

## The Mechanics of a Reliable Roll

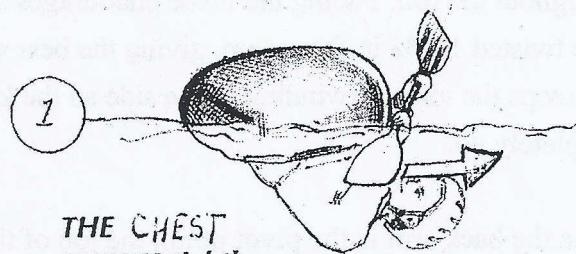
Mary DeRiemer Illustrations Bruce Mosier

A good roll is reliable and safe. When complete, your posture is upright and ready for whatever the river sends you next. As with every stroke, rolling uses a wind-up to store energy. This is the purpose of the set-up. Sometimes the river gives you the set-up, more often you have to make it happen. The actual rolling of the boat happens during the sweep. The purpose of the sweep is to unleash the energy you created in the set-up. As the chest unwinds out to the side, torque is generated on the rolling knee and this rights the kayak. With the blade near or just past 90°, it's time to center your body over the middle of the righted boat. Called the recovery phase, this finish is essential for an effortless roll.

Let's look at the specifics of the roll.

### Illustration 1)

**Set-up:** The upper body twists completely toward one side of the boat, chest wrapped toward the outside of one thigh as snugly as possible. The back hand is near the hip and the angle of the front blade is neutral to *slightly diving*.

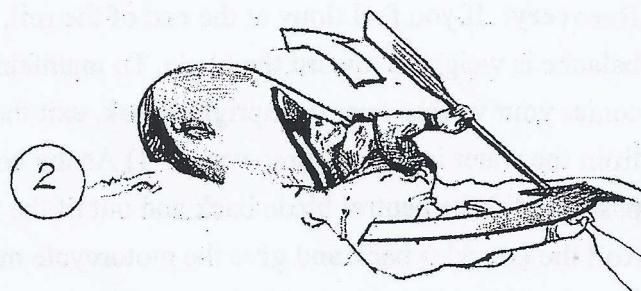


THE CHEST  
TWISTS tightly  
to one side to  
set up the roll.

(Why? The torso needs to twist out from under the boat in order to create tension in the rolling knee. The body isn't very strong traveling in this direction. The resistance of a climbing blade is enough to stop the body, which stops the boat rotation. Then instinct takes over. The quads push hard against the foot braces and the arms pull down on the paddle, driving it deep underwater. This substitution of muscle over technique can lead to shoulder injury and an exposed face as the body pushes to the back deck. So keep your blade angle neutral.)

### Illustration 2)

**The Sweep and Boat Rotation:** As the chest twists out, the blade slices in an arc away from the boat, and torque is generated on the rolling knee. The kayak rolls up during the time it takes the paddle to reach 90°. A delay in boat rotation occurs when the sweep moves faster than the boat can be rolled, and results in the blade traveling way beyond 90°. To synchronize the sweep to the roll, slow the sweep down.



The blade slices  
out, away from  
the boat.

### Illustration 3)

During the sweep, the back arm must stay passive. As the pivot point of the paddle, it forces the torso to do the sweep, not the arms. The passive back arm also keeps the body centered throughout the roll so that at 90°, with the boat upright, your body weight is evenly distributed side to side. If the back hand punches forward or up, the roll will finish off balance, the head comes up for air and the roll fails.

A trick to keep the head from coming up (an instinct which puts torque on the wrong knee) is to watch the front blade throughout the roll. Facing the blade encourages the chest to be twisted 100% in the set-up, giving the best wind-up, and keeps the torso unwinding to the side so the kayak rolls completely up.

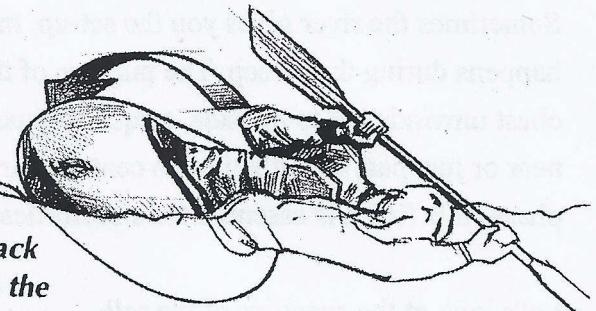
While the back arm is the pivot point, the job of the back hand is to maintain the slicing blade. This is accomplished by smoothly rolling the knuckles back, as if giving full throttle to a motorcycle. The back hand finishes on top of the shoulder with the elbow pointing forward, as if carrying a heavy tray of food. The face and chest finish slightly twisted toward the blade. This position is the key "fix-it" for roll tune-ups and is the classic recovery finish to the roll.

### Illustration 4)

**Recovery:** If you feel tippy at the end of the roll, your balance is weighted toward the blade. To maintain or re-center your weight over the upright kayak, exit the blade from the water in one of three ways. 1) As the body twists past 90°, lift the neutral blade back and out of the water. 2) Roll the knuckles back and give the motorcycle maximum throttle. This will knife the blade out of the water. 3) Finish by sliding the blade inward toward the knee, as in a high brace. These three recoveries create a lifting and centering influence to the finish.

3

*The back  
arm is the  
pivot during the  
sweep.*



*The blade  
comes out.*