

**Water Rescue Swiftwater Information Sheets**

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## References:

"Swiftwater Rescue Technician 1, Student Manual, 2<sup>nd</sup> Edition", Rescue 3 International, Elk Grove, CA, 1977

"Swiftwater Rescue Technician Advanced, Student Manual", Rescue 3 International, Elk Grove, CA, 2000

**Information Sheet #1**

TOPIC: NON-ROPE MOVING SHALLOW WATER CROSSING

INTRODUCTION: Basic skills for shallow water crossing in moving water.

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**Determination of Ability to Cross Water**

Depth – Water Level at Life Jacket Will Float a Person

Speed – Velocity of Water Can Push Over / Pin Rescuer

Channel Bottom – Slick or Unstable Bottom

Personnel – Training, Physical Size, Number

Risk – Hazard Assessment of Unsuccessful Attempt

**One Person Crossing Method**

Determine Need and Ability to Cross

Use Paddle or Pole as Brace (Pin Onto Shoulder, Pad as Needed)

Lean Into Brace, Brace is Upstream Of Rescuer

Check That Brace is Stiff and Will Support Weight of Rescuer

Use Brace With Small Profile (Paddle With Blade Upwards)

Move One Point of Contact at a Time – Brace, Leg

Secure / Stabilize Contact Point Before Next Move

Do Not Position Foot Where Entrapment is Imminent If Swept Off Feet

Move Perpendicular to Current

**Line Astern Method - Multiple People In Line Parallel to Current**

Determine Need and Ability to Cross

1<sup>st</sup> Person Uses One Person Crossing Method

2<sup>nd</sup> Person in Line is the Heaviest (Assuming Equal Training for All Rescuers)

Positioned Behind 1<sup>st</sup> Person (1<sup>st</sup> Person Creates Eddy)

2<sup>nd</sup> Person's Job is to Secure 1<sup>st</sup> Person in Position Against Current

Grab 1<sup>st</sup> Person's Life Jacket at Arm Hole, Forearms Flat Against Back

Pull Down on Life Jacket, Press Elbows Down and Forward on Hips

3<sup>rd</sup> and Additional People in Line

Use Same Technique as 2<sup>nd</sup> Person

Less Force Required for Resistance to Current (Larger Eddy)

1<sup>st</sup> Person Leads Movement Perpendicular to Current

2<sup>nd</sup> Person Follows Lead Person Using Lead Person as Brace Point

3<sup>rd</sup> and Additional People in Line Follow by Position in Line

Move One Point of Contact at a Time – Brace, Leg

Secure / Stabilize Contact Point Before Next Move

Do Not Position Foot Where Entrapment is Imminent If Swept Off Feet

When Secure at New Position Call Out Position in Line and "Secure"

**Line Abreast Using a Pole - Multiple People In Line Parallel to Current**

- Determine Need and Ability to Cross
- Everyone Shoulder to Shoulder and Holds Onto Pole
- Brace Person to Front of Line With Upstream Side of Body
- Row of People Move Together
  - Secure / Stabilize Contact Points Before Next Move
  - Do Not Position Foot Where Entrapment is Imminent If Swept Off Feet
  - When Secure at New Position Call Out Position in Line and "Secure"
- Smaller People or Less Trained People Positioned Downstream of First Two

**Triangle of Support Method – Three People Leaning Into Each Other**

- Determine Need and Ability to Cross
- Each of the 3 People Leans into Each Other
  - Heaviest Person Faces Upstream
  - Grab Person on Each Side's Lifejacket At Upper Arm Hole
  - Pull Downwards Securing Self and Other Rescuers
  - Position Head on Left Side Rescuer's Shoulder
- One Person Moves at a Time
  - Secure / Stabilize Contact Point Before Next Person Moves
  - Do Not Position Foot Where Entrapment is Imminent If Swept Off Feet
  - When Secure at New Position Call Out "Secure"

**Information Sheet #2**

TOPIC: CONTINUOUS LOOP SWIFTWATER CROSSING METHOD

INTRODUCTION: Basic skills for shallow water crossing in moving water.

