

*Swiftwater Rescue:  
An Introduction*

October, 2012

1 SWR

This manual is intended to serve as a guide for those who want to enter the wondrous world of Swiftwater Rescue! It can only serve as a resource and any *real* learning must take place on river while running 'the meat'. There is no substitute for hands-on training, your own practice and experience, and developing good river judgment.

\*This training is based on the *American Canoe Associations (ACA) Swiftwater Rescue – Level 4*

***ACA Swiftwater Rescue*** (Level 4) teaches recognition and avoidance of common river hazards, execution of self-rescue techniques, and rescue techniques for paddlers in distress. Emphasis is placed both on personal safety and on simple, commonly used skills. Techniques for dealing with hazards that carry greater risks for both victim and rescuer, such as strainers, rescue vest applications, entrapments, and pins, also are practiced. Scenarios will provide an opportunity for participants to practice their skills both individually and within a team/group context.

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## **The River – Intro to Hydrology**

### INTERNATIONAL SCALE OF RIVER DIFFICULTY

#### **Class I**

Fast moving water with riffles and small waves. Few obstructions, all obvious and easily missed with little training. Risk to swimmers is slight; self-rescue is easy.

#### **Class II: Novice**

Straightforward rapids with wide, clear channels which are evident without scouting. Occasional maneuvering may be required, but rocks and medium-sized waves are easily missed by trained paddlers. Swimmers are seldom injured and group assistance, while helpful, is seldom needed. Rapids that are at the upper end of this difficulty range are designated “Class II+”.

#### **Class III: Intermediate**

Rapids with moderate, irregular waves which may be difficult to avoid and which can swamp an open canoe. Complex maneuvers in fast current and good boat control in tight passages or around ledges are often required; large waves or strainers may be present but are easily avoided. Strong eddies and powerful current effects can be found, particularly on large-volume rivers. Scouting is advisable for inexperienced parties. Injuries while swimming are rare; self-rescue is usually easy but group assistance may be required to avoid long swims. Rapids that are at the lower or upper end of this difficulty range are designated “Class III-” or “Class III+” respectively.

#### **Class IV: Advanced**

Intense, powerful but predictable rapids requiring precise boat handling in turbulent water. Depending on the character of the river, it may feature large, unavoidable waves and holes or constricted passages demanding fast maneuvers under pressure. A fast, reliable eddy turn may be needed to initiate maneuvers, scout rapids, or rest. Rapids may require “must” moves above dangerous hazards. Scouting may be necessary the first time down. Risk of injury to swimmers is moderate to high, and water conditions may make self-rescue difficult. Group assistance for rescue is often essential but requires practiced skills. A strong eskimo roll is highly recommended. Rapids that are at the lower or upper end of this difficulty range are designated “Class IV-” or “Class IV+” respectively.

### **Class V: Expert**

Extremely long, obstructed, or very violent rapids which expose a paddler to added risk. Drops may contain\*\* large, unavoidable waves and holes or steep, congested chutes with complex, demanding routes. Rapids may continue for long distances between pools, demanding a high level of fitness. What eddies exist may be small, turbulent, or difficult to reach. At the high end of the scale, several of these factors may be combined. Scouting is recommended but may be difficult. Swims are dangerous, and rescue is often difficult even for experts. A very reliable eskimo roll, proper equipment, extensive experience, and practiced rescue skills are essential. Because of the large range of difficulty that exists beyond Class IV, Class 5 is an open-ended, multiple-level scale designated by class 5.0, 5.1, 5.2, etc... each of these levels is an order of magnitude more difficult than the last. Example: increasing difficulty from Class 5.0 to Class 5.1 is a similar order of magnitude as increasing from Class IV to Class 5.0.

### **Characteristics of Swiftwater**

#### **Swiftwater is powerful!**

- Strong stuff! One CFS weighs approx. 62.4 lbs.

#### **Swiftwater is relentless!**

- River currents push against objects in the water continuously.

#### **Swiftwater is predictable.**

- Know learn and know how to read whitewater to determine hazards, fun, and safe spots.

### **Variables of Swiftwater**

The nature of a river is determined by many things:

- The amount of water
- How fast it moves
- What's on the river bed and its banks
- Volume – Cubic Feet per Second (CFS). How much water is passing a certain point during a given period of time.
- Gradient – Feet per Mile (FPM). The amount of drop between two given points.

If you change any of these variables, the river will change. Mother Nature can do this at any time!

## Flow Types

**Laminar** – Laminar flow is most of the water that flows downstream. Think laminator (sheets). The top most sheet is the fastest, and then it gets slower as you go down in layers. The friction of the bank and obstructions in the river slows water on the bottom and sides; so the fastest water is in the center just below the surface of the river.

**Helical** – Helical flow is a corkscrew motion downstream. Friction of water against the banks causes water against it to flow in a corkscrew motion downstream between bank/rocks/eddies/ etc. and the main current.

