Essentials of River Safety and Rescue

reviewed 05/04/05

COURSE OVERVIEW: This workshop teaches recognition and avoidance of common river hazards, execution of self-rescue techniques, and simple rescues of paddlers in distress. Emphasis is placed both on personal safety and on simple, commonly used skills. Fundamental techniques for dealing with hazards that carry greater risks for both victim and rescuer, such as entrapments, and pins, also are taught. This course is aimed primarily at new boaters, or boaters who do not anticipate paddling in whitewater.

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
- Practice methods for recovering swimmers, and loose boats and equipment

PARTICIPANT QUALIFICATIONS: All paddle craft are welcome. Boaters should be able to competently maneuver their craft in class I rapids. 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 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 and throw rope.

COURSE DURATION: One day (7 – 9 hours)

LOCATION: A deep chute of water with well-defined eddy lines and no immediate hazards or risks below. The site may include moving water or class I rapids. Protected space is needed for on-land work, with adequate shelter for inclement weather.

Successive classes: Swiftwater Rescue, Advanced Swiftwater Rescue

1) Introduction (15 minutes)
- Introductions and expectations
- Class overview
- Waivers and medical forms
- Safety plan, “challenge by choice” approach
- Site logistics (bathrooms, food and drink policies, no controlled substances…)
- ACA overview

2) Rescue Philosophy (30 minutes)
- 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
- Trip Organization
  - lead and sweep
  - know the group, the river and the weather
  - plan the trip and communicate the plan

3) Scene Management (15 minutes)
- 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 structure
- Incident Command structure
  - leader
  - safety
  - rescuer
- Complete the rescue without compounding the situation
- Communication (AW signals)
  - hand and whistle signals
  - cell phone or radio if appropriate

4) Medical Issues (5 minutes)
- 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

5) Equipment (40 minutes)
- 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
    boat, paddle, whistle, throw rope, knife, saw, first aid kit, rescue PFD
- Group rescue gear
    specific needs depend on the river paddled and local weather
- Survival equipment
    specific needs depend on the river paddled and local weather

6) Throw Ropes (45 minutes plus in water practice during swimming and wading drills)
- 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 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

- Figure 8 knot and figure 8 on a bight

7) Water Hazards and Hydrology (20 minutes)
- Rivers are powerful, predictable and persistent
- Subjective vs. objective hazards
  - poor judgement 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

8) Swimming (60 minutes)
- Essential self-rescue tool
- Safe eddy rule, don't try to stand in swift current
- Defensive and aggressive swimming
  - breathing techniques
- Defensive to aggressive transitions
- Crossing eddy lines
- Ferry techniques
- Swiftwater entries
  - modified belly flop; head and feet up, impact on the PFD
  - set ferry angle
  - protect face with crossed arms - swimming with gear
- Handling strainers, holes and drops (discussion)

9) Wading (45 minutes)
- Safe eddy rule
- Swim instead of fighting for marginal footing
- Water depth, water speed, and bottom conditions affect performance
- Maintain balance
- "Look with your toes"
- One person with paddle/prop
- Two person

10) Boat-based rescue (90 minutes)
- Often fastest and easiest technique for boaters, but potentially high risk
- Many uses for boats
- Ferries for people and equipment
- Tool to sprint for help
- Paddle recovery

throw, two paddles in hand, put in your boat
- Boat recovery
    bulldozer or shove
    set a ferry angle
- Self rescue
    hold boat and paddle in one hand when swimming with gear
    set a ferry angle
    boat stays downstream of victim
- Swimmer rescues and assists
    assisting victims back into boats
    strengths and limitations of canoes, kayaks and rafts
    stern and bow tows

11) Pins (20 minutes)
- 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
- 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
- Self rescue
    avoidance, high side to avoid inverting, wiggle off the rock, bail out
- If all participants are safe, waiting for low water may be a viable option

12) Entrapment (30 minutes)
- High risk; hands-on rescue places rescuers near the entrapping object
- Avoid by hazard recognition and appropriate swimming techniques
- Most commonly foot entrapments, strainers, or trapped in a boat
- Keep victim heads up with stabilization line
- Snag line to release foot entrapments

13) Scenarios (60 minutes)
- Managing common river problems, including multiple swimmers and loose gear
- Debriefing to reinforce rescue priorities

14) Closing (10 minutes)
- Opportunities for additional training
- Recommend first aid training
- Continue to practice skills – this is just the beginning!
- Avoiding incidents is far better than reacting to them

Times shown are estimated total teaching times for each part. Instructors and students should expect actual times to vary depending on the site, weather,

number of sessions over which a class is spread, number of switches between on-water and off-water in any given session, and the students' interest, abilities and experience.

Resources

- Whitewater Rescue Manual (Walbridge and Sundmacher)
- Swiftwater Rescue (Ray)
- River Rescue (Bechdel and Ray)
- Heads Up! (video)
- Whitewater Self Defense (video - Ford, Walbridge and DeCuir)
- River Safety Reports (Walbridge)