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**Determination of Ability to Cross Water**

Depth – Water Level at Life Jacket Will Float a Person

Speed – Velocity of Water Can Push Over / Pin Rescuer

Channel Bottom – Slick or Unstable Bottom

Personnel – Training, Physical Size, Number

Risk – Hazard Assessment of Unsuccessful Attempt

**Continuous Loop System**

Determine Need and Ability to Cross

Limit of Distance is About 75' (One Throwbag Rope Length)

Setup of System

Tie Up to 3 Throwbags Together

Tie Loop In System For 3<sup>rd</sup> Person Crossing

Position 3 People at Corners of Triangle to Be Formed With Rope

1<sup>st</sup> Person Positioned Upstream On Near Bank

2<sup>nd</sup> Person Positioned Downstream On Near Bank

3<sup>rd</sup> Person Position Will Be Midway Between 1<sup>st</sup> and 2<sup>nd</sup> (Far Side)

3<sup>rd</sup> Person Goes to Far Side Water (Swim, or Has Line Thrown)

For Swim or Using Non-Rope Moving Shallow Water Crossing

Attach Line to Back of Lifejacket (Live Bait Only)

1<sup>st</sup> Person Belays Crossing (No Body Belay)

2<sup>nd</sup> Person Pulls 3<sup>rd</sup> Person Into Shore After Fall As Needed

Once all People in Place

Everyone Holds Rope in Front of Body (No Body Belay)

Use of System – Rescuers Can Move Up / Down Bank As Needed

Tie / Position Loop in System for Person Crossing

Person Crossing Starts at 1<sup>st</sup> Position

Holds onto Loop, Rope Moves Through Rescuer Hands

1<sup>st</sup> Rescuer Lets Out Line as 3<sup>rd</sup> Pulls in Line

2<sup>nd</sup> Rescuer Feeds Line Out to 1<sup>st</sup> Upstream

Person Moves Across and Downstream to 3<sup>rd</sup> Person

For Person Crossing Returning to Near Bank

Holds onto Loop, Rope Moves Through Rescuer Hands

3<sup>rd</sup> Rescuer Lets Out Line as 2<sup>nd</sup> Pulls in Line

1<sup>st</sup> Rescuer Feeds Line Out to 3<sup>rd</sup> Downstream

Person Moves Across and Downstream to 2<sup>nd</sup> Person

**Information Sheet #3**

TOPIC: TENSIONED DIAGONAL TRAVERSE SYSTEM "ZIP LINE"

INTRODUCTION: Basic techniques for setup and use of a tensioned diagonal.

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**Determination of Ability to Cross Water or Need of System as Safety Backup**

Depth – Water Level Deep Enough for Person to Clear Obstacles

Speed – Velocity of Water Can Pin Rescuer / Loose Grip on System

Channel Bottom – Projections Sticking Up From Bottom

Personnel – Training, Physical Strength / Condition, Number

Risk – Hazard Assessment of Unsuccessful Attempt

**Setup of System**

Establish Communications and Access Across Water

Rope Across Water – Throw, Shoot, Ferry, Swim

Select Mid Point of Rope if Critical (i.e. Access to Point at Center of River)

Account for Bend in Rope Due to Person + Current If Needed

Select or Create Anchor Point(s) on Either Bank

Rescuers or Equipment Will Move From Upstream Side of Line

Angle of Rope To Current At Least 45 Degrees

Rope Will Be Above Water When Tensioned

Solid Anchor Points Are Required (Able to Withstand >4,000 lb Load)

Preferred Anchors Not Directly On Edge or In Moving Water

Preferred Open Area for Tensioning of System (Mechanical Advantage)

Attach Anchor Hardware to Anchor Points

Consider Possible Need to Release System With Load Stuck on Line

Anchor Rope on One End (End of Rope Which Will Not Be Tensioned From)

Tension Rope on Other Side (Standard Rope Mechanical Advantage System)

**Use of System**

Start At Upstream Section of System

Attach Rescuer or Floating Load to System (Carabiner With Webbing Strap)

For Webbing Strap Held By Rescuer (Facing Downstream Below Rope)

Hold Strap Under Arm That's Opposite the Direction of Travel

Pull Strap Across Chest and Hold Secure

For Use With Live Bait Life Jacket

Attach to Rear Hook Point of Life Jacket (Carabiner)

Test Release Capability of Life Jacket On Shore (No Binding)

For Use With Floating Load

Secure Load to Webbing Strap (Position Load to Stay Nose Up)

Step Out Into Current and Let Current Pull Across to Far Bank

Feet Upwards in Defensive Swim Posture, Release If Stuck Midways

If Rescuer Stuck and Unable to Self – Release, Release Anchor System

**Information Sheet #4**

TOPIC: TWO AND FOUR POINT TETHERED BOAT AND ROPE SYSTEM

INTRODUCTION: Basic boat and rope system used in current.

