

River Safety/River Rescue Theory

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RESCUE THEORY:

Objective = SAFE, efficient rescue

S.A.P.

STOP (Gather knowledge)

ASSESS

PLAN

Consider:

1. Safety of the rescuer
2. Safety of the victim and other people
3. Gear

Simple is the best. The more complicated the process, the more chance of chaos.

STAGES OF PANIC

1. Anxiety. Ask if they are OK? "Victim" responds to their name, questions etc.
2. Fear – becoming irrational
3. Unresponsive, complete panic. DANGEROUS to rescuer. See: "strong swimmer rescue" and stage 3 panic.
4. Catatonic. eg. floats face down in water.

FIRST AID:

A.B.C.

Airways (check for blockages. Tilt head back)

Breathing (check with hand on diaphragm)

Circulation (stop bleeding)

1 Person CPR:

- 15 pumps
- 2 breaths

2 Person CPR:

- 5 pumps
- 1 breaths
- check pulse after 10 circuits
- check circulation thoroughly, as it is possible to stop heart with CPR if it is already beating
- Position for hands: Locate Xiphoid process, measure 2 finger-widths up, then place heel of palm for pumping action

RESCUE KIT:

- Buoyancy Aid: min of 6.2kg flotation. Note, the flotation deteriorates in UV light
 - Good fit, is number one priority
 - no knife on buoyancy aid. Gets in the way. Rambo image
 - cows-tail (not too long for efficient towing, put loops in to shorten)
 - check cows-tail will detach from lifejacket, prior to it being used. i.e practice run
 - Ensure have decent size toggle on quick release (eg. size of squash ball, for easy location).
- Whistle
- Slings x 2 min per person. 2- 3 person.
 - Simple slings not knotted into loops are more versatile.
 - Put simple loop in each end for karabiner attachment
- Prusik x 2. 1 x long, 1 x short
- Karabiners
 - Minimum per person = 1 x screw-gate, plus Snap-gate karabiner on B.A. towline. Often also have snap gate on throw-bag (=3 total)
 - Check karabiners regularly for cracks
 - Never drop on concrete or rocks.
- 20m throw-bag x 10mm polypropylene
 - bright colour
 - check knots in bottom of throw-bag (not going to break carry bag under pressure)
 - Have a grab loop on bottom of bag that is smaller than comfortable hand hold (swimmer should be holding rope, not bag, where hand could get caught, twisted and hard to extract).
 - in good condition (not frayed)

RESCUE TYPES:

Boat Rescues:

Barrel Roll

- Bang on bottom of boat first (communicate with person being rescued)
- Throw own paddle in between boats
- Leverage is key – lean far over their boat
- Rescuer should be directly opposite the weight
- Push and pull with arms on edge of cockpit
- Hold life jacket of rescued paddler
- Ask “Are you OK?”
- Paddler being rescued must lean forward when upside down

Paddle Barrel Roll

- Requires a more competent victim
- Rescuer does low brace with paddle across both boats
- Far hand is used to place victim’s hand on paddle
- Victim uses paddle to flick themselves up.
- Practice with victim ensuring their head comes up last, else they are likely to hit head on paddle

T Rescue

- Victim bangs on bottom of boat for attention
- Runs hands up and down boat sides, feeling for rescuers boat.
- Hands must be vertical, (palms out) else injury from rescuer’s boat nose is likely
- Rescuer places own boat nose, FORWARD of cockpit
- Victim to practice move, with head coming up LAST.

Piggybacking Boats

- Boats placed nose to tail,
- Rescuer clips short cow-tail to other boat front grab loop (long cow-tail, makes this exercise harder as boat drifts away)
- Victim must hold tight to keep boats locked together.
- Tell victim of instructions: “Lean on”, “Lean Away”, “Flat” for doing eddy turns.
- Voice instructions well before you would normally expect – the combined boat length is much longer, so eddy turns must be initiated much sooner than usual.

