AMERICAN WHITEWATER

SAFETY CODE

AMERICAN Whitewater

AMERICAN WHITEWATER SAFETY CODE

Seven decades of service to the river enthusiasts of America. Our mission is to protect and restore America's whitewater rivers and to enhance opportunities to enjoy them safely.

Adopted 1959
Revised 2024

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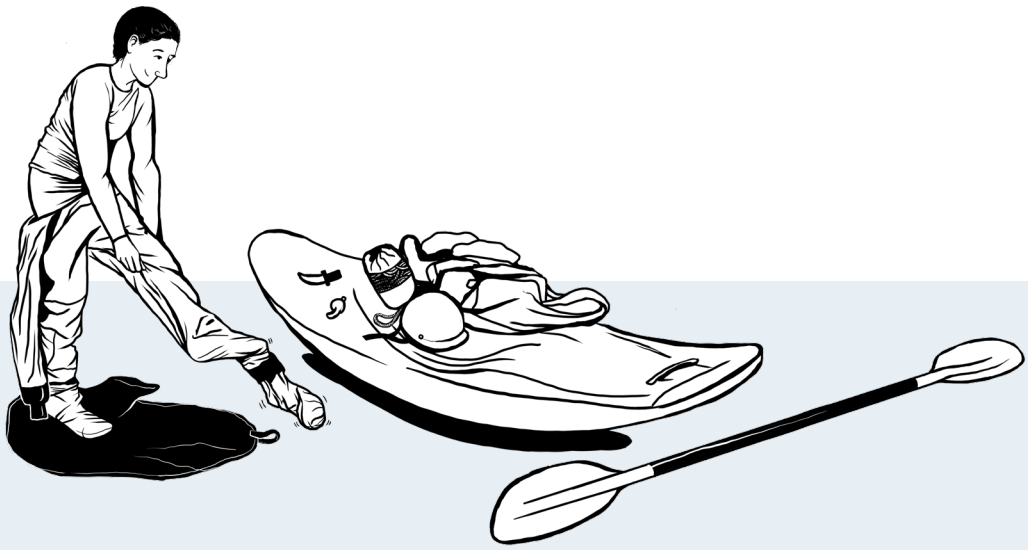
CONTENTS

A printable online version, appendix, and other materials related to the American Whitewater Safety Code can be found at americanwhitewater.org/safety.

Bold titles are single page overviews designed as handouts for use in safety and rescue instruction.



INTRODUCTION

River recreation can be one of the most rewarding experiences of your life. The clean water, wild places, and adventure with family and friends can all add up to an unforgettable time. Although it is a place of freedom and adventure, the river is also a place where dangerous situations can and do occur. Fortunately, these situations can be mitigated through knowledge, preparation, and humility.

The following guidelines have been prepared using the best available information and reviewed by a broad cross-section of whitewater experts. They are, however, only a collection of guidelines; attempts to minimize risks should be flexible and not constrained by a rigid set of rules. Varying conditions and group goals may combine with unpredictable circumstances to require alternate procedures. These guidelines are not intended to serve as a standard of care for commercial outfitters or guides. These guidelines are for informational purposes only.

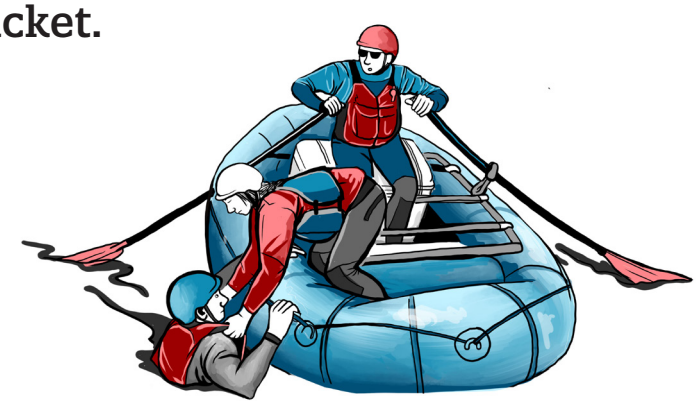
THE BIG FOUR

Ways to Avoid Injuries and Incidents

1

DRESS FOR THE SWIM

Always wear a life jacket.



2

BOAT WITH A TEAM

Set safety and help others.

3

KNOW BEFORE YOU GO

Research the river. Avoid high water, dams and trees.

4

SOBER IS SAFER

Stay alert and think clearly.

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SECTION 1

PREPAREDNESS AND RESPONSIBILITY

It is up to each participant to acknowledge, understand, and accept the risks inherent in river recreation.

Assumption of Personal Responsibility

Flowing rivers contain many hazards which are not always easily recognized and can cause injury or death.

River running alone is strongly discouraged. Single-craft outings are a common factor in incidents and drownings.

Come to the river with an honest assessment of your river-running ability. Only attempt rivers or rapids for which you know you have the skills to navigate. You should be in sufficient control of your craft to stop or reach shore well before reaching danger. Recognizing hazards and danger in advance is a prerequisite skill for the ability to stop.

Only attempt rivers where you are sure you can self-rescue. Self-rescue can be done by re-entering some crafts or swimming aggressively to shore. You should be a competent swiftwater swimmer, confident in your ability to identify hazards, utilize river features, and manage strong currents.

Despite the mutually supportive group structure described in this code, individual paddlers are ultimately responsible for their own safety, and must assume sole responsibility for the following:

- **Running rivers sober:** The use of alcohol and drugs that reduce reaction time and impair judgment before or during river trips is strongly discouraged.
- **Deciding to participate in any trip:** This includes an evaluation of the expected difficulty of the rapids under the conditions existing at the time of the put in.
- **Selecting the appropriate equipment:** Choose a craft suited to your skills and know how to use your rescue and survival gear.
- **Deciding to scout any rapid:** Scout, run, or portage according to your best judgment.
- **Choosing to continue downstream:** Acknowledge and consider opportunities to exit a river throughout a run.
- **Continuing to evaluate your own and your group's safety:** Voice your concerns and what you believe to be the best course of action.

Assumption of Group Responsibility

A river trip should be regarded as a common adventure by all participants—aim to provide an enjoyable outing for the least comfortable member of the group.

You are encouraged to speak with anyone whose actions on the water are dangerous, whether they are a part of your group or not.

- **Preparation:** Is everyone prepared for the chosen river? Know the skills and experience of your fellow group members. Teams are only as strong as their least skilled and experienced member(s).
- **Decision-making:** Participants share the responsibility for the decisions made on the trip. Foster an environment where everyone feels comfortable expressing their concerns, feelings of unease, etc.
- **Objectives and expectations:** Describe the expected conditions, known hazards, safety plan, communication plan, team equipment, descent plan, known scouting sites and portages, etc.
- **Active engagement:** Celebrate participation and re-assessment of changing conditions during the trip.
- **Self-sufficiency:** Do not expect to be rescued. All group members should be well-versed in self-rescue techniques.

Be aware of thinking errors and biases that can lead to poor decisions and incidents on the water (the “human factor”). The best way to catch thinking errors is through group discussion. Common examples of thinking errors include:

- **Cognitive biases:** Thinking errors allow us to ignore pertinent data such as rising water levels or a partner’s obvious discomfort in an effort to stick to our original objective.
- **Heuristic traps:** Mental shortcuts can lead us to make poor decisions such as feeling pressure to run a river because of the fickle and sometimes fleeting nature of flows.
- **Social pressures:** Seeking the respect of our peers or knowing that other paddlers have recently had success on the same section of water can lead us to make poor decisions.

PADDLE WISE

A Responsibility Code for River Runners

PADDLE SMART

Paddle within your ability · Keep your skills sharp · Communicate with your team on the river · Think for yourself · Don't let bad decisions compound · Go big, but come home safe

PADDLE PREPARED

Plan ahead · Consult existing beta · Understand International Scale of River Difficulty and your chosen river's rating · Carry proper equipment including medical kit, spare paddle and emergency food/layers

PADDLE INCLUSIVE

Share it · Everyone with the proper skillset is welcome · Find a mentor · Be a mentor · Acknowledge Indigenous stewardship and land · Be a positive part of the community

PADDLE SAFE

Wear your PFD · Carry a throw rope, knife & other safety gear · Practice safe river running technique · Set safety where appropriate · Take a swiftwater rescue course · Practice whitewater rescue skills regularly

PADDLE NO TRACE

Leave no trace · Always be a river steward · Use existing access areas, trails, and campsites · Pack it in · Pack it out · Use restroom facilities or bring your own waste disposal · Be aware of and remove micro-trash

PADDLE AWARE

Check weather and flow conditions · Check for closures and river regulations · Know your ability and your group's ability · Understand surrounding landscape and escape routes · Research existing hazards, portages, and critical features

PADDLE RESPECTFULLY

Consider impacts to gateway communities · Consider impacts on other paddlers · Drive slowly · Park in designated areas · Respect closures · Be friendly and represent the whitewater community positively · Appreciate cultural resources and leave undisturbed

NRS

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Skills and Experience

Personal preparation includes:

- **Self-assessment:** Share your experience level with the group regarding river travel, safety, rescue, and medical emergencies.
- **Seeking learning opportunities:** Ask your local outfitter about educational and training opportunities, seek out mentors, practice with your partners, and analyze river situations you've experienced or heard about to further your understanding.
- **Physical and mental conditioning:** Be in condition appropriate to the demands of the river. Adjust your expectations for loss of skills due to health, age, and fitness.
- **Sharing medical considerations:** Share any preexisting medical considerations with your fellow paddlers before the trip.

Team preparation includes:

- **Share your self-assessment with your team members.**
- **Start on less difficult water:** Plan less difficult runs when the group members are unfamiliar with each other. These outings provide an opportunity for practicing communication, figuring out the group dynamic, and assessing each team member's comfort level and paddling objectives.
- **Choose the right group size:** A party of three or more people and at least two crafts (i.e. not all three people in one raft) provides more opportunities for rescue if things go wrong.

SECTION 2

PLANNING YOUR OUTING

A good trip plan can make the difference between a successful trip and an emergency.

Trip Organization

This guide is a reference for river excursions under a common adventure format.

Common adventure trips are undertaken by individuals who assume all of the responsibilities and risks of the trip as individuals, but also assume a common goal, contain multiple experienced river runners, and use their knowledge to work as a team.

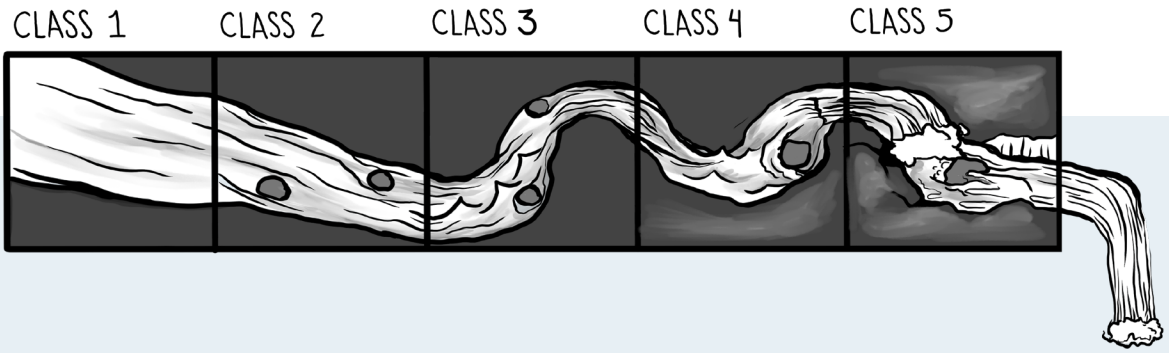
Instructional or commercially guided trips differ in nature from a common adventure trip format. In these outings, an instructor or commercial guide assumes some or all of the responsibilities normally exercised by the group. This format works especially well for participants who lack significant experience on rivers and can be a great place to learn the ropes.

Gathering River Information

Before embarking on a trip to the river, a group member should gather the existing knowledge (or "beta") for the chosen river reach. Beta can be found in guidebooks, online guides (e.g. American Whitewater's National Whitewater Inventory), online forums and social media groups, first-person conversations with experienced river runners, and any other way information can be communicated about the river.

Beta might include:

- **Difficulty:** The difficulty of the run at current water levels.
- **Access locations:** Appropriate and legal put-ins, take-outs, and egress from the river.
- **Maps:** The lay of the land and watershed via maps. These can be especially helpful in emergencies and can be brought on the river in both paper and digital formats.
- **Existing hazards:** Hazards might include dams and other structures in the riverbed, significant rapids, and dangerous river features such as wood and strainers.



The International Scale of River Difficulty

The International Scale of River Difficulty is the American Whitewater version of the rating system used to compare river difficulty worldwide. The scale is not exact. Rivers do not always fit easily into one category, and regional or individual interpretations may cause misunderstandings. It is not a substitute for a guidebook, first-hand descriptions of a run, or other sources of river information.

As river difficulty increases, the danger becomes more severe. As rapids become longer and more continuous, the challenge increases. Running an occasional Class IV rapid on a stretch of river is less consequential and demanding than dealing with an entire river run of this category.

Use river ratings cautiously!

