Making It Habit: Descending Devices and Best Fishing Practices to Mitigate Barotrauma

By Erica Hussey, S.C. Sea Grant Consortium

“The hurricane should have churned up good things,” says Captain Chuck Griffin, as he steers an AmeraCat 27 that effortlessly glides across the water. Departing from the Isles of Palms Marina, the boat picks up speed. A pod of dolphins passes in the periphery, one spyhops and another descends offering a fleeting view of its dorsal fin.

It’s early morning, with just a hint of a low rising sun. Hurricane Idalia is headed northeast. Everything points to the perfect weather opening for an offshore charter trip. David Hugo the Sea Grant Reef Fish Fellow; Ashley Oliver the Best Fishing Practices Outreach Specialist; and Julia Byrd the Citizen Science Program Manager all from the South Atlantic Fishery Management Council (SAFMC) are hoping for reef fish.

Everything is prepared. The boat has been wiped down, chrome and metal pieces glisten in the light, and fishing rods

stand at the ready.

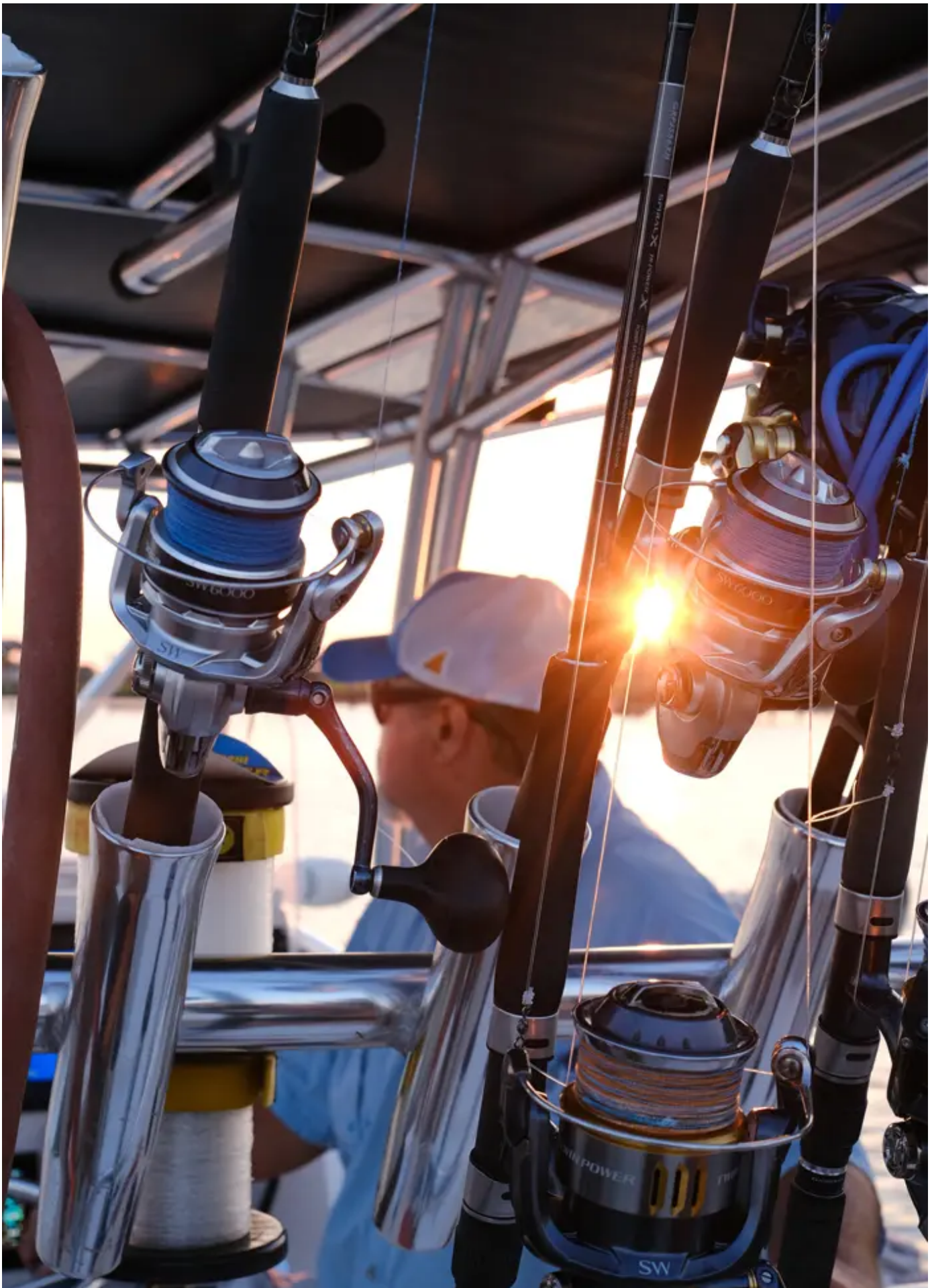


Photo by Erica Hussey, S.C. Sea Grant Consortium.

Captain Chuck is at ease. His crewmate, Drew Nettles, easily navigates the 27-foot-long catamaran, hopping along the bow, cast nest in hand. With the shore still visible in the distance, the boat begins to circle and slow. They're both watching and waiting. Plunge-diving pelicans pepper the sky.

"We're listening and looking for 'plops,'" says Captain Chuck. "You're out here long enough you start noticing the small things."

The "plops" he speaks of are of bait fish breaking the surface. Nettles points; another pelican takes a dive. Captain Chuck turns the boat slightly, allowing Nettles to toss the cast net out over the water in an elegant arc. They work in concert with one another until the 50-gallon livewell is full of bait fish. Upon closer inspection, some unseen creature has created a large hole in the net, but it doesn't matter—they've learned to adapt to what's thrown their way.

Everything is always at the ready.

The boat moves forward, out to sea. Hours later, the crew is now 20 miles offshore. *Sargassum* (a brownish seaweed or

type of algae) floats by in clumps and the occasional fist-sized cannonball jellyfish bobs alongside them. The ocean rhythmically pushes the boat back and forth as the anchor is lowered.

Captain Chuck signals to his passengers that they're clear to drop their lines. Nettles secures a rod with a descending device then double-checks the scale at the back of the boat.