Boat/Swimmer rescues:

Boat to Boat rescue:

- Get swimmer to hold on to front of your boat.
- Drag swimmers boat up on to yours by the nose.
- Rock backwards and forwards to empty out water
- Place boat back into water beside yours with tail to your nose
- Get swimmer in between two boats
- Rescuer braces swimmers boat
- Get swimmer to push off both boats and slide legs in first.
- Swimmer holding onto cockpit rims helps

Unconscious victim:

- Attach karabiner on towline to near side of victim’s Buoyancy Aid (else get dragged face down in water)

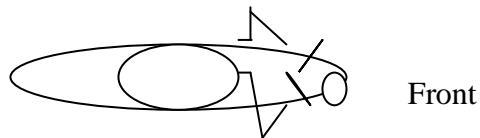
- Priority – get them to side of river ASAP! THEN first aid
- N.B. Ensure any Buoyancy aid tows have been practiced – i.e. releases easily, and has been practiced while rescuer upside down underwater.

Back Deck Carry:

- Victim climbs on back of boat
- Puts arms around rescuers waist, spreads legs for stability
- Rescuer advises victim they MUST get off boat when told to.
- Rescuer uses LOW brace

Front Deck Carry:

- Victim lays in water at front of boat
- Wraps legs and arms around boat, with feet on the deck
- Boat nose MUST be in front of victim's head. Otherwise you will break victim's neck if the boat hits a rock.



Strong Swimmer Rescue:

- Need 2 people as an anchor
- 2nd person holds buoyancy aid of person in front
- Attach throw-bag to cow-tail of rescue swimmer
- Timing essential – better to swim down onto the victim, than to jump in too early
- Rescuer takes hold of victim's life jacket from behind, holds at arms length
- Anchor's on riverbank pendulum them onto bank (take note of exit position – i.e. safety of exit position – strainers etc)
- Problems – victim trying to swim against the current; getting tangled in the rope. or in Stage 3 Panic
- STAGE 3 PANIC. If strong swimmer reaches victim in this state, they are likely to climb all over rescuer, putting them at risk. Options: Splash water in their face, or if they have already grabbed you, dive underwater – they generally let go when flotation device (you) disappears.
- Consider: - 2 people in water, increases the chance of the situation worsening!
- Ensure release kit works on your cow-tail in practice sessions.

THROWBAGGING:

- Minimum of 20m rope
- Put rope behind waist, end in non-throwing hand, bag in other
- Draw out a length of rope to aid swing
- Yell/whistle to attract victim's attention
- Aim for rope to land in front of swimmer in current, not behind
- Underhand throw
- Aim BEYOND person (improves trajectory and rope goes further)
- Throw at approx 45° angle upstream
- Yell instructions “swim to the rope, pull it to your chest, HOLD ON”

- Rescuer drops immediately to the ground for anchorage
- Then pendulums victim to river bank
- Landing spot of victim – avoid snags, undercuts. i.e plan where you will ferry glide them to beforehand
- Victim puts throw-rope over FAR shoulder from rescuer, to assist ferry glide.

FOOT ENTRAPMENT:

- Speed essential (victim gets cold and tired quickly, struggling against the water)
- Stabilise upper body first
- Get rope across river in front of victim’s chest, to support their body
- Get 2nd rope across river (may need 2 throw-bags tied together with stones in the bag to weight it down)
- 2nd throw-bag is levered down the person’s body, as low as possible – to ankle level
- 2 people, on either side of bank, then move directly upstream at as high an angle as possible.
- This should dislodge foot
- Have back-up safety plan for getting released victim to side of river (exhausted, may need help)

V-LOWERS

- Used to lower a person attached to rope to rescue boat or person in centre of river
- Throw rope fed through rescuers Karabiner on cow-tail of B.A.
- Rope end with bag thrown to other side of river, while non-bag end held
- Best if have 2 people on each side of river to act as solid anchor (2nd person holds B.A. of person in front with rope)
- Rescuer enters current, floats on back with feet up.
- Rescuer instructs “right”, “left” for persons on river right and left respectively to let out more rope. Such a motion results in a V shape with rescuer in centre. able to be lowered more left, or right, to desired position in the river.
- Essential that cow-tail release mechanism has been tested

RIVER CROSSINGS:

1. Gather knowledge first, before making a decision
 1. Depth
 2. Speed of current
 3. Clarity (storms, flooding, potential hidden snags which you can’t see)
 4. Riverbed – uneven, boulder-strewn, slippery surface
 5. Run-out: safe i.e. a pool, or a rapid
 6. Obstacles/aids (e.g. eddies)
 7. Where to cross if were to decide to – i.e. shallow braid Vs deep pool
 8. Back-up plan if you fall in. i.e. swim to other side or back to start
2. Only after info gathering, ask: is it safe to cross? Important not to ask this question first as it will prejudice info gathering.

