
- 

Buffer waves:



Standing waves: Animation showing standing waves



## 7) Strainers

- A strainer is an obstacle in the river that allows water to flow through it but stops larger solid obstacles.
  - Strainers are typically:
    - Tree branches or roots held in the river across the current
    - Fences
    - Construction debris like reinforced steel mesh
    - Collections of boulders
  - Strainers may be visible or fully submerged.
  - Swimmers can be trapped against strainers by the force of the river flow. They cannot get free and drown.
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## 8) Weirs

- Weirs span the full width of the river or waterway there is no opportunity to move away from them.
  - Weirs can have strong re-circulating waves.
  - Do not swim, boat, or cross the river near a weir.
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**Strainers:** The log caught between two rocks acts as a strainer



**Weirs:** A weir with animation showing the flow of water over the river



## 9) Unstable or undercut banks

- The force of the water flowing down a river constantly erodes or wears away its banks. Banks where the force of the water is wearing away land at water level become undercut or unstable. These banks look stable to people walking on top of them but they may be ready to collapse.
  - People standing on a river bank or walking beside a river can fall in when an undercut bank collapses into the river.
  - An unstable or undercut bank can also collapse if a swimmer tries to climb out of the river onto it.
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**Unstable or undercut banks: An example of where the water is wearing away land and forming an undercut bank**



# Crossing the River

The Fraser River is one of the greatest hazard in the outdoors of the Lower Mainland of B.C. Error of judgement often have serious consequences. Before you or your party attempt to cross a river, there are questions you need to ask:

**1) Should we cross?**

If in doubt, stay out

**2) Where do we cross?**

The choice of the safest place to cross is vital. Try to view the river from a high bank. You should be able to see gravel spits or sandbanks just below the surface and get some idea of the depth and position of channels.

**3) How do we cross?**

Use the mutual support method. The more people in the party, the more strength there is for crossing and for supporting anyone who slips or falls. All river-crossing methods have their advantages and disadvantages and, in difficult conditions, no method is absolutely safe.

Knowing when to cross a river is not a black and white decision. It's about good judgement. We advise that you learn how to anticipate what might go wrong and therefore recognize and avoid potential problems. To safely enjoy rivers, it's important to respect their hazardous nature.

# If you (and your group) need to enter the river, you must select a safe place to cross.

Consider the following factors when selecting a safe place to cross:

## 1) Depth of the water

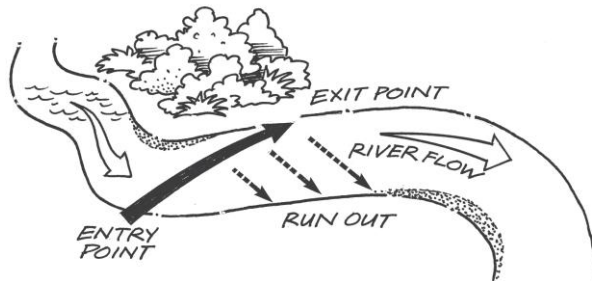
The river at its deepest point should be no deeper than knee or mid-thigh depth on the smallest group member.

## 2) Current or speed of flow of the water

The water should not be fast flowing because the force of the water can make individuals lose their footing and be swept downstream. The river should not be flowing faster than you can walk beside it. Test this out by throwing a stick into the river and walking down the bank beside it. If the stick is moving faster than you can comfortably walk, then the current is too strong for you to cross.

## 3) Safety entry and exit points

You need to be able to get into and out of the river easily and safely. Avoid areas with: steep undercut banks, edges covered with debris, and steep single banks.



## 4) Safe run out

A safe crossing area will have a run out area or a safe area where the current will take you to if you need to turn back.

## 5) Nature of the river bed and river water

Look for a place where the river flows over a wide area and is not compressed into a narrow fast-flowing channel. Avoid areas of cloudy or muddy water since you cannot see the nature of the bottom.

