Safety on Rivers

UAPS, University of Alberta, 25th February 2004, by Chip Powell

With thanks to Patch Bennett and Spencer Cox for additional contributions

It is not my intention to try and rewrite many of the excellent books and articles on River Safety, I would concentrate on the things I feel should be reinforced. Basic Stuff and the appropriate attitude. The right attitude will keep you alive, but only if you use all the other skills you possess. The best advice I've ever had was "Make only good decisions"

Safety on Rivers

Starts with:

Pre trip Assessment

Where are we going? Local run, a roadtrip, or an Expedition? Where are the put in and the take out? Have they been accessed recently by any member of the party? What vehicles were used last time and what will you use this time? How long will it take to get there? What are the emergency access and egress points?

Who is coming? Friends/ Paying customers / beginners, How well do we know this group? Relationship/ group dynamics? Can they be depended on to act in a predictable manner in an emergency? If not then ask yourself some hard questions.

Is this a realistic run for this group? Are we in a big water year after several of drought? Are the participants up to speed on different styles of water? Is the group paddling at an appropriate level for this run? What gear do we have to take?

What is the weather forecast? Temperature/ Rain/ snowmelt can affect whether a run will rise or fall when we are on it. What about if it's dam controlled? Is it fed from a glacier?

Time constraints? How long until dark? Is it a full moon or overcast?

Are we running rivers or doing park and play? How are people dressed? Park and play has led to underdressing on rivers. Are you going to be 5 minutes away from the car or are you going to be wet for 3 hours paddling out of a run? How long could it be for you to sort out a victim and then get out?

A useful way to judge participants skill level is to ask what rivers they've paddled and how they enjoyed them, also ask about the easier runs they've done rather than only the hardest. Ask about who they have paddled with. It is easier to suggest politely that this may not be the run for someone before they reach the river than when getting changed.
Don't overestimate the capabilities of a group. Being hours short of the take out, in cold rain at dusk isn't great.

Before you get on the water have a quick chat and find out how people are feeling, who's carrying what gear, any medical conditions, etc. and agree what to do if you do have a swimmer, eg some of party will chase boat once victim is on bank and others will stay with victim. This means the victim doesn't end up feeling abandoned (which isn't nice).

Basic Stuff (Gear)

Within the group

If you are on a river trip, who is carrying:
First aid kit?
Duct Tape?
Spare clothing /Bivi bag?
Spare food?
Split paddles?
Saw?
Pin kit (Slings, pulleys, prusiks, Karabiners)
Flashlight (for the group if not personal)?
Spread it among the group so that someone isn't carrying all of the load and before you get on the water ask to make sure everyone in the group is aware of where gear is.

Personal Gear

Munchies
Water/ fluids
Throwbag
Medication- if reqd. Carry spare on your person and a spare set with another group member
Lighter (on person)
Whistle (on person)
Knife (single sided) (on person)
Slings
Karabiners
Flashlight
Dress appropriate to the trip,
Spare fleece
Spare contact lenses (on person)

Helmet
Composite helmets are the rage but does it provide adequate coverage for running rivers? Does it protect the ear/temple/jaw? Big drops may require taping over the earholes or a hothead/ swim cap underneath to protect the eardrum.

PFD
It's got to fit well and have adequate flotation. Filling its pockets with excess gear means less float. Squirt boating may have different requirements. Shoulder straps need to be strong enough to pull someone out of the water by. Rescue PFD's with harness and tow line should be used only by those who have practised their use. Remove the towline if you haven't practiced potential scenarios with it.

Throwbag
Always carry a throwbag, even on the Kananaskis. 20m (70feet) of 3/8 inch polypropylene is a good compromise between weight, strength, length and cost. Fluid Designs make some nice ones about $65-$70. Spectra is stronger but twice the cost.
Practice with it. When you put down your paddle, pick up your throwbag.

Drytop/ waterproof /windproof top
The best you can afford. MEC sometimes have some good deals on end of line stuff.