Mutual Assistance River Crossings:

- a. Link arms in a row. Hands must be clasped to your neighbour. Put most sure-footed person nearest to top of current, not necessarily the biggest or strongest person

- b. Triangle: More stable arrangement.
- Ascertain entry/exit point
- Use current – move downstream, don't fight it.
- i.e. angle downstream across current

ROPE WORK:

KNOTS:

1. Tape knot (joins to bits or ends of tape)
2. Figure Eight (double around ends, with a bite)
3. Figure of eight on the Trace (rewoven. single piece of rope looped around something e.g. a tree or rock)
4. Italian Hitch (moves when rope pulled on)
5. Clove Hitch (doesn't move)

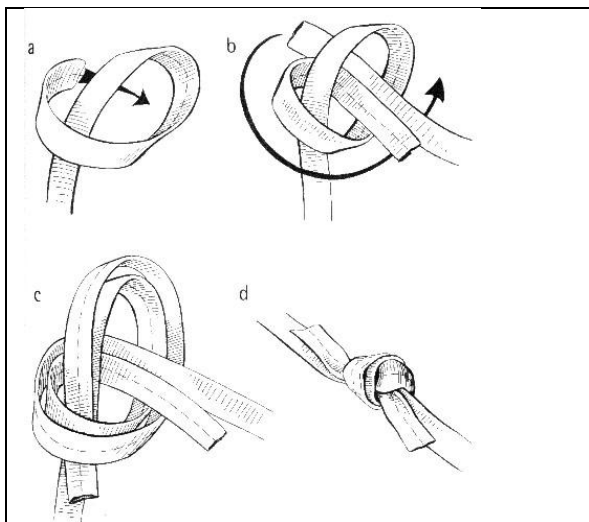


Fig. 6-8. Water knot (also known as ring bend knot)

Tape knot (joins to bits or ends of tape)

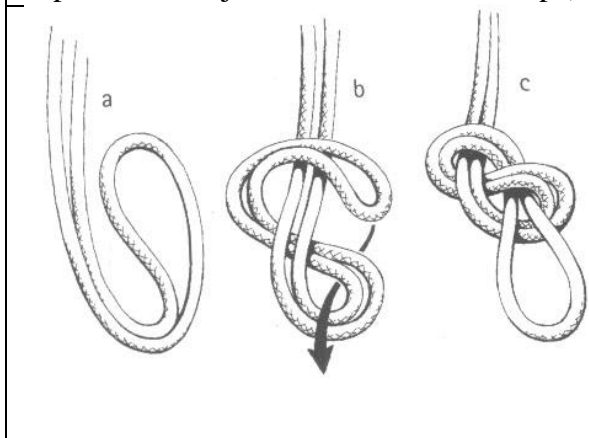


Fig. 6-12. Figure-8 loop

Figure Eight (double around ends, with a bite)

