Chapter 3:
Rope Rescues [1]

Rope rescues rely on ropes and throw bags as an integral part of the swiftwater rescue. These rescues are divided into throw bag, shore based rope rescues, swimming based rope rescues, and cinches. Some of the rescues are fairly simple and other can be quite complex in their setup.

Swiftwater rope rescues have evolved considerably since the 1970s. Initially, they cloned climbing techniques such as the Tefler Lower which was used to lower rescuers and/or litter to a rescue site. Many of these techniques were equipment and personnel intensive. They were oriented to a rescue squad rather than group of paddlers paddling down a river. Paddlers tend to be minimalists who travel mean and lean. Typically, a paddler will carry a throw bag, two or three carabiners, a knife, and perhaps a carabiner pulley. On a trip of five people, multiply the above items by four, assuming one of the paddlers is the victim. It supports the following dictum. "***All the resources you bring with you are all the resources you will have for a rescue***."

Throw Bags

Throw bags come in many sizes and shapes. One of the main determinants for selecting a throw bag is to ask yourself the following question. "***Will you take it with you at all times?***" If you don't have it with you, you can't use it. The bag may be one like the author's pictured in Figure 3.1, a hip belt, or a small hand bag. Regardless, the first and most important rule is that the throw bag is of no use if it isn't with you.

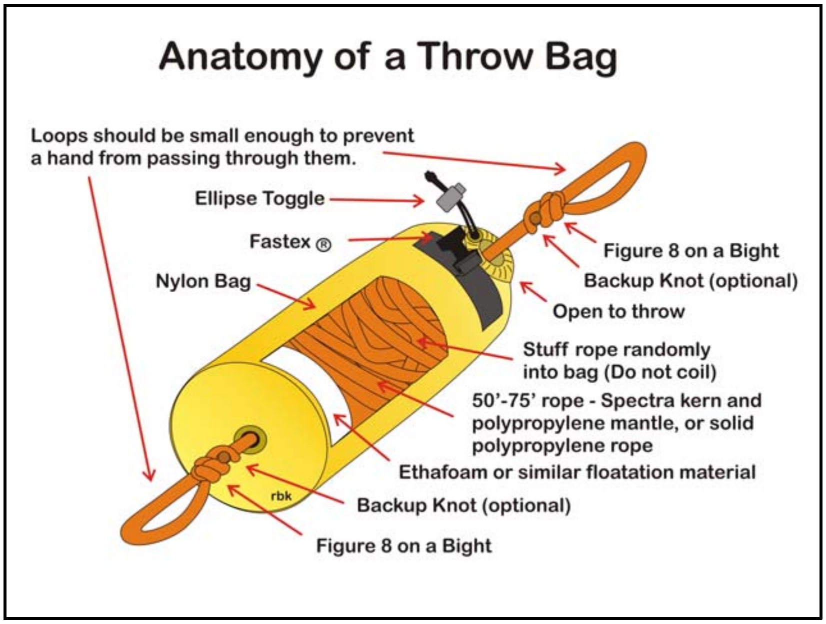

Figure 3.1: Anatomy of a Throw Bag – Caption: Throw bags come in may sizes and shapes. The bag diagramed is a typical bag used by the author. Remember to choose a bag that you will carry with you. Source: Author – [file: \BAG-AnatomyThrowbag.cdr]

__Anatomy of a Throw Bag__ (Figure 3.1) – The design of a throw bag is relatively straightforward. The rope is stored in the bag. One end is knotted and passes out the bottom end of the bag into a loop. The other end of the rope passes out the opening in the top of the bag. When the bag is thrown, the rope in the bag feeds out through the opening in the bag. The following sections discuss the items identified in Figure 3.1.

[1] This chapter was written by Robert B. Kauffman who is solely responsible for its content. This chapter is copyrighted © Robert B. Kauffman, 2017.

Loops – Two loops are pictured in Figure 3.1, one at each end of the rope. On some bags, the loop on the bag end is built into the bag. It is important that the ***loops should be small enough so that a hand cannot pass through it***. This may require retying the loops since some commercial brands have loops that are too big. Carabiners (not shown) can be used to fasten the loop and bag to the boat. It is important to disconnect the bag end carabiner before throwing the bag. It is one thing to be hit by a soft bag and another thing to get hit by a carabiner.

An important sidebar. Many swiftwater rescuers incorrectly connect the throw bag directly to their life jacket with a carabiner. To do so is to create a potential hazard that can ensnare the rescuer. The throw bag can be fastened directly to the release belt on a rescue vest with a carabiner since the rescuer can potentially extricate himself from the bag if it becomes ensnared.

Figure Eight on a Bight – Create the loop by tying a figure eight on a bight. It is one of the few knots that doesn't need to be backed up. If you feel more comfortable backup the knot.

Nylon Throw Bag – Most bags are constructed out of nylon. The purpose of the bag is several fold. First, it protects the rope from ultraviolet radiation, dirt and abrasion. Second, the bag can be partially filled with water for a second throw. Some bags have open webbing partially exposing the rope in the bag. These bags expose the rope and make a second throw with a partially filled bag difficult. Third, UV light breaks down nylon and changes the color of nylon to white. This provides a visual check of the fabric.

Ethafoam – To aid the throw bag floating in the water, most throw bags include an ethafoam or similar closed cell foam as part of the throw bag construction.

Ellipse Toggle – To use the throw bag, the opening needs to be expanded. When not being used the opening is cinched down to prevent the rope from exiting the throw bag. There are numerous ways to accomplish this function. In the diagram pictured in Figure 3.1, the ellipse toggle is used to cinch down on the cord which closes off the opening above the knot. It is a relatively primitive but effective method. Other throw bags will utilize a Fastex ® closure system where the handle of the throw bag passes through the loop of the rope going into the throw bag and the closure is snapped together with a Fastex ® connector. To throw, unclip the Fastex ® and grab the loop end of the rope in one hand and throw the throw bag.

Throw Bag Rope – Rope types are covered in the following section. Generally, throw bags hold 50-75 feet of rope. Hip belts may hold less.

River Knife – This is a discussion of whether to carry a river knife. It is not a discussion of what that knife should be. As a general rule, if you are working with and around ropes, you should have a knife. It is included in this section because throw bags are ropes and rescuers can become entangled in them.

Throw Bag Summary – Throw bags come in many different sizes and shapes. The throw bag pictured in Figure 3.1 is one example of a throw bag. Choose a throw bag which you will carry with you at all times. If this means a small bag with a small diameter rope, it is a better option than not taking a larger throw bag that you won't carry with you. Next, you should feel comfortable using the bag. Throw it. Stuff it. This is an empirical test.

The key to stuffing the throw bag is to randomly stuff the rope into the bag. DO NOT COIL THE ROPE, it will only become entangled. There have been numerous tests performed and randomly stuffing the rope into the bag results in the least chance or the rope becoming entangled when the bag is thrown.

<u>Types of Ropes</u> (Figure 3.2) – Generally, two types of ropes are used in swiftwater rescues. These are braided and static kernmantle ropes. Static kernmantle is preferred. The following discussion is excerpted from Smith and Padgett's (1996) discussion of rope construction in *On Rope*. They have a more thorough discussion of ropes and the testing process in their book. Although their focus is on climbing, it is equally adaptable to swiftwater rescue situations.

Braided Rope – Smith and Padgett's (1996) note that there are several types of braided rope construction. A significant disadvantage of braided construction is that the braiding process exposes the yarn to abrasion when it is on the outside surface of the rope. This can significantly reduce the strength of the rope.

Kernmantle Construction – Kernmantle construction consists of two parts, the kern and the mantle. In general, kernmantle construction is preferred over braided ropes because the mantle protects the kern. The mantle is the outer sheathing of woven material. In general, it provides little strength to the overall strength of the rope. Also, the mantle and kern can be constructed from different materials. The kern may be constructed from high strength Spectra and the mantle may be constructed from polypropylene.