Base layers
Fleece/polypro/wool. Not cotton

Legs
Long wetsuit pants give protection if you swim and are nice in BC bush. Being able to split at the waist is useful but not as warm. Drypants are only good up to waist deep. Full drysuits are nice but pricey. Good for expedition work though as you can sleep in your gear.

Footwear- playboats are tight on the feet but if you are running a river can you walk out in what you are wearing? At the very least neoprene wetsocks (approx $9 from MEC) stay on most of the time. Duct tape them to your ankles if need be and they make walking out much better if you swim. Remember it may not be your swim that causes the hiking.

Sprayskirt
Should fit the boat, check your grabloop occasionally and make sure its OK and not going to pull away when you need it in anger.

Use Sealsaver or similar on gaskets and don't leave gear out to freeze over winter, as the seals degenerate faster.

Boats and outfitting

If it is your own boat, you have no excuses, it should be fitted to you. However make sure you have marked things like footrest positions etc so that you can easily reset them if you've leant it to a friend!
When outfitting consider the position of the pelvis and spine, be prepared to adjust the tilt of the seat to make it fit, if you are short in the torso and in a big boat consider raising the seat (gluing on foam works) so you can lean without ribs hitting the cockpit rim. Extra foam on bulkhead footrests helps if accidentally ramming rocks, as does extra for the knees.
Creek boats and river runners can benefit from 20 - 30 cm webbing tails with a knot in the end attached to the stern grabloop. In the event of a swim it is easier to identify which end is the stern (it's usually the end with the float bags in too!) and to hold on to the boat. It is impossible to hold a boat by the grabloop if it is rotating in a hole. Make the tails long enough to hold but not so long that they can be wrapped around the hand. Don't create a loop that could trap a hand or limb. Try and keep them short enough not to chock in rocks on shallow runs, but long enough to hold.
If it's a rental boat, have some spare foam & duct tape to do minor customising. If you're in charge of a club trip with beginners along, they won't be aware of this. Allow at least 30 minutes extra in terms of time to get on the water if fitting boats to beginners.

AIRBAGS.
Make it much easier to rescue a boat. The only kayak I've ever lost on a river was a borrowed one that didn't have airbags. A friend who swam at the same time retrieved his redline minus one airbag and with a big split in the side, but at least it came back. An expensive lesson.

Do not try a new boat on a run at the upper level of your ability. In hard water you need familiarity and predictability. This is not the time to find out the Pyriot sport Big Job is a hard boat to roll when you're stuck in a hole, or that the Waveranha logic EZ Space Ace handles like a bag of sick on a stick with no forward speed as you fail to hit the must make eddy above the class death fall.

Pick a boat that is appropriate to the sort of paddling you do.
If you run rivers, the current crop of spud playboats are slow. Anything designed for retentiveness in a

hole can be regarded as hole bait on a pushy run. Pointy slicey boats are hazardous on runs where the bedrock has pin potential. Creek boats are generally the safest out there but can be boring unless you're creeking. Just because you're paddling a creeker does not make you immortal, they just increase the margin you may have. Squirt boats and slalom boats are particularly good for improving technical skills. Practise making hard moves on easy water, eddy hopping builds river reading skills and eddies are your friend (Eddy is your friend?)
A note of caution regarding squirt boats (applies to some playboats too)
Walbridge et al. have for years promoted the approach that squirt boats are an experts craft when used for river running and the dangers of such craft should not be underestimated. Some of the things I do in squirt boats I won't recommend to others in any sort of boat. Fairy falls, Oetzalerache, Huka falls, Pipeline and similar are scenarios where one makes up ones own mind and must have a full understanding of the consequences before one commences. Squirt boats do have a place in river running but one must understand how to do it. It isn't possible to transfer directly across from paddling class IV in a float boat to paddling class IV in a squirt boat. It's just too big a learning curve. Start easy. Learn the objective hazards.
Emphasize appropriate boat choice to less experienced paddlers.