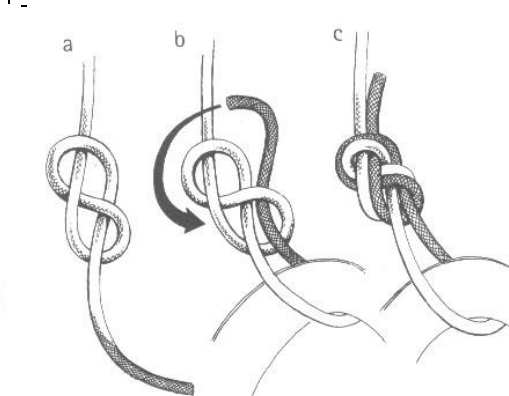
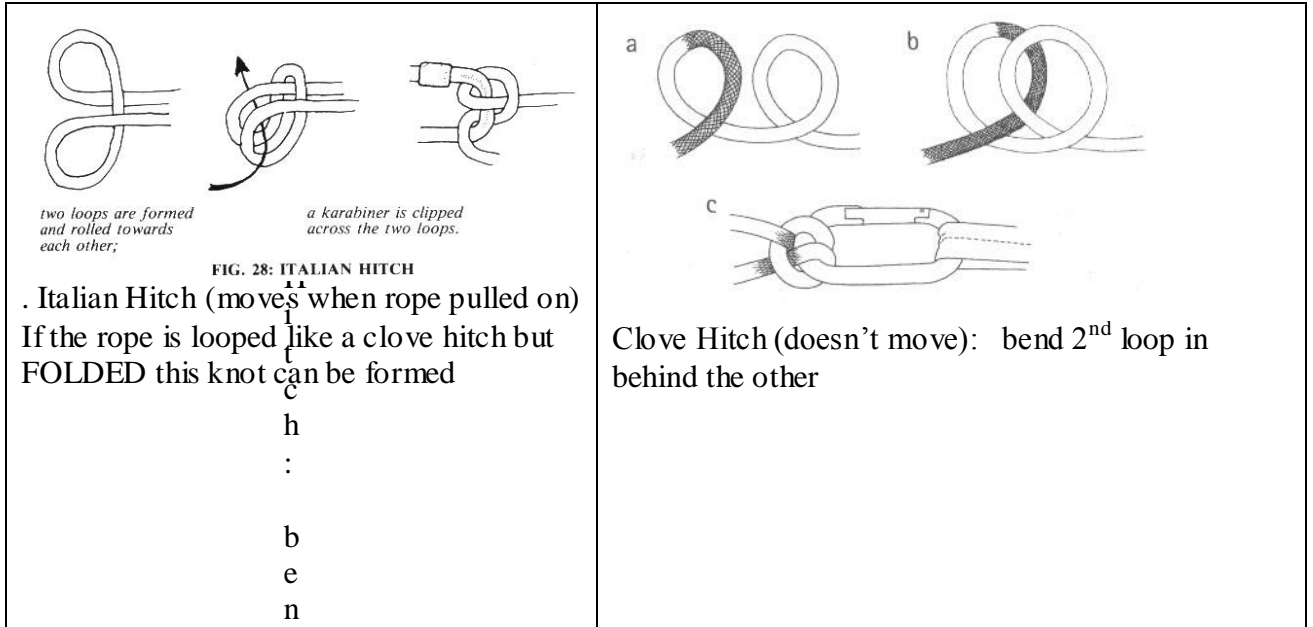


Fig. 6-13. Rewoven figure-8

Figure of eight on the Trace (rewoven. single piece of rope looped around something e.g. a tree or rock)



d
2 loops together and fold

6. Making a Prusik knot (fisherman's knot)(basically joins to ends of thin rope into a secure loop)

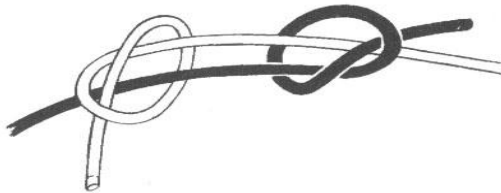


Fig. 6-10. Fisherman's knot

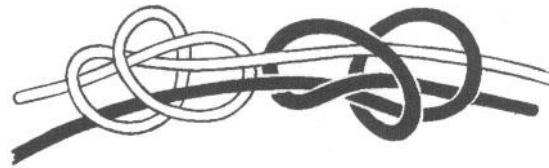
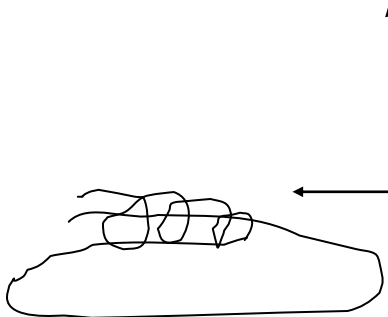


