

## The Port Erie Challenge

You want to buy a new fishing boat in the twenty foot size range that doesn't cost a lot of money and can go fishing in just about any type of weather condition. The problem you are probably having is the "trade-off" involved in the decision making process.

The biggest problem in deciding what type of boat to buy is that you want a boat that will allow you to fish in all types of weather. When the wind is blowing fifteen to twenty knots; when the water's surface turns into a continuous field of nearly vertical two to four foot waves; when those waves are spaced extremely close together; that is when the owners of most fishing boats under 25' stay off the water because it is nearly impossible to run out to the better fishing grounds under these conditions. How can you find a boat that will accomplish this task?



Back to the trade-offs. First, you could consider an aluminum skiff that is moderately priced and has all the basic fishing accessories. They are light enough to be pulled on a trailer by almost any mid size car or small SUV. They are rugged, nearly maintenance free and can move briskly in flat to slightly choppy water conditions, but you don't want to venture very far from shore under rough conditions in this type of boat. These boats were not designed for these types of conditions. The forty-plus year old design can't handle rough water without pounding severely when trying to run into a chop. Or, you could consider one of the new deep V fiberglass fishing boats with a big outboard motor that goes fast in moderately choppy sea conditions. They are more stable than the aluminum boats, comfortably accommodate four big guys, but deliver poor fuel mileage, and they are heavy and expensive.

Okay, so what's the solution to the problem? Answer: A catamaran. Catamarans (cats) have been the answer for several decades in Europe, Australia and New Zealand where the sea conditions are frequently fierce. Everywhere you look in these areas, cats are replacing the heavy V bottom boats. From fast passenger ferries that transport heavy trucks, cars and people on runs across the English Channel, to recreational yachts, to racing sailboats that have recently shattered every speed record for non-stop around the world voyages, cats are the superior vessel. In recreational or commercial use, all cats will handle sea conditions that keep other boats in the harbor. In fact, an easy way to express catamaran performance in general is by "halves and doubles." Example: cats generally can transport double the weight at twice the speed on half the fuel of a conventional vessel. This equation changes fluidly with the size of the vessel. There is an even greater gap when it comes to fuel mileage, where small cats outperform comparable sized conventional vessels by more than 100%.

To summarize: cats are far more smooth and stable than V bottoms when running in challenging conditions. They have more interior volume, can handle more weight, will deliver at least double the fuel mileage of a deep V and remain stable while drift fishing. This stability allows many people who are prone toward sea sickness to enjoy fishing aboard a cat while anchored or drifting. However, (here comes the trade-off) they are usually fairly pricey, they don't turn quickly and most cats have a nasty tendency to occasionally "trip" on the leeward bow (bow steer) when running in a following sea. This can cause a dramatic lurch and sometimes a "spin out" that could be difficult to control for even an experienced skipper. Usually this

following sea problem is compounded by cavitation. Another less important but annoying fault of conventional cats is "sneezing". A cat sneezes when it crests a swell, then compresses air in the tunnel as it settles down. This compressed air is forced forward, carrying water with the air that winds up being blown back into the boat.

So how can a fisherman's wish for the perfect small boat at a reasonable price come true? Answer: a new "clean sheet of paper" hull design. A design that will actually deliver all of the performance, safety and comfort features that a fisherman could possibly hope for.

### **Introducing Port Erie Catamarans**

The Port Erie cats were designed for rough sea conditions. They are built in Erie, PA and have been exhaustively tested on Lake Erie the shallowest and roughest of the Great Lakes. They have a superior hull design that can handle sea conditions that one would not expect of a vessel under thirty feet. Lake Erie's bad weather conditions are more difficult than ocean conditions of similar wind speed, due to the shallow water. The shallowness causes the waves to run very close together, causing a nearly impossible situation for small boats when trying to run straight into the wind or downwind.

### **What makes a Port Erie Cat different?**

Two very important features set PE cats apart. The first is the shape of the bow. All other cats have a vertical, or nearly vertical bow at the leading edge. This bow section is efficient for driving smoothly into a steep chop and saving fuel by cutting through the water instead of having to part the water like a conventional boat bow. This bow shape has served cat designers well for many years, but it has some drawbacks as mentioned above.



Conventional catamaran bottom

The Port Erie catamaran bow is shaped like a sailboat bow. In fact, the bow design is inspired by one of the most successful American racing sailboats of all time, circa 1930's. This design totally eliminates the possibility of tripping in a following sea and because the bow section is fuller, it has more "**reserve buoyancy**" than the narrow shape. This added buoyancy causes the hull to lift quickly when it encounters a steep wave, thereby permitting the boat to run in a slightly bow-high attitude at all times. The Port Erie boats have been successfully tested, repeatedly, in extreme conditions that would cause other cats to "stuff the bow" into an oncoming steep wave and would simply swamp a conventional boat of this size.