Developing Judgement

University groups in the UK had a horrible reputation for being the home of young tyros who have a point to prove and want to play the numbers game. Well we did OK on class III last week so let's try class IV this week, and we're in a hurry to get to class V and VI.
It is not just the technical skill or who has the biggest balls and will take the hits to bang a line down a technical descent but also how do you deal with the problems. If a group has no idea how to resolve a vertical pin scenario, they should reconsider if a pool drop river with a large vertical component is an appropriate destination. If you can't make successful rescues on class III, don't try pushing class IV+.

Always have a lead boat and a sweep boat, people should know who these are. Paddlers in between should always try to keep the two adjacent boaters in sight. If there is a feature that will prevent visual contact, arrange to meet below it. It's no fun being stuck on something by yourself wondering when your friends downstream will miss you.

Be wary of big water. Some eddylines can swallow a full volume creek boat, swimmers and squirt boats go for 30+ second mystery moves and surface in bizarre and unexpected places. High water runs are different rivers to the normal run. Expect bizarre stuff.

Soloing, whilst fun, is not for everyone. By running rivers solo you have reduced the safety margins, simple errors have massively disproportionate consequences. Be very careful.

If you force the pace it will turn off the less experienced paddlers. It is not necessary to go hard or go home.

Paddling as part of a group means making sure that as a member of the group you are considering the groups best interests. If it is cold and has been a long day, the group may need to move on at a safe but accelerated pace, by perhaps cutting out pictures, playboating, just messing around or quickly deciding to portage instead of inspecting and running a rapid. Do not rush or be unsafe but make decisions based on accelerated time constraints. Be conscious that less experienced paddlers may be getting freaked by the pressure especially if they've previously swum.

In the event of being caught by nightfall be prepared for things to take longer. Slow the pace down and be cautious. Once it is dark it is not going to get any darker so don't get pressured into rushing. Everything takes twice as long and rescues can be difficult, so avoid the need. Keep tight group structure and check how people are frequently. Cold and scared are not uncommon reactions the first time someone is paddling in the dark.

This is quite a difficult area to address as the experience that develops good judgement is frequently the product of overenthusiasm or previous poor decisions. Most paddlers try to learn from others but learning is reinforced by the beatings, the trick is to survive the beatings.

Inspection/Scouting

There are few excuses for not inspecting. If you can, do.

What is the difference between boat scouting and shore scouting?
Boat scouting is eddy hopping, scouting from the crests of wavetrains and using benign holes to maintain your position whilst checking downstream. Boat scouting builds on the experience developed by shore scouting. Remember that being stuck in an eddy at the base of a cliff you can't climb above a drop you don't want to or can't run is not a good option.
The advantage of shore scouting is more time to spot the line, you get chance to stretch your legs/ pee/

throw sticks into the hole to see if it flushes and check out photo opportunities.
Do not mistake boat scouting with not scouting. If you are boat scouting with a group of less experienced paddlers, tell them what you are going to do, how and why.

If you do not inspect and then you swim, you are an idiot. If you do not inspect and you hit a strainer you may be dead.

When is it a good time to scout? If you can see two eddies you can hit and climb out of the river from, you are OK. If you can only see one and you haven't scouted, stop and get out. If you see a horizon line, stop and look. Just because it was OK last year doesn't mean there isn't a tree at the base of the drop now. It may be as simple as breaking out in the eddy immediately above the drop and just having a look over the edge.

Some horizon lines are difficult to spot, use the banks to give you clues, discontinuities in the shoreline, spurs of rock, different coloured banding in canyon walls are more than just pretty, they can hint of a change in river bed level. i.e a drop.

If you reckon inspection isn't required and someone else gets hurt, how are you going to feel? Err on the side of caution.
Some runs are difficult to inspect, this requires forethought. If it may be tricky to inspect at least have a hand signal system that is understood BEFORE you get on the water. Your friends will thank you for this.

Practice hitting eddies and sticking in them, learn not to drift out of the bottom end into the main flow again. The smaller the eddy you can hit and stay in the better.