## How to Determine a River's Volume

To determine a river's volume, multiply the width by the depth times the speed of the current. For example, a channel ten feet deep and twenty feet wide moving at a velocity of five fps equals a volume of 1,000 cfs ( $10 \times 20 \times 5 = 1,000$ ). Doubling the speed of the current doubles the volume. "When a river is constricted, such as by narrow banks or a shallow section, the water must speed up to move the same amount of water through the reduced space. Conversely, when the size of the riverbed is increased, as in a wide section or a deep pool, the water flows more slowly.

## Hazards & River features

### Hydraulics/holes

- A hole forms as water flows over an obstruction that is usually near or above the surface of the water. As the water pours over that boulder/obstruction water fills the drop/area behind it causing a recirculation on the other side. This recirculation, or hole, is a frothy and aerated feature that actually flows or pushes upstream. This means that kayaks, canoes, and rafts can actually get stopped and stuck in holes. As the river flows downstream the hole will be "holding" the paddler as it pushes them upstream and recirculates them.
- \*Holes can be fun. Hydraulics can be deadly.
- The distinction between holes and hydraulics is wishy-washy (pun intended). Think of a hydraulic as a stronger, more retentive, and potentially dangerous hole.

- Tongue – the tongue of a hole is the (usually) smooth downstream V entering the hole. This is the main current. Some of this water is getting recirculated, while some of it is flushing out underneath the hole.
- Boil line – the boil line marks from where the water is recirculating upstream. The Further the boil line from the actual hole, the stronger the hole.
- Backwash – the backwash is water that is being recirculated into the hole from the boil line.
  - The more backwash the stronger the hole.
- Outwash – the outwash is the water that is escaping the holes grasp.
  - The more outwash the weaker the hole.

Smiling vs. frowning (seen from upstream)

- Smiling hole has its outer edges curving downstream – recirculating water feeds OUT (edges curve downstream as you look downstream).
- Frowning hole has its outer edges curving back upstream – recirculating water (and you) back INTO the hole.

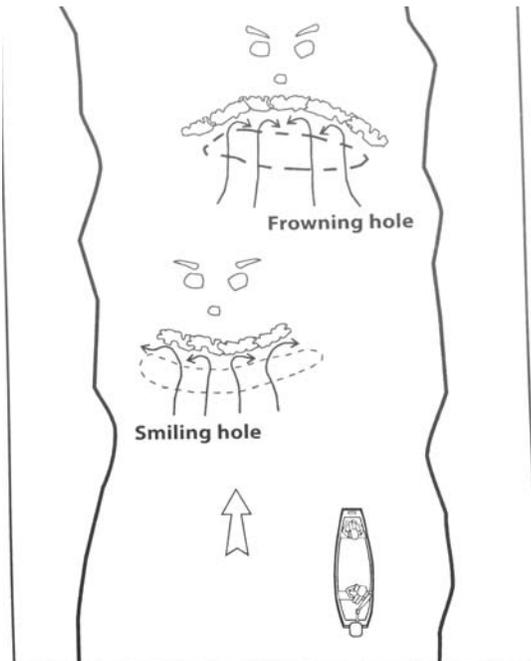


Fig. 2.10 Water flows out of the ends of a smiling hole, making escape easier. Water flows back into a frowning hole, making escape more difficult.

#### Geography of riverbed

- Some rivers are more prone to sieves, sharp rocks, crevices that are angled upstream (rather than down), narrow continuous whitewater, or lack of eddies than others.
- Cracks and crevices in a riverbed can lead to *entrapments*. The can include body or *foot entrapments*.

#### Foot entrapments

- Foot (or other body/gear part) gets jammed into crevice, submerged object, or other underwater feature. Force of current holds swimmer under.
- *\*One of the biggest killers in whitewater!*

#### Undercuts

- A rock or ledge in the current that is cut away under the surface. This allows water to come through but could trap objects. Usually identifiable by the lack of an upstream pillow of water on the rocks upstream side and water rushing from the rock on the downstream side (lots of moving water in eddy or no eddy). Swimmers, boats, gear, etc. can become entrapped/pinned if forced into it by the current.

#### Strainers

- Just like straining water out of spaghetti. The noodles get trapped but the water flows through.
- A strainer is any object (natural or manmade) that lets water through but catches objects (you, your boat, and your gear).
- The force of the current can hold objects against the strainer...very deadly
- ALWAYS AVOID STRAINERS
- Strainers are usually trees/debris

#### Sieves

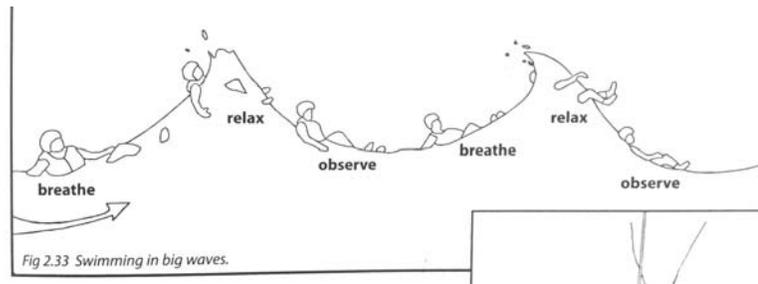
- Sieves are like strainers; they filter water through but catch other objects. Usually made of boulders (boulder sieve) as opposed to downed trees and fences which may make up strainers.
- Sieves and strainers can be hidden below the waters surface.

