



Level 4: Swiftwater Rescue

(Sample Skills Course)

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

Course Objectives:

- Promote proactive prevention of river accidents and injuries.
- Develop and practice key self-rescue skills.
- Identify and avoid river hazards by understanding hydrology, hazards, and river features.
- Focus on fast, low-risk strategies for early management of river accidents
- Develop and practice methods for recovering swimmers, and loose boats and equipment
- Develop and practice more advanced rope-based and in-water skills
- Gain experience using the rescue PFD, and understand it's strengths and weaknesses
- Utilize rescue scene management principles needed within a paddling group

Essential Eligibility Criteria: In order to participate in an ACA Skills Course, each participant must satisfy the following essential eligibility criteria:

- Be able to independently participate in all individual skills and activities listed in the course outline while also maintaining an appropriate and safe body position
- Be able to hold their breath while under water and, while in the water wearing a properly fitted lifejacket, be able to independently turn from a face down to a face up position keeping their head above water
- Be able to effectively communicate with the instructor and other course participants
- Be able to manage all personal care independently, or with the assistance of a companion
- Be able to manage all personal mobility independently, or with the assistance of a companion

Course Prerequisites:

- All paddle craft are welcome. Ideally, students should be able to competently maneuver their craft in at least class II whitewater. However, all boaters, and non-boaters with an interest in swiftwater rescue (e.g., professional rescuers), will benefit from the class. Participants should be in good health and overall fitness, possess solid swimming ability, and be comfortable swimming in moving current during river drills.
- Participants should dress appropriately for weather and temperature, and should expect to be in the water for extended periods of time.

Minimum personal equipment for class: PFD designed for whitewater use, whitewater helmet, protective clothing suitable for extended swimming in cold water, protective footwear, boat, paddle, whistle, throw rope, 15+ feet of one inch tubular nylon webbing, 2 locking carabiners, and 2 prusick loops.

Course Duration: Two days (16 – 18 hours)



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Course Location / Venue: A chute of water with deep, clean wave action, well-defined eddy lines and no immediate hazards or risks below. Ideally, the site should contain class II rapids, although it may be taught on less difficult rapids. Protected space is needed for on-land work, with adequate shelter for inclement weather.

Succeeding courses:

Level 5: Advanced Swiftwater Rescue

The following is a general summary of course content for the **Swiftwater Rescue** course. The content covered and sequence of instruction should be adjusted to best fit the participant's needs, class location and time allowance.

Course Content

Introduction, Expectations, & Logistics:

- Welcome, introductions, paperwork
- Student & instructor course expectations and limitations
- Course itinerary & site logistics
- Review waiver, assumption of risk, challenge by choice, medical disclosure
- About the ACA
- PFD policy (always wear on water)
- Appropriate personal behavior
- No alcohol / substance abuse
- Proper etiquette on & off the water
- Respect private property
- Practice Leave No Trace ethics

The Paddling Environment:

- Wind
- Waves
- Weather
- Water

Personal Preparation:

- Personal ability
- Swimming ability
- Water comfort & confidence
- Fitness, conditioning, and warm up
- Safe paddle and boat handling
- Safety and rescue considerations
- Personal equipment (reviewed by Instructor)

Rescue Philosophy

- Accident avoidance and proactive rescue
 - Accident timeline
 - Prevention and “what if...?” strategy
 - Prior planning for accident management
- Priorities
 - Me, my group, bystanders, the victim
 - Simple and fast to complex and slow
- Liability and Ethical issues
 - Negligence, duty to act, breach of duty, harm, standard of care, abandonment
 - Moral vs. legal obligation to act
 - Trip leader vs. common adventurer
- Trip Organization
- Trip planning principles
- Emergency action plan
 - Lead and sweep
 - Know the group, the river and the weather
 - Plan the trip and communicate the plan

Scene Management

- Locate, access and assess, stabilize and transport
- Prioritizing the rescue
- Most rescues performed quickly, without a formal structure
- Larger groups and longer rescues often need more structure
- Incident Command structure
 - Leader
 - Safety
 - Rescuer
 - Additional roles – medic, rigger, runner, ...
- Complete the rescue without compounding the situation
- Communication (AW signals)
 - Hand and whistle signals
 - Cell phone or radio if appropriate
- Boat, paddle, whistle, throw rope, knife, saw, first aid kit, rescue PFD
- Group rescue gear
 - Survival kit, haul rope, communications, ...
 - Specific needs depend on the river paddled and local weather
- Survival equipment
 - Food, water, extra clothing, shelter, fire making supplies, ...
 - Specific needs depend on the river paddled and local weather