## Use the Mutual Support Method to cross a river

The method requires individuals to:

- 1) Be close together
- 2) Hang on tightly to hip belts, pack straps, or pack hang grips
- 3) Take a firm hold of the waistband of their neighbour's shorts or pants if they are not wearing packs
- 4) Do not let go of the grip
- 5) Stay together throughout the crossing
- 6) Communicate so that the group acts as one

The mutual support method is recommended for a group of people to cross a river. It is a way for people to support each other as they cross. If one person lost their footing, they would be supported by the others in the group.

### **How to use the mutual support method:**

- 1) The group links together to provide mutual support and functions as a single unit. The group forms up with the strongest and most experienced people on the outside, with the least experienced in the middle. Everyone must hold on tightly to their neighbour and not let go.



- 2) Keep the side of the body on to the current to minimize the effect of the water flow.
- 3) Take small shuffling steps. This is easier and safer than trying to lift feet.
- 4) Move diagonally downstream with the current to conserve energy. This means the exit point is not parallel with the entry point.
- 5) The upstream person meets the full force of the current, they create buffer wave that provides slightly calmer water for the rest of the group to walk through.

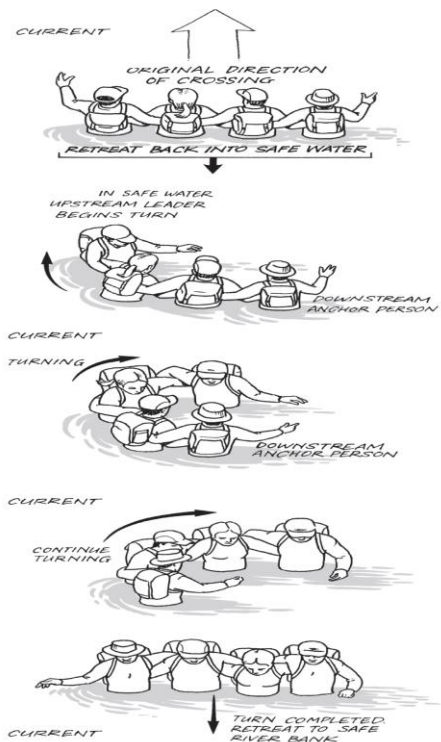
Sometimes it is necessary to stop a river crossing and retreat out of the river.

### How to retreat out of the river:

- 1) The best way to get out of the river is to leave the same way you and your group entered. Back all the way out of the river by walking backwards and retracing your steps. This way, the group will be more stable since no one is moving across (perpendicular to) the current or feeling the full force of the current.
- 2) If the river is wide, the group may choose to back to a safe area and then complete a caterpillar turn and walk out of the river. During the caterpillar turn, the group does not remain parallel to the current. At some time, all members of the group will feel the full force of the water and there may be an increased risk of someone losing their footing.

### Caterpillar Turn:

- 1) The upstream person begins to turn with the downstream person acting as anchor person.
- 2) The group communicates and executes the turn slowly with each member finding safe footing.
- 3) Each person in the group moves slowly and turns with their back to the current.
- 4) The group continues to turn until the group can retreat back to the river bank, moving parallel to the river current.
- 5) The group stays together until they leave the water.



## It is important to know what to do if you end up in the river.

Nobody intends to be in the river unless they are crossing it; however, sometimes the unexpected happens and they end up in the river being propelled downstream by the force of the current.

If you are wearing a pack, it will provide buoyancy and allow you to float either head first or feet first.

### If you are in the river, to get out:

- 1) Flip onto your back - moving either head first or feet first in the current. You can float down a river feet first or head first. If you find yourself in a river you may instinctively adopt a feet first position. When you are in the river current, you need to stay calm and keep your feet up so they do not get trapped in rocks.
- 2) Lift your head and look for a suitable exit point and run out area. All the time you are in the water, you're using up energy and maybe being bumped against rocks. Find a suitable exit point as soon as possible, and then use a lot of energy to swim across the eddy line to the bank.
- 3) Angle your body to the run out area and use your arms as oars to paddle toward the run out area.
- 4) Paddle hard to cross the eddy line and move into calmer water.
- 5) Reach the river bank (and - if you have one - remove your wet pack. If you try to get out of the river wearing a wet pack, it will be very heavy and you could fall back into the river).