#### Cold water

- Different water temperatures can make for very different experiences in numerous ways.
  - Hypothermia, fatigue, and different rates of drowning survival are great risks at different temperatures.
  - Always plan ahead and prepare.
  - Cold weather is also a factor.

### Big water

- In big whitewater *flush drowning* can occur – drowning by aspiration while swimming through big water. It's often associated with a gasping reflex caused by cold water and fright, although lack of knowledge of when and where to breathe is also a factor.



### High water

- The river's speed and power increase tremendously as the flow increases, raising the difficulty of most rapids.
- Rescue becomes progressively harder as the water rises, adding to the danger. Floating debris and strainers make even an easy rapid quite hazardous.
- It is often misleading to judge the river level at the put in, since a small rise in a wide, shallow place will be multiplied many times where the river narrows. Use reliable gauge information whenever possible, and be aware that sun on snowpack, hard rain, and upstream dam releases may greatly increase the flow.

### Low-head dams

- Can create super strong hydraulics – “drowning machines”

#### YOURSELF

- Know your abilities/limits
- Drugs and alcohol can inhibit ability and judgment

#### OTHERS

- Know the abilities/limits of your group
- Watch out for crazy rafters and out of control kayakers!

## Other River Features

### Rapid

- A rapid is a series of whitewater river features that are strung together. While it could refer to just a wave or two, the word rapid generally refers to 3 or more connected river features in a section of river.

### Line

- Very generically, a line in whitewater is the path that the paddler will want to take through any rapid, wave, hole, or other river feature.

### Horizon Line

- As a paddler approaches a drop they usually cannot see the river below. This makes the drop itself look like a line going across the river. This is called a horizon line. A kayaker, canoeist, or rafter should never paddle over a horizon line without knowing what is on the other side of it. While nearly all river features can be dangerous, this type of whitewater river feature is particularly dangerous.

### Pool

- A pool of water can be a section of river with no rapids and slow moving water. Pools can follow rapids, especially on a 'pool-drop' river.

### Flat-water

- Flat-water is a section of river that has no rapids. However, this doesn't always mean that there is not a current. The river can be moving quickly and still be flat.

### Downstream V

- A downstream V usually indicates the current's path between two obstacles. This usually is the best place to go or 'the line'. The 'V' is created by two object upstream, submerged or otherwise. The 'V' is open at the top and closes downstream.

### Upstream V

- An upstream V usually indicates an object in the water. Try to avoid lone upstream V's. They open downstream, so the 'V' points upstream to the object.

### Pillows

- A pillow can be formed on an exposed rock. Water rises on the upstream face of a rock (but doesn't go over). The water is then shed around the sides.

#### Pour-over's

- A pour-over is a rock in which water pours over the entire surface. Often times, a hole is created on the downstream side of a pour over.

#### Ledges

- A ledge is a section of river that has an obvious drop below it. A ledge can be as wide as the river or just a portion of a rapid or line. Holes and eddies can form behind ledges.

#### Eddy

- An eddy is an area of calm water that is created by an obstruction upstream. This can be behind exposed boulders or on the sides of rivers around bends. As the river flows by these areas it can create an effect that causes the water in the eddy to flow upstream. Eddies are usually calm spots that kayaks, rafts, and canoes can sit in while the rest of the river flows downstream.
- Anything in the river can make an eddy, including a person or group of people...

#### Eddy line

- An eddy line marks the difference between the eddy and the downstream current. They can often be violent or calm and are usually identifiable.

#### Pocket

- The eddy itself. You can be high or low in the pocket.

#### Waves

##### Wave train

- A wave train is a series of waves in succession. Wave trains usually consist of three or more waves. The effect of paddling through a wave train is often that of riding a roller coaster. Wave trains usually indicate deep water. This is the river's method of giving off energy.

##### Tongue

- The tongue is the downstream V that enters the wave.

##### Trough

- The trough is the lowest point in between (or leading to) a wave(s).

##### Peak

- The peak is the tallest point of a wave.

##### Upstream Face

- The face of the wave on the upstream side (ramp leading up from trough to peak).

##### Downstream Face

- The face on the downstream side of the wave (ramp leading down from peak to trough).

### Pool-drop

- This phrase can be misleading. The word “pool” is before “drop,” leading one to believe that this is the order in which the river features will be encountered. However when a whitewater paddler uses the phrase pool-drop, they are referring to a drop that falls into a pool. This is significant, as whitewater kayakers and canoeists want to know if they will have recovery time upon surfacing from a drop, should they flip over or be off balance. Pool-drop rivers allow more time between rapids as opposed to ‘continuous whitewater’.