Medical Issues

- NOT a first aid class; perform medical care to your level of training
- Don't make the situation worse
- Obtain more training; calling 911 is rarely an effective option
- Rescuers should be familiar with common medical problems including hypothermia, drowning, cuts and scrapes, and dislocations/broken bones.
- CPR and wilderness first aid skills are essential for rescuers

Equipment

- Protection from rocks and water
 - Shoes, helmet, PFD
- Thermal protection
 - Wet suit vs. dry suit, wool vs. synthetics, avoid cotton in cold/wet conditions
- Personal rescue gear

Rescue Vest

- Multi-use rescue tool
- Components of the vest
 - Sewn in harness
 - Quick release buckle
 - Belt
- Hazards of the vest
 - Buckle jam (avoid by correct release, smooth belt end and appropriate belt length)
 - Cross lock harness and belt (avoid by using only locked carabiners)
 - In-water risk exposure (avoid by practicing and recognizing limits)
 - Tow tether strengths, limitations and hazards
- Communications
 - One hand waving in air means "help me"
 - Point with one or two hands for directional changes
- Applications
 - Anchor and belay
 - Towing boats or gear (with tether)
 - Personal extrication
 - V-lower and direct lower

- Live bait (preset and “on the fly”)
- Uses limited only by your imagination

Throw Ropes

- Selection based on rope material, diameter, and length
- Advantages and disadvantages of traditional bags, waist bags, coiled lines
- Care of the rescue rope
 - Avoid sun exposure, keep clean, avoid stepping on the line, avoid sharp or rough edges
 - When in doubt, replace the line
- Rope safety
 - Avoid standing over lines
 - Avoid tensioning lines perpendicular to current,
 - Keep your body out of loops in the line
 - Consider clean line techniques
 - Keep entire rope in bag to avoid accidental deployments
- Throwing and recovery zones
 - Consider where the victim will land, don't make their situation worse
- Types of throws
 - Over-arm (football and arc), underarm, side-arm
 - Deploying less than full length for close targets
- Factors impacting an accurate throw
 - Rope length and diameter, brush and trees, footing, distance to target, cold hands, practice
- Receiving the rope
 - Hold over your shoulder, with hands on your chest and elbows tucked into stomach

- Rope ideally should sit on the shoulder opposite the target shore (to set ferry angle)

- Belay techniques
 - Hip belay, sitting, buddy, dynamic, tree
 - Line on downstream side
- Coiling and rethrowing
- Vector pull to assist landing
- Stuffing techniques
- Multiple swimmers

Line Ferries and Line Crossings

- How do you get a line across the river?
- Essential skill for many rope-based rescues
- General principles
 - Look for narrow areas
 - Look for clear throwing zones
 - Establish a line receiver
 - Tethered line receiver using rescue vest
 - Keep the line as high as possible out of the water, to avoid drag
 - Upstream safety and downstream safety vital
- Throwing techniques
 - Direct throw
 - Buddy throw
 - Messenger line
- Boating, swimming, and wading techniques
 - Use a reverse pendulum and, whenever possible, keep the line out of the water
 - Downstream loop
 - Rescue vest
- Simple line crossings
 - Pendulum (can be done with multiple people, vector pull speeds the pendulum)

- Hand over hand tag line (hard in fast water, excellent wading assist)

Knots

- Components of a good knot
 - Recognizable form, strong, easy to tie and untie, minimal rope use, minimal loss of rope strength, common use
- Terminology
 - Standing and running ends, bights, loops
- Key actions
 - Set, dressed, backed up
- Figure eight family
 - Strong, easily tied and recognized, fundamental rescue knots
 - Figure 8, figure 8 on a bight, figure 8 follow-through (as both a loop and a bend),
- Additional important knots
 - “no-knot” (friction hitch), butterfly knot, clove hitch, two half hitches, water knot (for webbing), double fisherman’s bend, prusik
- Many other knots available; these form the foundation of river rescue
- Knot mastery comes from practice; plan on tying knots with cold hands, under water

Anchors

- Foundation for many advanced skills
- Places team at higher risk; consider what happens if the anchor fails
- Good anchors
 - Can hold the load
 - Are close to the load, and in line with it (anchor-belayer-climber concept)