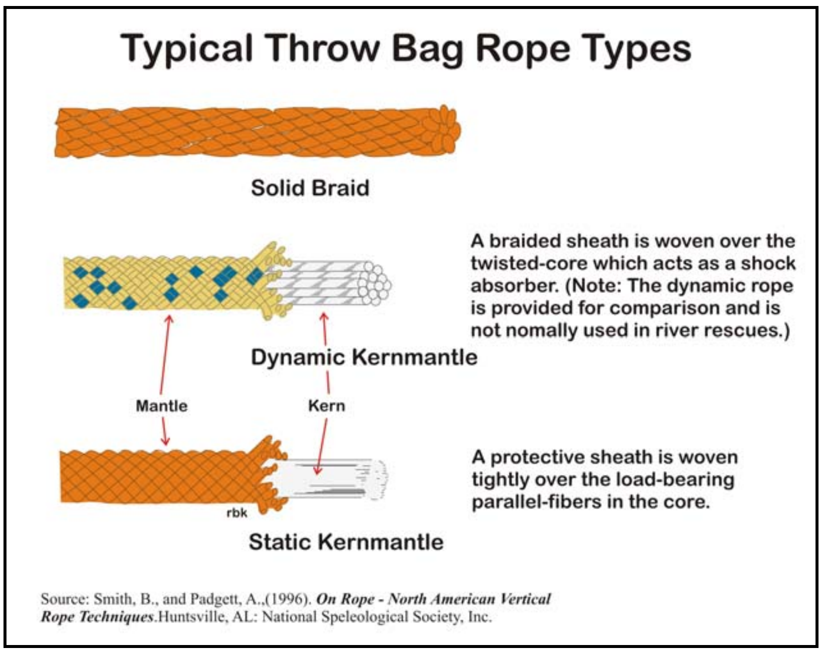

Figure 3.2: Typical Throw Bag Rope Types – Caption: There are many different types of rope construction. Typically, throw bags use either a braided or static kernmantle rope. Source: Author – [file: \BAG-RopeTypes.cdr]

The kern is the strands of rope housed inside the mantle. The kern provides the strength in the rope. The overall characteristics of the rope are influenced by they type of material from which the yarns are constructed and by how the yarns are woven. Twisted fibers (dynamic kernmantle) tend to have more elasticity or bounce when loaded than unidirectional fibers (static kernmantle). Nylon has considerable elasticity or bounce when loaded compared to Spectra which has virtually no elasticity. In climbing situations, the elasticity found in dynamic kernmantle rope is considered a good feature to absorb the shock of a falling climber. In rescue work, static lines are preferred. Mountain rescue prefer nylon static ropes. River rescue prefer Spectra ropes.

<u>Materials</u> – The following discussion is also excerpted from Smith and Padgett's (1996) discussion of rope construction in *On Rope*. Discussion of three types of rope materials are included in this section: nylon, polypropylene, and spectra.

Nylon – When wet, nylon may shrink and lose 10% to 15% of its strength. Nylon is very flexible and its bouncy nature enables it to absorb shock loads. Stretch characteristics can be influenced by the weave of fibers in the rope. Nylon does not float. For these reasons, nylon is generally not used in throw bag construction and in swiftwater rescue situations.

Polypropylene – Polypropylene has two important characteristics for throw bag construction and swiftwater rescue situations. It floats and it doesn't absorb water. It has low abrasion resistance and a low melting point. This makes it a poor choice for Prusiks in a swiftwater rescue. Compared with other materials such as Spectra and even nylon, it has a relatively poor tensile strength. These attributes make polypropylene a good choice for inexpensive throw bags.

Spectra – Spectra is a extended chain polyethylene that makes the rope pound for pound ten times stronger than steel. As might be expected, it is more expensive than polypropylene or nylon. It floats and doesn't absorb water making it a good choice for swiftwater rescue situations. Also, it has good abrasion resistance. It has virtually no stretch. This is an advantage when used in mechanical advantage systems. Although having no stretch in a climbing situation can be considered a disadvantage, it is not much of a disadvantage when used in a throw bag to rescue a victim in a river situation. Because of these attributes, Spectra is a good choice for throw bags and use in swiftwater rescues.

Stuffing a Throw Bag (Figure 3.3) – There are many different ways to re-stuff throw bags. The method presented in Figure 3.3 was used by an employee whose job it was to stuff throw bags for sale. It was the method he used to stuff hundreds of bag for sale. The key to stuffing the throw bag is to randomly stuff the rope into the bag. DO NOT COIL THE ROPE, it will only become entangled. There have been numerous tests performed and randomly stuffing the rope into the bag results in the least chance or the rope becoming entangled when the bag is thrown. As a footnote, may graphic artists incorrectly draw a neatly coiled rope in the throw bag. This is incorrect.

The recommended method of re-stuffing a throw bag is as follows. Open the end of the throw bag. Hold the bag open using the middle finger of each hand. The fourth and fifth fingers may be used also but most people will find using the middle fingers most comfortable. This frees up the first finger and thumb to grasp and stuff the rope. Place the rope over the shoulder. The life jacket prevents the rope from slipping off the shoulder. With the thumb and first finger, grasp the rope and thrust it downward into the bag. At the same time, the other hand repositions itself up the rope. In a hand-over-hand motion, stuff the rope into the bag. If

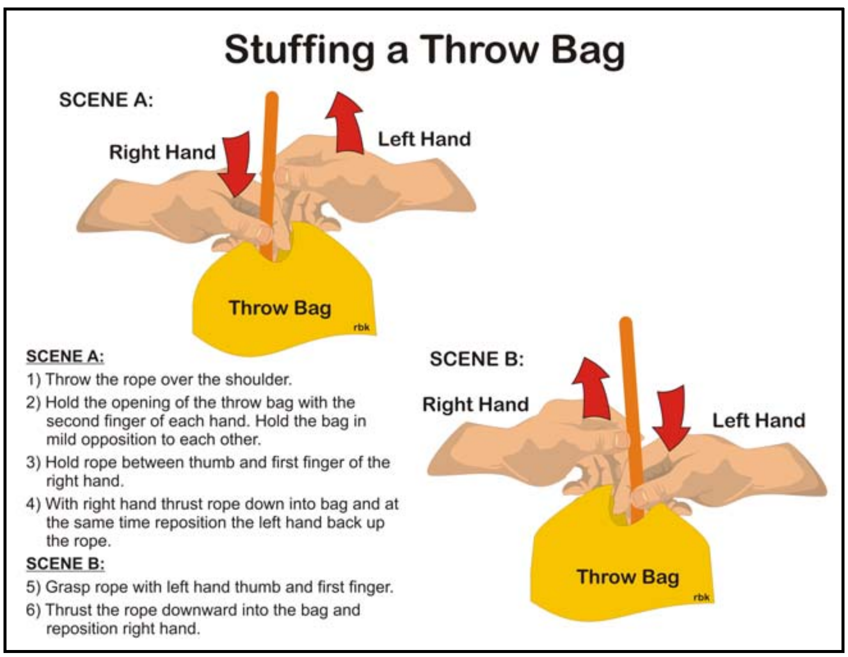

Figure 3.3: Stuffing a Throw Bag – Caption: There are many ways to stuff a throw bag. This method was used by an employee who stuffed hundreds of throw bags for sale. Source: Author – [file: \BAG-StuffingThrowbag.cdr]

the rope needs to be settled in the bag to create more room for rope, quickly drop the bag five to six inches so that the inertia of the rope will pack it snugly into the bag.

First Throw of a Throw Bag – There are three approaches to throwing a throw bag. These are the underhand, sidearm an overhand approaches. All can be use effectively. Generally, the farthest throws occur underhand. When standing in knee deep or deeper water, the underhand throw becomes impractical and a side arm or overhand throw needs to be used. Practice all three methods and determine which works best in different situations.

Second Throw (Figure 3.4) – The rescuer throws the throw bag. Perhaps it misses or another victim is floating past the rescuer on the first throw. Time to the second throw is important. Retrieving the bag, stuffing it, or even filling the retrieved bag with water is not really an option if the rescuer is in a hurry.