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**Determination of Ability to Use System**

Depth – Water Level Deep Enough for Boat / Lines to Clear Obstacles

Speed – Velocity of Water (Up to Class III and Speed < 8 ft/sec)

Channel Bottom – Clear Path From Projections Sticking Up From Bottom

Personnel – Training, Physical Strength / Condition, Number

Bank Access – Width < 250 ft and Open Space on Both Sides of Bank

Equipment – Inflatable Boat (Lightweight) and Rope Equipment

Risk – Hazard Assessment of Unsuccessful Attempt

**General Cautions / Operations**

Rescuer(s) or Equipment in Aft Part of Boat – Keep Bow From Submerging  
Never Let Boat Get Sideways In Current (Do Not Use At a Bend in the River)

Watch Water Level in Boat – May Need to Bail Out

Use Ferry Angles To Help Move Boat When Able

**Setup**

Get Line Across River – Throw, Shoot, Ferry, Swim

Attach Two Lines to Bow of Boat – One From Each Bank (Near and Far Banks)

Have Extra Line On Bow Lines – Easier to Let Out Line to Position Boat

Secure Rope To Anchor With Raising / Lowering System as Needed

System Will Form V With Boat Pushed Downstream By Current

Try to Keep Lines Out of Water – Especially Fast Moving Water

4 Point Tether – Setup When Need to Secure Rear of Boat

Possible Suction of Boat into Hole or Low Head Dam

Slow Moving Current and Can't Position Boat Well

Determine and Brief Course of Actions Before Starting Operations

**Operations**

Rescuer in Boat or Spotter Directs Movement of Boat

Use Whistle Blasts and / or Signals – Use Clear Signals

Point Left / Right or Point Upstream / Downstream

Approach Object / Target from Downstream Side If Able To

Use Caution When Adding / Moving Loads In Boat – Don't Submerge Bow

Person in Boat Watches for Shallow Water Hazards – Branches, ...

**End of System** – Breakdown Operations on Far Side

If Needed For Last Person Attach Tag Line to Rear of Boat (Near Bank Side)

Last Person Gathers All Far Bank Equipment and Self Into Boat – Pull Across

**Information Sheet #5**

TOPIC: SWIMMING LINE ACROSS CURRENT

INTRODUCTION: Basic method for swimming a line to far bank of river.

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**Determination of Ability to Use System**

Depth – Water Level Deep Enough for Person and Rope to Clear Obstacles

Speed – Acceptable Velocity of Water for Swimmer

Channel Bottom – Clear Path From Projections Sticking Up From Bottom

Personnel – Training, Physical Strength / Condition, Swimming Ability

Bank Access – Able to Safely Enter / Exit Water, Also Area for Feeding Rope

Risk – Hazard Assessment of Unsuccessful Attempt

**Setup**

If Needed – Additional Swimmer Go First - Help Rope Swimmer Out of Water

Attach Line to Rear Ring of Swimmer's Lifejacket (Live Bait Jacket)

Test Line Release Buckle of Lifejacket on Bank

Reattach Belt and Ring of Lifejacket After Successful Test

Give Clear Instructions on Operations After Swimmer Reaches Far Shore

Projected Extraction Point(s) on Far Bank

Possible Midpoint Crossing Decision Point(s) – Abort Attempt Limits

Pull Swimmer Back (Swing Back to Near Bank)

Based on Downstream Hazards / Conditions

Location Rope Will Be Needed After Successful Swim

Belayer Checks for Appropriate Amount of Rope Free and Available

**Operations**

Swimmer Enters Water – Offensive Swim to Far Bank

Use Ferry Angle – 45 Deg To Current, Head Upstream

Pace Self and Check Direction, Location As Needed

Belayer Lets Out Line

Move Downstream As Line Lets Out to Relieve Drag on Swimmer

Maintains Slack on Line

Be Prepared to Pull / Swing Swimmer Back to Near Bank If Needed

When Swimmer Reaches Far Bank

Belayer Continues to Feed Slack – Don't Pull Swimmer Back Into Water

Swimmer Exits Water and Secures Rope on Far Side

Belayer Holds Rope Out of Water As Able to Reduce Drag on Rope

Position Rope to Needed Location

**Information Sheet #6**

TOPIC: GUIDELINES FOR SELF-RESCUE AND SURVIVAL SWIMMING IN SWIFT WATER

INTRODUCTION: Rescuer techniques to swim in swift water conditions.