- **In extreme conditions:** Allow an extra margin of safety between skills and river ratings when the water is cold, at higher flows, or if the river is remote and inaccessible.
- **When visiting new regions:** Boaters attempting difficult runs in an unfamiliar area should act cautiously until they learn how the scale is interpreted locally.
- **As conditions change:** A river's difficulty may change at any point due to fluctuations in water level, downed trees, recent floods, geological disturbances, or bad weather. Stay alert for unexpected problems!

The International Scale of River Difficulty is a rough guide to help determine what gear, planning, and skill level is necessary. Always gather additional information from firsthand sources.

INTERNATIONAL SCALE
of River Difficulty

CLASS 1 Skill Level: Beginner

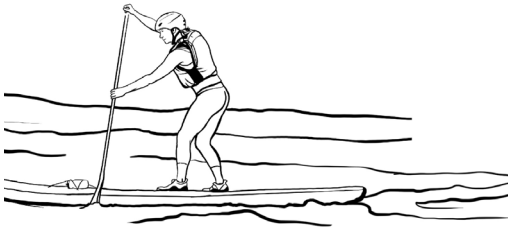
River Environment: Very easy with small, regular waves and riffles.

Recommended Craft: Suitable for a wide variety of craft.

CLASS 2 Skill Level: Novice

River Environment: Easy rapids and waves requiring some maneuvering.

Recommended Craft: Suitable for a wide variety of river-specific craft.



CLASS 3 Skill Level: Intermediate

River Environment: Moderate difficulty with large waves and features requiring skilled maneuvering.

Recommended Craft: Suitable only for whitewater-specific craft and equipment.

CLASS 4 Skill Level: Advanced

River Environment: Difficult with powerful rapids and hazardous features requiring precise maneuvering.

Recommended Craft: Suitable for skilled groups with whitewater-specific craft and equipment.

CLASS 5 Skill Level: Expert

River Environment: Very difficult with long rapids and strong turbulence and features that require expert maneuvering around frequent obstacles. Near the limits of navigation.

Recommended Craft: Suitable for highly skilled groups with whitewater-specific craft and equipment.

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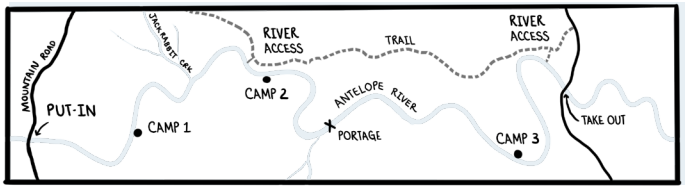


A float plan outlines where you intend to recreate and when you will return.

The Float Plan

A **float plan** should be filed with a responsible person. On some publicly managed rivers, the group *must* file a float plan with local agencies. If you are overdue, the float plan will help friends or authorities initiate a search effort.

For extended runs in the backcountry and wilderness, it is wise to establish check-ins along the way. Knowing the potential access routes for help to reach you can speed rescue efforts.

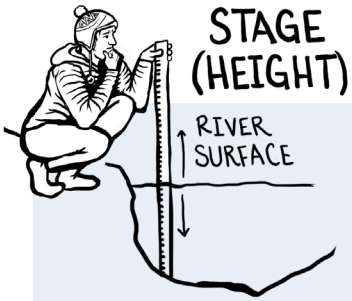
Know the Conditions

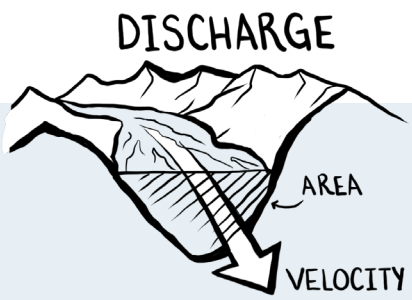
River conditions fluctuate and can change quickly. Understanding the current conditions is essential for a successful river trip.

FLOW

The amount of water flowing in many river reaches is available in online tables and graphs from the USGS, NOAA, and other agencies, as reported on American Whitewater River Info pages. Flow is typically provided as a stage height or discharge rate. It can be difficult to determine how a gage measurement relates to the flow in the section of the river where the trip will take place. Gages that are within the river reach you are planning to visit are the most helpful.

- **Stage:** The height of the water surface above an arbitrary river bottom point. The value of the stage can be used as a proxy for high, medium, and low flow levels. However, one station's stage is not meaningful compared to other stations or rivers.
- **Discharge:** The volume of water that flows through the river in a unit of time, reported as cubic feet per second (cfs) or cubic meters per second (cumec). The measure of discharge is meaningful in comparison to other rivers, but can still materialize differently depending on a riverbed's shape, size, and geology.





River flow is measured in both stage (height above an arbitrary datum) and discharge (rate of flow of volume of water).

VOLUME

Rivers and creeks come in many different sizes but are sometimes grouped into low- and high-volume runs because of the different experiences these broad categories of streams can produce. Both categories of river require a unique river running and rescue skill set.

- **Low-volume runs** are narrow and shallow.
- **High-volume runs** are deep and wide.

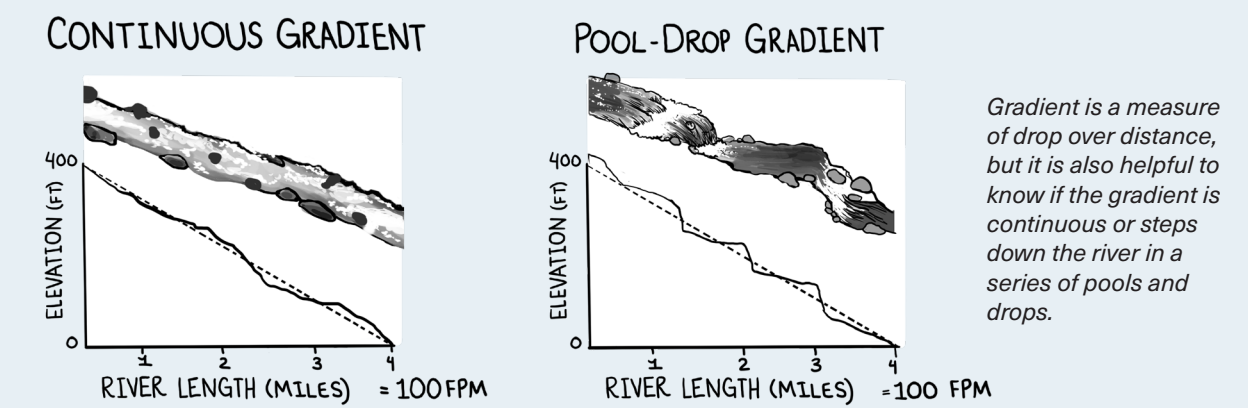
It can be challenging to determine the relationship between difficulty and flow level. The more difficult the run, the more important accurate flow information will be. Guidebooks, paddle shops, and local boaters are your best resources to develop these understandings.

Be aware of possible changes in river level after you last checked the gage, and how this will affect the difficulty of the run. For example, if rain is forecast in the same drainage that you are floating, the river level may rise above the current gage reading. The amount of snowmelt feeding a river can also change significantly throughout a day, creating low-flow conditions in the morning and high-flow conditions in the afternoon, or vice versa depending on the river section's distance from the snowpack.

GRADIENT

Similarly to how diverse rivers are grouped by volume, rivers can be broadly divided into two categories of gradient: continuous or pool-drop.

- **Continuous rivers:** Rapids with few breaks between them. Continuous rivers can make it more challenging to perform a rescue because the lack of breaks between rapids can prevent the recovery of swimmers and equipment. Continuous rivers at high flows are extremely dangerous, as long stretches become one continuous rapid, making rescue increasingly difficult.
- **Pool-drop rivers:** Clearly defined rapids with pools or slow-moving water between each rapid. These pools can aid in rescues and the recovery of gear. However, boaters should not become complacent in pool-drop rivers. These rivers can contain numerous hazards within each rapid, each rapid can be long itself, and at high water, even the current between rapids can be fast and turbulent.



Gradient is a measure of drop over distance, but it is also helpful to know if the gradient is continuous or steps down the river in a series of pools and drops.

Anticipate sudden immersion. Dress warmer than you would for a similar excursion on land, especially in regions where rivers are fed by snow and glacial melt.

TEMPERATURE AND WEATHER

Choose equipment and clothing based on the approximate temperature of the river's water and the weather forecast. Dress for the swim and to be an effective participant in a rescue.

- **Water temperature:** Cold water requires specific gear, and immersion in cold water slows reaction time significantly.
- **Air temperature:** Colder temperatures and snow can stop snowmelt and cause high-elevation rivers to drop in flow significantly. Warm temperatures in areas with a snowpack may cause extended snow and glacier runoff, causing rivers to rise.
- **Wind:** Wind can cause separation from boats and equipment after capsizing and exacerbate cold temperatures. A headwind can also limit downstream progress.
- **Precipitation:** Rain can cause rivers and tributaries to rise quickly. If the area sees flash floods, be aware of rain in drainages that feed into the river and watch for storm clouds.

SECTION 3

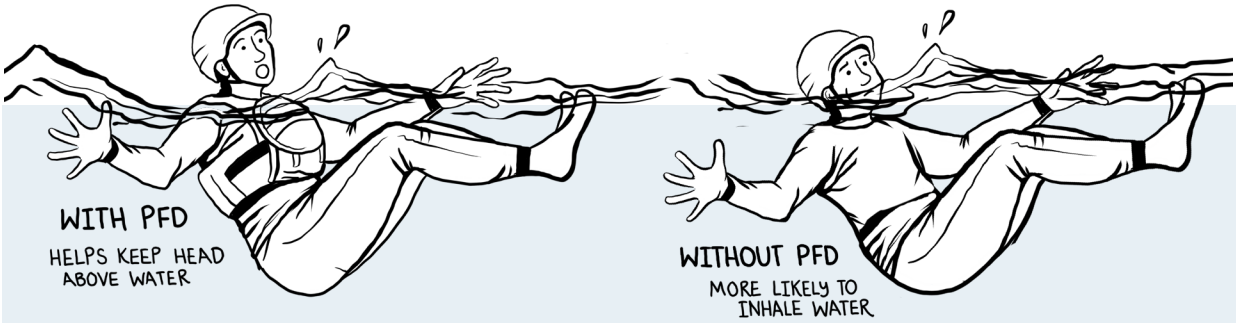
EQUIPMENT

Appropriate paddling equipment depends on craft type, river character, and difficulty level. A list of craft-specific considerations is provided in the online appendix.

Personal Protective Equipment

Personal Protective Equipment, or PPE, is worn equipment that can make your outing safer and more enjoyable.

Always wear a life jacket. A snug vest-type personal flotation device (PFD) offers the flotation needed to swim in whitewater, as well as protection from impact. Coast Guard-approved whitewater-specific PFDs with a minimum Performance Level of 70 (Type III or Type V), are the most common and comfortable life jackets for river recreation.



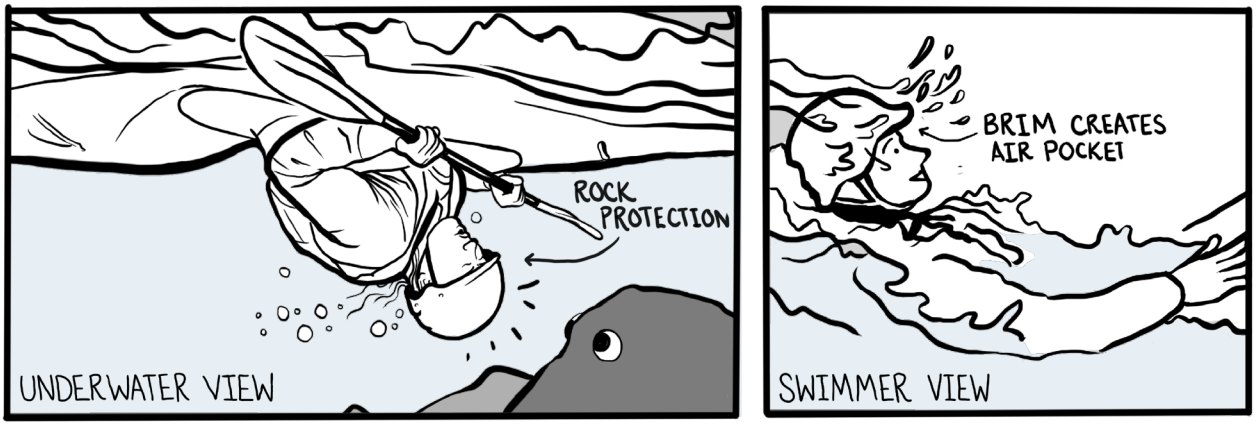
Vest-type personal flotation devices (PFD) help keep the swimmer's head above water during swims. Without a PFD, you may get pulled underwater unexpectedly, for extended periods.

Dress appropriately. Base layers might include a thermal top and bottom (wool or synthetic). Outerwear is most commonly a dry-top (warmer climates) or drysuit/wetsuit (water temperature below 50ºF). Waders should not be worn in turbulent water because they can fill with water and inhibit your ability to tread water.

Other protective equipment includes:

- **Footwear:** Protect your feet from rocks while hiking along the river shore, exiting the river, and participating in rescues.
- **Helmet:** Whitewater-specific helmets are designed to withstand multiple impacts and constructed to stay intact underwater.
- **Throw bag (throw rope):** Carry ropes in easy-to-access locations. Refer to the Team Rescue / Rescuing Swimmers section for details on how to use throw bags.