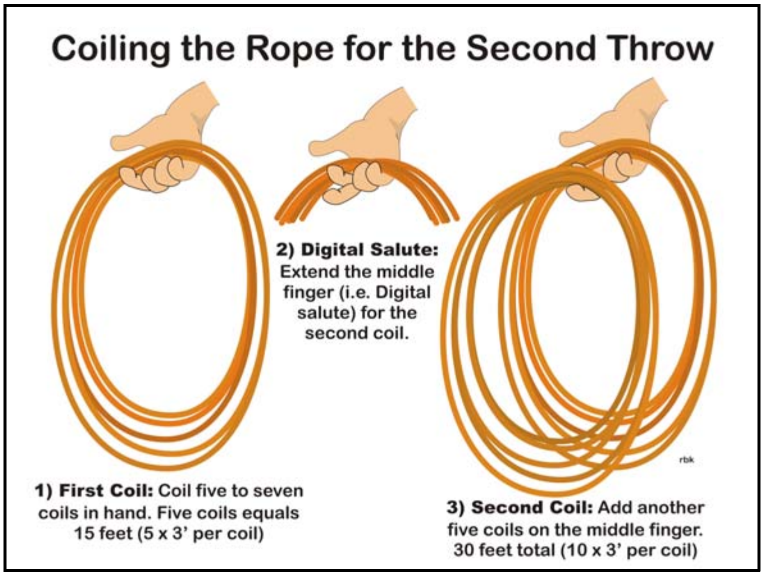

Figure 3.4: Coiling the Rope for the Second Throw – When coiling the rope, try making two coils which when released are less likely to be come entangled. Source: author – [file:\BAG-SecondThrow.cdr]

For the second throw, start coiling the throw bag rope end on shore (Figure 3.4). Let the bag float downstream if necessary. Count the coils. The length of each coil will depend on the person coiling. Figure three to four feet per coil. Counting the coils is important because if the victim is fifteen feet away, there needs to be at least five coils or fifteen feet of rope to reach the victim. If not, the second throw will fall short.

Coil five to seven coils in the throwing hand (Figure 3.4; Scene #1). The number of coils can vary according to what is comfortable for the rescuer. Practice and determine what is a comfortable throw for each rescuer. Figuratively speaking, extend the middle finger as if giving the digital salute (Scene #2). It is not really the digital salute but the use of the middle finger to make a second coil independent of the first coil. Again five to seven coils or what feels comfortable to the rescuer. Practice will determine the comfort level regarding the number of coils and throws (Scene #3).

To make the second throw, take the second coil and hold it in the non-throwing hand. Step on the line. This prevents the line from slinking away from the rescuer into the river. With the first coil in the throwing hand, throw it to the victim. At the same time gently release the second coil in a manner that doesn't place a drag on the first coil thrown. This takes practice to perfect and most rescuers practice this skill in between rescue drills to perfect their proficiency at this skill.

As an epitaph, many rescuers use the second throw approach as their first throw. It is a pain to constantly repack the throw bag and using this approach initially reduces the amount of rope that has to be repacked into the throw bag. Setting up for a potential rescue situation, the rescuer drops the bag on the rock and coils the rope using the loose end to the throw bag. Step on the throw bag or throw bag end of the rope and throw the coiled rope to the victim as previously depicted. When performing as a safety rescuer stationed below an exercise, this author uses this approach frequently.

<u>Throw Bag Drill</u> (Figure 3.5) – Actually the throw bag drill is both a defensive swimming and throw bag throwing drill. It provides participants in a swiftwater rescue class the opportunity to swim defensively as well as practice using the throw bag to rescue swimmers. The exercise has found itself being used in summer camps and other non-swiftwater class settings. It is really two activities in one. It is an excellent activity to familiarize participants with moving water and its potential dangers. Also, it is fun. Some of the following discussion may be more detailed than necessary since it has been influenced by litigation cases.

Instructors – Normally, this activity is done with two instructors. Students can be substituted for the described roles below and the instructors can perform other onsite functions. The instructor should inspect the site for hazards such as strainers and undercut rocks. If they are present, they need to be identified to participants, or the activity should be moved to another site. Also, the instructor should swim the site prior to conducting the activity.

One instructor is upstream with the swimmer group and the other instructor is with the rescuers (i.e. throw bag throwers). The upstream instructor supervises and instructs participants on the following key points. The first key is the entry into water. Depending on the site, the entry may involve wading or a swiftwater entry dive. Next, swimmers may need to be prompted to swim to an appropriate distance away from shore. Third, swimmers are reminded to keep their feet up and to use the defensive swimming position. If properly instructed, a student or participant can assume the instructor's role at this station.

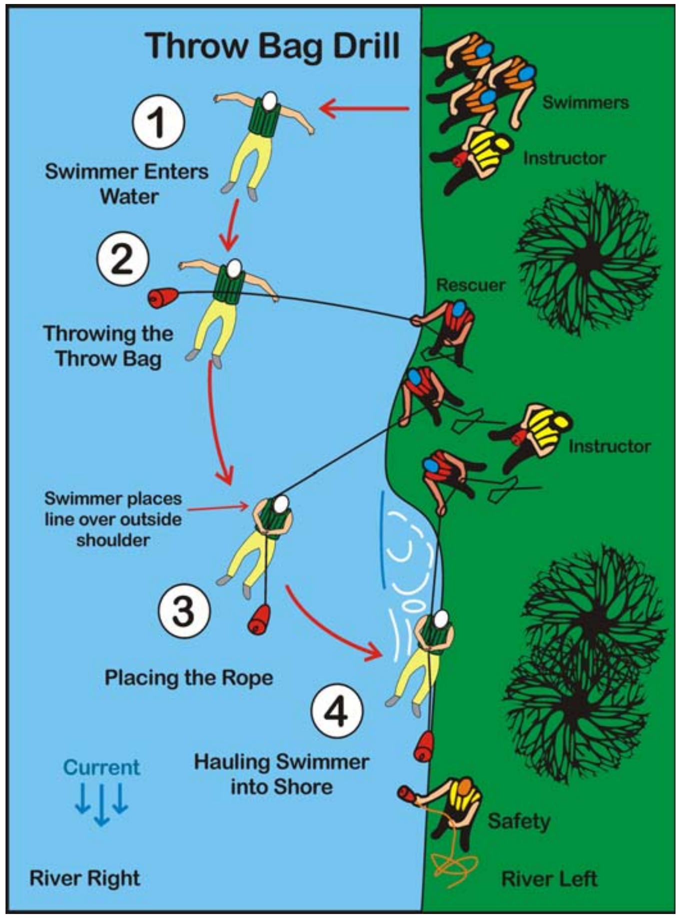

Figure 3.5: Throw Bag Drill – The throw bag drill is a two activities in one. It is both a defensive swimming and throw bag throwing exercise. Source: author – [file:\BAG-ThrowRopeDrill.cdr]

The second instructor supervises the throw bag throwers. This involves the throwing of throw bags and hauling the swimmer into shore. Normally, the instructor has a throw bag in hand in case it is needed on missed throws. In addition, there needs to be good communication between the instructors in coordinating the swimmers and rescuers.

Downstream Safety – One or more downstream safeties should be located downstream to rescue any swimmers not rescued by the throw bag rescuers. Remember, swimmers can always swim to shore if the rescuers miss them. Students or participants can be used for this function.

Scene #1*: Swimmer Enters the Water* – Depending on the site, swimmers can enter the water by wading or using a swiftwater entry dive. The swiftwater entry dive is not really a dive, but a belly-flop with hands held outward to protect the face. The instructor coordinates the entry with the other instructor and monitors the key points to swimmers.

Scene #2*: Throwing the Throw Bag* – Holding the throw bag in the throwing hand and grasping the loop in the other hand, the rescuer throws the throw bag to the victim. Two keys to a good throw are the throw bag should be thrown over or past the swimmer, and the line should land over the chest of the victim. There is a lot of discussion on whether the line should be thrown upstream, downstream, or at the victim. Best result is when it is thrown over the victim and the rope lays across the victim's chest.

There are numerous variations to this drill. There can be multiple swimmers and rescuers. The swimmer can purposely miss the first throw requiring a second throw. The rescuer can practice using a second throw as their first throw.

Scene #3*: Placing the Rope* – The swimmer grabs hold of the line and places it over the shoulder facing away from the rescuer. The swimmers head is pointing toward the shore and the rescuer. This creates a good ferry angle for the swimmer that aids in swinging the swimmer to shore. The force of the water at an angle on the swimmer creates a ferry angle.

Some people find the placement of the rope over their outside shoulder objectionable since it can bite into their neck. They may prefer using the shoulder facing the shore. This is one of those instances where it most likely doesn't matter. Either shoulder will normally work. However, placing the rope over the outside shoulder is technically correct.

Scene #4*: Hauling Swimmer to Shore* – The rescuer hauls in the victim to shore. Ideally, there is a large eddy to haul the swimmer into. Depending on circumstances, the rescuer can move laterally or inward on shore which increases the pendulum effect (see Figure 3.7). The different belays can be practiced, and if needed a backup belayer can be used. Participants can be rotated through the different stations including downstream safety.

Belays – In a belay, the rope is bent around an object which transfers all or part of the load to the belay object. Although the focus is on the rescuer's hip belays, rocks and trees can be used as belays. The rope can be wrapped around a rock or tree. Be sure the rock or tree is substantial. If needed, the rescuer can add a hip belay to a partial belay around a rock or tree.