### Rescue Philosophies

Four building blocks for a successful swiftwater rescue.

- Training
- Practice
- Experience
- Judgment

No two river rescues are alike.

Be adaptable and understand that every river unique situation.

*Emphasize training over equipment*

*Value simplicity and speed*

*Minimize risk where possible*

### Rescue Priorities

You may want to jump right in to save your friend or participant, but always prioritize the rescue to the simplest form...

*\*Value simplicity and speed & Minimize risk where possible)*

*\*The safety of the rescuer always comes first – before that of the victim!*

Rescue 3 reminds us that “self-sacrifice in rescue services is traditional and commendable...and a useless waste. Rescue instructors would rather appear as expert witnesses to testify why nothing was done, than as to why a rescuer was injured or killed”

### Speech

- Can you talk to the person and coach them to self-rescue?
- Ex. “SWIM TO SHORE! SWIM THIS WAY!”

#### Reach

- Can you reach the person? Can you reach them with your paddle or a tree branch?

#### Throw

- Can you safely and successfully throw them a rope?
- This is third on the list because it's not the simplest tool in the box...and Ropes are a HUGE hazard in the water.

#### Row

- Paddle to them. Can you tow them on you bow or stern? Can you paddle to them to cut a line or assist in other ways?

#### Go

- Can you swim to them for a contact rescue?

#### Helo

- Can we call in a helicopter to remedy the situation? (probably body removal at this point...)

### **Rescue Types**

#### Shore-based rescues

- Any rescue where the rescuers remain on shore is safer than one in the water.
- Most common are when rescuers on land coach a swimmer, reach a swimmer, or throw ropes to a swimmer.

#### Boat-assisted rescues

- Risk increases when leaving shore.
- Boat can be used to ferry equipment, patient evacuation, etc.

#### Boat-based rescues

- Boat is used for the actual rescue.
- This requires more skill and creates more danger.

#### In-water contact rescue

- The rescuer may enter the water and contact the victim directly.
- This is a last resort option.

## **SWR Equipment Essentials**

Boat & Paddle

PFD

- 4 F's
  - Fit (good fit)
  - Flotation (adequate floatation)
  - Fashion (color, visibility, reflection)
  - Function (uses, rescue, etc.)

Helmet – whitewater - composite or plastic

Footwear – wetsuit booties or appropriate whitewater shoes (we must have closed-toed shoes)

Fox 40 whistle (mounted on PFD)

Rescue knife (mounted on PFD)

Thermal protection

- Wetsuit or dry suit, helmet liner, gloves, extra thermal protection

Rescue rope – recommend - 75' 3/8 diameter spectra or "grabline"

Throwbags, waist belts, etc.

### Pin Kit

- 4 Locking carabineers
- 3 pulleys
- 2 prussiks
- 1 length of webbing

### Leader Kit

A leader kit includes all of the above AND

- First Aid Kit
- Extra food
- Extra water
- Communication device (whistle, cell phone, etc.)
- Light source
- EAP's (w/ maps, evac procedures, medical info)
- Extra thermal protection (hypo bag)

## River Orientation, Communication

There are numerous ways to look at a river. But, anyway you look at it you must be able to relate to others where you're looking!

### 4 Orientations

Upstream – anything *upstream*

Against the flow of the current

Where the water is coming from

Downstream – anything *downstream*

Where the water flows (usually)

Whitewater enthusiasts usually speak of rivers as they are looking downstream...even if you're looking upstream...

River RIGHT – the right side of the river as you look downstream

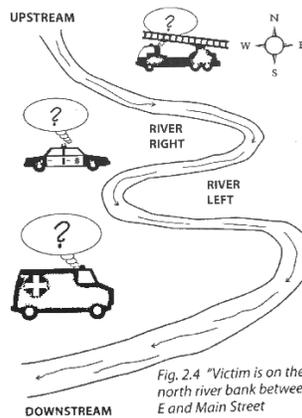
River LEFT – the left side of the river as you look downstream

So...if you are looking upstream and you refer to river right – you are referring to the right side of the river from a downstream orientation.

Even if you're nowhere near a river, river right is the right side of the river from upstream to downstream!

Get it?

River orientation. A river has four directions: upstream, downstream, river right, and river left. While the first two are self-explanatory, right and left are not. To avoid confusion, directions right and left are always given looking downstream, and are referred to as river right and river left.



## Universal River Signals

### Paddle and Arm Signals

Stop: Potential hazard or problem (or lunch!)

