

The Right Pick: Choosing an Anchor

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A steady 35-knot southeaster, gusting to 50, swept the low headland that sheltered my anchored 50-footer from the wild gray waters of northern Bristol Bay. Glancing out into the turbulence beyond the point, I saw an occasional burst of spray that gradually materialized into a gillnetter working its way toward the sheltered cove. Eventually, the little boat and its haggard crew pulled even with me and then advanced closer to the beach, seeking the calmest possible spot to lay for the night.

A crewman on the bow dumped the pick overboard and the boat backed down to set it. And backed. And backed. After dragging the anchor all the way out into open water, the boat picked it up and motored in to reset. Again it dragged out. A third try produced the same result. The skipper gave up and headed out into the maelstrom, looking for a more sheltered spot. I didn't envy him the long slog to the next anchorage where his anchor might afford him the security to enjoy a good night's sleep.

No other simple chunk of steel is quite so crucial to the safety and comfort of ship and crew as the anchor, and the fact that it can securely hold a vessel a thousand times its own weight in the face of wind, wave, and tide is amazing. As fundamental as the anchor is, there is little agreement among mariners about which of the various designs is best, and for good reason. Any anchor is best only for certain conditions, and conditions vary greatly. Working vessels typically carry at least two, and cruising yachts often have three or four aboard so as to be prepared for any eventuality.

Furthermore, the anchor is only part of the ground tackle system. Much of the literature about anchoring focuses on the *rode*—that is, everything between the anchor and the boat, including shackles, chain, rope, or cable—and on techniques for securing the rode to the boat and retrieving it all when it is no longer needed in the water. (Ground tackle and retrieval may be the topic of a future column.)

Ground tackle aside, the effectiveness of any modern anchor has far less to do with its weight than with its design, and the way it grabs the bottom to create tremendous lateral resistance. In fact, some of the anchors with the greatest holding power are extremely lightweight. Since bottoms vary, so do anchor designs; and each is better on some bottoms and worse—or practically useless—on others.

Most modern anchors are divided into two basic types: the pivoting fluke type, which includes the original Danforth and similar styles such as the Performance, Fortress, and Hooker; and claw or plow types, including the Bruce, Claw, CQR, Delta, and Max. The old standby, the Fjirforth, is a pivoting fluke anchor still in widespread use in the fleet; but the fluke area is relatively small, and the old-style pick relies as much on weight as on the ability to dig into the bottom.

Several factors influence anchor selection, including ease of setting, holding power, resistance to veering or ability to reset after veering, strength, ease of retrieval, and ease of storage on board. Considering the importance of an anchor as a safety device, cost should not be a factor.

In the anecdote related above, the issue was ease of setting. The unlucky gillnetter's anchor may have been capable of holding the boat securely in a hurricane once it was set, but on the cobbly bottom of that particular anchorage that particular style of anchor just didn't want to dig in. I happen to be a fan of the Bruce anchor, in part because, here in Western Alaska, big tides and strong currents combined with a mix of bottom types makes initial setting problematic, and my experience is that Bruce anchors dig in the first time, every time. Tests (see below) showed that generally the claw and plow type anchors tend to set more readily than the fluke types, particularly on hardpan or rock, or in grass, where the plow excels.

But ease of setting is only one consideration. Independent organizations have conducted numerous controlled anchor tests, and while they have confirmed that Bruce and some others set easily on a full range of bottoms, they also showed them to have relatively poor holding power. The Danforth type pivoting fluke anchors are superior, particularly in sand and mud. The down side is that they tend to do poorly at grabbing rock or cobble and they'll skate right over grass or kelp.

How much holding power do you really need? The effect of wind force varies by the square of the wind velocity, and wind resistance on a boat hull also increases by the square of the hull length. That means that, with each small increment in boat size or wind strength, the size of the required anchor goes up dramatically. The horizontal force exerted on an anchor by a 40-foot boat in 15 knots of wind is 300 pounds, but in 60 knots the force has increased to 4,800 pounds. Even at 42 knots, none of the claw and plow anchors rated for that size of boat has the holding power to resist the estimated 2,400 pounds of force imparted into the boat by the wind. Several of the fluke types do meet that standard. In tests, only the Max and CQR rated with the fluke anchors in holding power.

An anchor that holds superbly against a steady pull in one direction may flop over and come out when the wind or tide shifts. The Bruce and some of the plow anchors tend to be more resistant to the effects of veering, and will quickly reset themselves if they do pull out. In particular, the CQR with its pivoting shank is especially resistant to veering.

Most modern anchors have sufficient overall strength to withstand the force imposed by a boat in normal conditions; but some, particularly those with large flat flukes, may set themselves so well that they're hard to get up. I have twisted the shanks of a couple of them during retrieval

from mud bottoms. The plow and hook-shaped anchors are extremely stout and will break free from a sticky bottom with a direct upward pull (1:1 scope). Sometimes it's necessary to snub the rode and power over the anchor, or use the surging on the waves to break out a well-set anchor.

On commercial vessels, storage usually isn't a big issue, at least not for the main anchor. Stowing spares can be a problem, however, and sculpted anchors like the Bruce and the plow types are particularly inconvenient to stow. Pivoting fluke anchors such as the Danforth stow flat, and some can actually be disassembled for easier stowage.

Considering all of the above, what is the best all-around anchor? The independent journal *Powerboat Reports* picked Performance (a house brand of West Marine and a Danforth knock-off) based on total holding power in straight-pull tests. They rated Bruce tops in all categories except convenient stowage and holding power. The versatile CQR has long been a favorite with cruising yachters, and several others, including Delta and Max, scored well in the tests. The best anchor, it seems, is not one but two or three different anchors. A Bruce, Max, or one of the plow types would be a good choice for routine use, and a fluke anchor such as one of the Danforths or its copies could be reserved for storms. One limit on choice is that some of the best anchors are not made in sizes big enough for larger vessels.

In the final analysis, the right question may not be "What is the best anchor?" but "What is the right bottom?" Stick to a mud or clay bottom, use good rode with plenty of chain and a 7:1 scope, and any of the major anchor types will keep you secure.

Some operational tips: Be sure all shackles are moused—that is, the pins secured in place with monel wire. Use plenty of heavy chain. (The old standard of one foot of chain for each foot of boat length is minimal. Two to three is preferable.) Keep handy one or two sets of chafing gear made of a three-foot length of split rubber hose and appropriately sized hose clamps. Always set the anchor with the boat slowly underway in reverse so the chain doesn't pile up and foul the flukes of the anchor, and always snub (set) the anchor with the engine before shutting down.

When retrieving, use the engine to bring the boat to the anchor, not the anchor winch. It is designed only to raise the anchor from the bottom, not tow the boat into wind and current. Never use the winch brake or dogs to hold the rode—always secure it to a samson post or use riding chocks or stoppers to take the strain off the winch drum. A rolling hitch will hold it, or a lineman's "frog leg" works well. If the boat is surging, use a length of nylon rope as a snubber to absorb shock, particularly with cable or all-chain rode.

A few maintenance tips: Clean rocks and grass from the anchor, particularly at pivot point. Lubricate the pivot point. Paint won't do much for a rusty anchor, but it can be regalvanized. Clean chain links and check for corrosion. Check rope for cuts and chafing. If you find any, cut the rope back to that point and re-splice the eye thimble, or splice directly to the chain. If you use rope, periodically reverse the ends ("change the nip") to distribute the wear. If you ever bend a fluke or shank, put the anchor into service as a yard decoration and get a new one—a repaired anchor never works as well as new. ♦