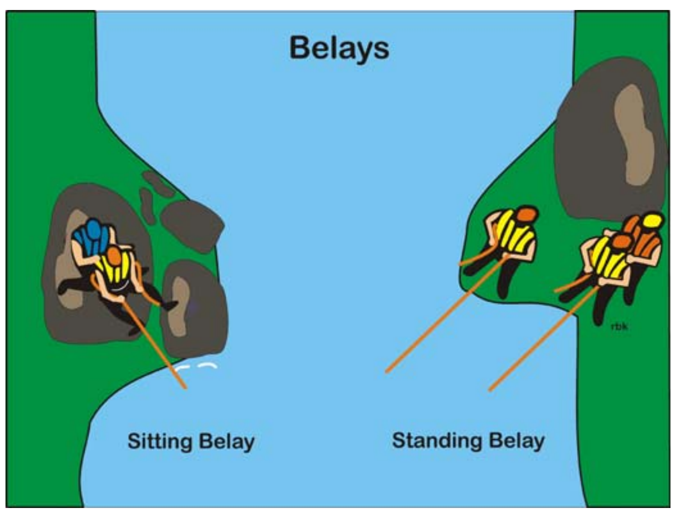

Figure 3.6: Belays – In both the standing and sitting belays, the line passes around the upper portion of the butt. The backup belayer holds the should straps of the belayer's life jacket and pulls down. Source: author – [file:\ROPE-Belays.cdr]

In a hip belay, the rope goes around the butt of the rescuer. As a rule, the line extending to the victim is downstream and the unloaded end is on the upstream side of the rescuer. This reduces the likelihood of the rescuer becoming entangled in the line if they have to let go of the victim. If the rescuer needs to increase resistance on the belay, he pushes the line over and down the leg in the crouch area with the upstream hand.

Standing Belay (Figure 3.6) – In a standing belay, the rescuer belays the rope around the upper portion of her butt while standing. The advantage of a standing belay is that it allows mobility. The rescuer can move to a new location which can reduce the load and pendulum the swimmer to shore more easily (see Figure 3.7). Another rescuer can backup the standing belayer if needed. The backup belayer holds onto the life jacket shoulder straps of the belayer. The backup belayer emphasizes pulling down rather than pulling backwards. If more belaying is needed, the standup belayer can reposition herself in a sitting belay.

Sitting Belay (Figure 3.6) – In a sitting belay, the rescuer belays the rope around the upper portion of her butt while in a sitting position. The advantage of a sitting belay is that it offers more resistance with the ground and in general, it can carry more load. Also, the belayer can use rocks and other objects to brace her feet. The disadvantage is that the rescuer lacks mobility. As with the standing belay, a backup belayer grasps the shoulder straps of the life jacket and emphasizes pulling downward.

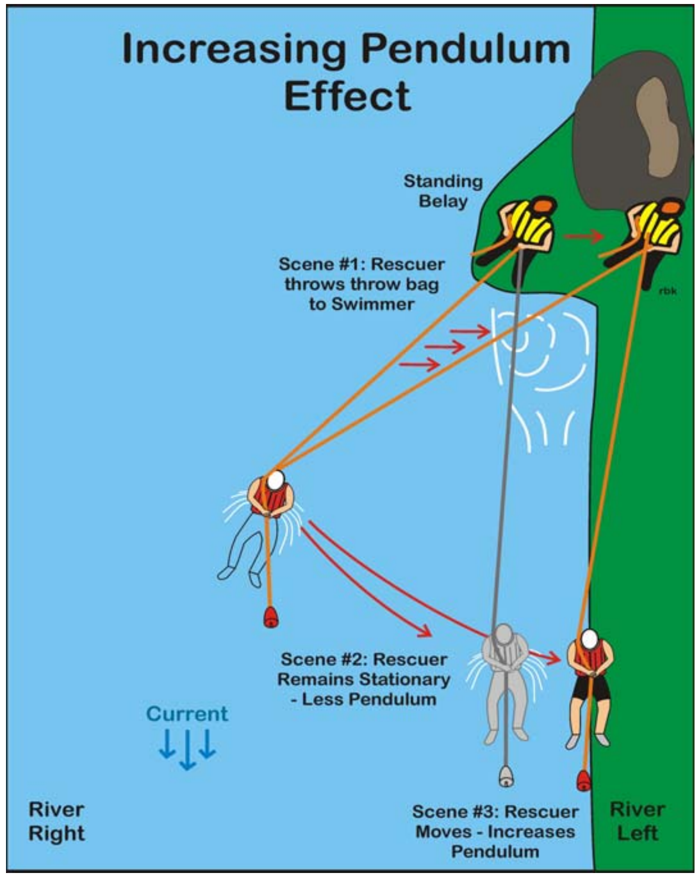

Figure 3.7: Increasing Pendulum Effect – After throwing the rope, the rescuer takes several steps inward which makes swinging the swimmer into shore easier. Source: author – [file:\ROPE-Pendulum.cdr]

Increasing Pendulum Effect (Figure 3.7) – Many rescue sites have sufficient room to allow the rescuer to take several steps backward toward the shore. Taking several steps backward or laterally offers the rescuer several benefits. First, it increases the ability of the rescuer to pendulum the victim to shore. In Scene #2 the line is parallel with the current and there is no pendulum effect left. The victim is left dangling in the current. In Scene #3, the rescuer is able to pendulum the victim to shore. Note, there is still an angle in the system if needed.

Second, taking several steps backward, reduces the load on the rescuer. In Scene #2, the total weight of the victim including the force of the water is borne by the rescuer. Often this requires the rescuer to go into a sitting belay to counteract the weight of the victim. By taking several steps backward on the shore, there is a greater angle between the line and the current which reduces the weight or force borne by the rescuer. In many rescues, the reduced weight or force on the rescuer allows the rescuer to remain in a standing belay. It may avoid having to use a belay at all, and it allows the rescuer to simply haul the swimmer into shore.

The following is a tip for those using this technique. The rope is thrown to the victim in Scene #1. Because of the angle, there is little weight on the rescuer as the rescuer moves on the shore. Also, the rescuer can let out several feet of line as they reposition themselves. When repositioned, the rescuer pulls the rope taught and pendulums the victim to shore. In other words, in most cases a little extra drift is without consequence.

Increasing Pendulum Effect with Vector Pull (Figure 3.8) – A second method to increase the pendulum of the swimmer to shore is to use the vector pull. Conceptually, the vector pull is a variation of the 120 degree rule where the angle between the two anchors is 180 degrees (See Figure 6.5 and Figure 6.6). In this case, the rope is taught (180 degrees) between the standing belayer and the swimmer. When a second rescuer pulls on the taught rope, the pull on both ends is theoretically infinity. The swimmer is easily pulled to shore. Since the belayer is stationary, most of the force is exerted on the swimmer. As the angle decreases toward 120 degrees, the second rescuer needs to exert more pull. However, the initial pull is usually sufficient to pull the swimmer the extra couple of feet into shore.

The vector pull can be used in conjunction with the standing belayer stepping backwards toward shore. Both methods increase the pendulum effect and more easily swing the swimmer into shore.

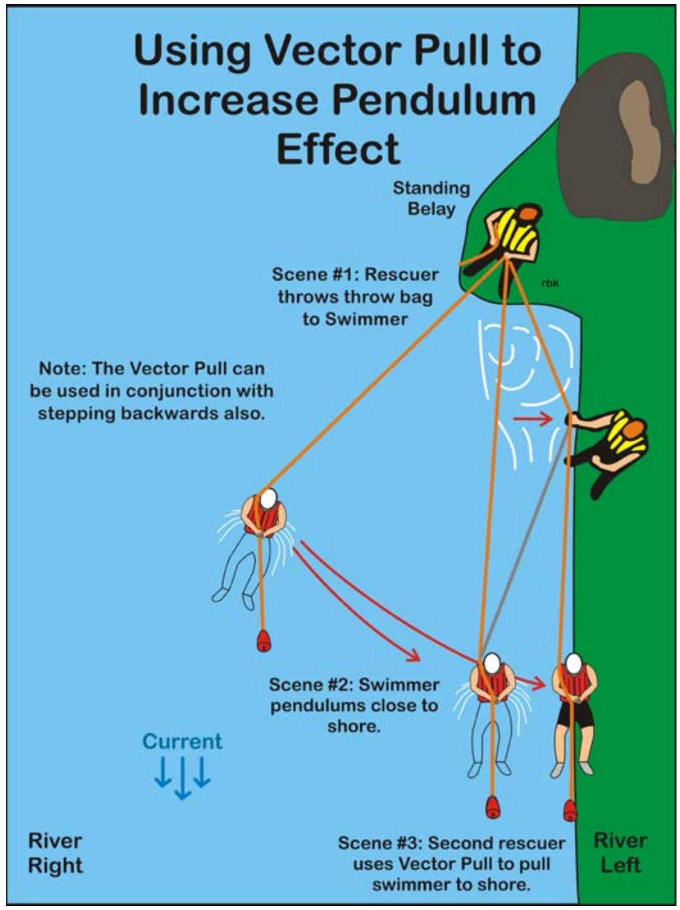

Figure 3.8: Using Vector Pull to Increase Pendulum Effect – Second rescuer applies vector pull and easily swings the swimmer into shore. Source: author – [file:\ROPE-PendulumVector.cdr]