Remember that rivers change. Just because you ran the line last year doesn't mean it is the same this year. It is faster to get out and look before running than it is to collect gear, boat and paddler from assorted bits of river. If this procedure is required on two paddlers, you should have scouted.

Spotting the line

You will go where you are looking, so look at where you want to go. If there is a large nasty undercut 10 feet off your line, don't concentrate on it. Be aware of it, protect it, but then leave it alone. Blocking out the extraneous trash with your hand so you can concentrate on the line works. Visualise the move you are going to make, even down to the paddle strokes and the crunch as you boof. Do not forget to practice the tuck and turn to help prevent injury on bigger drops.

Setting safety

There is no excuse for not setting safety when required if it is at all possible.
When you are paddling, every time you put down your paddle and get out of your kayak to inspect a rapid you should pick up your throwbag and take it with you.
After all, how would you feel if someone from a different group floated past face down and you couldn't perform a tethered rescue because your throwbag was in your boat?

Equally, when scouting along the shore keep your helmet and PFD on. You wear a helmet when on the river where there is a cushion of water between you and the rocks, it makes sense to wear one if sliding around on wet/slippy rock when there is no cushion of water.
It also protects against random stonefall in canyons.

If you are prepared to run something as probe, set safety as soon as you can. Trying to support swimmers in big water has cost the lives of some of the best paddlers. Pre set safety, even to the point of pre rigged pin/tag lines has made the difference between coming home and being dead. Consider the shore line, can you run along it? If not, set safety. Static throwlines, & Chase boaters. Be aware of what is downstream and don't pendulum swimmers on a throwline into a worse situation. Never add to the number of victims.

Always Obey Rule # 1:
Never Add to the Number of Victims

Look at a rapid and work out where the hazards are. Set safety to minimise the response time. The faster you get to a victim, the longer they have. In a head down pin you can have less than four minutes to connect them with air again. Minimise situations where running along banks is required.

Searches and Rescue

Keep the group together while establishing a plan of action and stick to it. People wanting to go and do their own thing are a good way of adding to your

problems. Search and rescue is a time to be conservative and play it safe, not a time for heroics. Don't forget the basics, if you are going to walk away from your boat to find someone take all the gear you'll need. Food, WATER, first aid kit, boating gear (at least helmet and Buoyancy Aid-will you need to swim to your victim?) Throwlines etc. Remember to stay together or have a recognizable meeting point. Wear your helmet on steep ground or close to edges. Have a look at a map before you go so you have an idea of which way to go to walk out, and if it's feasible. Ensure your boat is secure before you leave it.

Drugs etc.

Do you know if any of your party take prescribed medication, what that med does and when they need to take it? Mention it at pretrip briefing to give anyone shy the chance to approach you privately, Carry spare meds on your person and labelled. Consider giving your regular paddling partners a spare set to carry on your behalf in case you go for the swim from hell.

Recreational pharmaceuticals- If you are in a position of responsibility recreational drugs are inappropriate. What would the papers say after an autopsy? Going hard the night before can knock grades off your paddling skill. This includes alcohol. Feeling completely rancid as you get on a river, still buzzing, dehydrated, and not having eaten properly, is not going to let you perform at your best. You get cold, feel lethargic and in an emergency have less in reserve to cope with it.

Hypothermia

Is a killer, Prevention is better than cure, know the warning signals.
Shivering, pain/numbness, confused behaviour, belligerence, atypical mood swings. Any one who is cold, wet and tired is a potential casualty, Learn to recognise the situations that may cause hypothermia and encourage those who have swum to get out of the water quickly.

Know how to use the gear you carry

Can you use a throwbag? Accurately? If you've borrowed a bag for a run, throw it out and repack it before you put it in your boat. Then you know it's not knotted. Always clip it in to your boat.
Remove karabiners from the bag end before you throw it. Big lumps of metal to the face hurt.