Port Erie Catamaran bottom. Note fullness on bow section and vertical tunnel.

The second design departure from other cats is the hull bottom. All other small cats have a round bottom, or a slight V (about 8-10 degree angle) bottom to help cushion the ride in a chop. As is the case with all V bottom boats, the V cuts through the water and displaces it to the sides. With cats, the water that is displaced to the inside (the tunnel) causes turbulence in the tunnel. If the cat is using two motors, this is not a problem. However, small cats cost less and are more fuel efficient when using only one motor. The turbulence in the tunnel is a considerable problem in this situation. The turbulent water causes propeller slippage called cavitation. Single-engine-cat cavitation occurs when the

propeller does not have dense water to bite into. The problem is most noticeable under two conditions. The first is when running in following sea conditions. Conventional cats pull the propeller out of the water when the boat crests a wave and the bow is pointed down. With at least one brand of cat, when this occurs the

cavitation is so severe that the driver has to quickly reduce the throttle to idle speed to “clear the bubble” before the boat can proceed down wind. This best selling cat has very low sides and no aft bulkhead (back wall). If a wave washes over the transom while the throttle is momentarily reduced and the speed drops off, the lack of a bulkhead lets the wave come aboard unimpeded. The Port Erie cats have a deck-high **bulkhead and a splash well**, to say nothing of the fact that PE cats **don't cavitate** in a following sea. The second problem with conventional cats is that they have a difficult time with full throttle acceleration (hole shot) from a dead stop. Again, the turbulated water in the tunnel causes prop slippage.

Port Erie Boatworks has a **considerably different approach to bottom design** that corrects the turbulence and cavitation problems. This design allows PE cats to run quickly in following sea conditions and deliver a superior ride in rough water. The PE cat bottoms have a very steep slant, (dead rise) similar to the big high speed, ultra deep V, Cigarette, Fountain and Donzi ocean racing boats. The dead rise, from the inside edge of the tunnel bottom (keel) toward the outside edge, (chine) is a twenty six degree angle, thereby throwing the displaced water to the outside of the boat and leaving the tunnel flow undisturbed. This departure from conventional bottom configuration, combined with the unique bow design, permits the PE catamarans to run in rough water without cavitating or slamming, at speeds that at first frighten an experienced skipper of conventional craft. It does not seem possible to run a small boat straight into a 3-4 foot chop at a sustained 20 knots, but the PE cats have done this repeatedly for many miles on all points of the wind.



Aft section of one of the best selling cats. It has no aft bulkhead or splash well.



Conventional catamaran bottom.



Splash well and aft bulkhead. Bulkhead is notched to let the motor tip up fully.

The P.E. crew is demonstrating the stability of an 18' model with 840 pounds on the edge of the deck. The new 20' version is even more stable.



Port Erie tunnel and 26° dead rise angle of bottom.

Finally, all other cats have a reduced ability (compared to V bottoms) to turn sharply. One of the reasons is that they lean to the outside of a turn like a car. V bottoms (and motorcycles) lean to the inside. This outside leaning is disconcerting to passengers and requires some practice on the part of the driver. In fact, racing cats with two motors are forced to turn quickly and remain flat by reducing the power on the motor to the inside of the turn and increasing the power on the outside motor.

The PE cats remain flat in turns and have a remarkable

ability to turn very quickly. During testing, at moderate speed, the boat could be steered into an ever diminishing- radius turn until the steering wheel was turned fully, without the need to reduce power. Instead of the motor cavitating, the boat would continue to circle until it was turning in its own length similar to a sailboat pivoting on its keel.

### **Construction**

PE cats are **built entirely of premium composite materials** (no wood). The hull, floors, deck and bulkheads are built of Nida Core brand foam core, laminated together with biaxial fiberglass cloth and vinyl ester resin. This advanced composite laminate yields a surprisingly light construction with superior rigidity. The weight of a PE-20 rigged with an Evinrude E-tec 115 hp motor is only about 1500 pounds. Total weight with some fuel, personal gear **and trailer** is about **2500 pounds**. This is light enough to pull with almost any mid size vehicle.

### **Summary**

If you want to go very fast in moderately choppy water, (PE cats have a top speed of approx. 43 mph with 115 hp) consider purchasing a high powered deep V. But if you want a boat that can run quickly and safely in almost all conditions **without pounding and slamming**, you need a Port Erie cat.

### **The Port Erie Challenge**

You have just waded through a long description of a vessel about which some very large claims have been made. Now, Port Erie Boat Works would like to invite you to take a test run and see for yourself what this remarkable boat can do. Bring along your best fishing buddy and accept the Port Erie Challenge.\*

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Designer  
December, 2005

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