Shore Based Rope Rescues

In shore based rope rescues, the primary activity of the rescuers is from the shore. Shore base rescues can include rocks in the channel or other structures. Stated another way, these rescues do not normally utilize swimmers or wading as part of the rescue. Technically, the inverted paddle rescue involves wading, but since it is a variation or extension of the snag line, it is included here. The shore based rope rescues in the section include the stabilization line, snag line, and inverted paddle snag line.

Stabilization Line (Figure 3.9) – The purpose of a stabilization line is to provide support with which the victim can raise his head above the water to breath, particularly in a heads-down foot entrapment. It provides enough support for the victim to brace themselves against the line with their hands and arms.

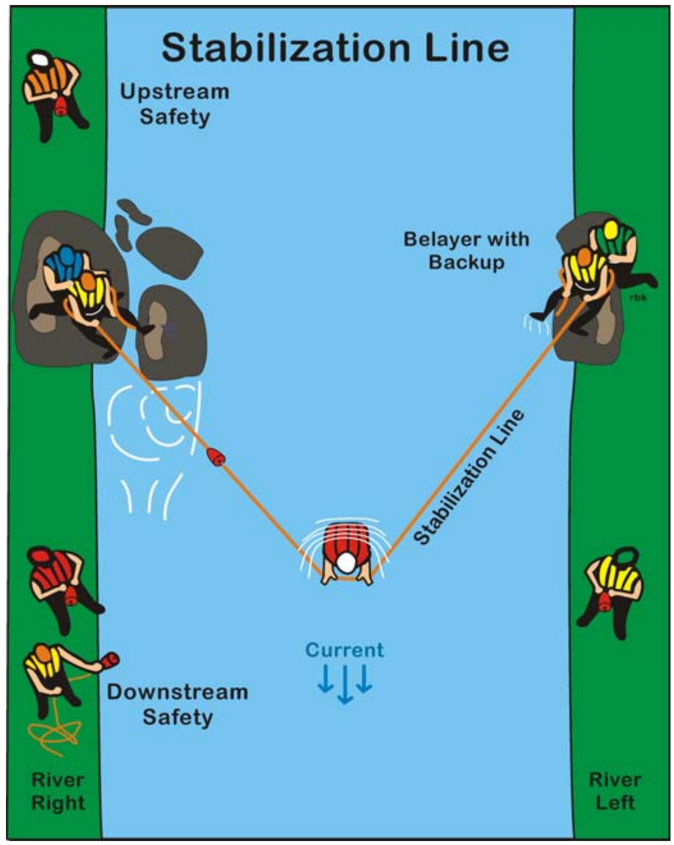

Figure 3.9: Stabilization Lines – The purpose of the stabilization line is to provide sufficient support to the victim so that they can breath. Source: author – [file:\ROPE-StabilizationLine.cdr]

The pressure on the belayers is considerable. Also, the stabilization line can be fatiguing when the time frame becomes extended. Hip belays are recommended. Also, consider the 120º rule where if the angle between the victim and the two belayers is 120º, the force is equal on the victim and the two belayers. If there is 100 lbs of force on the victim, there is 100 lbs of force on each belayers. Although it is not always possible, the belayers want to minimize the angle between them and the victim to reduce the force on the belayers. When possible, the belayers should be backed up. Holding onto the shoulder straps of the life jacket, the backup pulls downward on the belayer to prevent them sliding off the rock.

Position both upstream and downstream safeties. When there is a stabilization line or any line across the river, use an upstream safety. The purpose of the upstream safety is to redirect or stop anyone coming down the river. One or more downstream safeties should be provided. The downstream safeties provide two services. If one of the rescuers becomes a swimmer, they can rescue the rescuer. When a conscious or unconscious victim is extricated, they will need to be rescued or they will continue to float downstream. As a graphic note, to save space, not all the diagrams have the upstream and downstream safeties pictured. If there is any question, post them.

Snag Line (Figure 3.10) – The purpose of the snag line is to position the snag line low enough on the victim to extricate them. Traditionally, two throw bags filled with river rocks are used to lower the snag in the water and snag the victim loose (see also the next section on the inverted paddle snag line). Normally, the snag line is used in conjunction with a stabilization line.

Construct a snag line as follows. Rescuer (a) on river right throws a line to rescuer (b) on river left (not shown). Using a carabiner, rescuer (b) fastens the two throw bags together, and fills the bags with rocks to weigh them down in the water (not shown). Rescuer (a) on river right pulls on the line while rescuer (b) on river left lets out line. The bags are positioned downstream of the victim.

Both rescuers move upstream to a point were they can pull the entrapped victim off the obstruction. Remember the 120º rule. The further upstream the two rescuers can move, the more leverage they have to pull the victim off the obstruction. Also, when crossing over the stabilization line, it is important to go **under** the stabilization line.

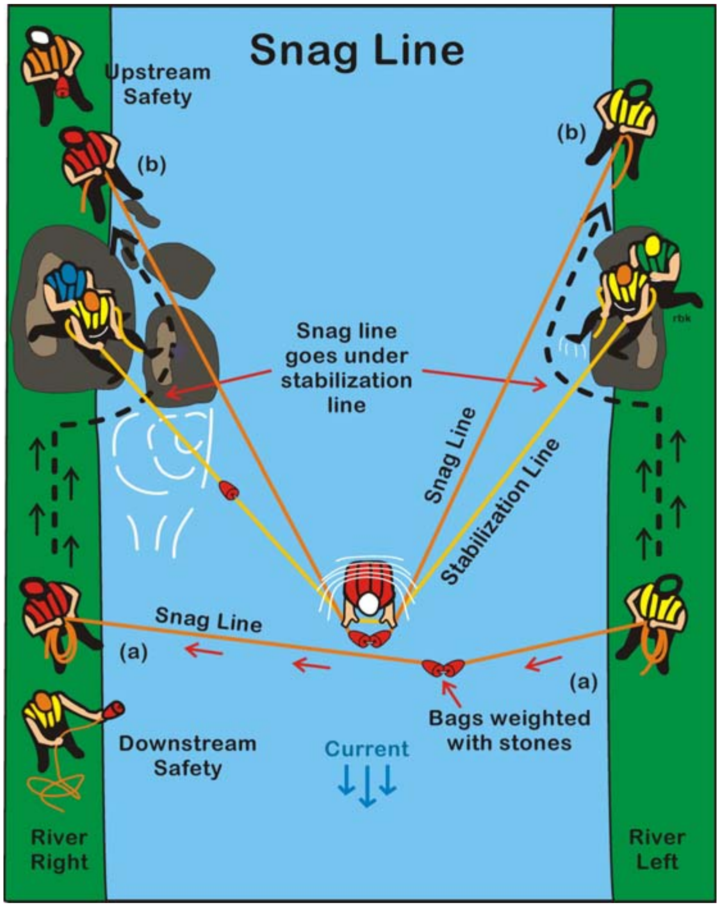

Figure 3.10: Snag Line – The purpose of the snag line is reach down under the victim to extricate them from the obstruction. Source: author – [file:\ROPE-SnagLine.cdr]

Inverted Paddle Snag Line (Figure 3.11) – The inverted paddle snag line is a variation of the snag line. The swift current keeps the snag line on the surface. This technique lowers the snag line on the victim where it can snag the victim and extricate the victim from the entrapment. The problem with the snag line is that even when the throw bags are weighted with rocks, the current tends to make it difficult to move the snag line lower on the victim. Essentially, the inverted paddle snag line uses paddles to lower the snag line on the victim. It is one of those techniques to include in your repertoire if needed.