- Hold arms out horizontally
- Hold paddle horizontally
  - The response should be the same

Go: All clear, come ahead if you're ready

- Hold arm straight up in the air
- Hold paddle straight up in the air
  - The response should be the same

Go this way: signaling preferred course/direction

- Point upward arm or paddle in the direction the paddler needs to go

Help or emergency: Need assistance immediately

- Wave a paddle, one arm, helmet, or other object quickly from side to side
- Give 3 sharp whistle blasts in combination with this signal

Injury: assistance needed

- Two paddle/arms making the shape of an 'X'

Are you OK?: Used to ask if someone is ok

- While holding the elbow outward toward the side tap your helmet repeatedly, while pointing at the person
  - The response should be the same if OK
  - If no response, assume there is something wrong!

### Whistle Signals

One blow – all clear/come ahead/gaining attention

Use in combination with paddle/arm signals

Three blows – Emergency need assistance

Use in combination with emergency signal (wave arms/paddle side to side)



### **Group Assessment**

Always bring the right equipment. Remember your 5 essentials:

- Helmet
- PFD
- Skirt
- Paddle
- Boat

Within our program do not forget closed toed shoes; for the rescuer (Leader) this is something that's both good to swim in and hike someone out in the case of an evacuation. Don't forget water, food, rescue equipment, communication, first aid, etc. (YOUR LEADER KIT)

You want to make sure that you have a good assessment of both your own skills and those within your group. When you're leading a group down a river and unfamiliar with the other paddlers within the group, it's very important that you're able to make a quick assessment of their skills. There are many ways to do that once you're on the water.

Things to assess:

- Attitude in Pre-Trip meetings
- Ability in Roll Session
- See how well someone rolls, how frequently they have to roll, how often they *aren't* trying their roll
- If they're switching hands with the canoe paddle, extra wobbly in the canoe
- Measure how many questions they're asking about the run – do they seem confident or hesitant and unfamiliar

Things to monitor:

- Are they getting too cold
- Getting tired
- Or getting hungry or cranky
- Are they 'guarding'/rubbing a body part or stretching often

If there are any weaker paddlers in the group, be sure to continue to assess and monitor them. Also, keep them 'contained'. Put experience in front – both downstream and in eddies along the way, also, in back sweeping the group. Now with this experience surrounding the group they can corral and surround the less experienced paddlers.

Containing the group:

- Upstream
- Downstream
- And in eddies along the way, preferably on both sides

Always know what you are getting yourself into. Check water levels and the weather.

Remember: **BACK**

**Bring:**

Make sure your group is properly equipped before getting on the river.

**Assess:**

Review the skill level of your group on and off the river.

**Contain:**

Monitor and protect your group while traveling down the river.

**Know:**

Have the proper info to safely navigate the river prior to putting on.

## **Ropes**

### Packing

- Become familiar with the specific type of throw bag you're using.
- \*Always repack a throw bag before each trip, especially if you weren't the one who packed it!
- Feed line in inch by inch, stacking rope in on top of itself. Do not coil and shove into bag.
  - This allows for rapid, flawless deployment.

### Setting Ropes

The act of positioning throw ropes on shore is usually called 'setting rope'. The knowledge of where to set them is as important as how to use them.

- Where do you think a rope will be needed? Where is an accident most likely to happen?
- What will happen after the accident?
- Are there any hazards below this point?
- Is there a good place for the swimmer to be recovered? Where will they land?
- What will happen once the swimmer grabs hold? Can you anchor yourself? Get a solid base.

### Deployment

#### **\*Never wrap wrists or tie rope to yourself or other objects**

- Loosen retainer cord, pull out end of rope
- Hold the bag in the hand that you plan to throw with. Remove the end of the rope from the other hand and hold it firmly.

#### Establish contact

- Preferably eye contact and always yell "ROPE" or give 1 whistle blast to get the swimmers attention.

#### Aim and throw

- Throw over the victim if possible – this presents the swimmer with the rope and not the rope bag. It also puts more rope out for the swimmer to find and grab.
- "Lead" the swimmer by aiming slightly downstream of them. Wait until the swimmer is closest to you, but still slightly upstream, before you throw.
  - There is some argument as to whether it is better to miss upstream or downstream of the victim. If the rope lands upstream of the victim, they can't see it. However, it will probably float faster on the surface than a person in the water, especially if they are backstroking against the current. Hence it will be easier for them to catch.
  - On the other hand, if the rope is thrown downstream of the victim, they can see it but, in order to catch it, they may have to swim forward to get it, and thus come out of the whitewater swimmers position.

### Catching the rope

- Coach your swimmer to catch the rope and not the rope bag.
- After catching the rope, roll over on your back and hold it against your chest.
- Hold the rope over the shoulder opposite shore and angle body towards the shore.
- Swimmer should remain in the whitewater swimmers position.

### A few safety considerations...

- Carry a knife. Whenever working with ropes always have a knife in case you have to cut yourself or another person free.
- NEVER yourself to the rope!
- Practice, practice, practice!
- One person throws at a time.
- Hang on to the rope when you throw...

If rope thrower is in danger – let go of rope. BUT never leave a rope in the river. Try everything you can to retrieve it!

