

## RIVERS, STREAMS, AND WADING

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### Preamble

According to the NZ Mountain Safety Council, rivers present possibly the greatest hazard in the bush and mountains. This must also extend to all waterways in rural and urban environments as well. The School considers working around waterways among the most potentially hazardous activities that staff and students will encounter on a working basis and therefore treat it very seriously.

The primary hazards associated with rivers and streams are;

- Drowning
- Slipping (losing footing and control)
- Being caught by snags or whirlpool currents
- Polluted water
- Hypothermia

As with all fieldwork and other off-campus activities, staff and students must complete the requirements as covered in the School of Environment *Field Safety Guide*.

Most importantly,

- Avoid working alone.
- Assess and identify hazards and manage them appropriately.
- Construct a robust communication plan and itinerary and stick to it, within reason.

### Choose the safest place to work

You will first need to assess the river and decide on the safest place to undertake the given activity.

#### 1. Potential changes in conditions

Be very wary of changing conditions such as rainfall, water levels, and stream flows especially in gorges and other highly confined flow channels. Check weather reports and plan ahead accordingly. Exit water if sudden downpour occurs. Check for the possibility of dam controlled waters and if so, obtain a schedule of spill times.

#### 2. Assess the speed of the river

Throw a stick into the fastest current and try to keep pace with it, walking along the bank. If this is more than walking pace, then entering the water is potentially dangerous. Do not work in heavy rain. The National Environmental Monitoring Standard for working in and around water (<http://www.lawa.org.nz/media/16575/nems-code-of-practice-2013-06.pdf>) provides the following table as a guideline (when trained in the use of PFDs).

| Surface Velocity (m/s) | Depth          |  |  |  |  |
|------------------------|----------------|--|--|--|--|
|                        | Shin           | Knee   | Mid Thigh                                      | Full Thigh   | Over Groin   |
| > 1.0                  | Single manning | Single manning with personal floatation device                 | Double manning with personal floatation device | Double manning with personal floatation device and throw bag | Double manning with personal floatation device and throw bag |
| 1.0 to 0.5             | Single manning | Single manning.<br>Personal floatation device is discretionary | Double manning with personal floatation device | Double manning with personal floatation device and throw bag | Double manning with personal floatation device and throw bag |
| < 0.5                  | Single manning | Single manning   | Single manning with personal floatation device | Single manning with personal floatation device               | Single manning with personal floatation device               |

*Note: These provisions are applicable only to able-bodied persons in normal daylight, good visibility and firm bed conditions.*

### 3. Assess the depth of the water

Think very carefully about entering water above thigh depth. Consider the height of other members of your group. Do not enter turbulent water or areas where you cannot see the bottom.

### 4. Try to assess the river bed

Avoid cloudy or dirty water which hides the bottom. Beware of slippery or cobbly river beds. Beware of soft or sticky river beds which can restrict your movement and ability to exit. Avoid areas with debris, logs, snags or boulders.

### 5. Entry and exit points

Ensure that you can enter and exit the water easily and safely (and escape if necessary). This is especially important if crossing a river. Steep banks are often associated with deep water.

### 6. Look downstream and assess the “run-out”

If you fall in, where will you end up? Avoid deep pools, rapids, culverts, waterfalls, logs and debris, whirlpools, convergences with other waterways. Can you reach safety easily?

## Preparation

### 1. Physical ability

Ensure that you and your group have the knowledge, ability and strength to cope with the task at hand and potential hazards that may arise. How well can you and your group members swim? Attending a river safety course is highly recommended.

### 2. Clothing

Wear sensible outdoor clothing that is warm and reasonably snug fitting but does not restrict mobility. Wear shorts or tight fitting longs – NO baggy trousers! Pack a towel and spare change of warm, dry clothing. If appropriate, wear a wetsuit or waders.

### 3. Footwear

Wear sturdy footwear with thick tough grip soles such as boots or comfortable sneakers. These should protect you from slippery surfaces and sharp objects and provide sturdy support for your feet and ankles. Definitely no bare feet or jandals.

### 4. Rescue equipment

Consider what kind of rescue equipment may be useful (e.g., rescue rope, rescue tube, etc).

## Wader Safety

The School owns numerous sets of neoprene waders for use in shallow water activities. They are suitable for keeping you warm, dry, and clean however they are a bulky garment and can pose a hazard in themselves. Most importantly, if you fall into the water and fill your waders, some can become incredibly heavy and cumbersome making the risk of drowning much higher. Identify the type of waders you have before making judgement.

If wearing waders, there are a few basic but essential rules;

1. Waders are for shallow water work ONLY (up to waist depth max.). Be very careful when working around deeper water.
2. A life jacket must be worn when wading in water above knee depth.
3. A wading belt should be worn over waders at waist level or higher to restrict the amount of water that enters them should you fall in. Some waders have positive buoyancy when full of water and used with a belt.
4. DO NOT wear waders when working on boats.

It is highly recommended that you try wearing a set of waders in a swimming pool and submerging yourself to test your ability to cope in an emergency. Should you fall into deeper water, do not attempt to swim – immediately tuck your knees up to your chest (this traps air into the waders) and roll onto your back. Either tread water or float in an upright position. You should be able to use a backsculling action to return to shore. If being carried by the current, face downstream (feet first). If possible, attend a wader training course.

## River Crossings

The knowledge and ability to cross rivers safely is essential to working in all rivers but cannot be covered here. Again, a river safety course is strongly recommended. A useful overview is covered in “Bushcraft Manual - Outdoor Skills for the NZ Bush”, a NZ Mountain Safety Council publication (the technical staff have a copy on file). It is recommended that you also read relevant sections in The National Environmental Monitoring Standard for working in and around water (<http://www.lawa.org.nz/media/16575/nems-code-of-practice-2013-06.pdf>).

## Hygiene

- Due to prevalence of waterborne organisms such as coliform bacteria and giardia, do not drink directly from streams.
- Similarly, prevent the spread of didymo by observing required disinfection procedures,
- Practice good hygiene by washing hands after contact with soil or water,
- Never discard waste or defecate into streams or rivers.

## Miscellaneous

- Obtain appropriate consent to discharge tracer dyes into waterways.
- Enhance your vision of the stream bed by wearing Polaroid sunglasses.
- Decide on what other equipment is necessary when working around water
  - PFDs
  - Communication Equipment
  - Maps
  - First Aid kit
  - Torch

## See Also

- School of Environment Field Safety Guide,
- River Safety - a NZ Mountain Safety Council publication (on H&S website)
- Bushcraft Manual - Outdoor Skills for the NZ Bush - a NZ Mountain Safety Council publication (the technical staff have a copy on file),