- **River knife:** Serrated blades are preferred to cut ropes, straps, and skirts.
- **Whistle:** Attached to the outside of your life jacket where it can be used hands-free.
- **Nose and/or ear plugs:** Protect yourself against infections and exostosis (known as "surfer's ear," a cold-water phenomenon). Note that hearing protection can impede river communication.
- **Protective padding:** Elbow pads, knee pads, and shin guards.
- **Sun protection:** Sunglasses, sun-protective clothes, and sunscreen.
- **Headlamp:** Include extra batteries for extended trips.



Whitewater-specific helmets protect from impact and create an air pocket above your airway.

Group Equipment

Group equipment should be suited to the difficulty of the river.

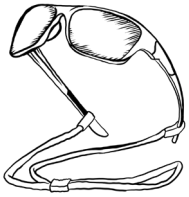
- **First aid kit:** One comprehensive kit per 3-4 group members.
- **Communication devices:** These can include cell phones and satellite messengers.
- **Navigation tools:** Can include GPS, compass, maps, and river guides.
- **Repair kit:** For gear and crafts.
- **Fire starter:** Matches, lighter and tinder, or stove, as appropriate.
- **Extra layers:** Sufficient to survive an overnight emergency.
- **Extra food and water:** Bring extra food and a water purification system.
- **Pin kit:** Carabiners, Prusik loops, pulleys, etc.
- **Spare paddle or oar.**
- **Other considerations:** Shelter, folding saw, goggles, climbing chocks or other protection (for setting anchors), climbing rope.

PERSONAL EQUIPMENT

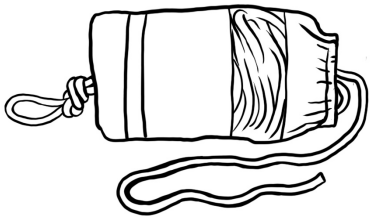
Checklist

Personal equipment for a river trip should be suited to your craft, trip, weather, and duration. **Add items necessary for your trips in the blank spaces below.**

- ☐ **LIFE JACKET**
- ☐ **OUTERWEAR**
- ☐ **FOOTWEAR**



- ☐ **WHITEWATER-SPECIFIC HELMET**
- ☐ **RIVER KNIFE**



- ☐ **WHISTLE**
- ☐ **NOSE AND/OR EAR PLUGS**

- ☐ **ELBOW PADS**
- ☐ **HEAD LAMP** (plus extra batteries)
- ☐ _____

- ☐ **THROW ROPE**
- ☐ **SUN PROTECTION** Sunglasses, sun-protective clothes, and sunscreen
- ☐ _____
- ☐ _____
- ☐ _____

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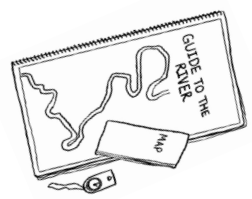
GROUP EQUIPMENT
Checklist

Group equipment should be customized to your trip with duration, terrain, and difficulty in mind.

☐ **FIRST AID KIT**
(one per 3–4 group members)

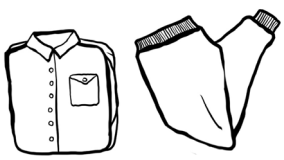
☐ **COMMUNICATION DEVICES**
such as cell phones or satellite messengers



☐ **NAVIGATIONAL TOOLS**
such as GPS, compass, maps, and river guides

☐ **REPAIR KIT**
for gear and crafts

☐ **FIRE STARTER**
matches, lighter and tinder, or stove as appropriate



☐ **CLOTHING LAYERS**
sufficient to survive overnight

☐ **EXTRA FOOD**

☐ **EXTRA WATER**
or the means to purify

☐ **PIN KIT**
carabiners, Prusik loops or other rope grabs, pulleys, etc.

☐ **SPARE PADDLE OR OAR**

OTHER ITEMS MAY INCLUDE:
Shelter, folding saw, goggles, climbing chocks or other pro (for setting anchors), climbing rope

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Choosing the Right Craft

The appropriate craft for each style and difficulty of whitewater is determined by personal preference, experience level, and safety considerations. All types of crafts have desirable and undesirable features. See the online appendix for the pros and cons of many watercrafts.

Some crafts are not suited for even moderate whitewater rivers. These crafts are sometimes labeled "recreational," but are more accurately defined as crafts not designed for whitewater rivers. Whitewater-specific crafts adhere to important safety and durability standards. "Recreational" rafts and SUPs should never be used on Class III whitewater or above.

Safety Considerations with Crafts

Evaluate the safety of your craft before each outing. Test new equipment under familiar conditions before relying on it for difficult runs, especially when using a new boat design or outfitting system.

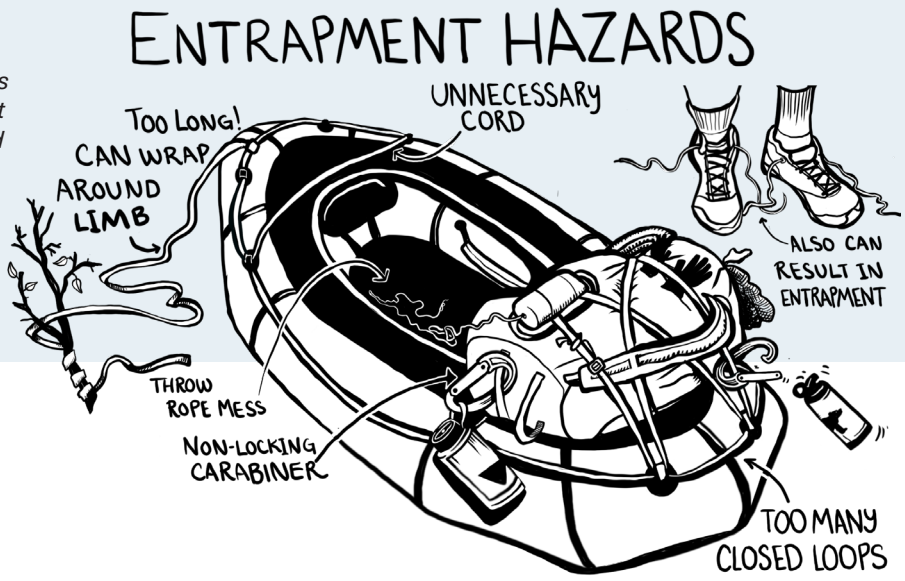
- **Carrying capacity:** Know your craft's carrying capacity and how cargo affects handling in whitewater. Do not exceed the maximum crew size.
- **Maintenance:** Be sure your craft and gear are in good repair before starting a trip. The more isolated and difficult the run, the more rigorous this inspection should be.
- **Flotation bags:** Securely install flotation bags in non-inflatable crafts. Flotation bags displace water and reduce the swamped weight of the boat, making it easier to rescue.
- **Inflatable boats:** Check for leaks before each launch. Inflatable boats should have multiple air chambers in case one chamber fails while on the water.
- **Paddles or oars:** Have strong and properly sized paddles or oars for controlling your craft. Carry sufficient spares for the length and difficulty of the trip.

ENTRAPMENT AND ENTANGLEMENT HAZARDS

Outfit your boat to ensure that nothing will cause entrapment or entanglement when coming free of an upset craft. The ability to exit your boat quickly is essential for safety in rapids. Common entrapment and entanglement hazards include:

- **Outfitting that is too tight:** This is most common in low-volume kayaks or decked canoes. Inadequate clearance or inappropriately packed cargo can inhibit coming free from your craft.
- **Loose ropes:** Beware of any length of loose line attached to a whitewater craft. All items must be tied tightly and excess lines eliminated. Painters, throw lines, and safety rope systems must be completely and effectively stored.
- **Sprayskirts:** Kayak and packraft sprayskirts can be hard to release if the pull handle is not exposed. Skirts can also release prematurely resulting in a swamped boat.
- **Foot braces, cups, and holds:** Adjust low-hung thwarts in canoes and foot braces (or bulkheads) in kayaks so that your feet can't become wedged under them. Footcups or footholds in rafts should be designed so that a paddler's feet cannot fit through them.
- **Non-locking carabiners:** Non-locking carabiners and hook-shaped hardware can incidentally clip onto you or your equipment.

Unnecessary cords, loose throw bags, non-locking carabiners, and cargo straps can cause a swimmer to get entangled or entrapped and lead to drowning.

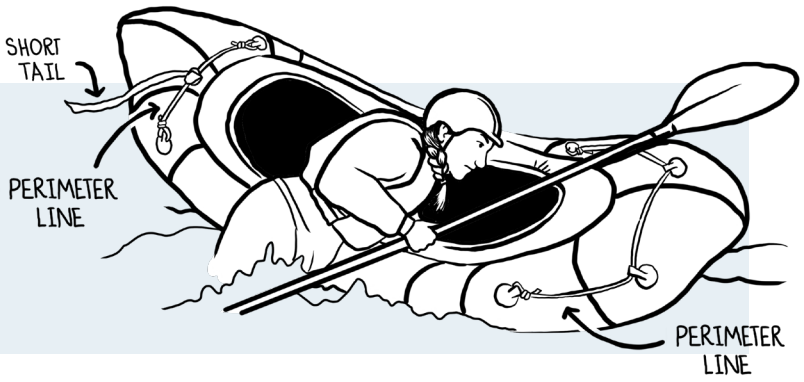


All boats should have something to hold onto during a rescue, such as a taut perimeter line on a raft or bow and stern handles on a kayak.

HANDLES AND PERIMETER LINES

Make sure your craft has something to grab onto during a rescue. Here are some common setups:

- **Kayaks and covered canoes:** These crafts should come with prefabricated grab loops at the bow and stern.
- **Open canoes:** Should have securely anchored bow and stern painters. Grab loops are acceptable but are more difficult to reach after an upset.
- **Rafts and dories:** May have taut perimeter lines threaded through D-rings. Flip lines should be carefully and reliably stowed.
- **Other crafts:** SUPs, river surfboards, inflatable kayaks, packrafts, and other small crafts often come with grab loops or attachment points where you can install handles.



Packrafts often come with tie-down points that are used similar to D-rings on larger inflatable rafts. This is a good place for a perimeter line.

LEASHES

A leash between you and your craft can prevent you from losing the craft when far from shore or in turbulent water. However, leashes may not be necessary in all situations and there is growing evidence that SUP and river surfboard leashes pose a significant hazard. When losing your board downstream is likely, such as when a river is very continuous, the danger of wearing a leash might be outweighed by the ability to stay with your board.

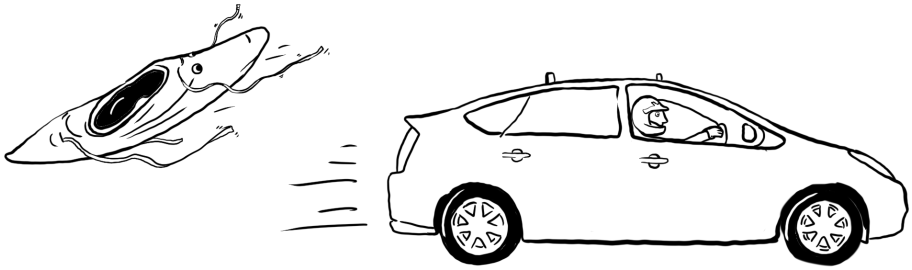
- **Quick-release:** A leash should always be attached by an easy-to-access quick-release system when used on a river.
- **Attachment point:** For SUP users and river surfers, leashes should be attached to the waist so they can be easily accessed in case of entanglement. Attachments to the ankle are hard to reach in whitewater, and nearly impossible to release in an entanglement situation, and therefore should never be attached there on the river.

Leashes increase the danger of entrapment. In whitewater, the possibility of the leash getting caught on rocks and wood should be carefully considered.

Leash attachments to the ankle are hard to release in whitewater. Attachments should be quick-release and attached to the waist so that they can be easily removed in case of entanglement.

CAR-TOP RACKS

Boating injuries aren't limited to the water! Car-top racks must be securely attached and designed for your vehicle. Check that each boat is secure and use bow and stern lines for additional safety.



SECTION 4

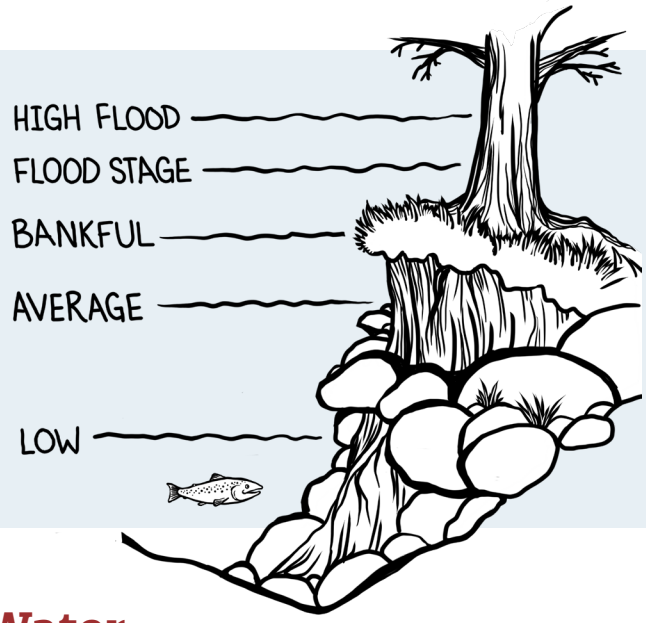
RIVER HAZARDS

Whitewater rivers contain many hazards, some of which are not easily recognized. The following are the most common.