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Use Fins As Able to Or Needed

Lif jackets, Wet Suit and Some Dry Suits Provide Some Blunt Trauma Protection

Use Ferry Angles and Combination of Offensive / Defensive Swim to Avoid Hazards

Body At 45 deg Angle To Current, Head Points Toward Dir. of Travel

**Self-Rescue** – 1<sup>st</sup> Priority: Get to Safe Area (Signal Team “OK” or “Help” As Able)

Boat – Self Extraction Into Boat (Flip As Needed) or Pickup by Boat Crew

Avoid Downstream Side of Boat (Pinned By Boat Against Object)

Bank – Swim or Float to Shore or Safe Area (Enter at Eddy When in Current)

Pick Exit Point At Bank for Ability to Exit Water

Avoid / Mitigate Hazards While Going to Safe Location

Survival Swimming Techniques for Long Term Water Exposure

Defensive Swimming Techniques for Floating With Current

Offensive Swimming Techniques for Movement in Relation to Current

**Survival Swimming** – Refer to Guidelines for Survival Swimming and Self Rescue

**Defensive Swimming** – Basic Swimming Position for Swift Water

Face Up, Head Positioned Upstream, Feet Positioned Downstream

Use Hands to Move Body and Position Body in Current

If Wearing Fins, Flattening Out Feet and Allows Blades to Rise to the Surface

Heel Slightly Lower Than Buttocks Hold Feet Up (Avoid Foot Entrapment)

Flatten Out to Slide Over Shallow Rocks or Use Feet to Fend Off Rocks

Backstroke to Propel Self As Needed

Use Defensive Swimming Pass Through Hazardous Areas As Able

Avoid Blunt Trauma to Face, Groin, Thighs, Knees

**Offensive Swimming** – Provides More Power and Speed for Water Movement

Face Down, Head First in Direction of Swim

Freestyle or Crawl Stroke While Kicking With Feet

Use Offensive Swimming To:

Enter / Leave Eddies

Approach a Strainer

Use a Rescue Board

Swim a Line Across the River

Move Quickly Across Current

Move Sideways in Large Wave Trains

Chase a Victim Who Is Downstream

**Information Sheet #6**

TOPIC: GUIDELINES FOR APPLICATION OF ROPE RESCUE TECHNIQUES IN THE SWIFTWATER ENVIRONMENT

INTRODUCTION: Techniques for rope work in swift water conditions.

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Use standard rope systems as baseline for swiftwater techniques. Increased loading potential of moving water and personal safety issue include the following considerations.

**Support / Safety Issues**

- Assign Upstream Spotter
- Assign Downstream Safety As Needed
- Create and Brief Contingency Plan (Include Need for Cutting Rope)
- Watch Footing Around Water's Edge

**General Operations**

- Use Lowest Risk Method for Getting Rope Across Water as Able
- Do Not Tie Rescuer Directly to Rope
  - May Use Releasable Live Bait Jacket
- Stay Out of Water as Able (Especially Moving Water)
- Use Change of Direction to Provide Safe Working Area

**Changes Due to Increased Loading of Rope Systems**

- Anticipate Loading of Rope from Force of Water
- Keep Tensioned Rope and Equipment Out of Water
  - Use Anchors Further from Water as Needed
  - Hold Rope Out of Water As Able
- Test Anchor(s) and Re-Check After Rope is Loaded
  - Use Multiple Anchor Points and Backups as Needed
  - Anticipate Failure of Anchor Point
- Use Double Prusiks Knots for Wet Ropes
- No Personnel in Hazard Area of Bight in Rope
- Destroy Rope Compromised by Excessive Loading from Water Force