- Can be attached to a haul line
- General concepts
 - Stay low to the ground
 - Pad or, better yet, avoid friction points
 - Consider what happens if the anchor fails
 - Internal angles ideally less than 90 degrees
 - Hard on soft, soft on hard
- One point anchors
 - “no-knot”
 - Simple loop
 - 3 bight (internal angles should be less than 90 degrees to reduce risk of triloading carabiner)
- Two point anchors
 - Use with marginal anchors, when a live load is attached, and just on general principles
 - Load distribution and self-equalizing loop
 - Expect the load to move

Mechanical Advantage

- Key for advanced unpinning techniques and rope rescues
- Places team at higher risk, takes time, and is complex
- Safety rules
 - Use dampers when possible
 - Use brakes when possible
 - Stay out of the line of fire
 - Pull with your back towards likely failure point, wearing PFD and helmet
 - Consider directional changes
- 10 boy scouts
- Vector pull standard method and progressive vector
 - Good for MA, bad for anchors
- 3:1 (Z-drag)

Pins

- Avoid getting pinned or entrapped by recognizing hazards
- Pin mechanics
 - Balance between gravity, friction, and force of water
- Types of pins
 - Vertical, center broach, end to end, pinch pin, flat pin
- Release by unbalancing forces
- Tag line on boat for recovery after release
 - Consider what happens when the boat releases
- Stabilization line to support trapped victim
- Cinch line techniques may be helpful for pinned gear
- Self rescue
 - Avoidance, high side to avoid flipping, wiggle off the rock, bail out
- If all participants are safe, waiting for low water may be a viable option
- Advanced techniques
 - Hull wraps/Steve Thomas rope trick with slippery clove hitch
 - Raft tacos

Entrapment

- High risk; hands-on rescue places rescuers near the entrapping object
- Most commonly foot entrapments, strainers, or trapped in a boat
 - Avoid by hazard recognition, appropriate swimming techniques, and appropriate outfitting
 - Extrication often requires hands on contact by a rescuer (e.g., two+ person wading techniques, live bait)
- Keep victim heads up with stabilization line

- Snag line to release foot entrapments
- Cinch line to secure victim

Stabilization, snag, and cinch lines

- Upstream and downstream safety is essential
- Consider what happens when the victim is freed; consider pre-set live bait
- Fundamental tool for entrapment and pin rescues
- Stabilization line
 - Supports trapped victim
 - Set a sharp downstream pointing V in the line for optimal support
 - Line ideally should be under armpits and support victim in heads up position
 - Very effective, with documented saves
 - Very difficult for unresponsive victims – requires some victim cooperation
- Snag line
 - Line designed to release a foot entrapment
 - Tensioned and deep
 - May need to be weighted or submerged with a paddle
- Cinch lines
 - Designed to wrap about victim and maintain control
 - Takes more time and practice
 - Victim is at higher risk, but also is more secure
 - Very useful for pinned gear
 - Simple cinch – open and closed
 - Lasso loop cinch
 - Kiwi stabilization line/cinch

Hazards and Hydrology

- Rivers are powerful, predictable and persistent

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- Subjective vs. objective hazards
 - Poor judgment can be fatal
 - River hazards don't care if you don't recognize them
 - Flooding dramatically increases risk
- Water reading (upstream and downstream Vs)
- Eddies and eddy lines
- Waves
- Hydraulics
- Strainers
- Horizon lines
- Undercut rocks, broaching rocks
- Foot entrapment risks
 - Ball up over drops
 - Escape holes by aggressive swimming towards ends, changing shape or
 - Crawling to river bottom
- Swimming with gear
 - Keep boats downstream
 - Boat and paddle in one hand

Strainers

- Lethal hazard, common cause of river fatalities
- May appear benign (it's just a tree...)
- Possible approaches
 - Avoid (best by far)
 - Aggressively swim into and over (best if can't be avoided)
 - Defensive and/or passive (potentially fatal)

Swimming (60 minutes)

- Essential self-rescue and access tool
- Safe eddy rule, don't try to stand in swift current
- Defensive and aggressive swimming
- Strategies to conserve energy including positioning, short aggressive position sprints and "porpoising" for in-water scouting
 - Breathing techniques – timing in waves and focus on downstream side
- Defensive to aggressive transitions
- Aggressive upstream and downstream orientation (upstream ferry and downstream eddy catching)
- Crossing eddy lines
- Ferry techniques
- Swiftwater entries
 - Modified belly flop; head and feet up, impact on the PFD
 - Enter water with a good ferry angle
 - Protect face with crossed arms
 - Consider crawling or sliding into water, especially if shallow and rocky
- Managing holes and drops