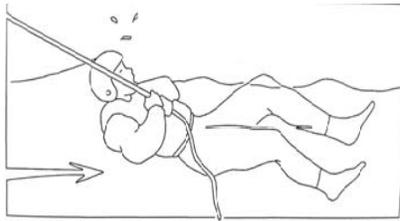


Fig 2.34 After grabbing a throw rope, roll over on your back and hold it against your chest.

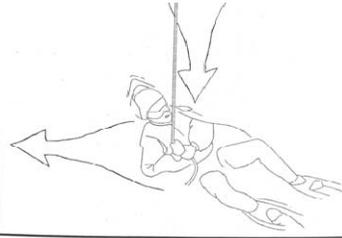


Fig 2.35 When holding a throw rope, angle your body toward shore. Hold the rope over the shoulder opposite shore.

## Wading

Wading is not the first option for river rescue.

- It can usually end in a swim, which puts the rescuer in danger. \*Consider what's downstream before wading.
- It also contradicts never standing in swiftwater...
- And it is limited by the river depth and strength of current.
- If you slip while wading immediately assume the whitewater swimmers position.

### One Person Wading

- You will need something to lean on – paddle or stick (stick is nice, in case you swim you won't have to worry)
- Face upstream and lean forward drastically on your staff
- Move one of your three points of contact at a time (feet, stick)
  - Make sure your foot plants with each step
  - Move staff quickly and replant, as to not lose its angle
  - If using a paddle to wade, using the bladed end has pros and cons
    - It can create a small eddy, the force of the current can pin it in place
    - Feather the blade to move it sideways or plant it dramatically upstream to avoid it being washed into you.

### Line astern

- Same principles of single person wading
- Each subsequent wader pulls down and braces forward on persons PFD straps

Communicate – “stepping...plant...stepping...plant”

### Wedge

- Same principles as before
- Grab partners PFD shoulder straps

Communicate – “stepping...plant...stepping...plant”

### People pivot

- Holding the PFD of person next to them
- Pivot in a helical motion towards destination
- Pivot person is the person most upstream

Fig. 7.0 Swiftwater Wading

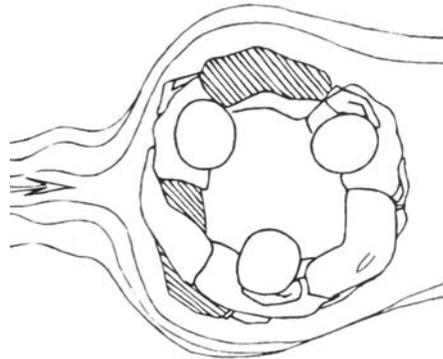
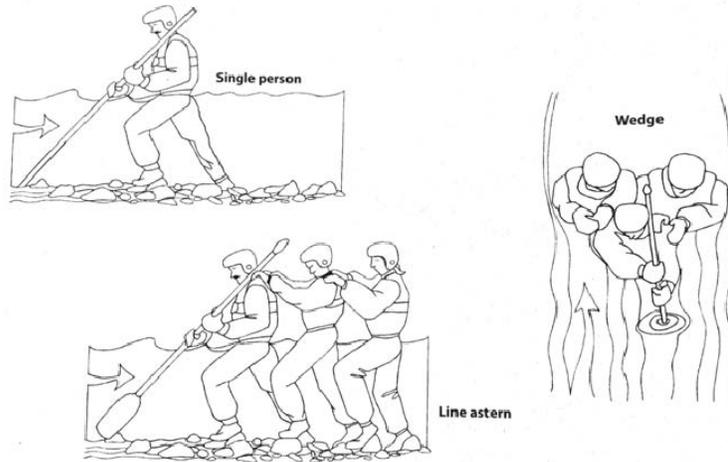


Fig. 7.1 "People Pivot"

## Swimming

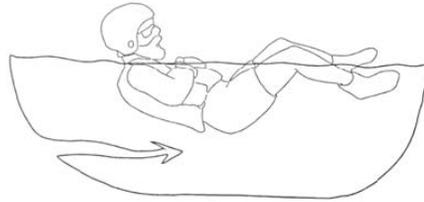


Fig 2.31 When swimming in swift water, face downstream and keep your feet near the surface. Fend off rocks with your feet. Do not try to stand until you have reached a safe eddy.

**\*\*\*DO NOT TRY TO STAND UP OR STOP YOURSELF FROM GOING DOWNSTREAM BY PUSHING AGAINST THE RIVER BOTTOM WITH YOUR FEET\*\*\***

The Whitewater Swimmers Position is the standard for all people out of a boat and in whitewater.

- Lie on your back, butt down, feet up, chin up, looking downstream
- Nose and toes out of the water
- Use your feet to bounce off surface rocks
- Direct yourself with your arms
- Use a ferry angle to swim to shore

### Aggressive Swimming

- On your belly, aggressively swimming, set ferry angle, barrel roll into eddies
- \*Never put your feet down!