Hugo, Oliver, and Byrd bound to the sides of the boat and prep their fishing lines, while Nettles assists when needed. Their goal is to catch reef fish and document the use of descending devices while demonstrating best fishing practices for use in SAFMC and Sea Grant outreach efforts. In situations that require a fish's return to the water, using proper release methods can improve the survivorship of released fish.

The trio are specifically hoping to use descending devices to address a condition known as barotrauma. "Barotrauma is synonymous with pressure-related injury," says Hugo.

Deep dwelling fish experience barotrauma when they are pulled from the depths up to the surface. For fish, the signs are unmistakable, hallmarked by tiny bubbles across the surface of fish, bulging eyes, and a protruding stomach through the mouth. This condition makes it difficult or impossible for the fish to descend on its own, which

diminishes its chances of making it back to the bottom and surviving. Through the use of descending devices to return the fish to its home depth, reducing air time and contact with fish, the released fish's chances of survival may increase.

Scamp Grouper showing several barotrauma symptoms including bulging eyes and a protruding stomach, caught out of Charleston, S.C. Photo by South Atlantic Fishery Management Council.

With recorded demonstrations showcasing the use and ease of descending devices, there is hope that this knowledge could have a positive impact on the survival rate of released fish—fish that are caught but for one reason or another

(season, limit, legal size) are released. “It’d be great to demonstrate how easy it is to use the descending devices,” says Oliver.

Fish caught at depths of more than 50 feet and reeled to the surface show these signs because of the expansion of air in their swim bladder as the pressure changes with the depth of water—with less pressure, gas expands.

“It’s basic physics,” says Hugo, as the boat sways.

The swim bladder is essentially a fish’s “buoyancy organ” that allows a fish to maintain its position and depth without risk of sinking or floating upward (and in some species it also acts as a resonating chamber). When gas expands in the swim bladder, the expanded swim bladder prevents the fish from being able to submerge. Once this occurs, fishermen can help descend the fish through the use of venting or descending devices.

