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A Nimble Yet Stable Platform for Aging Sailors

by Mike Waters

I was glad to see an article in *Professional BoatBuilder* about trimaran folding systems ["Know When (and How) to Fold 'Em," PBB No. 201, page 18], but rather than adding to that technical discussion, I'd like to share my personal experience after 40 years in trimarans and my surprise that multihulls still struggle for acceptance over traditional monohulls, especially among older sailors. With marina space growing ever tighter and more expensive, a folding trimaran that can be towed home could be worth a lot to those who still want to sail as they age. Slip fees aside, a good, seaworthy small trimaran is a fantastic boat for older sailors as it comes without the body strain and risk of losing one's balance, swamping, or capsizing that can compromise a tender, competitive monohull of similar length.

I camp-cruised for many years in traditional dinghies before I ever studied to become a naval architect, and it was always an exciting adventure. But knowing how one can get caught out in 30+ kts before reaching safety, at 88, I don't feel at ease in such boats in those conditions anymore. So I am happy I made the change to a small trimaran many years ago, and I couldn't go back. With good design, the speed and efficiency of a multihull is just so much higher than a monohull's, especially relative to one's physical input; it's no wonder that Dennis Conner declared back in 1988 after he first sailed the catamaran *Stars & Stripes*, "Yikes, where have I been all my life!"

While a trimaran feels more like a very sleek monohull than a catamaran does, the real game changer for us oldies is this: its stability is automatic and self-adjusting and comes with no performance penalty. Even many trimaran sailors don't take the time to really conceptualize and appreciate this, just accepting the boats as they are. This

essential difference from a monohull is truly night and day. Most monohulls require ballast for stability. If it's fixed ballast, this will typically range from 30% to 50% of total displacement, which means the hull must be much larger underwater just to support (float) the extra weight. Everyone will understand this is much harder to drive through the water. When the boat is vertical, this weight gives back very little but increasingly adds to the righting lever at angles up to around 90°, when the boat is uninhabitable. On small, open monohulls this stability comes primarily from movable human ballast perched on the rail for leverage, having to constantly watch for puffs and moving in or out in response so the boat stays fairly level and avoids swamping or capsizing. On a very windy day, you might need to add one or two extra adults on the rail, again increasing the boat's displacement by 30%-50%. When it's gusty, those extras will need to be diving in and out, getting a real workout.

Now consider the trimaran. On a professional-designed model, the amas (or floats) on each side of the main hull should barely touch the water when the boat is level yet ready to sail. When the wind is strong, the leeward ama is pushed down into the water while its buoyancy resists directly in relation to the water it displaces. Let's say that figure is 5 cu ft (0.14m³) of seawater. That means the ama is offering 320 lbs (145.15 kg) of upthrust. As an example, if the original full displacement was 640 lbs (290.3 kg) for boat, equipment, and crew, half of that total is now supported by the ama and half by the main hull. The latter has actually lifted and given up a buoyancy volume equal to the volume now offered by the ama. Simultaneously, the buoyancy center has automatically moved out halfway to the ama, where it's in a far better

position to counter the heeling moment from wind in the sails. As wind increases, the ama automatically presses farther into the water and more ama buoyancy is applied, meaning less buoyancy is supplied by the main hull, as the total buoyancy will always equal the total vessel weight.

A defining virtue of a trimaran is that this balance of stability and buoyancy is totally automatic right up until there is no more buoyancy available from the ama. Such a stability system carries near zero weight penalty, compared to that 30%-50% extra displacement needed on a monohull. This enables slimmer and faster hulls for a trimaran plus a far more relaxed ride; stability adjustment from ama displacement requires zero movement by the crew, though starting off sitting to windward on a windy day still makes sense to provide even more righting moment.

So, for older, slower, and less mobile individuals who want the thrill of speed and efficiency, I contend that a well-rigged trimaran is the ideal boat and can be very safe, provided some basic rules are observed—set up the mainsheet to be readily released, and plan to maintain at least 1% of the boat length as freeboard for the ama bow at all times. Overall performance (a combination of comfort, dryness, space, strength, performance, and security) was the goal of the W17 trimaran (17'1"/5.20m) I designed for my own senior years. After 10 years of regular use, it has truly proven its worth and is now enjoyed by many retirees around the globe. **PBB**

About the Author: In addition to his career as a big-ship designer, naval architect Mike Waters has spent 60 years sailing high-performance boats and 40 as a trimaran enthusiast. Learn more about his work at www.smalltridesign.com.