

# Canoes for Pennsylvania's Twisty Streams

by Cliff Jacobson

**P**ennsylvania has thousands of miles of twisty streams. These waterways are headwaters and tributaries of our main rivers, and they are relatively narrow with many twists and turns. They are ideal for canoes—the right kind of canoes. Here are some canoe rules and how to apply them to choosing the right canoe for Pennsylvania's twisty streams.

## **Rule:** The shorter the canoe, the easier it will turn.

Canoes are displacement hulls, so the longer they are, the faster they run. You can compute the relationship mathematically by applying the over-simplified formula: Speed in miles per hour equals 1.55 times the square root of the waterline length, measured in feet.

Thus, an 18 1/2-footer peaks out at around 6.7 miles per hour. A 16-footer runs about 6.2 miles per hour. The difference is about eight percent, which is significant if you're paddling long distances or into a head wind.

But when you accentuate one variable (speed), you detract from another (turning ability). Invariably, the result is that the longer the canoe, the harder it is to turn. This quality can be a serious handicap on twisty streams.

The late Harry Roberts, former editor of *Canoesport Journal* magazine—an outdoor publication that was popular in the 1970s—was often quoted as saying: "You can learn to turn a fast canoe, but no amount of learning will make a slow canoe fast."

Yes, a good team can maneuver a long, fast canoe through a tight course, but it won't be easy. Or fun. Why drive a semi through a twisty course when a compact car is available?

## **Rule:** More rocker means faster turns.

One-and-one-half inches of rocker is reasonable for a twisty stream canoe.

The upward curve of the canoe's keel-line is called "rocker." Generally, a canoe with lots of rocker turns easily and rises quickly to oncoming waves. But it's hard to hold on course (tracks poorly) and it's slower than a similar canoe with no rocker (see Figure 1).

Racers like a canoe with zero rocker—perhaps a hint of lift in the ends, that's all. Whitewater canoes should have severe rocker—three or more inches is common. One-and-one-half inches is reasonable for a twisty stream canoe that will also be paddled on larger, gentle rivers and lakes.

## **Rule:** Beefy, well-rounded stems are the rule on a twisty stream canoe.

Thin, square ends break easily and they discourage turns. The shape of a canoe's stems (ends) affects its ability to carve turns. Rounded stems encourage turns, while square stems act like rudders and tend to keep the canoe on course. Squaring the stems is an easy way to lengthen the waterline (and increase speed) of the canoe without increasing its overall length (see Figure 2).

Square stems are fine for racing and lake travel, but elsewhere they're an abomination. The thin, jutting ends catch on rocks and break—and turns are something you must plan.

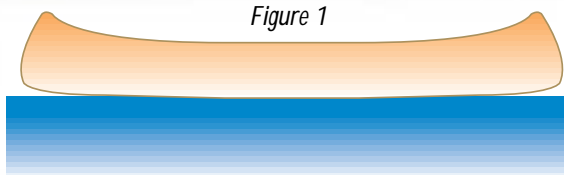
## **Rule:** Avoid canoes with keels!

The exceptions are aluminum canoes, which are formed in two pieces and don't come any other way. A twisty stream canoe should not have a keel!

An external keel will make any canoe track (hold its course) better. However, it will also catch on rocks and en-



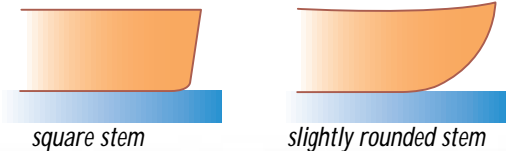
Figure 1



About 1 1/2 inches of rocker is reasonable for a twisty river canoe.



Figure 2



courage upsets. Let's not mince words: External keels are usually the sign of an inferior canoe. Any craft that requires an afterthought tacked on below to make it paddle straight belongs back on the drawing board. Straight tracking is achieved by combining a round or "V" bottom with minimal rocker and narrow, deep-running (square) stems.

The real reason for a keel is to stiffen a flat, floppy bottom. The biggest, flattest canoe bottom can be strengthened considerably by hanging a piece of angle aluminum or a 1x2 along its length. Throw in a bunch of ribs and a vertical strut or three, and the most shapeless hull will become rigid. Indian and fur trade canoes didn't have keels, and neither should yours!