High Water and Flooding

The river's speed and power increase tremendously as the flow increases, raising the difficulty of most rapids and reducing the number of eddies/stopping points. Rescue becomes progressively harder as the water rises, adding to the danger. Floating debris and strainers make even easy rapids quite hazardous.

It is often misleading to judge the river level at the put-in, since a small rise in a wide and shallow channel will be multiplied where the river narrows. Use reliable gage information whenever possible, and be aware that sun on snowpack, hard rain, and upstream dam releases may greatly increase the flow after you have started a run.



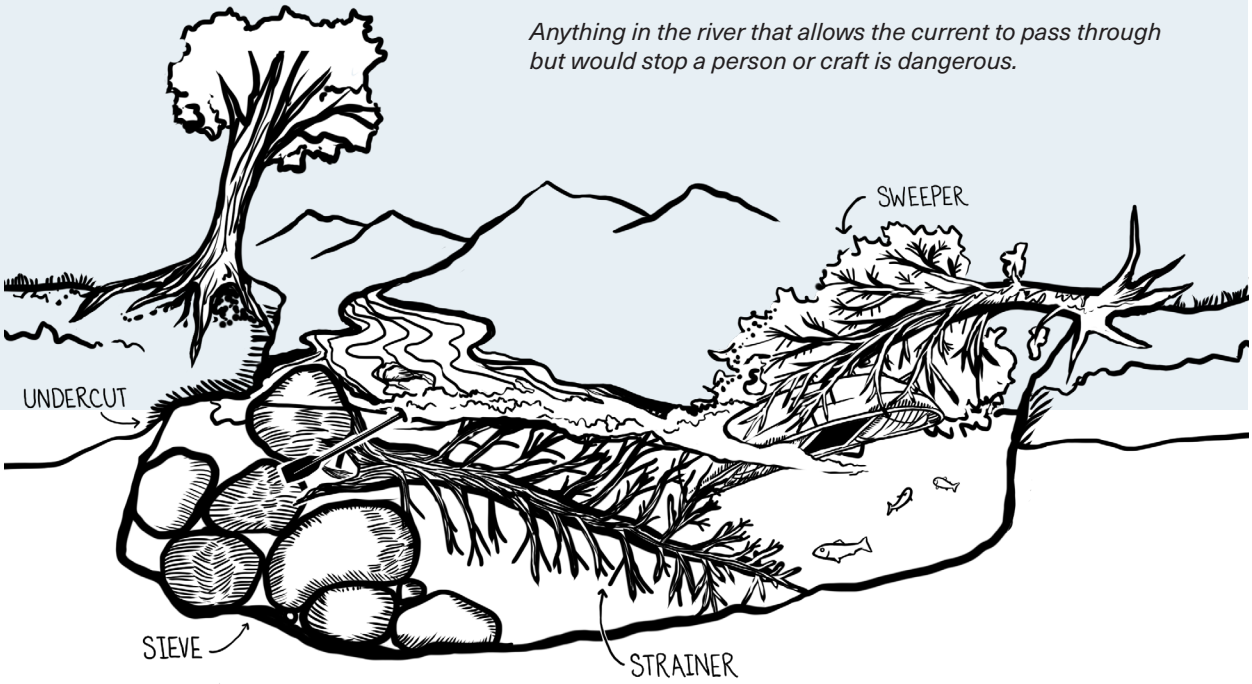
Use all available information to judge the water level and associated hazard: the height of the water in the river compared to surrounding vegetation and known markers, gauge information, and weather data.

In remote and fluctuating rivers, the water levels associated with each gauge height can change year-to-year.

Cold Water

Cold water drains your strength and robs you of the ability to make sound decisions on matters affecting your survival. Cold-water immersion is especially dangerous because of the initial shock and rapid heat loss.

Dress appropriately for sudden immersion in the water. When the water temperature is below 50ºF, a wetsuit or drysuit is essential. The next best option (if a drysuit or wetsuit is unavailable) is wool or synthetic (non-cotton) clothing. However, your layers will become immediately saturated if you swim, making the swim more difficult. If, after prolonged exposure, a person experiences uncontrollable shaking, loss of coordination, or difficulty speaking, they may be hypothermic.



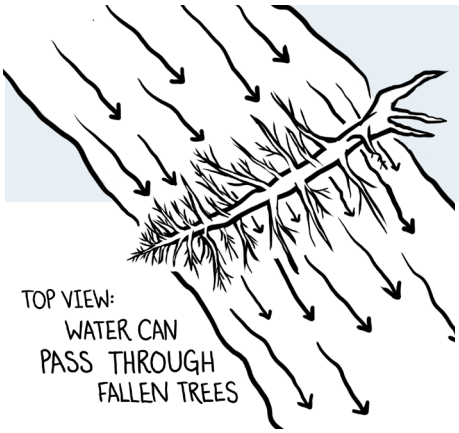
Anything in the river that allows the current to pass through but would stop a person or craft is dangerous.

Wood Hazards: Sweepers and Strainers

Avoid trees, logs, brush, and roots in the water. Water can pin crafts and people against wood hazards with thousands of pounds of force. Rescue is often extremely difficult. Pinning may occur in fast currents with little or no whitewater to warn of the danger. The three most common forms of wood hazards are:

- **Sweepers:** Trees hanging over the river.
- **Strainers:** Trees at river level and underneath the water.
- **Submerged wood:** Waterlogged wood built up at the base of large rocks.

Note that bridge pylons and other river debris can pose similar threats as wood hazards.

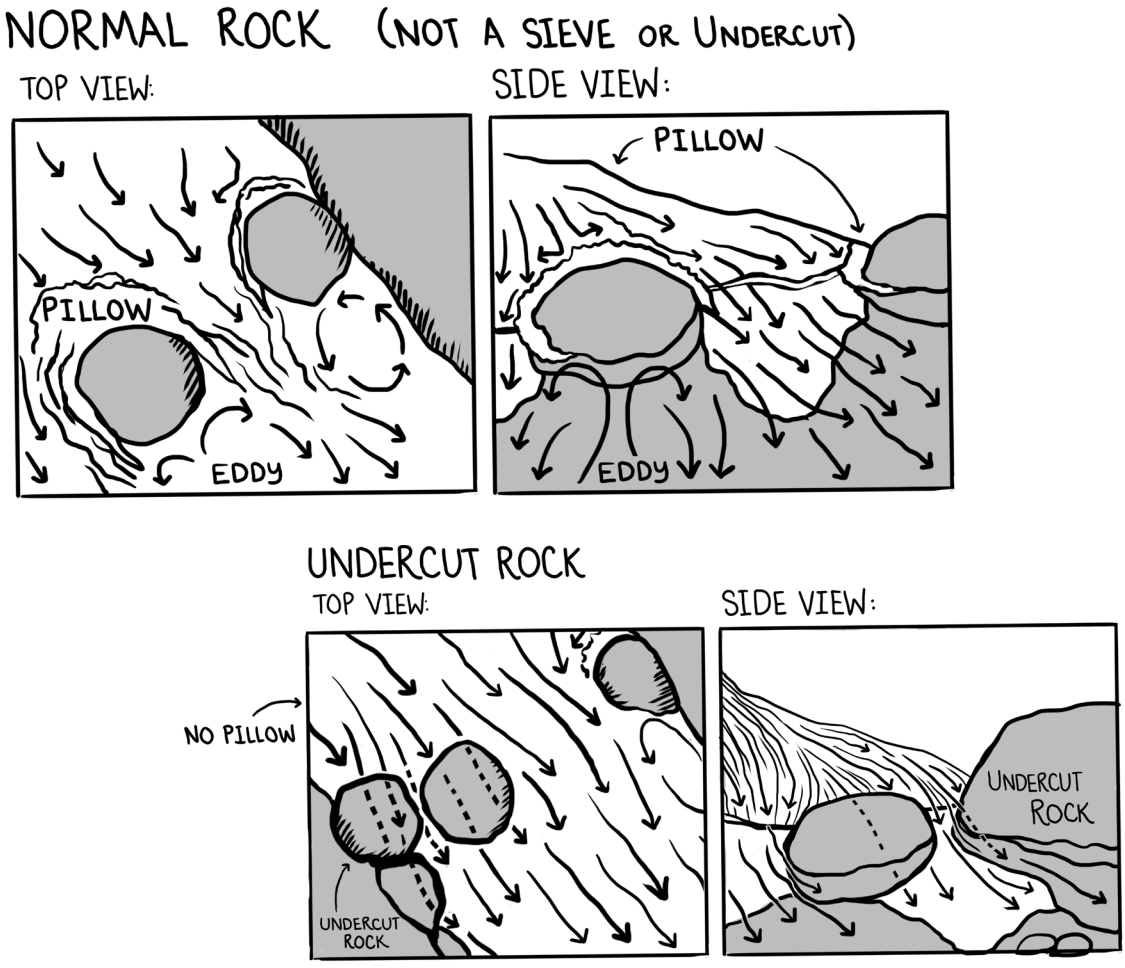


Avoid trees, logs, brush, and roots in the water, whether in the form of a sweeper (hanging over the river) or strainer (underneath the water).

Rocks

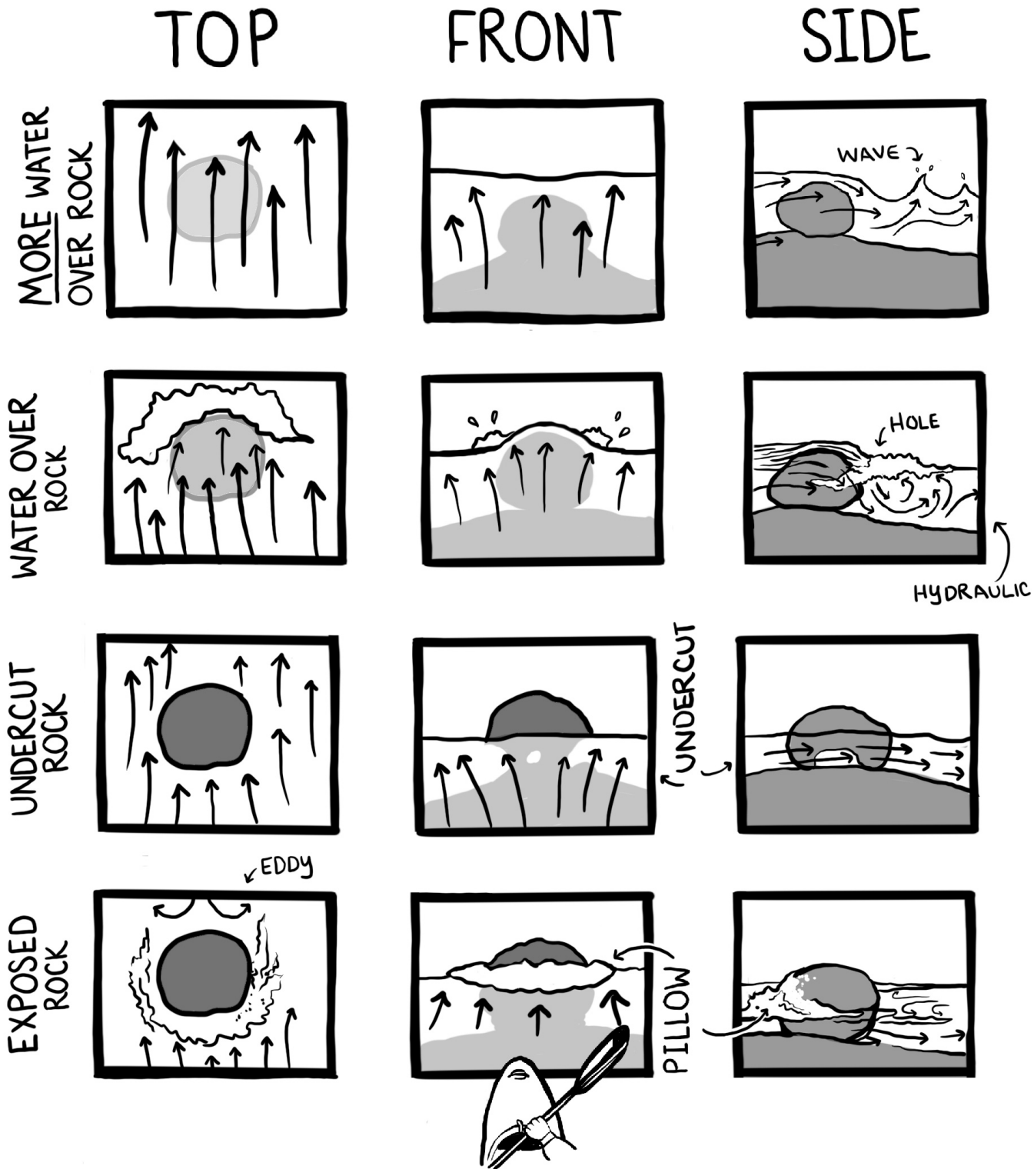
Avoid running into rocks and cliff walls, whether in your craft or swimming. Running into rocks head-on can damage crafts, send river runners into the river, and cause injury. Rocks can form dangerous formations such as the following:

- **Rock sieves:** Rock sieves, or siphons, are created when a rock formation allows water to pass below and between boulders, but the rocks are too close together to allow a human or boats to pass downstream. Sieves are extremely dangerous drowning hazards and should be avoided.
- **Undercut rocks:** An undercut occurs when water flows into a cave under the riverbank or the sloping side of a boulder or bedrock. If a swimmer gets pushed into an undercut, they can become pinned underwater by the force of the current.