Venting is the practice of inserting a long needlelike device into a fish’s swim bladder to release gas that will then allow the fish to descend.

Using a descending device is another option that is straightforward: devices guide fish back to the bottom where the air in the swim bladder recompresses, increasing survival odds. And as of summer 2020, descending devices are

required equipment for fishermen operating in South Atlantic federal waters. Descending fish benefits future anglers—more surviving fish equates to more fish for future catches.

As Hugo steadies himself, his rod doubles over. Byrd's does as well.

The first bites signal excitement. After a long fight, the first fish breaks the surface. It looks familiar, sharklike. As it is pulled from the water, spines down its back become more apparent as are two black stripes running down its flanks. The second breaks the surface. They both have an odd expression on their faces; they look almost prehistoric. It becomes obvious that they are also not sharks. They're cobia, *Rachycentron canadum*.

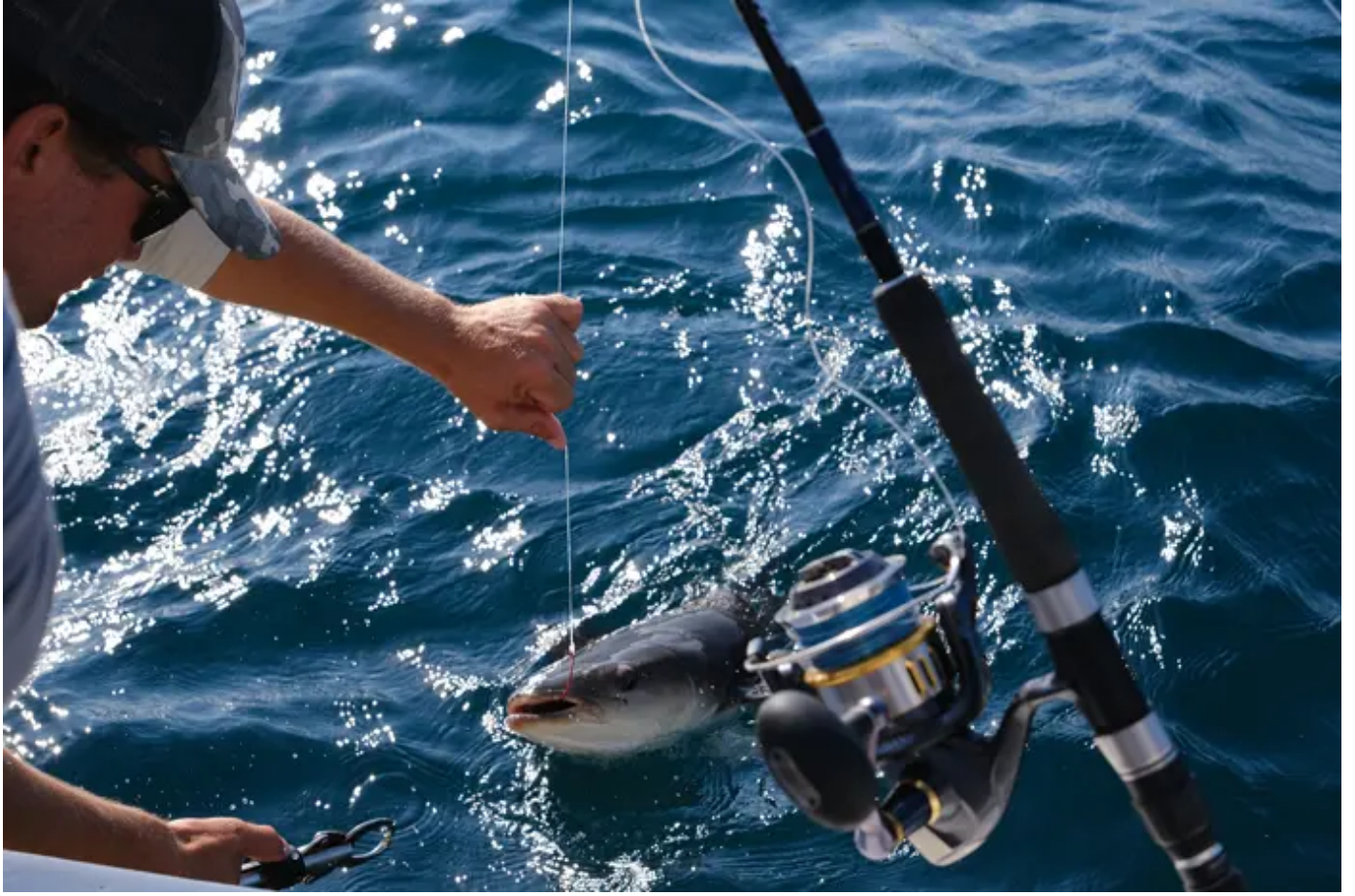


Photo by Erica Hussey, S.C. Sea Grant Consortium.

Cobias are unique in that they are the only extant species of the genus *Rachycentron*. Remoras the infamous fish seen clinging to sharks, rays, whales, and turtles are their close relatives—slightly resembling each other in body profile. Generally, cobia prefer to live alone except during spawning, but they occasionally come together. They are pelagic, preferring coasts and open oceans while avoiding the bottom or shores. Notably, cobia do not suffer from barotrauma as they lack a swim bladder.

"They are known for their head-shakes," says Hugo. He mimics how they snap their heads back and forth with his

hand. Robust and strong—you'll know when you've landed one.

Soon three large cobias are pulled in and placed in the front fish box and iced, but Hugo, Oliver, and Byrd continue their search for reef fish. Only now, whenever something is caught (mostly cobia, with a stray amberjack), they minimize contact. Nettles assists in these moments, releasing what they've caught without bringing the fish aboard by deploying a dehooking device.

A few medium-sized cobias warrant a closer look; some are brought on board for quick measurements and photos. But everyone is cognizant of air time and skin contact with the fish—fish have a slime coat that is made up of a mucus that protects them from harmful microorganisms and parasites; aids in reducing drag, creating more efficient swimming; or in some species, acts as something akin to sunscreen to prevent sun damage. But Hugo, Oliver, and Byrd aren't here for cobia. Their target is reef fish.

