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## Tactics for Turning

### TECHNIQUE—August 2006

Tactics for Turning  
 Text and photos by Doug Alderson  
 Illustrations by Christopher Hoyt

In calm conditions, a sweep stroke is usually sufficient to turn a kayak, but when the wind blows, turning a kayak may require something more. Depending on the relative direction of the wind and the direction you want to turn, some strokes will work more effectively than others. In choosing which strokes to use, it's helpful to understand how the forces imparted by the wind and the water affect the directional control of a kayak. You don't have to struggle in the wind if you use strokes that let the wind do some of the work for you.

#### Weathercocking

As the kayak moves forward through the water, the bow and stern encounter different forces. The bow moves forward into undisturbed water and pushes it aside. At the stern, the water moves back in to fill the void created by the passage of the middle of the kayak, leaving turbulent water in the kayak's path. In calm air, these forces are balanced on both sides of the kayak. But if the wind is blowing against the side of the kayak and pushing it sideways (and here we'll be considering the behavior of kayaks without rudders or skegs or with those devices retracted), the bow meets more resistance in the undisturbed water than the stern meets in the turbulent water.

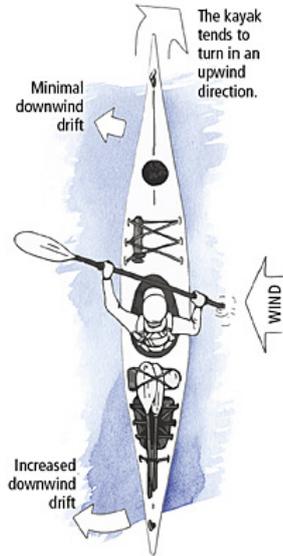
Because the stern of a forward-moving kayak has lower lateral resistance than the bow, it is more readily pushed downwind. The net result is that the kayak changes its heading, a phenomenon referred to as weathercocking. From the paddler's perspective, the bow seems to be pulled up into the wind. As the paddling speed increases, difference in lateral resistance between bow and stern grows and the kayak veers more forcefully upwind.

Choosing your strokes to work in concert with the forces imparted by the wind on the kayak will improve your performance and reduce the effort required to manage your kayak. Turning the kayak in the wind begins with good forward speed and by using the paddle effectively on both sides of the boat. For turning in wind, you'll need good basic skills with the sweep stroke and bow and stern rudders.

#### The Forward Sweep Stroke

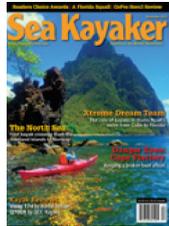
The forward sweep stroke is the fundamental stroke for turning a sea kayak. The sweep is a modified forward stroke that adds to forward momentum and causes the kayak to turn. Consider a turn to the right—the stroke is preceded by an initial upper torso twist clockwise and then the left paddle blade is planted well forward on the left side of the kayak. During the stroke, you unwind the lower torso to turn the kayak against the resistance of the paddle. At the end of the sweep, you'll have to withdraw the paddle blade from the water quickly or it will reduce the momentum of your turn.

The sweep stroke uses only one paddle blade, but you can use both blades to turn. For more turning



Weathercocking: Wind coming from the side will push the stern downwind more than the bow, causing the kayak to veer into the wind.

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power, combine two strokes into a smooth sequence, and follow the sweep stroke on one side with a bow rudder or a stern rudder on the opposite side.

The Bow and Stern Rudders

Rudder strokes are performed by placing the blade either forward or aft of your hips and holding it in a static position. The power face of the paddle is the side normally facing you (usually the concave face bearing the manufacturer's label) and the back face is the side normally facing away from you. For a bow rudder in the wind, the paddle shaft is held in a nearly vertical orientation, and the blade is placed in the water at a forward position near or beyond your knees. The power face of the blade is toward the kayak, with the leading edge of the blade rotated slightly outward, creating an angle of attack that pulls the bow into the turn.