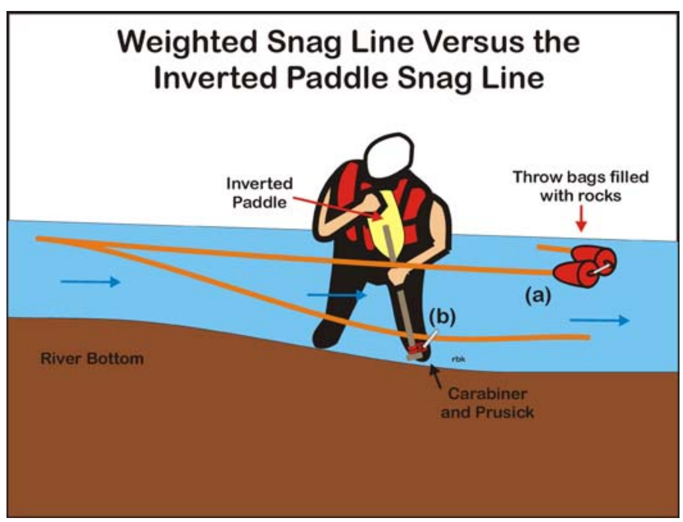

Figure 3.11: Weighted Snag Line Versus the Inverted Paddle Snag Line – The inverted paddle snag line can be used to lower a snag line to snag and extricate the victim. Source: author – [file:\ROPE-InvertedPaddleSnagLine.cdr]

Swimming Based Rope Rescues

Swimming based rope rescues involve situations where the rescuer is wading or swimming to actively rescue the victim. In this section, swimming based rope rescues include the simple rope tether, tethered swimmer or live bait, and V-lower
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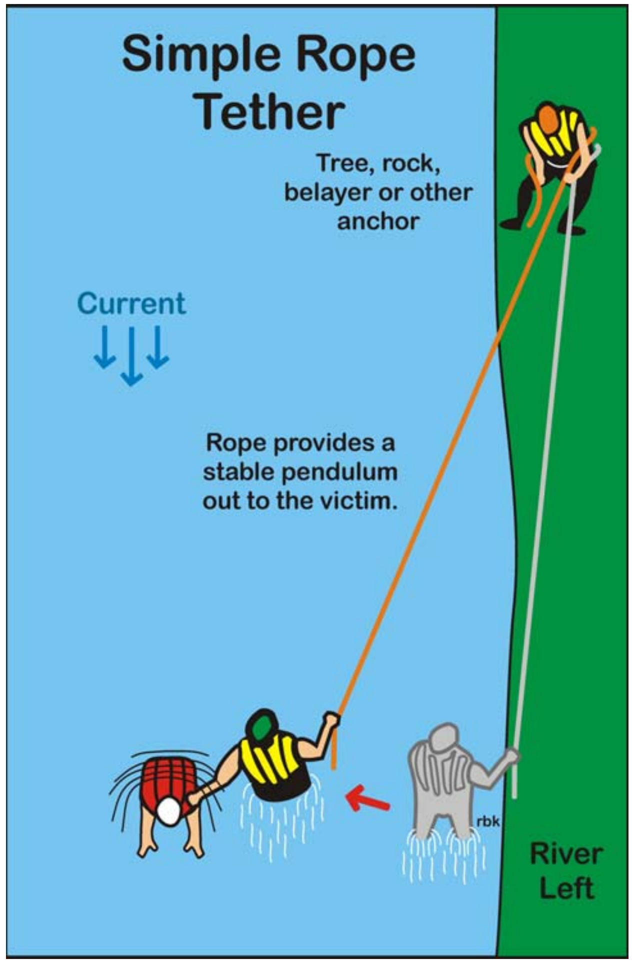

Figure 3.12: Simple Rope Tether – The simple rope tether illustrates that sometimes keeping it simple can create an effective rescue. The rescuer uses the belayed rope for stability as she wades out to the victim. Source: author – [file:\ROPE-SimpleRopeTether.cdr]

Simple Rope Tether (Figure 3.12) – The simple rope tether illustrates that often simple techniques can be done quickly and efficiently to effect a rescue. This technique illustrates a technique that can be setup quickly and with little fanfare. In the simple rope tether, the rescuer uses a belayed line for stability. In the solo rescue with a paddle, the paddle provides the same stability. In the two person rescue, the second person provides this stability. In this rescue, the belayer on the shore provides this stability. A belayer is shown in Figure 3.12. However, a rock, tree, or other object can just as easily provide the belay point for the rescuer to pendulum out to the victim using the belayed line for stability.

Tethered Swimmer or Live Bait Rescue (Figure 3.13) – The live bait rescue is useful in rescuing an unconscious victim or equipment floating downstream in the current (Figure 3.13). It is useful in rescuing boaters who come out of their boats in whitewater above a major hazard. The following text corresponds with the figure and explains the live bait rescue drill.

Scene #1: *Victim Enters Water* – Using a swiftwater entry, the victim enters the water upstream. A swiftwater entry is hands in front of the face with a shallow belly flop dive. The victim swims out into the main current and floats downstream. Normally, they are simulating an unconscious victim. As noted, it can also be equipment floating downstream or anything that cannot self-rescue.

Scene #2: *Rescuer Enters Water* – First, the rescue bag is clipped into the tether of the rescuer's rescue vest. This allows the rescuer the ability to eject herself from the line if needed. The line and not the bag is clipped into the rescuer. This enables only the needed line to be used. Clipping the bag end into the tether results in all the rope in the bag coming out. Using a swiftwater entry, the rescuer enters the water and swims toward the victim. On shore, the assistant feeds the line out of the throw bag. It is important for the belayer on shore to feed out the line with as little resistance as possible. Also, to reduce drag on the swimmer, the assistant can allow the rope to float downstream if necessary.

Scene #3: *Grasping the Victim* – The rescuer grasps the victim by the shoulder straps of the life jacket with both hands. If the victim is conscious, some recommend splashing water into the victim's face. This temporarily disorients the victim which allows for the rescuer to grab a hold of the victim. With the victim in her grasp, the shore based assistant or rescuer can haul in and pendulum the rescuer and victim to shore.

Scene #4: *Hauling into Shore* – Both the rescuer and the victim are hauled to shore by the rescue assistants on the shore. If possible the rescuers on shore can step laterally or horizontally back on the shore prior to going into a sitting belay. This increases the pendulum effect and makes hauling the swimmer into shore much easier (not shown). If necessary, the rescuer on shore may need to go into a standing belay or a sitting belay. If needed, the belayer can be backed up with another rescuer. Remember, the force on the victim is equal to the force on the belayer. Reducing the force on the belayer with a good pendulum reduces the force on the rescuer and victim and makes hauling to shore easier.

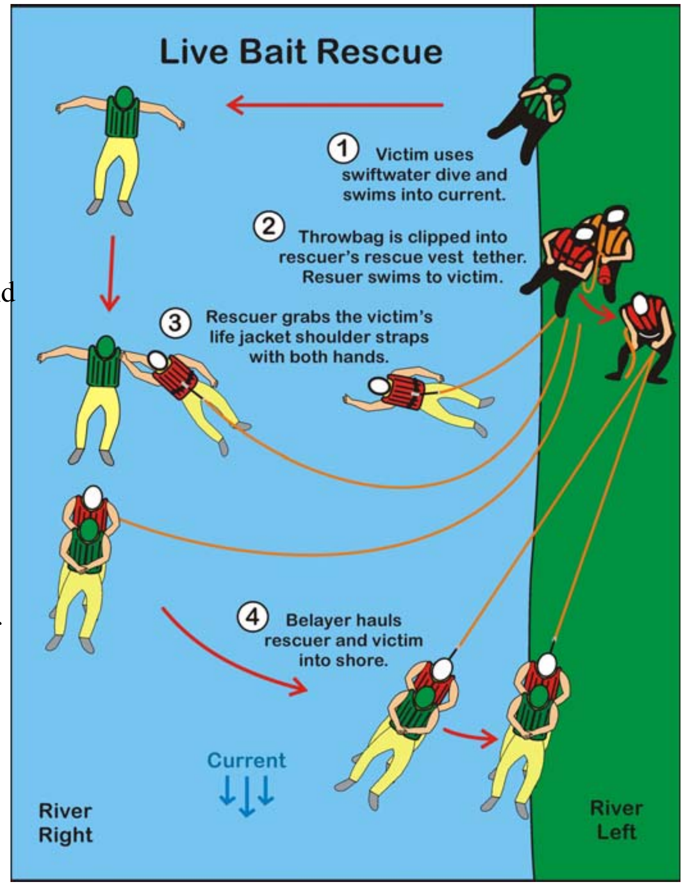

Figure 3.13: Live Bait Rescue – The tethered swimmer "live bait swimmer" swims out rescues the unconscious swimmer or equipment and hauled back into shore. Source: author – [file:\ROPE-LiveBaitRescue.cdr]

__**V-Lower**__ (Figure 3.14) – The V-Lower lowers a rescuer in moving water to effect a rescue of a trapped victim. With one or more belayers on each side of the river, one or more lines are connected and extended across the river. Also, two rocks in the river can be used by the belayers to lower the rescuer in a channel of the river. If possible, setup of the belayers and rescuer should consider the 120º rule to reduce the load on the belayers.