Wading

- Safe eddy rule
- Swim instead of fighting for marginal footing
- Water depth, water speed, bottom conditions affect performance
- Maintain balance
- "Look with your toes"
- One person with paddle/prop
- Two person
- Wedge
- Line astern

Boat-based rescue

- Often fastest and easiest technique for boaters, but potentially high risk
- Essential to critically evaluate personal boating skill
- Many uses for boats
- Ferries for people and equipment
- Tool to sprint for help
- Paddle recovery

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- Throw, two paddles in hand, put in your boat
- Boat recovery
 - Bulldozer or shove
 - Set a ferry angle
 - Tow with tether system on rescue PFD
 - Tow with painter or tow line on boat
- Self rescue
 - Hold boat and paddle in one hand when swimming with gear
 - Set a ferry angle
 - Boat stays downstream or to the side of victim
- Swimmer rescues and assists
 - Hand of God rescue
 - Assisting victims back into boats
 - Strengths, limitations and techniques with canoes, kayaks and rafts
 - Stern and bow tows
- Hold 10 to 20 feet of rope on entry (toss downstream)
- Entry ferry angle is key
- Time entry so as to ferry directly to victim
- Avoid hovering
- Speak to victim
 - Splash and back away for self protection
 - Rescuer safety is highest priority
- Turn victim and hold to PFD, or execute cross chest or surf carry
- Rescuer and victim belayed in to shore
 - Vector-puller on shore helpful

Contact Rescues and C-spine control

- Fast, simple, extremely risky
- Very difficult to swim victim to shore
 - Redundant downstream safety is essential
 - Requires fins or near-competitive swimming ability
- Recommended only for unconscious victims where no other option exists
- Maintain in-line c-spine control to the extent possible and bring victim face up
 - Crossed wrist method for fast moving water
 - “Body sandwich” for deep slow moving water

“Live Bait” Rescues

- Higher risk for rescuer, but fast and simple
- Requires rescue swimmer, rescue vest, locking carabiner, throw rope and belayer; vector pullers, backup belayers and landing zone helpers are useful
- Downstream safety is essential
- Victim psychology
 - Normal: able and willing to assist in their own rescue
 - Panicked / aggressive: extremely dangerous
 - Near (or counter) panic: initially nearly unresponsive, then becomes panicked
 - Unresponsive: assume C-spine injury for unconscious victims
- Timing for water entry is key, and takes practice

V-lowers

- Slower, higher risk, more complex
- Requires two belay teams, rescue vest, rescue swimmer, downstream safety,
- Locking carabiner and at least two throw ropes
- Allows direct maneuvering to rescue location
- Hand signals and safety plan



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- One hand waving in air means “help me”
- Point with one or two hands for directional changes
- Arching back to plane to surface
- Hands behind head to help create an air pocket
- Single rope technique for direct lower
- Higher water volumes and deeper water can overwhelm the rescuer
- Very effective as a wading assist
- Provides strong support for rescuer forced to work upstream of significant hazards
- Swiftwater Rescue (Ray)
- River Rescue (Bechdel and Ray)
- Heads Up! (video)
- Whitewater Self Defense (video - Ford, Walbridge and DeCuir)
- River Safety Reports (Walbridge) Whitewater Safety and Rescue (Ferrero) Kayaker’s Toolbox (video – Holt and Dickert) High Angle Rescue Techniques (Vines and Hudson)

Scenarios

- Managing common river problems, including multiple swimmers and loose gear
- Debriefing to reinforce rescue priorities
- Emphasis on what worked and what could be done differently next time.
- Goal is to create appropriate confidence in training and techniques

Conclusion & Wrap Up:

- Group debrief / Individual feedback
- Course limitations
- Importance of First Aid & CPR
- Importance of additional instruction, practice, experience
- Importance of appropriate level of safety & rescue training
- Demo advanced maneuver
- Life sport / Paddling options
- Local paddling groups / Clubs
- Handouts / Reference materials
- ACA Membership forms
- Course evaluation
- Participation cards

Resources

- Whitewater Rescue Manual (Walbridge and Sundmacher)



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