Do not tie off a rope attached to someone in a river, when it pulls tight they may plane down to the bottom.
Do you know how to set a tag line to stabilise a pinned /trapped victim?
Do you know how to do CPR and rescue breathing? In a river incident you may have to cut PFD and drytop neckseal away as they restrict airflow in an unconscious patient and a PFD will cushion chest compressions.
Wrist seals may prevent finding a pulse in the radial artery (the one in the wrist). Cut them if you have to.
Beware of the possibility of spinal injuries in an unconscious swimmer.

If you are using a z drag to unpin or recover boats use a directional pulley to change the angle of pull so you are not in line with the rope or attach a pfd/water bottle/something heavy in case the boat end of the gear becomes detached. There can be a lot of force (in excess of 2000kg) on a pinned boat and a rope under tension will propel the ironmongery very quickly. Large lumps of metal to the face at high velocity, really hurt.

Courses

River rescue courses, either the basic river safety courses or the Swiftwater Rescue Technician courses (offered by Rescue 3 International) are a good investment.
Wilderness First Aid courses are useful. Persuade your friends to take them too.
You should know CPR/ rescue breathing

Suggested Reading

Kayak by William Nealy
White water Safety and Rescue by Franco Ferraro
River Rescue by Slim Ray & Les Bechdal
The River Safety Anthologies by Charles Walbridge and the American Whitewater Association
Whitewater Rescue Manual by Charles Walbridge and Wayne Sundmacher
Emergency Care and Transportation of the Sick and Injured, Eighth Edition
American Academy of Orthopaedic Surgeons (AAOS)

Please also read "Life by the Drop" by Tim Kelley and Gary Edgeworths report on the demise of Paul Zirkelbach (at the following links)
http://www.americanwhitewater.org/archive/article/518/
http://americanwhitewater.org/forum/AW/192718

I have included the following article by Will Leverette. Whilst not mandatory for groups of friends paddling, it has relevance to groups and group organizers in Canada

Risk Management in Six Steps

By Will Leverette

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Will Leverette is the Risk Management Department Director for the Worldwide Outfitter and Guide Association, International Special Event and Recreation Association, and Prime Insurance Syndicate. Will also does risk management consulting through his company, ARMOR, the Affiliation of Risk Managers for Outdoor Recreation. More importantly from our perspective, Will is the Whitewater Paddling Coach for Warren Wilson College. Will can be contacted at 353 Buckeye Cove Road, Swannanoa, NC 28778, Phone: 828-298-6920 Fax: 828-298-7492. Many of American Whitewater's members are also river guides or instructors and several own companies. This article is primarily directed towards protecting the outfitters from liability litigation. However, we think this information will be of general interest to our members and volunteers who help with events, races, and other activities. Liability and litigation are ever-increasing facets of river management and use and its good to be aware of trends in risk mitigation.

Introduction

A large part of the success of any risk management plan is the understanding, simplification, and implementation of a program that actually gets used by everyone in the organization.

Many levels of complexity and detail can be utilized, but the essential basics are fairly simple. Based on my examination of dozens of lawsuits against outfitters and the results of conducting hundreds of risk management consultations, a few instructive lessons are apparent. This process has given me the opportunity to identify the most critical factors that could hurt or help in the event an outfitter is faced with frivolous litigation.

The following comprises a list of these important risk management tools that most outfitters would benefit from using:

I. Develop Redundant System to Share Warnings and Other Information

Develop a means to prove that guests were adequately warned and informed. This avoids claims that, "My client was not adequately warned and informed, and therefore did not know what s(he) was getting into". This is the single most common allegation against outfitters and the most difficult one to disprove without some kind of documentation. There are many ways to go about it.

You can design a basic safety talk outline and laminate it on a small card that your guides can use to make sure they do not forget important points. You can give out handouts to participants with pertinent safety information prior to the trip. You can post signs, do a safety video, or any number of other creative solutions. Redundancy is always a good idea and reduces the possibility of ambiguity.

