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Equipment
INNOVATIONS

Force Fins offer greater efficiency with a shorter, more comfortable design

Tan Delta

THE OLD SAYING GOES, "IF YOU WANT SOMETHING DONE RIGHT, DO IT YOURSELF." AND THAT PHILOSOPHY TURNED UNDERWATER PHOTOGRAPHER BOB EVANS INTO A FIN DESIGNER. EVANS WANTED A PAIR OF HIGHLY MANEUVERABLE, COMPACT FINS THAT WOULD GIVE THE MOBILITY HE needed to pursue his underwater images. Since he couldn't find those qualities in any fins on the market, he decided to create his own.

From his prototype of chicken wire covered with newspaper and resin, Evans' Force Fins have evolved to the Tan Delta. A single glance will show just how different this fin is from its competitors. While other fins have long, stiff blades, the Tan Deltas — like all Force Fins — were designed from a totally different perspective.

Sleek and curved, the fins sport a deep V-shape. Like the caudal fins of fast-moving fish such as tuna and jacks, the Tan Delta relies on a high aspect ratio (wingspan divided by average width) for its efficient propulsion. By studying the biomechanics of aquatic animals and researching fluid dynamics, Evans concluded a shorter, wider fin would be better.

Rather than allowing water to spill over the sides of the fin and waste effort, the Force Fin channels water to the back of the blade, utilizing much more of your energy to locomote. On the downward kick, the blade of the Tan Delta opens to its largest surface area and flexes back, maximizing the amount of water that is displaced. On the recovery stroke, the fin recoils to its original shape, reducing the amount of drag. And that's where the engineering magic of the Tan Delta comes into play.

The polyurethane used in the manufacture of this new fin was chosen for its snap. This property actually decreases the amount of effort you have to provide. Since the Tan Delta returns to its original conformation, there is less surface area to create resistance on the upstroke. Less work means you use less air, and that translates into longer bottom times — something we all appreciate.

It's this reduced effort that ironically causes some people to reject Force Fins. Divers are used to feeling a tremendous resistance to their kick. They mistakenly assume that feeling is the "power" of the fin. According to Evans, it's actually a sign you're working too hard. I was a victim of the fallacy. On my first dives with the Tan Deltas, the reduction in effort was noticeable. I was convinced I couldn't be getting anywhere. However, when I glanced to my side, I was easily outdistancing my buddy.

Force Fins confer other advantages as well. The foot pocket with its open toe area is designed to transfer the effort away from your calves to the largest muscle group in your body — the quadriceps. Not only are stronger muscles utilized for finning, but toe and foot cramps are significantly reduced.

In addition, the compact Force Fins make packing you gear bag a breeze, and the sturdy polyurethane construction resists wear and tear like few other fins I've tried. While there are no quick-releases, the nylon webbing slide strap is easy to operate and slips very little.

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As far as performance goes, Evans succeeded in his mission. The fins are easy to use and significantly reduce the effort required to tour the reef or wreck. In terms of maneuverability, the Tan Delta can't be beat. While I found sculling a bit difficult due to the curved tips of the fins, I found that with proper foot positioning I could even swim backward. Easing in and out of cracks and crevices with minimal sit-up was never so easy.

One word of caution: Force Fins require a little reeducation. They were designed for a much higher kick frequency than other fins. Rather than utilizing a long, slow kick or a bicycle kick, Force Fins perform best with a normal swimmer's kick. It may take a few laps around the pool to get back into the habit of this natural flutter kick, but the results will be worth it. —*Vince Rhodes*