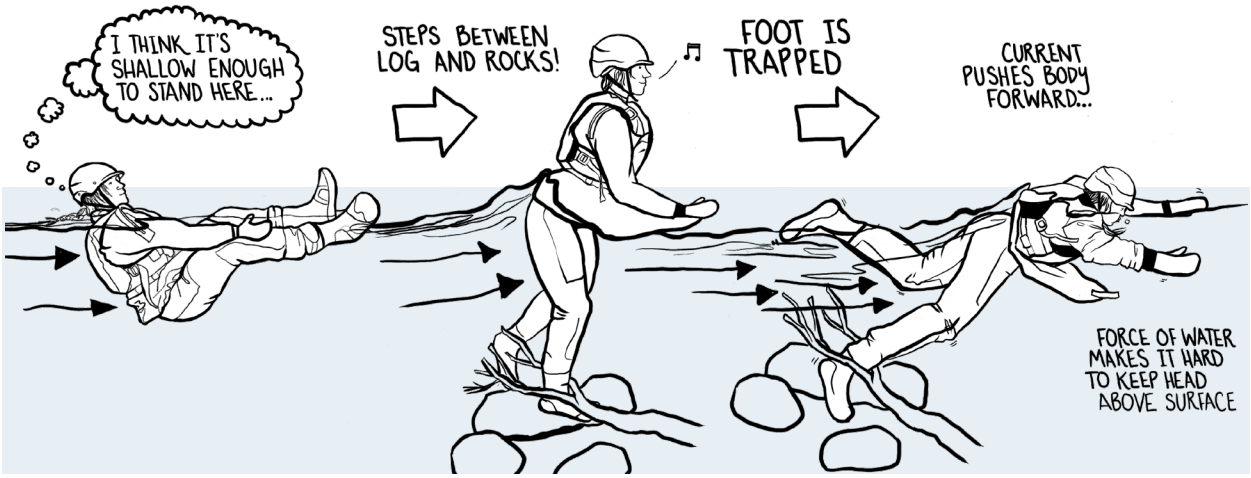
ROCK FEATURES

As Determined by Relative Water Level



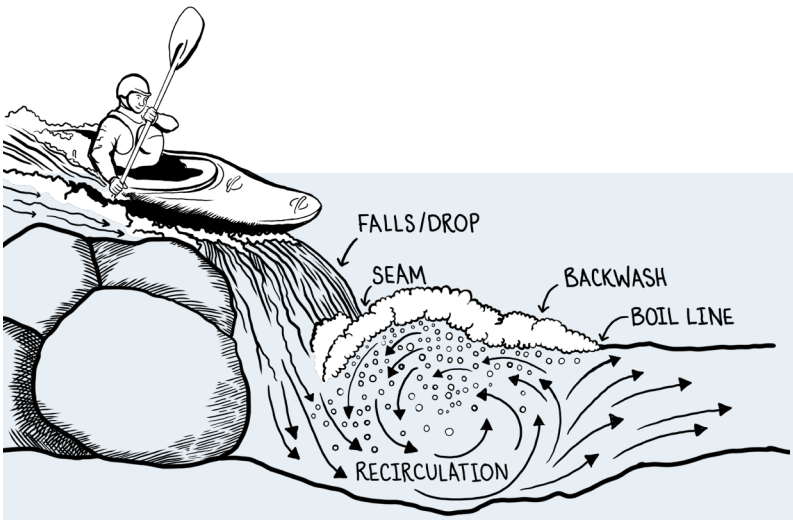
Foot Entrapment

Your foot can wedge between rocks, logs, or in crevices in the bedrock on the bottom of the river, which combined with current can push you under and keep you there. Do not attempt to stand in fast-moving water. Swim to slow-moving water (little to no current) or very shallow water (below your knee) before attempting to stand.



Hydraulics and Holes

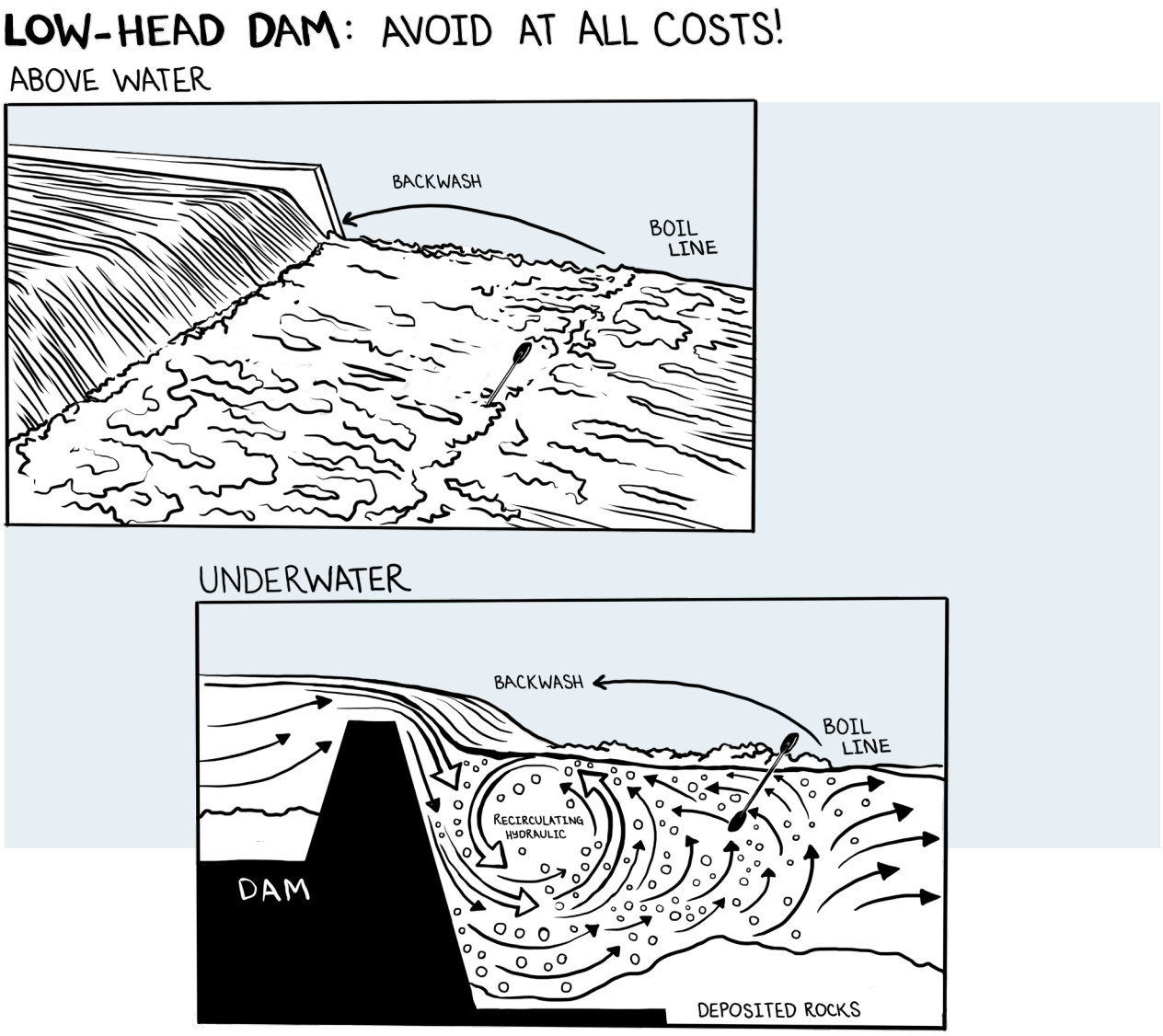
When water drops over an obstacle, it curls back on itself, forming a strong upstream current capable of recirculating a boat or swimmer. Natural and human-made river features such as dams, weirs, ledges, reversals, and holes can all be dangerous hydraulics. Some holes make excellent features to play in. Others are proven killers. River runners who cannot recognize the difference should avoid all but the smallest holes.



The further downstream the zone of recirculation, the stickier the hole.

Low-head Dams

Hydraulics around man-made dams must be treated with extra caution and the utmost respect, regardless of their height or the level of flow in the river. Despite their benign appearance, low-head dams can create an escape-proof trap. The swimmer's only exit is to swim back into the curtain of water forming the hydraulic, ball up, and allow themselves to be pushed towards the river bottom where the current flows downstream. This technique also works for exiting strong, naturally-forming hydraulics.



SECTION 5

RIVER RUNNING STRATEGY

Use a river running strategy to manage hazards as you descend the river. Your strategy should include a communication plan, descending order, scouting, setting safety, and portaging.

River Running as a Group

Have a strategy for descending a chosen river and discuss it with your group before you hit the river. Common topics to discuss before getting on the water include:

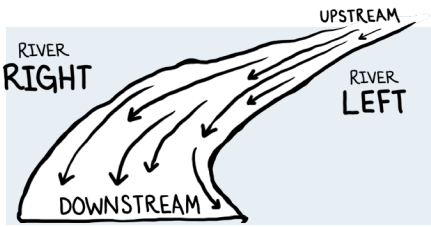
- **Familiarity with the river:** Have conditions changed since previous experiences?
- **Important landmarks:** Known hazards, portages, and sites to scout.
- **Non-verbal communication signals:** Review and agree on shared signals.
- **Paddler formation, scouting, and setting safety:** Decide who will lead and who will go last.
- **Emergency resources:** Review who has medical training, the first aid kit, etc.
- **Exit plan:** Outline exit points, road access, trails, and location of car keys in the event of an emergency exit.

Communication Types

VERBAL COMMUNICATION

When describing river sections, features, and hazards, less is more. Give simple directions and only point out hazards that could cause major issues.

- **River-left and river-right:** Always describe the river from the perspective of looking downstream.
- **Start upstream:** Begin with descriptions of where to enter the rapid and finish with descriptions of where to catch an eddy at the bottom.
- **Confirmation:** Make sure the correct instructions have been relayed by verbally repeating or mirroring the communication with hand signals. The river is loud, and it can often be hard to communicate verbally unless group members are very close together.



Always describe the river from the perspective of looking downstream.

HAND, PADDLE, AND WHISTLE SIGNALS

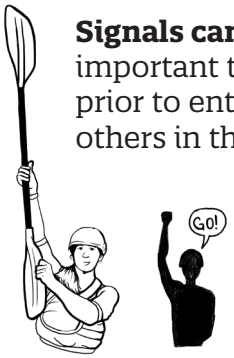
Non-verbal signals are useful on the river when group members cannot hear verbal communication. Signals vary between communities and user groups, so discuss the signals before entering the water.

- **Always point positive:** Signal toward the route a paddler should take. Never signal towards the hazard.
- **Relay the signal down the line:** Once on the river, signals should be passed along to others in the party.
- **Confirmation:** Mirror the signal back to your partner to show that you understand the message.
- **When to use a paddle:** A paddle is easier to see over long distances. Turn the blade flat and make movements large and slow for best visibility.
- **When to use a whistle:** A single whistle blast is an effective way to get the group's attention. Point at the hazard or swimmer while whistling so that your team knows where to look. Three-whistle blasts should be reserved for emergencies.
- **Additional signals:** In addition to the common signals shown on the next page, you might discuss a wide range of other possible signals including wood/strainer, hole, undercut, boof, surf, follow the tongue, down the middle, throw bag, etc.

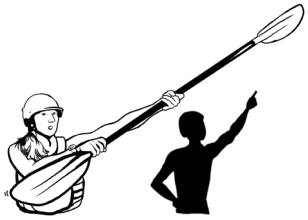
Signals should be specific to trip needs. For example, on a remote, wooded river, group members could agree that a whistle blast means that there is a tree hazard ahead.

RIVER SIGNALS

Common Hand, Paddle and River Signals



Signals can vary between communities and user groups. It is incredibly important to review river signals with a new group, or any new group members, prior to entering the water. Once on the river, signals should be passed along to others in the party.



ALL CLEAR

Come on down

Proceed. Hand or paddle raised straight up vertically. When visual communication is not possible, one whistle blow.

POINT POSITIVE

"Move that way"

Point in the direction a river runner should travel. Never point at an obstacle. Always point to the safe direction to travel.

STOP

Potential hazard ahead

Wait for "all clear" signal before proceeding. Form a horizontal bar with your outstretched arms or paddle held horizontally. Pump arms or paddle to attract attention.

I'M OKAY

Are you okay?

While holding the elbow outward toward the side, repeatedly pat the top of your head. This signal is used both as a question and as a response to indicate you are not badly injured or in immediate danger. If not okay, don't make this signal.

HELP/EMERGENCY

Assistance needed

Give three long blasts on a rescue whistle while waving in a crossing motion with arms over your head. If a whistle is not available, make three loud whooping tones.