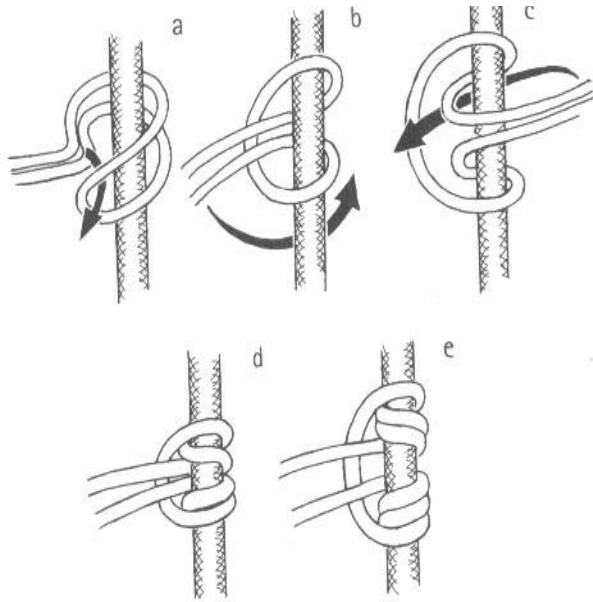
Fig. 6-11. Double fisherman's knot



Take end of rope, wrap it around 3 x, then reverse and wrap it around the other rope end, following previous rope turns. Make knot neat, and shift end knots together

Classic Prusik

- Used to join 2 ropes together or attach larger rope to karabiner
- Wrap the loop around the larger rope with loop wrapped toward object being clipped



Klemheist: Long loop is in direction of pull, short loop is toward object you are pulling (or the anchor if belaying)

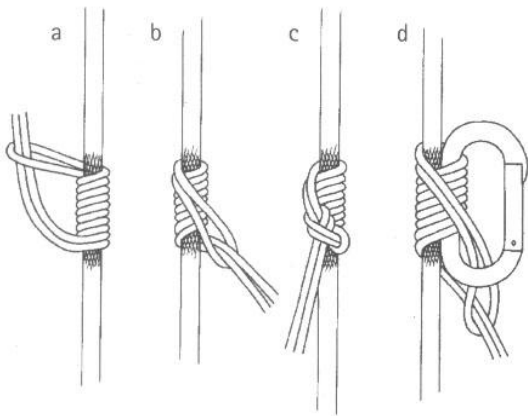


Fig. 6-26. Klemheist knot: a and b, winding and threading the basic Klemheist; c, Klemheist tied off; d, Klemheist tied around a carabiner.

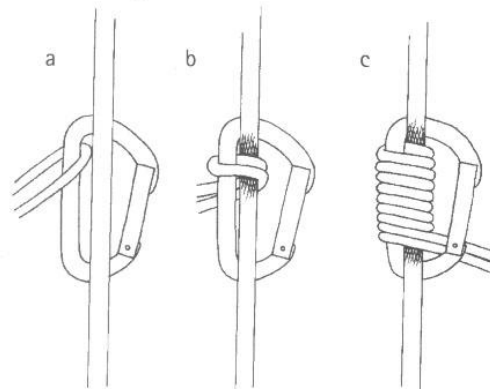


Fig. 6-25. Bachmann knot

Bachman Knot. Good for Z-drags, as it does not need tending

ANCHOR SYSTEMS:

1. Anchor (tree or rock)
2. Anchor point (karabiner on sling around the rock)

Slings:

1. Sling with tape knot
2. Sling with loop each end

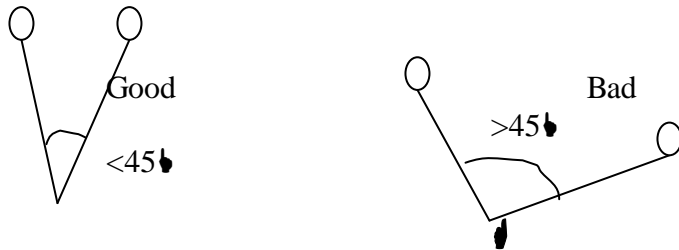


Single Anchor System:

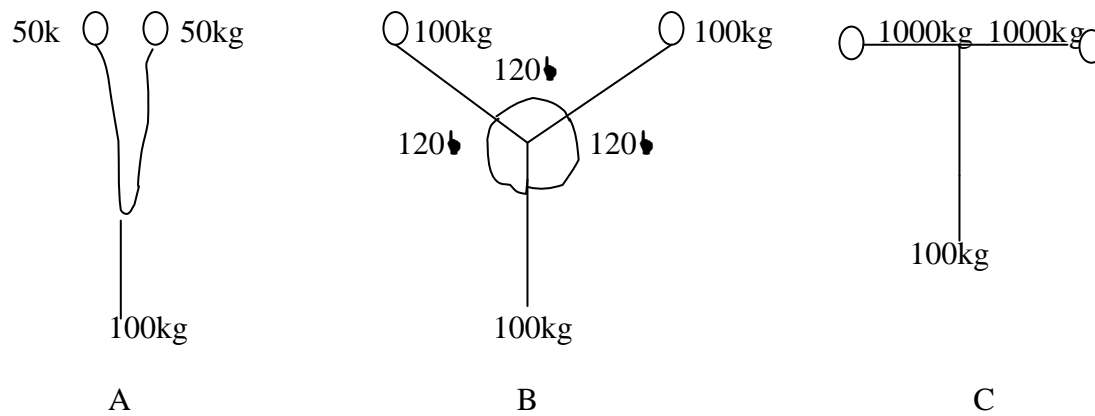
- Simple
- Quick
- 1 sling, 1 karabiner
- No back-up

Multiple Anchor System:

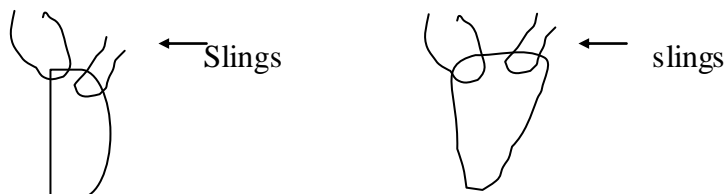
- safer, as back-up in case one anchor system fails
- Use anchor points with less than 45° between points
- Ideal set-up is one which spreads load over low angle
- EQUALISE load on each anchor point Hold tape in place with one hand while tying knot to ensure points do not become unbalanced
- ISOLATE each anchor point by using Figure of Eight knot.
- Is OK to put multiple anchors on same major anchor point (if MAJOR)



Spreading of Load:

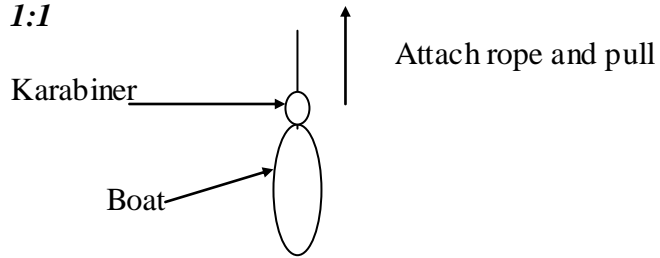


- (A) Is ideal set-up as it spreads load over low angle
- (A) Set-up can also be used for a vector pull – ie 2 ends moved away from each other to end in position (C), to move a lodged object (such as a boat)
- With D-Karabiner, put weight on long axis, i.e so sling loops are in narrow angle of the karabiner:

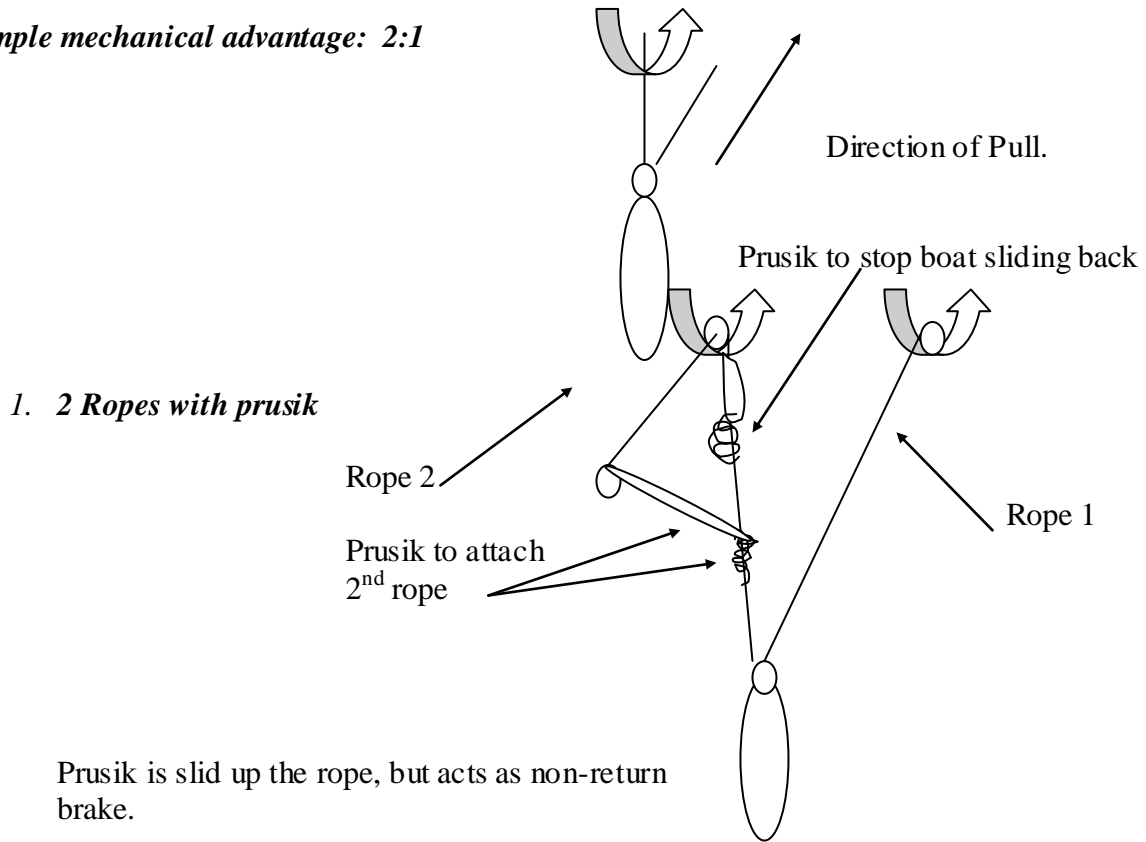


Methods of Boat extraction:

Simple: 1:1



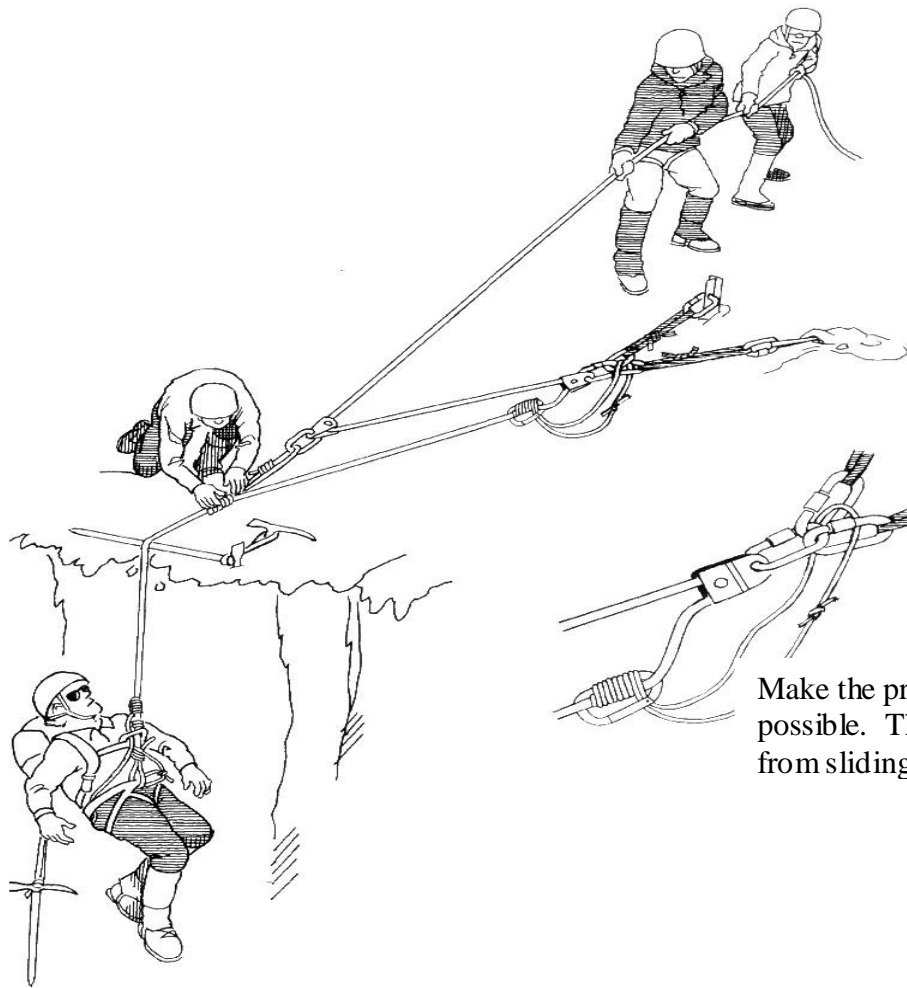
Simple mechanical advantage: 2:1



1. 2 Ropes with prusik

Prusik is slid up the rope, but acts as non-return brake.