#### Head first position



#### Feet first position when pack has no hip belt



#### Feet first position





## River crossing gear: Waders

While out on the water, safety should always be the highest point on the priority list. Waders allow people to access bodies of water such as rivers, lakes, streams, and wetlands in pursuit of their activity (i.e., fishing). They offer a convenient way to stay warm and dry while outdoors. It has been said that the very act of wearing waders can contribute to accidents - by simply permitting people to venture where they otherwise wouldn't; however, in most cases, panic and a lack of awareness and experience is the actual cause. When accidents occur, waders may be your only chance of surviving. Keep in mind that as with any venture into water, safety is paramount.

### **Types of waders:**

Waders come in several different styles and materials:

Hip waders	Waist waders	Chest waders
<ul style="list-style-type: none"><li>• Resemble long boots that come up to your hip.</li><li>• These waders work well in shallow-water conditions.</li></ul>	<ul style="list-style-type: none"><li>• Come up to waist level</li><li>• Provides extra coverage in deeper waters.</li></ul>	<ul style="list-style-type: none"><li>• Extends to the chest area.</li></ul>



***"I thought that I should share what I learned in hopes that it may save a life someday by educating others."***

**- Sherri Russell (of "She's So Fly Outdoor News")**

## Wader Safety Tips

### **1) USE A WADER BELT.**

A great addition to waders would be a wading belt. It prevents water from rushing down the legs if someone were to fall in. It also traps air in the waders to help float. If a wading belt isn't worn, the waders will fill with water.

### **2) Understand that WADERS DO FILL UP WITH WATER.**

"The common fear of wearing waders is that they will fill with water and drag your head under the water's surface", explains Mark Anderson of Outdoor Canada. An important aspect about wader safety is that if a person were to fall unexpectedly into a river, it's not any more difficult to swim while wearing them than it is to swim in regular clothes. Waders filled with water will not drag a person down. The weight in waders will approximate to that of the surrounding water. If several layers of clothing are worn underneath, their weight will add to the load. Once the water inside the waders matches that of the surrounding current, the force on the waders diminishes. Most new waders are designed with a lap belt tightener, which limits the amount of water that will fill the waders.

### **3) DO NOT PANIC if you fall.**

The goal is to get out of the water safely without any injury.

If you fall into the river with waders on:

1. Get your boots off if possible; it is easier to swim without them on.
2. Try to pull the waders down off of your shoulders to your belt.
3. Have your feet facing downstream since this will prevent any injury from rocks or trees and keep the air inside the waders. You can also see where you are going and will be able to look out for any exit points ahead.
4. All other instructions for getting out of the river (without waders) apply.

### **4) Wading staffs are a valuable asset.**

Wading staffs are a great help when crossing a river. Coloured water can impair vision and the wading staff can be used to feel for any loose rocks on the river bed that are not distinguishable.

### **5) Wear a personal flotation device (PFD).**

Even though waders provide convenience and sufficient safety, it should never be contemplated as a replacement for a life jacket or inflatable vest.



\*\*\* The information within this booklet has been obtained from the following resources with absolute permission for redistribution and use:

## Resources:



[www.watersafety.org.nz](http://www.watersafety.org.nz)



[www.grandriver.ca/index/document.cfm?Sec=19&Sub1=0&sub2=0](http://www.grandriver.ca/index/document.cfm?Sec=19&Sub1=0&sub2=0)

**preventable.ca**

[www.preventable.ca](http://www.preventable.ca)

***Fishtec Blog***

<http://www.fishtec.co.uk/blog/>

**LIVESTRONG™.COM**  
THE LIMITLESS POTENTIAL OF YOU

<http://www.livestrong.com/article/243467-wader-safety/>

**SHE'S SO FLY  
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