### Swiftwater entry

- Always assess where you will be jumping in
- Belly flop, arms and hands in front of face, palms down
- You want toes, knees, belly, and arms and face landing at the same time. This minimizes the depth you will sink, avoiding rocks.
- Immediately start swimming aggressively to target.

### Strainers

- Stay away from strainers!!!
- But...if your swimming and heading towards one – aggressively swim headfirst and up and over it!

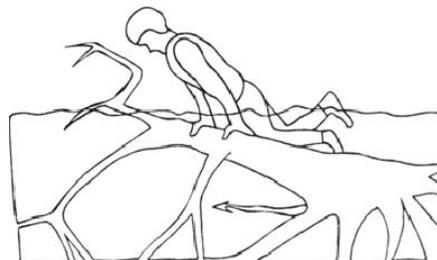


Fig 2.36 If you encounter a strainer, swim toward it headfirst, then push yourself up and over it.

## **In-water Rescues**

### Victim Psychology

- A victim can be in various stages of panic. This can affect the rescue and the rescuer. Some of the principle causes of panic are:
  - Sensory overload. There is too much sensory input about the dangers and too little time to process it.
  - Lack of knowledge about the situation the victim suddenly finds themselves in, and of appropriate responses and defenses.
  - The perception that death or serious injury is imminent and that escape has been cut off or that rescue is not possible.
- Any victim will do whatever they feel is necessary to survive, including grabbing or climbing on top of a prospective rescuer.
- Panic can be controlled by a number of factors – education program, pre-trip meeting, pre-river safety beach speech, or even giving instructions to a victim in the water. If so, the instructions must be clear and simple. Let them know that they're OK and rescue is on the way.

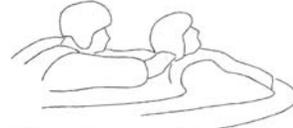
### Contact Rescues

- A contact rescue is any rescue where the rescuer makes direct contact with the swimmer.
- How to perform a contact rescue
- The rescuers goal is to get the victim into the proper position for rescue swimming: facing away from the rescuer and on their downstream side
  - Make contact – grabbing the swimmer's shoulder straps
  - Turn the victim around, facing downstream and away from the rescuer
  - Place one arm across the victim's chest (you can also grab through their arm and across chest)(cross-chest carry)
  - Head for shore with free arm side stroke while kicking
    - This is called "Reverse and ready"
    - Let the victim know how they can help and explain what's going on, if possible.

*"Reverse and Ready"*



**1. Make contact – grab victim's shoulders**



**2. Turn victim around, facing downstream and away from the rescuer**



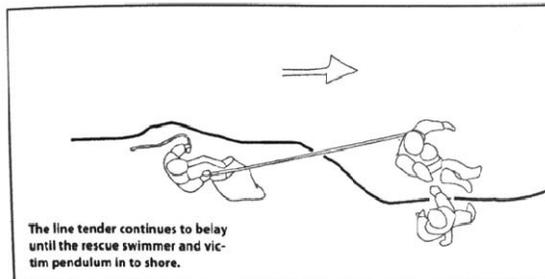
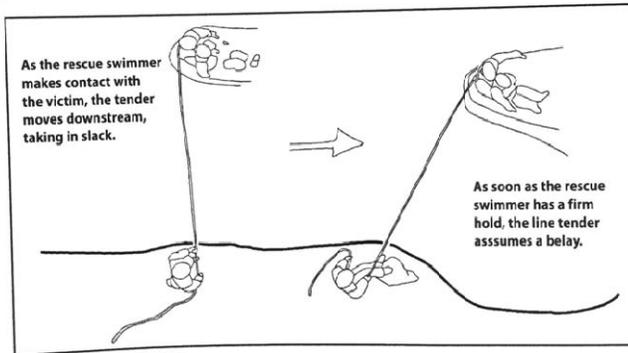
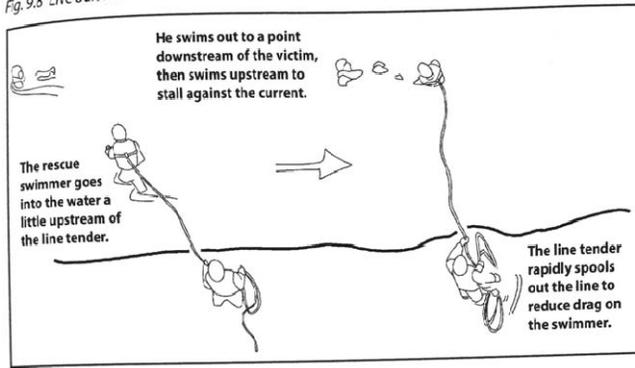
**3. Head for safety using a cross-chest carry**

**Live Bait**

- Contact rescues have obvious drawbacks. The 'live bait' method allows for a rescuer to make contact and then be reeled into shore with the use of a rescue vest.
- Disadvantages include: the rope snagging obstacles, rope drag, limit to length.
- Live bait should be considered to the equivalent of throwbags, except with a life attached to the end...
- Any 'live bait' swimmer must be equipped with a rescue harness.
- The rescuer clips their harness to the shore line, either directly or by means of a cow's tail.
- If the swimmer clips directly to the harness, he should use a locking carabineer to avoid inadvertently clipping themselves to one of the harness loops (which won't allow the releasable harness to deploy).