Next the line is connected to the tether of the rescue vest (Figure 3.15). Avoid situations that potentially side load one of the carabiners when under load. The use of locking carabiners is preferred. Several methods can be used. On the line, tie an inline figure eight on a bite or a simple figure 8 on a bite. If two lines are connected together with one or two carabiners, fasten the carabiner from the tether to the loop in the throw bag rather than clipping it into one of the carabiners. Clipping it into one of the carabiners tends to side load the carabiner under load and should be avoided. Clipping it into the loop provides flexibility and avoids side loading. Some rescue vests have an O-ring rather than a tether to fasten the rescuer to the line. The same principles apply.

Only a rescue vest with a detachable O-ring or tether. This allows the rescuer to free himself if needed. Again, a line should not be tied or carabinered directly to the rescuer.

Simple hand signals can be used by the rescuer. If the rescuer point toward river right, the river right belayer pulls in line and the river left belayer lets out line. If the rescuer points downstream, both belayers let out line and if the rescuer points upstream, both belayers take-in line.

When doing the V-Lower exercise, the rescuer will normally want to move left and right, and move upstream and downstream also. Also, the rescuer should ball-up and arch his back. Balling-up tends to sink the rescuer in the current. In contrast, arching the back tends to raise the body out of the water in a planing action. This is a good exercise to these experiences. When done, release the rescue belt and swim to shore. The tether remains attached to the line.

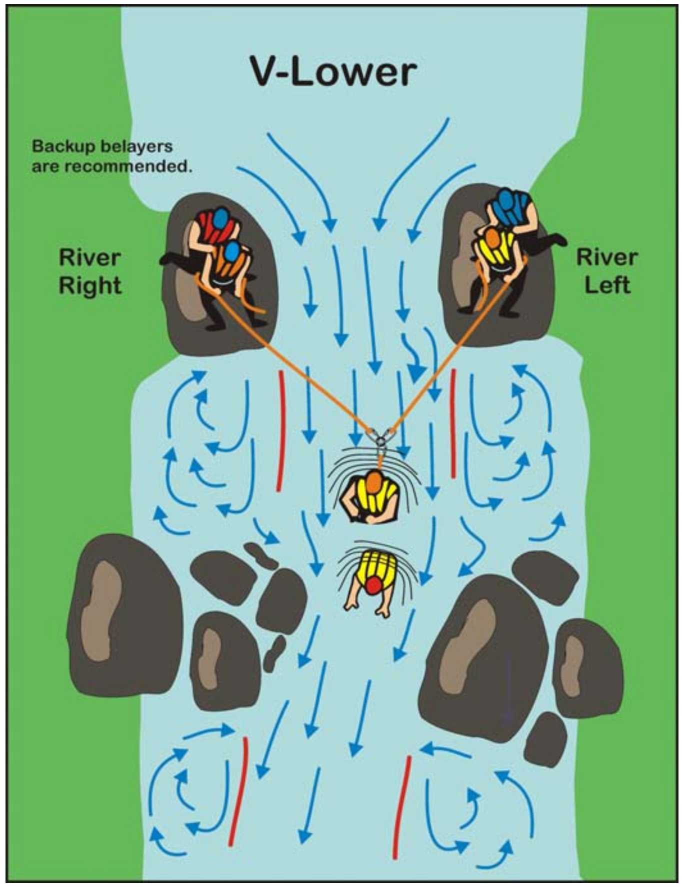

Figure 3.14: V-Lower – The V-Lower lowers a rescuer in the current. Use only with a rescue vest. Source: author – [file:\ROPE-V-Lower.cdr]

Cinches

As the term suggests, cinches use ropes to grip the victim firmly during the extrication. There are numerous cinches available. Three cinches are presented in this section. The first is the simple cinch. It was chosen because it can easily be morphed from a stabilization line. The Kwi cinch is a same shore rescue. The Carlson cinch is a true cinch where the victim will not slip out of the cinch.

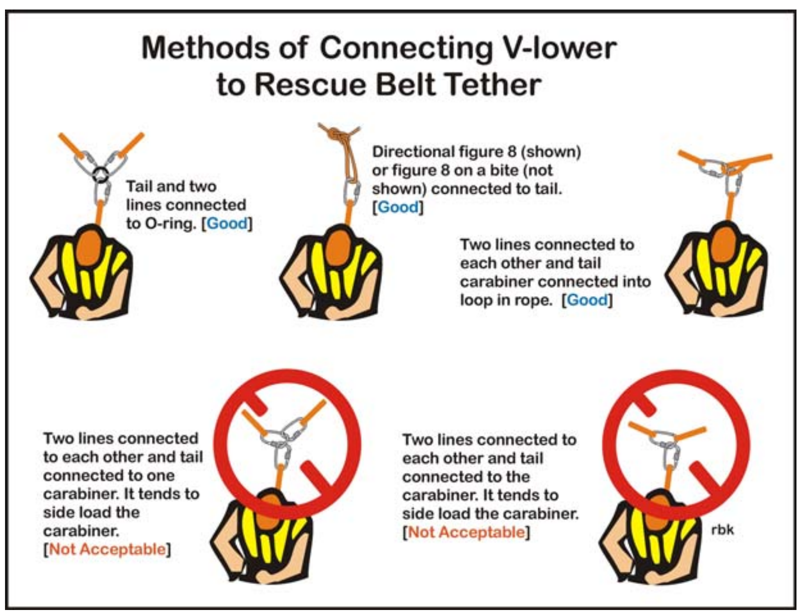

Figure 3.15: Methods of Connecting V-lower to Rescue Belt Tether – When connecting the line to the tether on the rescue vest, avoid situations that can side load a carabiner. Source: author – [file:\ROPE-V-LowerTetherHookup.cdr]

<u>Simple Cinch</u> (Figure 3.16) – The simple cinch converts a stabilization line into a simple cinch. It shows how one system can easily be converted into another. The steps listed for creating a simple cinch are listed below.

Step #1: *Throw the Rope* – A stabilization line has been established on the victim. The first step is to stretch a line across the river. This rope will create the cinch. The rescuer on river left throws a throw bag to the rescuer on river right.

Step #2: ***Clip In*** – The rescuer on river left clips the throw bag line into the stabilization line. Usually, it is the non-bag end of the throw bag.

Step #3: ***Cinch*** – The river right rescuer works the cinch. He moves downstream and pulls the rope down the stabilization line until it cinches snugly around the victim. To extricate the victim, the belayers on the river right side pull on the victim at an angle.

Step #4: ***Swing to Shore*** – When the victim comes loose, the river right belayers pendulum the victim to shore. The river left belayers give slack but maintain a snug cinch. The rescuer working the cinch can also haul the victim toward shore.