**Rule: The lighter the canoe, the better it will dance downriver.**

Take two identical canoes—a 70-pound fiberglass and a 55-pound Kevlar—out for a spin. You'll feel the difference immediately. The lighter boat will accelerate faster and turn more easily. It will also ride higher in the water and perhaps

run more quietly. If you want to dance down a twisty stream, wear light shoes!

Color may influence the weight of some fiberglass/Kevlar canoes. Royalex and polyethylene canoes all weigh about the same, regardless of color. But variations abound in fiberglass/Kevlar canoes: The weight difference (a pound or two) is caused by the amount of pigment needed to color the gel-coat. Red, blue, green and yellow canoes tend to be heaviest; almond and white are generally the lightest. Canoes with clear (no pigment) gel-coat are the lightest of all.

All fiberglass/Kevlar canoes "scratch white" when they hit rocks. For this reason, I prefer white and almond-colored canoes because they are the lightest of their breed and the scratches don't show through. Note that some of the best lightweight canoes are reinforced with carbon fiber (graphite), which is coal-black and can't be colored. A clear (no-pigment) gel-coat is applied over the carbon fiber to protect it from the elements.

photo: Cliff Jackson, illustration: Ted Wake



**Rule:** The shorter and lighter the solo canoe, the better.

Paddling down a snaky stream in a purebred solo canoe is like touring the back roads of America in a vintage roadster. These little canoes encourage smiles.

In the hands of a capable paddler, just about any solo canoe shorter than 15 feet will artfully negotiate a twisting course. Longer solos can be turned smartly if you lay them on their side and use the rocker in the sidewall to make the turn.

Until a few years ago, 13 feet was the norm for snappy whitewater solo boats. Now, nine-foot and 10-foot solo canoes are commonplace. These short, highly rockered play boats really do “pivot on a penny”!

The lighter the solo canoe the faster it will accelerate and turn. A lithe, well-built 13- to 15-foot canoe will weigh about 35 pounds. Except for rock-bashing whitewater, 45 pounds is the absolute limit for a true solo canoe. Ultra-light Kevlar composite canoes are worth the hundreds of extra dollars they cost. Compare a 32-pound Kevlar canoe

to an identical 42-pound fiberglass one and you’ll see why!

All in all, a good twisty stream canoe is short (15 to 17 feet long), lightweight and moderately rockered. The stems (ends) are well-rounded and there is no keel. The seats are set at a comfortable (safe!) height for kneeling.

Construction materials include aluminum, Royalex, polyethylene, cedar-canvas, wood-strip, fiberglass/Kevlar—take your pick. Except for bad rapids, hull materials don’t matter. I’ve used relatively fragile fiberglass-covered wood-strip canoes on some pretty mean rivers, and they’ve all come home in one piece.

Beginning canoeists are consumed with the belief that strength is everything! It isn’t. Good canoeists are able to avoid most obstacles; they seldom hit rocks at high speeds, head on. Any well-made canoe, even a wooden one, will take this kind of “gentle abuse” in stride.

Please put durability out of mind. Instead, select a well-built lightweight craft that makes you smile when you step aboard. ☐

### *Test It in the Store*

*You usually can’t take a new canoe out and try it, so here are some tests you can perform in the store:*

1. Place the canoe on a level, non-abrasive surface and climb in. Can you kneel beneath each seat? This is important because kneeling welds you to the craft and increases stability. **Exception:** Some fine-lined canoes—which are seldom good twisty stream canoes—are too narrow in the bow for kneeling (you can’t spread your knees wide for stability). In these boats, it’s better to have a low-mounted seat and to brace your feet solidly against the bow flotation tank. Knees should be spread and braced against the sides of the canoe.

Beginners feel most confident in a “stable” canoe, so manufacturers set their seats close to the floor, which lowers the center of gravity. However, you’re in big trouble if you capsize in moving water and your feet become trapped under a low seat. The minimal foot clearance you’ll need if you assume the recommended “heels down/ankles flat” kneeling position is 10 inches. “Heels up” paddlers will need 12 inches or more space.

***Don’t buy any canoe whose seats can’t be easily raised!***

2. The manufacturer’s listed canoe weights are almost always overoptimistic. Take a bathroom scale with you when you go canoe shopping!

3. Measure the rocker: Spin the canoe around on the ground. If it spins easily, it probably has a fair amount of rocker and will turn quickly. You can also look at the hull at ground level to see how much deadrise there is at the ends; or you can measure it precisely. But the spin test will help you estimate maneuverability if you compare several canoe models.—CJ.