A stern rudder works in a very similar way but has the paddle shaft in a more horizontal orientation, with the blade placed well aft of your hip. The blade is in a nearly vertical plane and the power face is toward the kayak. The paddle shaft is positioned to create an angle of attack so that the water pushes against the back side of the blade, which then pushes the stern to the outside of the turn. Effective bow and stern rudder strokes require subtle adjustments of blade position and angle of attack.

Combined Strokes

Combining a sweep stroke with a bow rudder or stern rudder incorporates both paddle blades into a set of blended strokes. To turn to the right, do a sweep stroke with the left paddle blade and follow that immediately with a bow rudder on the right-hand side. The left sweep stroke concludes with the right paddle blade in a forward position ready to be placed in the water for a right bow rudder.



Paddle rudders are static techniques that maneuver the kayak by the proper placement and angle of the paddle blade, held static, without pulling it through the water. The bow rudder is placed well forward of your hips with the front side of the paddle facing forward. The front face of the paddle pushes against the oncoming water. The bow rudder on the right-hand side blends easily into a forward stroke on the same side making for a smooth and effective combination of left sweep, right bow rudder and right forward stroke.

A similar combination for the same right turn is to sweep on the left and place a stern rudder on the right-hand side. After the sweep is complete, this combination requires you to swing the right paddle blade aft to a position near the stern. The stern rudder on the right is followed by the next forward stroke on the left. The stern rudder is placed well aft of your hips with the front face of the paddle toward the kayak. The back face of the paddle pushes against the on-coming water.

The effectiveness of a rudder stroke depends on proper paddle placement, blade angle and good forward speed of the kayak. It's important to keep in mind that a sweep stroke adds to forward momentum, while a rudder stroke reduces it.

In calm conditions, you could use a sweep with either a bow- or a stern-rudder stroke and achieve nearly equal results, but when turning the kayak in 15+ knots of breeze with moderate sea conditions, you need to choose the strokes that will work to your advantage. For the following examples, the wind is coming from the right-hand side of the kayak.

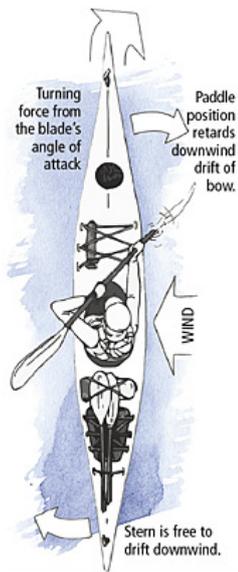


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An upwind turn. Using the paddle for a bow rudder will increase lateral resistance forward, causing the stern to swing downwind and the bow to turn into the wind.

### Turning into the Wind

An effective sequence for turning a kayak into the wind, in this case to the right, is to start with good forward speed, look right, edge-tilt left and sweep stroke on the left (downwind) side. While maintaining the left (downwind) edge-tilt, follow the sweep with a bow rudder on the right (upwind) side. It's best not to rush the sweep but to make a quick transition to the bow rudder at the end of the sweep.

During the bow rudder, the blade's angle of attack will pull the bow to the right. Placing the blade as far forward as possible will also increase the lateral resistance at the bow, retarding the bow's downwind drift while the stern remains free to drift, complementing the turn. Leaning forward will help you get the blade farther where it will be more effective as well as sink the bow deeper in the water, increasing its lateral resistance. Hold the bow rudder for only a moment to avoid any significant loss of speed. A loss of speed is detrimental to an upwind turn because it decreases the weathercocking you're using to enhance the turn. Any speed you lose in the turn will be difficult to regain as you head into the wind. To help maintain your speed, blend the bow rudder into a forward stroke on the same side. Be sure to keep the forward stroke straight back so it doesn't become a sweep stroke turning you in the wrong direction.