SWIMMER

Person in the water

Freestyle swimming motion with arms. Used to notify the rest of the group there is a party member out of their craft and currently in the water.

EDDY OUT

Get to side of the river

Swirling motion with a single finger or paddle in the air, then pointed to the side of the river (river left or right) with the eddy. Should be done well in advance of need.

SCOUT

Look at rapid

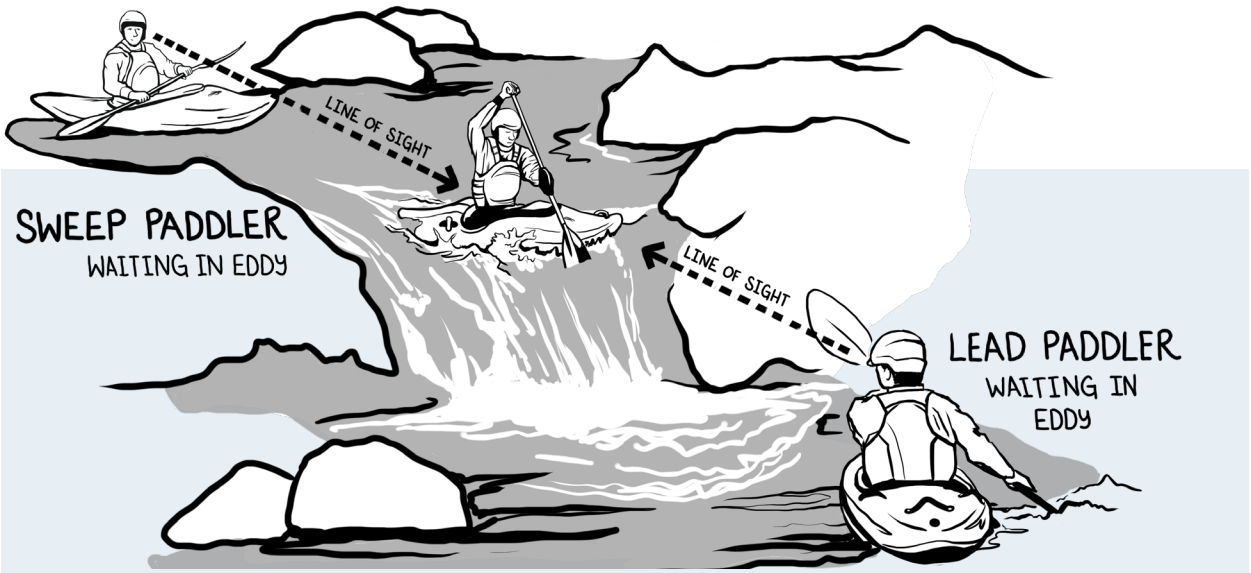
Get to shore for a look. Two fingers pointing to your eyes, then to the side of the river where the scout should take place.

PORTAGE

Walk around

Two fingers used to imitate legs walking. Signals a mandatory portage. After signaling, point to the side of the river the portage should take place.

AMERICAN Whitewater



It usually works well for the less-experienced members in your group to be sandwiched between the more experienced lead and sweep paddlers.

Formation

Place paddlers who require additional support at the center of a group. No one should paddle ahead or leave the river without first informing the group.

The **lead paddler** sets the pace. When in front, do not get in over your head. Never run drops when you cannot see a clear route to the bottom or, for advanced paddlers, a sure route to the next eddy.

- **Identify the next eddy:** Decide early when and where to eddy above drops and signal back to the rest of the group to eddy. If the drop requires a scout, signal that as well.
- **Identify the next exit:** Even when there is a clear path to the next eddy, never run a drop unless there is a clear way to exit the river from the eddy to scout the next section if necessary (i.e., do not run down to an eddy with cliff walls directly down to the water).
- **When in doubt, stop and scout.**

The **sweep paddler** brings up the rear of the group formation. Keep the group in sight and be ready to catch an eddy above other group members.

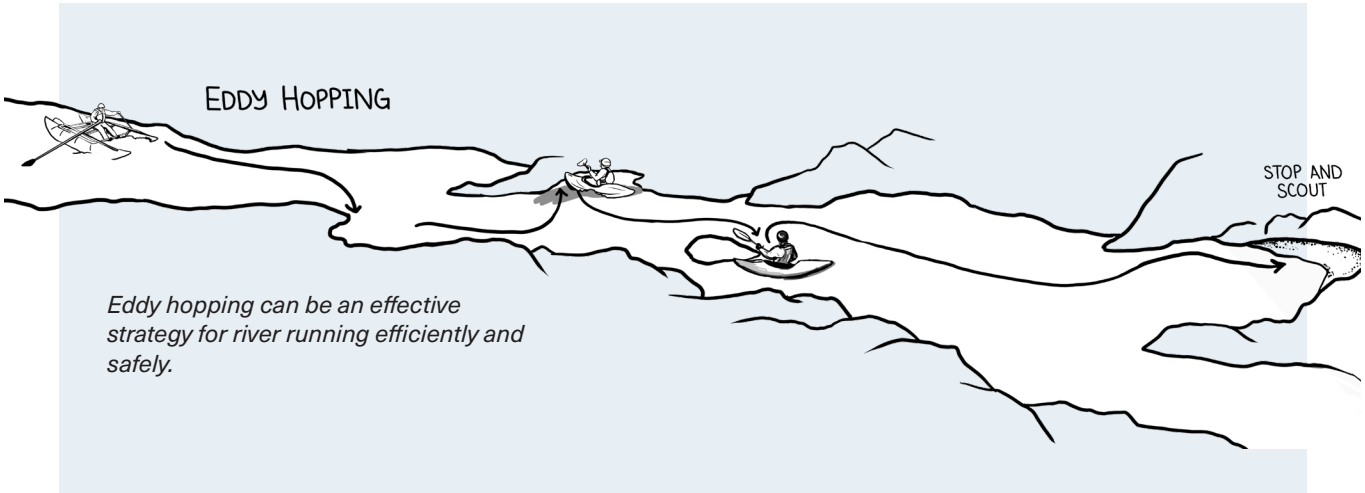
- **Who should sweep:** More comfortable and experienced group members often take on the responsibility of the sweep paddler.
- **Maintain your position:** Try to stay in a position where you can remain upstream of any incident involving the group members in front.
- **The sweep is more vulnerable:** Recognize that it may take longer to reach the sweep in a rescue situation, with the rest of the group already downstream of an incident.

Verbal commands or signals should be relayed from the leader to the sweep. For example, if the leader wants to eddy out, they will signal. The second and third group members will repeat the signal, making sure that the person behind them sees and understands the message.

Eddy hopping can be an effective strategy for river running efficiently and safely. As the group descends, especially in new sections of river, or in sections on the high end of the group's skill level, members can methodically move from eddy to eddy, assessing the river from each safe island to the next.

- **Keep track of the group:** Know how many people are in your group and take head counts regularly.
- **Line of sight:** Maintain a line of sight with the paddlers in front and behind. Stop to regroup if you lose sight of the paddler behind you.
- **Progression:** When the lead paddler leaves their eddy, the next paddler upstream can move down to the eddy they've vacated, and the third paddler upstream can move to the eddy the second paddler has vacated.

For **large groups**, it can be helpful to use the "buddy system" where each person keeps track of a specific group member. In smaller volume rivers or in very large groups break into smaller subgroups.



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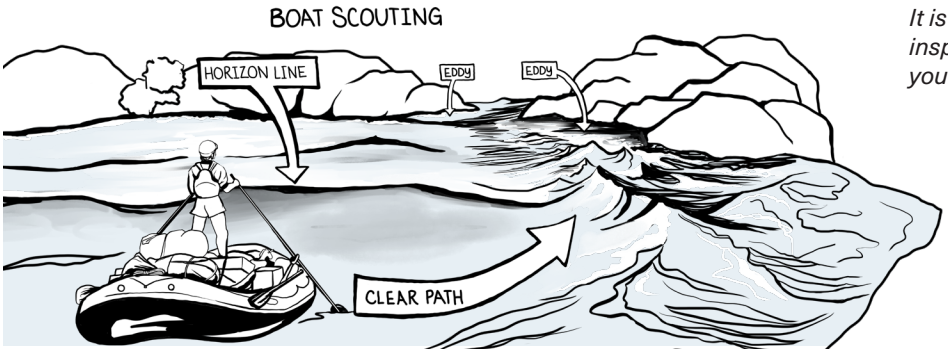


It is sometimes possible to inspect a rapid without exiting your craft.

Scouting

Scouting is the act of **visually inspecting a rapid or drop and determining a safe route through it.** Scouting can be done from the shore or river. Assess rapids from top to bottom, noting the entrance point and moves required to negotiate obstacles and avoid hazards as you descend. Always identify where you will finish the rapid and in which eddy you will stop.

- **Boat scouting:** Inspect the rapid without exiting your craft, either as you approach, or from a pool or an eddy above a rapid. This is an advanced technique that requires practice and experience in reading whitewater.
- **Shore scouting:** Walk the shoreline and change your perspective to get views of what the river will look like from your craft at river level if possible, especially to line up where you'll enter the rapid. Use river features as markers to help guide where you enter the drop. Bring your throw rope in case you end up setting safety.

Often the lead paddler will determine when to scout, however anyone in the group can decide to scout a rapid for themselves, even when others aren't. If the lead paddler is unsure whether to scout, they should signal to the team to catch an eddy, and either attempt to boat scout or get out and take a look. Advanced groups can increase efficiency by having one team member scout and relay safe routes through a rapid to the rest of the team using verbal or non-verbal signals. On longer difficult runs, efficiency of travel can be a safety concern, as daylight hours eventually end, and weather and water levels can fluctuate.

Identify the obstacles, choose a route through the obstacles, and identify markers to remember your line.

Discuss the group formation and where to set safety.

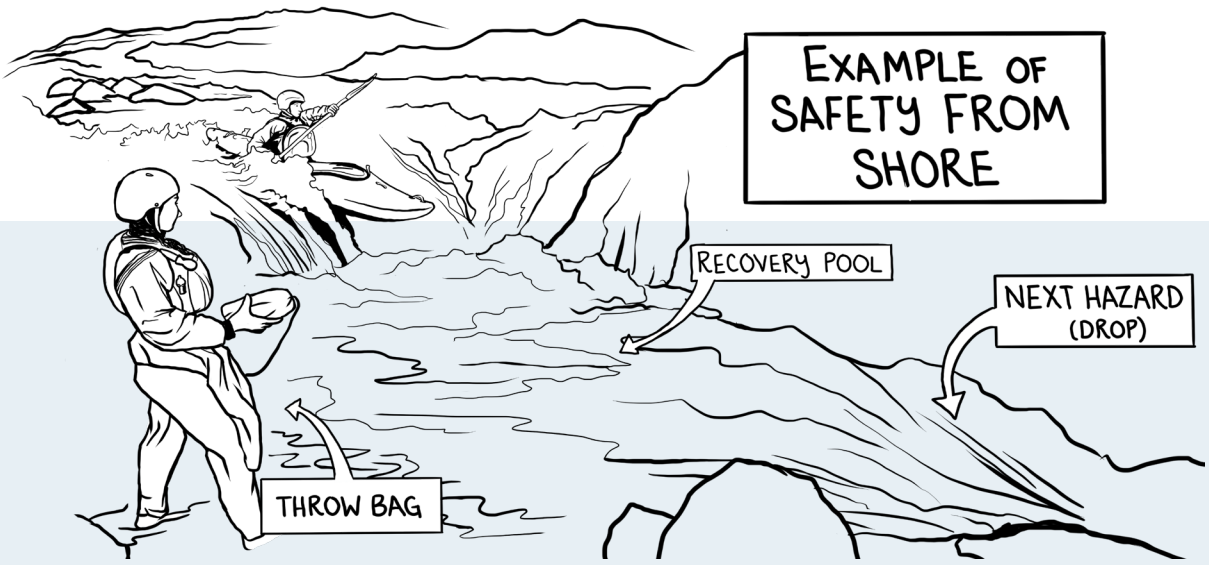
Setting Safety

Setting safety means getting into a position where you can quickly initiate a rescue. Safety can be set on the shore or in the water. Often having both is ideal.