2. Z Drag or 3:1 (Fix end of rope to object first)



Make the prusik as short as possible. This stops load from sliding back down.

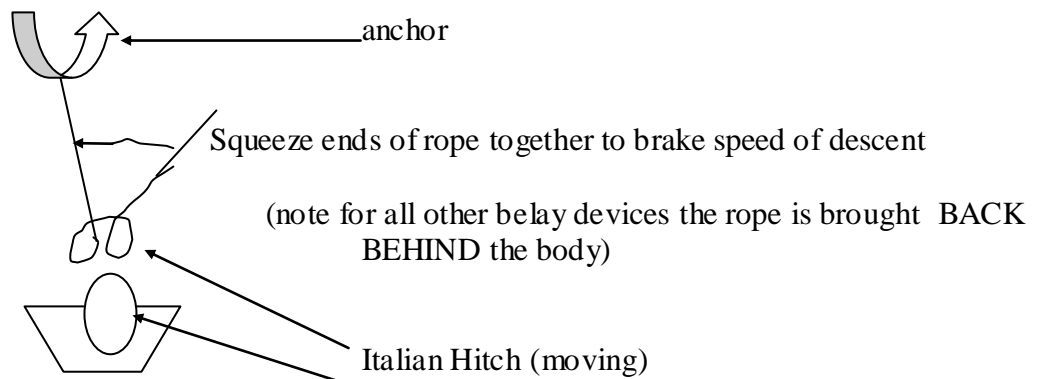
Fig. 14-23. Raising a climber with the Z-pulley (Bachmann friction knot shown)

6:1: Piggyback system possible

Is a 3:1 attached to a 2:1 separate rope (to object and back)

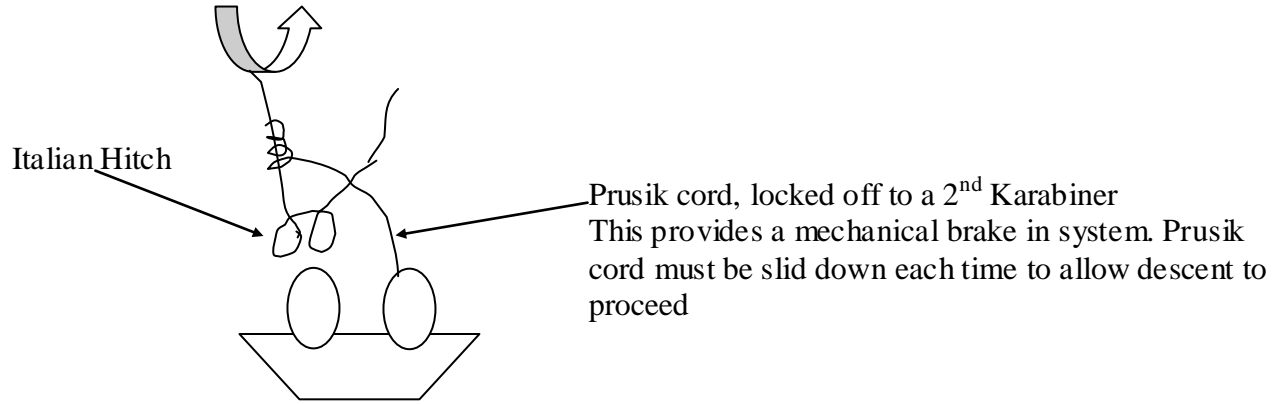
BELAY SYSTEM:

- Basic, no safety back-up: Using Italian Hitch



Karabiner
Harness

OR with extra brake in system: (Auto Block)



N.B. Can use long sling as makeshift harness. Put around bottom and legs, clamp ends all together in front with karabiner.