A bow rudder is an effective tool for upwind turns, but any paddle technique with a paddle placement aft of the cockpit will put you at a distinct disadvantage. It's quite common for beginners to use a stern rudder when trying to turn the kayak upwind, but the aft placement of the blade will increase lateral resistance aft and cause the bow to swing downwind. Some novices will even revert to a reverse-sweep stroke on the upwind side when they discover the stern rudder doesn't work. That will only serve to make matters worse, as a reverse-sweep stroke dramatically diminishes the forward speed that would contribute to a turn into the wind.

### Turning Downwind

To turn a kayak to a more downwind heading, in this case to the left, start with good forward speed, look left (downwind), edge-tilt right (upwind) and sweep stroke on the right (upwind) side. While maintaining the right (upwind) edging, follow the sweep stroke with a stern rudder on the left (downwind) side. Don't rush the sweep, but at the end of the sweep make a quick transition to the stern rudder.

During the stern rudder, the blade's angle of attack will continue the turn, and the aft placement of the paddle in the water will retard the downwind drift of the stern while allowing the bow to drift freely downwind. You can hold the stern rudder for a moment, as a small loss of speed reduces weathercocking acting against the downwind turn. The forward momentum you lose is easily regained downwind with one or two forward strokes.

### Cadence and Paddle Length



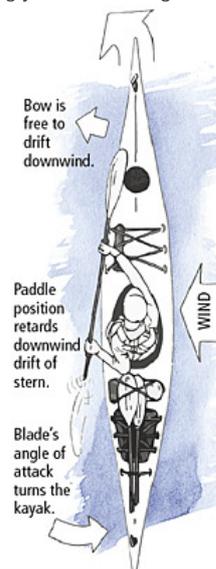
The sweep starts with the blade planted to pry away from the kayak. Edging the kayak will help it pivot quickly.

The cadence of blended strokes is an important consideration. It takes less energy to keep the kayak moving forward than it does to pick up lost speed, and a quick cadence for forward strokes and a quick transition between blended strokes is better for maintaining a good rate of speed. With a shorter paddle, you'll be able to develop a higher cadence and place the paddle blade close to the kayak in an efficient position for the forward stroke.

Quick and efficient forward strokes and maneuvering strokes such as the bow rudder are easier to perform if you use a more vertical paddle orientation and keep the blade (but not a significant portion of the paddle shaft) submerged in the water close to the kayak. Your height, the breadth of your kayak, and your personal style of paddling will determine your preferred

paddle length. For the best performance, choose a paddle length at the shorter end of your range of preference; I would suggest between 205 and 220 cm. If you have a paddle with a variable-length ferrule, you can experiment to find the best length that provides you with a good cadence and ample power.

### Using the Waves



A downwind turn. Using a stern rudder will anchor the stern and let the bow swing away from the wind.

Turning strokes are most effective when timed to coincide with the best position on a passing wave. Unless your kayak is parallel to the waves, each wave that passes will alternately lift the bow and the stern of the kayak partially out of the water. If you want to turn upwind, plant your bow rudder when the stern is lifted free to drift downwind. A downwind turn works best when the stern and your stern rudder are in the water and the bow is free of the lateral resistance of the water and responding more to the push of the wind.

An upwind turn into steep waves can be accomplished with a high-brace turn. The kayak is edged right into the wave and the paddle is placed as a high-brace in a forward position. Lean forward to set the brace closer to the bow, but keep your elbows close to your sides. The edge and brace add considerable stability, and the forward paddle placement holds the bow steady against the wind, while the forces of the wind and the oncoming wave turn the kayak by pushing the stern downwind and downwave. A high-brace turn can significantly reduce forward speed, especially with the added opposition of an oncoming breaking wave. After the wave passes, you must paddle forward vigorously to keep up good speed and maintain your new heading.



You can afford to lose some speed while holding the stern rudder to turn downwind. The following sea will get you moving again.