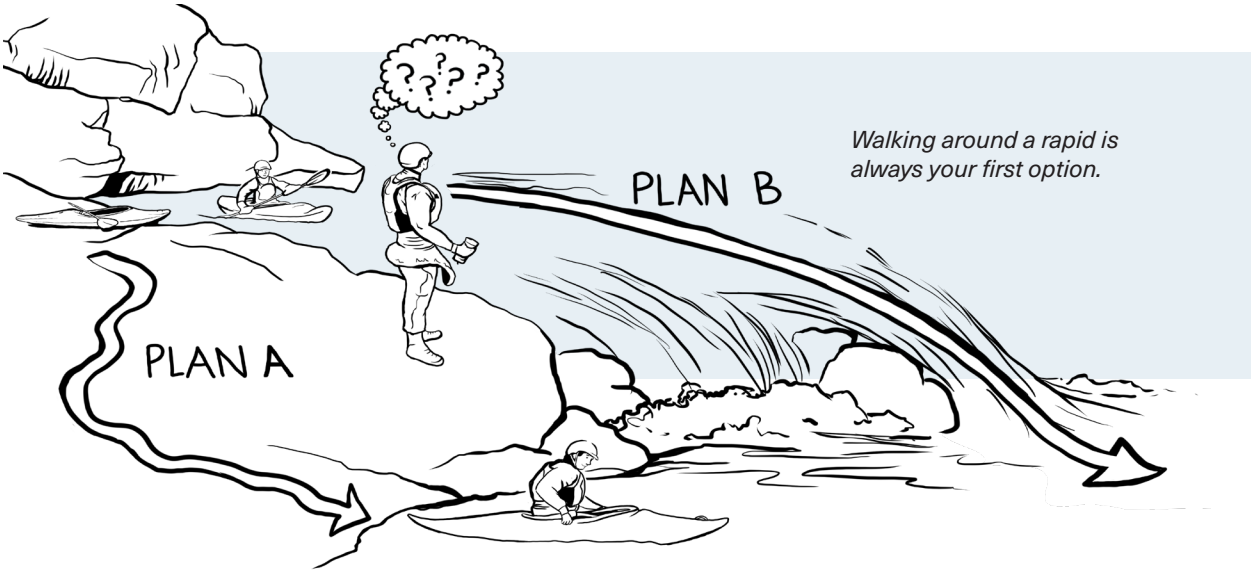
- **Safety from shore:** Safety from shore can consist of directing traffic down the river with verbal commands or hand signals, an extension rescue with a paddle, or using a throw rope to swing a swimmer to shore. Throw ropes are discussed in more detail in the Team Rescue section.
- **Safety from the water:** A safety boat can be mid-rapid or at the bottom of the rapid in a position to tow a swimmer or recover loose equipment. It is common practice for the first person through the rapid to set up in position as a safety boat. Team safety is discussed in more detail in the next section.

Determining where to set safety:

- **If the anticipated outcome is that the hazard will stop the paddler:** Set safety as close as possible to the hazard. This might entail climbing up directly on the hazard, such as a stable log jam or an undercut rock or sieve. Other hazard candidates include strainers, pinning hazards, and strongly recirculating holes.
- **If the anticipated outcome is that the swimmer will continue moving downstream:** Set safety well below the hazard, for example, below a large hydraulic that may hold a boat but is unlikely to hold a swimmer, or in high water and continuous rapids.



Set safety where your throw will reach the swimmer and swing them to shore without encountering rocks or other obstacles.



Walking around a rapid is always your first option.

Portaging

Portaging is the act of carrying or lining your craft around a rapid. Assess how you're feeling both physically and mentally before deciding to run or portage a rapid. The decision to scout any rapid, and then to run or portage, should be made according to your best judgment.

Walking around a rapid is almost always a safer option than running it. Don't persuade yourself or others to run a rapid just because portaging might be difficult or you feel pressured by other group members to paddle beyond your skills.

SECTION 6

WHAT TO DO WHEN THINGS GO WRONG

Even with the best preparation and planning, things can go wrong in the water. Anticipate, train, and practice how you will respond when they do.

Rescue Essentials

Make a rescue plan that minimizes the risk to the rescue team. **Don't compound the problem by creating another rescue situation.** It is important to balance risk to rescuers with timely action. A good reference to increasingly risky rescue options from safety onshore is **"reach-throw-row-go,"** but your team might have other considerations based on position of rescuers, skills, and resources. Often, simple and quick solutions are the most effective.

1. Assess site safety, changing conditions, and consider downstream hazards and upstream river traffic.
2. Participants and bystanders should only assist a rescue effort in roles they can safely perform.
3. Get swimmers to safety before dealing with equipment. If possible, reach the swimmer directly from shore with your hands, a rope, or from a watercraft.
4. Recover boats and equipment only after people are accounted for and if equipment recovery can be done safely.

Self-rescue

If you are separated from your boat, you will need to choose between getting back to your craft or swimming to shore. Listen for directions from team members.

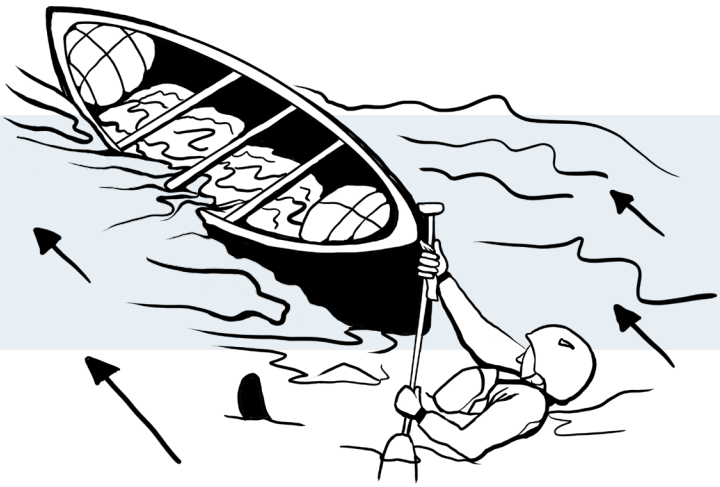
GET BACK TO YOUR CRAFT

When in a raft or other craft with multiple passengers, your craft will often be the closest safe spot. Yell or whistle to signal for assistance from the remaining passengers in the boat.

If you swim from a one-person craft in relatively easy whitewater, or there are no hazards downstream, hold on to your craft. Boats provide flotation to swimmers and are easier for rescuers to spot.

- **Move to the upstream side of the boat:** This orientation prevents you from being crushed between a rock and your boat by the force of the current.
- **Climb on top:** Persons with good balance may be able to climb on top of a swamped kayak or flipped raft and paddle to shore.
- **Wet re-entry:** River runners in inflatable boats or SUPs should practice wet re-entry in place of a kayaker's combat roll.

Stay upstream of your craft while swimming to avoid being crushed between the craft and downstream obstacles.



SWIMMING

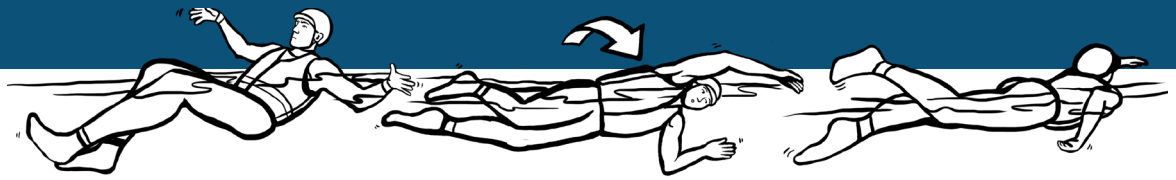
Actively attempt self-rescue whenever possible by swimming to safety. Listen to directions if another boater comes to your aid. Release your craft if this will improve your chances of swimming to safety, especially if the water is cold or dangerous rapids lie ahead.

- **Defensive swimming technique:** When swimming in shallow or obstructed rapids, lie on your back with your feet held high and pointed downstream. Use your feet to kick off objects at the surface and your arms to maneuver in the current.
- **Aggressive swimming technique:** If you're in slow moving water or the rapids are deep, roll onto your stomach and swim aggressively for shore. Watch for eddies and slackwater and use them to get out of the current.
- **Do not attempt to stand in fast-moving water:** If your foot wedges on the bottom, fast water can push you under and keep you there.
- **Look ahead:** Avoid pinning situations including undercut rocks, strainers, downed trees, holes, and other dangers by swimming away from them.
- **Riding the rapid out:** If the shores are obstructed with strainers or undercut rocks, it may be safer to "ride the rapid out" until a safe landing on shore can be found.
- **When it is appropriate to stand:** Swim to very slow-moving water with little to no current or very shallow water (below your knee) before attempting to stand or walk.

Defensive swimming (on back, feet up and facing downstream) keeps limbs away from unseen entrapment hazards in the river.

SWIMMING TECHNIQUES

Self-Rescue from River



DEFENSIVE SWIMMING

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AGGRESSIVE SWIMMING

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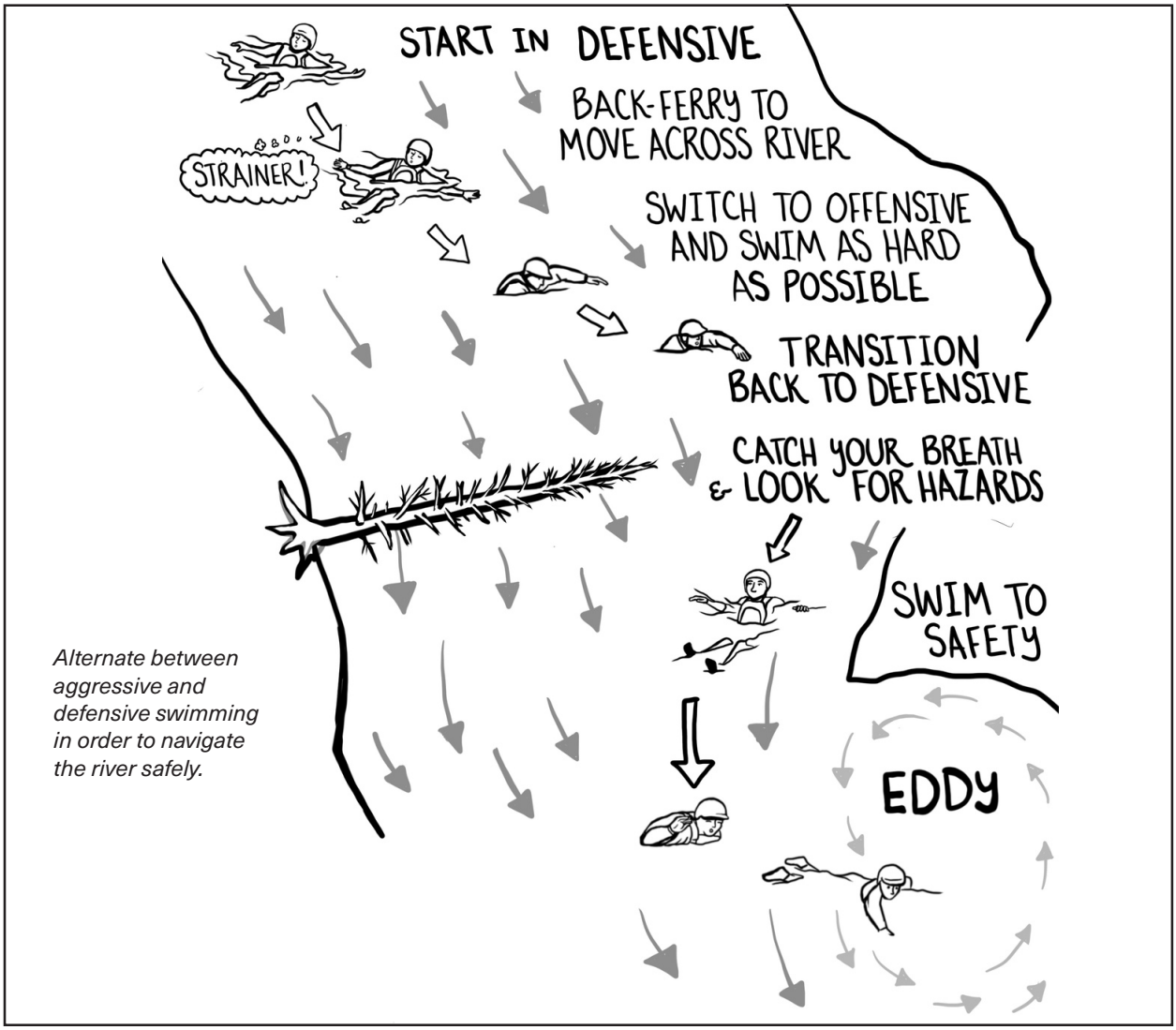


Alternate between aggressive and defensive swimming in order to navigate the river safely.

AMERICAN Whitewater

Team-rescue

River running is best done as a team sport. A competent team makes river recreation safer and rescues easier. There is no magic number for a team of river runners, however, having a team of **three or more** (including at least two separate crafts) allows for at least two team members to participate in a rescue. As team numbers increase, the risk of eddies being too small for an entire group and losing track of members on the water increases, so large groups (6 or more) should usually be split into smaller pods or use the buddy system.

RESCUING SWIMMERS

You can assist a swimmer from the shore or a safety boat in the water.