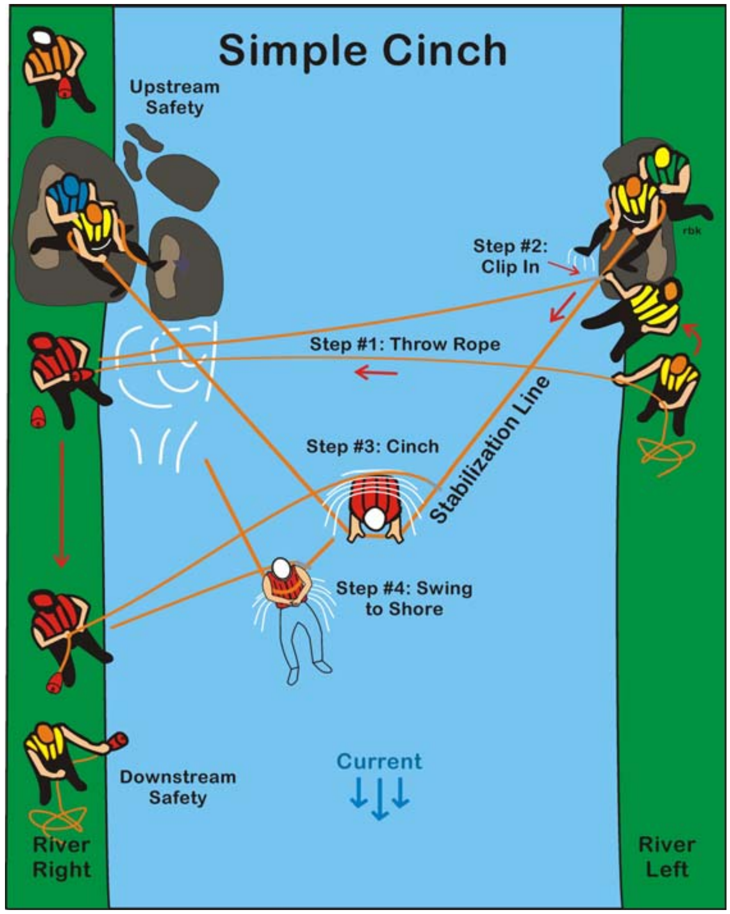

Figure 3.16: Simple Cinch – The simple cinch can morph quickly from a stabilization line. Source: author – [file:\CNCH-SimpleCinch.cdr]

<u>Kwi Cinch</u> (Figure 3.17) – The Kwi Cinch is a same shore based cinch to extricate a victim who is reasonably close to shore. The steps for the Kwi cinch are listed below.

Step #1: ***Find the Center of the Rope*** – In Step #2, the two rescuers are going to simultaneously throw their end over the victim. Hence, the two rescuers need to find the middle of the throw bag line. Their half of the line will form the line they throw around the victim.

Step #2: ***Coil the Ropes and Simultaneously Throw Both Ropes*** – Each rescuer coils his end of the rope using a butterfly coil or a simple coil. They simultaneously throw their coils together. This requires coordination between the two rescuers. The upstream rescuer throws his coil with his right hand. The downstream rescuer throws his coil with the left hand. Remember to hold the end of the line with the other hand.

Step #3: ***Over and Under*** – The crux move is the over and under. In order to create the cinch, the two rescuers exchange places. The upstream rescuer goes **<u>over</u>** the line of the downstream rescuer and the downstream rescuer goes **<u>under</u>** the line of the upstream rescuer. This creates the cinch.

Step #4: ***Cinch and Extricate*** – The two rescuers tighten the cinch around the victim. They extricate the victim by pulling on the upstream portion of the cinch and swing the victim to shore.

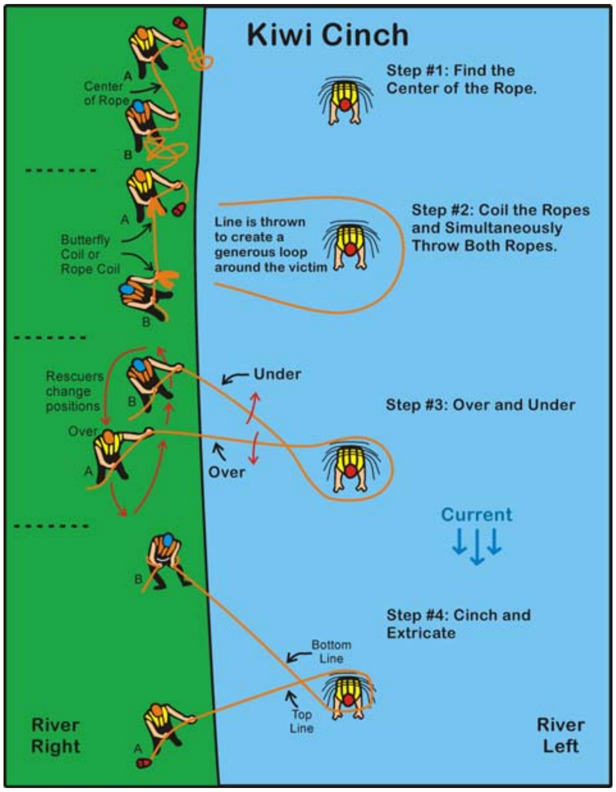

Figure 3.17: Kiwi Cinch – The Kiwi cinch is a same side cinch where the victim is reasonably close to the shore. Source: author – [file:\CNCH-KiwiCinch.cdr]

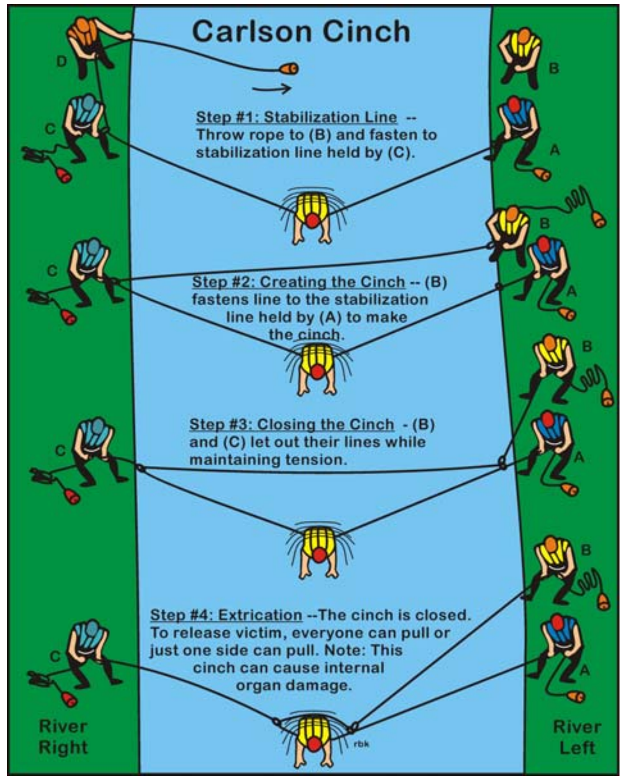

Figure 3.18: Carlson Cinch – A true cinch, the Carlson cinch should only be use where it is a life and death situation or body recovery. It can cause internal organ damage. Source: author – [file:\CNCH-CarlsonCinch.cdr]

Carlson Cinch (Figure 3.18) – The Carlson cinch is a true cinch where once the victim is cinched, the victim is not going to become uncinched. Although an experienced rescue team can moderate the tightness of the cinch, the Carlson cinch tends to cinch even tighter when the rescuers pull the victim free. This can cause damage to internal organs. For this reason, the Carlson cinch is used when it is a life or death situation for the victim or in body recoveries.

Step #1: ***Stabilization Line*** – A stabilization line has been established on the victim. The Carlson cinch will convert the stabilization line into a cinch to remove the victim. In this step the river right rescuer throws a throw bag over to the river left side and fastens his end to the end of the stabilization line on the river right side with a carabiner.

Step #2: ***Creating the Cinch*** – With a carabiner, the river right rescuer fastens another line to static line connected with the attached throw bag. This act converts the static line into a cinch. On the river left side, the throw bag from the other side is connected to the static line so that it can move freely along the static line. Another line is hooked into the carabiner also.

Step #3: ***Closing the Cinch*** – The lines attached to what was formerly the static line or stabilization line on both the river right and left sides work in opposition to each other as the cinch is closed by the river right rescuer. Rescuer (a) pulls on the line which closes the cinch.

Step #4: ***Extrication*** – The cinch is closed. If both rescuers B and C pull on their ropes, they can counteract the cinch and reduce it effect. This is easier said then done. Extrication can occur one of two ways. Both sides can pull the cinched victim off the entrapment, or the river left rescuers can pull the victim off the extrication. Usually, this is the extrication method.

Summary

The trend in swiftwater rescue is toward rescues that don't require lots equipment and resources. For paddlers, several carabiners and throw bags are the norm. The throw bag forms the basic tool used in most rescues.

First, stabilize the victim. A stabilization line can accomplish this. However, don't overlook other methods. A rescuer on a rope tether may keep the victim's head above water. Also, think multiple systems. For example, while the rescuer is holding the victim's head above the water, other rescuers can setup a stabilization line or snag line.

Next, extricate the victim. A snag line or cinch can be used to pull the victim. Many of the systems can easily be morphed into another rescue. For example, the stabilization line can easily be converted into a simple cinch or Carlson cinch, if needed.

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