To make a turn downwind in steep waves, it's still necessary to maintain stability by edging into the oncoming wave. While maintaining your commitment to stability and edging into the wave, turn your upper body to look where you're going and, with some care, place the paddle for a stern rudder. The wave will push your bow downwind, turning the kayak, while the stern-rudder paddle position will hold the stern from drifting. Stability relies on a sustained edging into the wave, and any lack of commitment to edging here will surely cause a capsize. In steep seas, a downwind turn, even off a small wave, is one of sea kayaking's more demanding maneuvers. Practice in deep water where you can roll or exit and swim as necessary.

When the wave is steep and its crest is breaking, your concerns for stability will take precedence over turning. You would likely capsize if you tried to do an upwind (right) turn with the usual sweep stroke on the downwind (left) side with the kayak edged downwind (left) away from the oncoming wave crest. To remain upright and stable in a breaking wave, it's necessary to edge into the tumbling crest, regardless of the direction of an intended turn.

#### Keeping a Steady Course

On a blustery day, with the kayak already traveling on the desired heading, your kayak will naturally waver and wander. Techniques for correcting a wavering course are much the same as turning onto a new heading, but the emphasis will vary.



The bow rudder on the windward side will bring the bow into the wind. Reach forward with the blade for more turning power.



A stern rudder will let the bow pivot downwind. Edging away from the blade will quicken the turn.

For small corrections on an upwind heading, avoid the bow rudder because it reduces overall speed. To make a small upwind (right) course correction, anticipate by looking and twisting your upper torso in the direction in which you're intending to turn, edge-tilt downwind (left) and sweep on the downwind (left) side. Concentrating on un-twisting your lower torso will help the kayak ease back onto course. At the end of a sweep stroke, remember to lift the paddle out of the water quickly so that it does not act as a contrary stern rudder. To make a small downwind (left) course correction, edge-tilt upwind (right) and sweep stroke on the upwind (right) side. As always, look where you're going and un-twist your lower torso. If the wind is at your back, pushing you forward, the sweep stroke can be followed by a downwind (left) stern rudder.

Effective paddling in dynamic sea conditions requires the ability to adapt and blend turning strokes to suit specific circumstances. Knowing how to use the paddle in concert with the wind and waves will get you where you want to go. When deployed, a rudder or skeg changes the underwater profile of the kayak and its weathercocking characteristics. When lowered, a skeg decreases the downwind drift of the stern and reduces or eliminates weathercocking. (If the blade of the skeg has sufficient area, it can create enough lateral resistance aft to get the bow to drift downwind, or "leecock.") A skeg also increases tracking, and can impede efforts to turn the kayak.

A rudder deployed and held in a neutral mid-ship position decreases weathercocking in the same way as a skeg. Changing the angle of the rudder with the foot pedals provides steering control as long as the kayak has good forward speed.

I have encountered numerous beginner paddlers stuck trying to paddle away from a lee shore with their rudder (or skeg) down and little or no forward speed. In this situation, their kayaks often have excessive leecocking, making them nearly impossible to turn upwind and get away from shore. The paddlers could make the desired turn upwind by raising the rudder so the stern is free to be pushed downwind. Rudders and skegs are excellent devices that supplement good paddling skills, and their effectiveness relies on an understanding of how a kayak maneuvers in the wind and waves.

In a moderate to rough sea-state, it can be difficult to maintain a steady downwind course. Cresting waves coming from behind accelerate the stern while the relatively unbroken water of the trough slows the bow, and the kayak persistently tends to twist (yaw) off course. Lowering a skeg, or a rudder in this case, has the advantage of anchoring the stern against the force of the tumbling wave rests. In addition to increasing straight-line tracking in a following sea, the increased lateral resistance aft also reduces weathercocking, so course corrections on a downwind run are fewer and smaller.

On a steady upwind heading, having a rudder or skeg down decreases weathercocking, and steering to counteract that effect might be a disadvantage. It is usually most effective to retract the skeg or rudder while heading upwind.

—D.A.

*Doug Alderson is a senior instructor-trainer for the Canadian Recreational Canoeing Association and the author of three books on sea kayaking, including Handbook of Safety and Rescue (Ragged Mountain Press, 2003), co-authored by Michael Parady.*

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