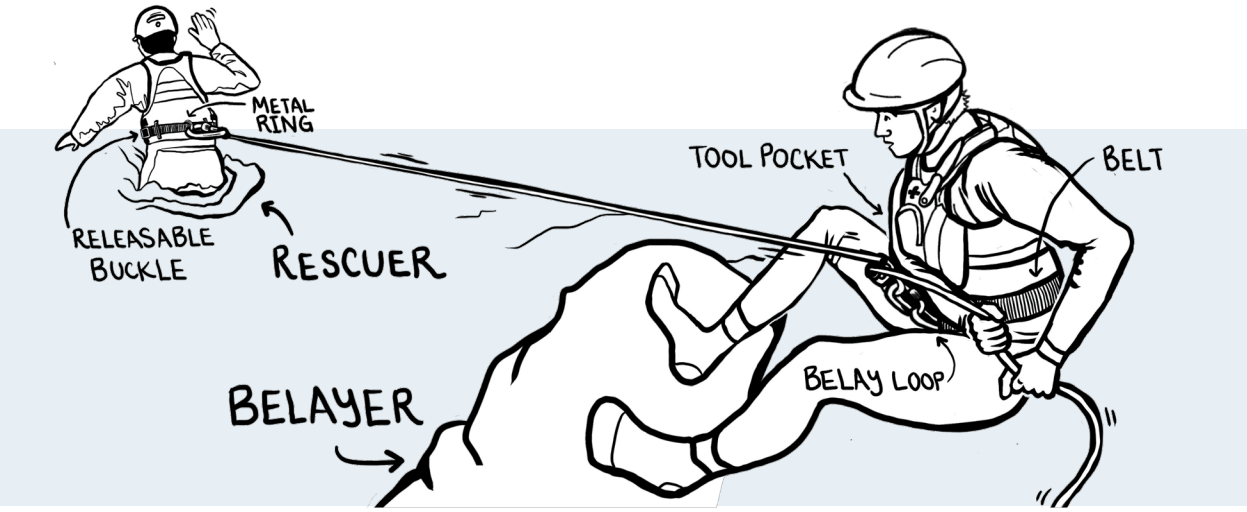
From shore: Coach the swimmer toward safety, grab them directly, or deploy a throw rope. When using a throw rope:

- **Choose an appropriate position on the shore:** Position yourself in a location at the downstream end of an eddy if possible. Throw the rope upstream to the swimmer so that you can use the current to pull the swimmer downstream into the eddy.
- **Preparing to throw:** Hold the free end of the rope in your off-hand and the bag in your dominant or throwing hand.
- **Making the throw:** A throw bag can be tossed with an underhand, overhand, or sidearm motion. Aim over the swimmer so that the rope drops to them. Practice will make your throw significantly more reliable.
- **Receiving the throw:** When receiving a throw bag in the water, grab onto the rope (not the bag), turn over on your back, and put the rope over your far shoulder (away from the thrower).

Be careful not to get tangled in ropes while throwing or swimming, and do not let go of ropes unless absolutely necessary because they can become entanglement hazards. Avoid tying knots and loops into ropes as they can also lead to entanglement.

An arm, paddle, or branch, can be an effective way to help a swimmer reach shore.

Trained rescuers may reach the victim by entering the water with a tether line attached to the quick-release belt on a rescue life jacket while on belay. This is a high-risk technique that should only be attempted after formal training.



Some PFDs have releasable rescue harnesses that allow a rescuer to enter the water on belay. This rescue system is high-risk and should be learned in a swiftwater rescue course.

From a safety boat: A safety boat can assist a swimmer in multiple roles. Evaluate your ability to stay upright before continuing downriver or making contact with a swimmer.

- **Coaching:** Coach swimmers away from hazards and toward shore.
- **Resting platform:** Offer your craft as a resting platform.
- **Towing:** Tow the swimmer from the stern or bow.
- **Assisted re-entry:** Assist the swimmer back into their own boat or a large raft.

RECOVERING GEAR

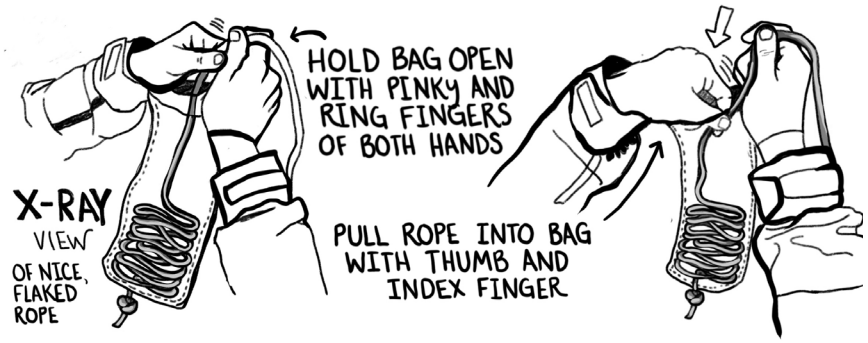
Once swimmers are all accounted for and on shore, rescuers can focus on recovering gear. **Never endanger yourself in the pursuit of gear.**

- **Bow bump or plowing:** You might be able to drive boats and other gear to shore by plowing them with the bow of your craft or shoving them with your hand.
- **Stowing:** Smaller gear can be gathered and temporarily stowed to carry or throw to shore.
- **Towing:** Towing gear to shore using ropes or lines should only be done by trained rescuers, should never be performed in or above difficult rapids, and tow lines must always be attached to a quick-release system.

THROW ROPE

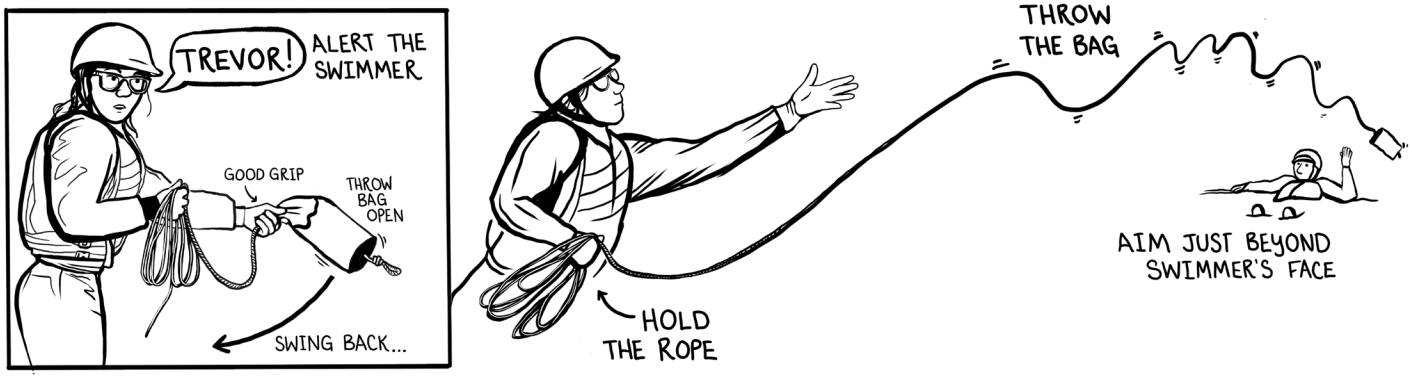
How to Throw and Receive a Rope

PREPARE



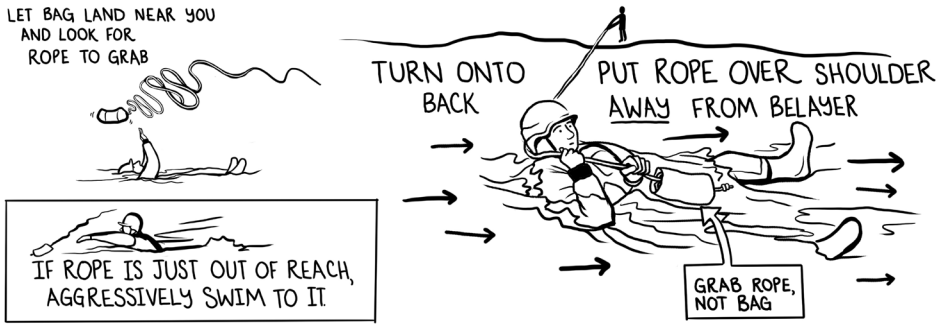
A throw bag can be tossed either underhand or overhand. Aim over the swimmer so that the rope drops to them. Practicing before a rescue situation makes your throw significantly more reliable.

THROW



Position yourself downstream of the swimmer, ideally at the downstream end of an eddy so that you can use the current to pull the swimmer into the eddy. Hold the end of the rope and throw the bag to deploy the rope.

RECEIVE



When being rescued by a throw bag, grab onto the rope (not the bag), turn over on your back, and put the rope over your far shoulder (away from the belayer).

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EXERCISES FOR RECOVERY

of Swimmer and Equipment

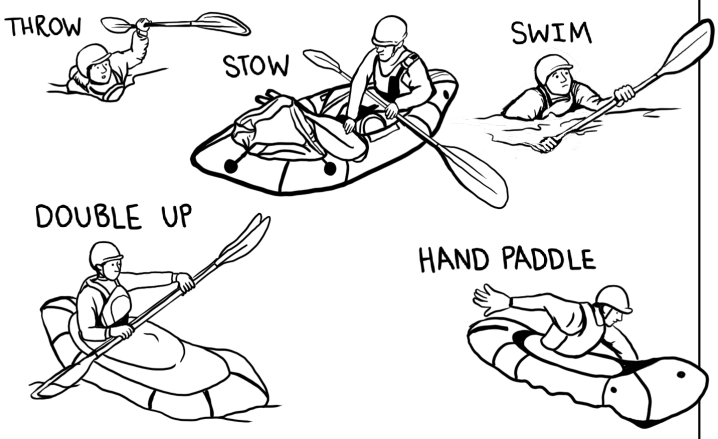
PLAN A

If it is safe, hold onto all your gear and either reenter your inflatable or swim your gear to shore.

PLAN B

If needed let go and swim to shore.

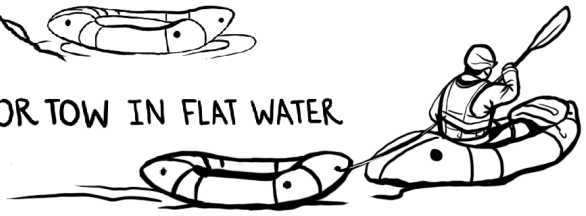
RECOVERY OF PADDLE



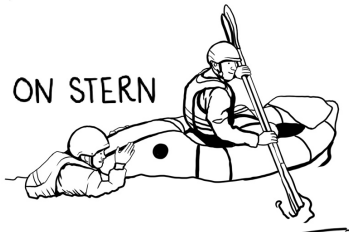
RECOVERY OF BOAT

HOPE TO COLLECT FROM AN EDDY

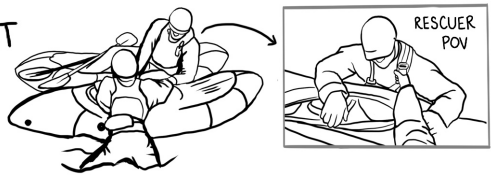
OR TOW IN FLAT WATER



SWIMMER



ASSIST



These exercises are applicable to some single-person crafts and inflatables. Take what works for your craft and leave the rest.

Adapted from Luc Mehl, Triple Point Training

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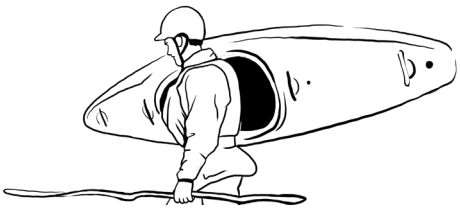


Exiting from the River

There are many reasons to justify exiting from the river. Weather and water levels might have been hard to judge at the put-in, misjudged while scouting, or changed during the day. Essential equipment might have been lost during a swim. If your team experiences multiple rescue scenarios or the river section feels unexpectedly out of your comfort zone, it is probably time to hike out. **Trust your gut.**

Communication Devices and Who to Call

Carry a communication device in a secure and dry location, preferably on your body.

- **Know how to use your device:** Your device is only useful if you can access it in an emergency situation and know how to use it. Practice using your device before going into a remote area.
- **One-way communication:** Having intelligible preset messages is essential for devices that don't have two-way communication.
- **Determine if an evacuation is urgent or non-urgent:** Before alerting search and rescue, ensure your situation necessitates an immediate emergency response. Some rescue situations may require outside assistance, but the authorities may not need to be dispatched.

Medical Considerations

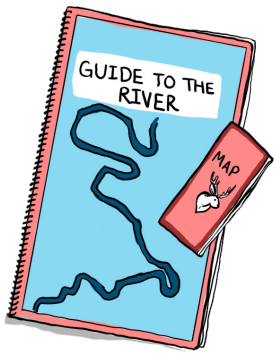
As with other outdoor activities, the most common injuries on river trips are broken bones and exposure to extreme heat or cold. The most common life-threatening injury is drowning. The medical definition of drowning is any respiratory impairment due to immersion/submersion in water. The priority for drowning victims is to keep the brain oxygenated by ensuring that the patient has an open airway and is breathing.

All river runners should learn basic first aid and CPR in case they need to resuscitate a patient by rescue breathing. Carry a pocket CPR face shield in your PFD and initiate rescue breathing as soon as possible, maybe even while they are still in the water. If the patient has foam in their mouth, deliver rescue breaths through the foam.

Note that cold water immersion lengthens the time for potential resuscitation, sometimes up to 30 minutes after breathing has stopped. There is hope!

THE RIVER RUNNER'S CHECKLIST

Planning



- [ ] **Choose an appropriate run** based on your experience and equipment.
- [ ] **Share your river plan** and expected time off the water.
- [ ] **Be prepared** for surprises and walking out.

Communication

- [ ] **Team Resources:** Who has medical, repair, and rescue equipment?
- [ ] **Signaling:** Review hand, paddle, and whistle signals.
- [ ] **Changing river conditions:** Review your options as you descend.

Running

- [ ] **Protective equipment:** Wear it.
- [ ] **River hazards:** Scout, set safety, and portage.
- [ ] **Swimming:** Keep your feet up and actively swim to safety.

americanwhitewater.org/safetycode

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