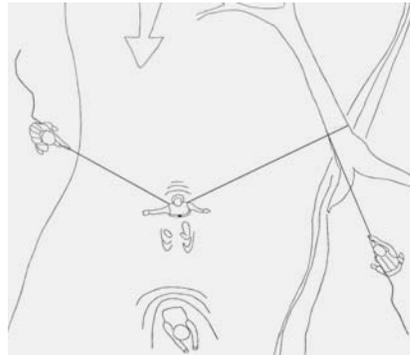
See Live Bait diagram on next page

Fig. 9.8 Live bait rescue.



### V-Lower

- For a victim in a fixed position (foot entrapment, etc.) the
  - V-lower provides a way to lower a rescuer down to them.
- The rescuer attaches tag lines to the rescue harness.
- A 'tender team' on shore belays each line.
- This system is best to aid the rescuer in wading downstream
  - to the victim.
- Even getting the rescuer upstream of them may break the force of the current enough to allow the victim to be freed.
- (They create an eddy upstream of victim)
- Be careful not to release the harness and get pinned...



### Foot and Body Entrapments

\*This is one of the biggest killers in whitewater!

- There are generally 2 types of entrapments
  - "Heads-down" entrapments refer to an entrapment where the victims head is underwater.
    - In most cases the time available to rescue a head down victim is very short – two to four minutes.
    - Rescue efforts must begin immediately.
    - High-risk efforts can be justified.
  - "Heads-up" entrapments means the victims head is above water.
    - Victim should be stabilized to reserve energy and prevent further damage.
    - Rescue efforts should be precise and deliberate.
- A 'Tag line' is a good option for stabilization. This is where a line is set across the river (victim) and brought back upstream, allowing them to use it to reach air.

- In some cases the stabilization line will also act as an extraction line.
- A second line can be added, in addition to the stabilization line, to snag the victims foot and pulled back upstream.

#### Other extraction options

- Wading to the swimmer can be an option if the water is shallow enough.
  - The wader(s) can create an eddy upstream of the victim which releases the currents pressure
- You can also deploy a V-lower or a fixed line
- Tethered canoes can be lowered to aid victims

#### Scene Management

To perform a successful rescue, not only do you need trained rescuers and equipment, but a way to control their use – an Incident Command System.

#### Incident Command System:

- Set priorities
- Allocates resources
- Organizes and provides leadership for the rescuers

#### The Incident Commanders (IC) responsibility is to

- Ensure the safety of the rescuers
- Choose the correct rescue systems
- Organize the rescue site
- Supervise the rescue and subsequent evacuation

The IC is in charge of the big picture. They need not be the most skilled rescuer – it might be better to use them in the rescue! They need to delegate duties and authority but will hold the ultimate responsibility.

#### The IC can be in charge of a number of people. These include:

Site spotters – there are two spotters: upstream and downstream.

- The upstream safety has two jobs. They keep others from entering the scene (other boats, river traffic). If there are unstoppable things coming (logs, stray boats, etc.) they warn the rescuers that something is coming.
- The downstream safety makes sure victims and gear wash down past them. They are the last line of defense. They should always be equipped with throw ropes or other rescue gear that may be needed.

Safety Officer – this person can be an invaluable asset as lots of things are happening on the scene of a rescue. Their only duty is to roam the rescue site looking for unsafe practices (no PFD, rope abrasion, knots improperly tied, rescuers becoming tired or hypo, etc.). They should either correct these problems or notify the IC.

Extrication – these people are assigned to the actual rescue. They should be the most experienced and knowledgeable and also be in good physical fitness.

Medical – this person treats the victim after or during the rescue.

Evacuation – in charge of both evacuation from the water and the river corridor.

Communication – this person helps coordinates rescue efforts between the actual rescuer and backup rescue units (Forest Service, Park Service, Police, etc.)

Support – these people help handle further logistics. Keeping people warm, getting extra gear, etc.

These are suggested roles. A simpler way to think about it is...

- Leader – IC
- Rigger – handles logistics of the rescue
- Gofer – ‘jack of all trades’
- Rescuer – handles the actual rescue

For our program just think

- IC
- Upstream & downstream spotters
- Rescuers
- Medical response
- Communication

**Resources**

American Canoe Association – [www.americancanoe.org](http://www.americancanoe.org)

R3 – Rescue for River Runners

[www.about.com](http://www.about.com)

Swiftwater Rescue

By: Slim Ray

The Nantahala Outdoor Center