II. Make No Outright Guarantees of Safety

Safety guarantees, which are made in your literature or marketing materials, are an open invitation for a lawsuit. Instead, you can talk about things like your excellent safety record, extensive staff training and/or experience, and membership in professional trade organizations without actually guaranteeing safety. Everything you can do to make sure your guests know what they are getting into and what is required of them is in your favor. This includes sharing information in all printed materials, advertising, and even scripts for your guides to answer frequently asked questions.

III. At a Minimum Maintain Basic First Aid Training and Certification

All field staff must have current basic first aid training. It's the industry standard. All the government's permitting agencies require it. You have to do it. In fact, in today's world, with numerous recreation industry specific first aid courses now widely available, it could be argued that basic first aid training may not meet the prevailing industry standard. Think of it this way: would you want one of your own family members to be attended to by someone with basic first aid, or would you want them to be helped by someone with a higher level of training?

IV. Develop a Written Emergency & Evacuation Plan

You should develop a written emergency/evacuation plan for all areas and activities that you'll be using. The plan does not have to be rigid or precisely adhered to in all situations as that would be unrealistic and impossible. However, it does needs to contain general guidelines and information that the field staff will find useful in an emergency situation.

V. Obtain Witness Statements at Accident Sites

One good witness statement will shut down a frivolous lawsuit faster, cheaper, and less painfully than anything else will. You must have some means of tracking the names, addresses, and phone numbers of all participants in your activities. Staff should also be alerted to the critical importance of witnesses and be trained to look for opportunities to obtain names and phone numbers of independent persons such as private boaters who might have seen the accident.

VI. Use a Properly Drafted Liability Release Form

You must use a properly drafted liability release form. The old adage that "they aren't worth the paper they are printed on" may have been true in the eighties, but it is no longer the case. The courts are increasingly supportive of the doctrine of the Express (written) Assumption of Risk. Part of the value of release forms lies in the fact that they may or may not be enforceable. The mere threat that a given release may work in a given situation is sometimes enough to encourage the litigation attorney in a frivolous cause of action (personal injury lawsuit), to advise his/her client to take the excess medical benefit offered by your liability insurance policy and be happy. Do they really want to spend the time and the money to find out if the release will or will not be upheld? Often times the answer is no.

Insurance?

It seems that obtaining general liability insurance should be a cornerstone of any risk management strategy. However, contrary to what most attorneys and all insurance agents will tell you, buying a huge liability insurance policy does not necessarily provide you with more protection. This is a case where less is truly more. The more money you put out there at the end of the rainbow, the more goofballs you're going to have looking for it. Huge liability limits, and I'm talking about a million dollars or more, encourage litigation. The rub comes when you are required to have liability insurance in order to get a government agency permit from the Forest Service or the Park Service and they require huge limits. Purchase the minimum required, do good risk management, be a pro, and you should be ok. The courts look at the facts of any suit and determine if the outfitter met the standard of care and determine if the accident was due to inherent risks.

The judicial system got terribly bogged down in the eighties with frivolous litigation and they started telling the ambulance chasers to take a hike in the nineties. Today, if you adhere to the prevailing professional practices of the river industry and somebody gets hurt due to inherent risks, you are defendable, and should insist on an aggressive defense from your liability insurance provider.

Summary

These risk management tools and strategies are easy to develop and easy to implement. Utilizing them is important for many reasons. The fear of litigation alone is not a good enough reason to do anything. If a tool does not serve the larger purpose of providing safer, better organized, less problematic programming then it's is not worth doing.

The bottom line must always be to do everything possible to reduce the likelihood of humane pain and suffering. Having better warned and informed participants should be a goal of all outfitters.

Safety talks, activity orientations, carefully drafted literature, and liability release forms all speak to this goal. Staff trained in first aid and emergency planning helps the outfitter take care of people when the unfortunate does occur. The secondary benefit of strengthening the outfitter's position when faced with a frivolous lawsuit is just a welcome bonus for doing the right thing!