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The Progressive Vector Pull (a.k.a "swigging")

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How many times have you been in a situation with a pinned boat and no one could remember how to set up a Z-Drag mechanical advantage system or you did not have all the right equipment? Here is a possible, easy solution to that problem.

"Swigging" is a nautical term referring to a process used to take the slack out of a halyard, anchor or dock line[1]. As it applies to dock lines the process simply involves attaching two lines to the boat, then wrapping those lines around a stationary point. Force is applied to the center of line (1) making a V (Vector) in the line, thus shortening the line and drawing the boat closer to the dock. This action causes line (2) to become slack. Before the vector force is released on line (1), the slack was removed from line (2), thus capturing the progress achieved from pulling on line (1).

Let's apply these techniques to swiftwater rescue and our understanding of vector forces as they apply to the rope systems used in rescue situations. In most discussions about mechanical advantage systems there will be a demonstration of a vector pull on the center of a haul line if just a little more force is needed. For the first few inches, up to about 150 degrees (180 degrees represents the straight, tight line), the force applied to the center of the line is at least doubled at the anchor points or the ends of the line.

The *progressive vector* is the swiftwater rescue version of swigging that allows the rescuer to capture the progress achieved by a vector pull on one line simply by taking up the slack in a second line. This method can be used to unpin a boat or right a flipped raft using just two throw ropes. Here is how it works: Attach two lines to the craft in need of help. Set both lines around a tree with a tensionless wrap. The number of wraps necessary will be determined by the diameter of the tree and the type of bark on the tree. Pull both lines as tight as possible and hold tension around the tree (*tip*: this works best with low stretch or static ropes). Apply force to the center of one of the lines and take up the slack that is created in the other line. You have just captured the progress generated by the vector pull by tightening the second line. Release the vector force on the first line and it will become slack because the second line is holding the load. Repeat the process. Each time, a little progress is made toward unpinning the boat.

Some of the advantages of this system include: low tech, fast, low manpower necessary, limited gear, removal of the weak point in many mechanical advantage systems (prusik connection), no

loss of force to friction, limited knots necessary (boat connection point only) which are weak points.

This technique does apply tremendous force to the ropes that you are using so you should use the same safety precautions that are used when employing any mechanical advantage system like dampers on the lines, staying out of the line of pull, wearing all of your protective gear (helmet and PFD) and turning your back to the line of pull.

This is a simple low-tech method for unpinning a boat. It requires a limited amount of equipment and is fast to set up. The system can be modified by using a Munter hitch or Prusik hitch and anchor system for progress capture if a tree is not available for the tensionless wrap. If you use one of these alternate systems it will be necessary to use separate anchor webbing for each of the two lines. If you attempt to use one piece of webbing for both lines when you apply the vector force to the first line it will pull the webbing in the direction of the force thus taking up some of the slack that would have been generated in the second line.

The most important tool for swift water rescue is your knowledge and creativity. This is just another tool in your arsenal for boat recovery.

Walter Felton is an ACA L5 Safety and Rescue ITE, L4 River Canoe IT and L5 River Canoe Instructor.

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