While the SAFMC crew is looking to demonstrate the use of descending devices, they are also aiming for opportunities to use SciFish, an app that houses the citizen science project, SAFMC Release. Hugo explains: the project partners with fishermen to collect data on released shallow water grouper and red snapper. Traditional data collection programs sample back at the dock, making information on released

fish difficult to collect. Shark predation, fish measurements (such as length and weight), depth of catch, hook type and placement, as well as whether or not descending devices were deployed are all valuable for SAFMC's Release project. These data fill key gaps and can help inform stock assessments and management.

"You never know what you'll get," says Oliver. "But it's wonderful to see the spread of diversity."

There are over 50 species in the area that they could potentially land. The boat now sits 80 feet above the ocean floor. Since only the cobia are interested, the boat moves again. Its final position: 30 miles offshore, about 110 feet above the floor. Captain Chuck mentions how odd it is not to land a single reef fish.

"You can see a lot of movement. A lot of activity here," Captain Chuck says, as he points to the colorful sonar screen. The anchor is deployed again and the lines are thrown in to test the waters.

Except there is only more cobia.

Still, the descending device attached to a rod sways above the water, prepared and able to assist in the event of landing a reef fish with barotrauma.

With three cobias in the boat and hours offshore, the crew

decides to call it a day. The reef fish have collectively decided against the offerings of bait fish.

But if the crew had landed a reef fish, the process of returning the fish to its home depth is simple with the use of a descending device that uses a mouth clamp or inverted hook or a fish elevator.

For a descending device with a mouth clamp or inverted hook, it's recommended to have a heavy-duty rod and reel available to attach a descending device to that will allow quick return to the water. The descending device and attached weight guide the fish back down to its home depth (allowing the fish's swim bladder to recompress in the process), where it is released. A good rule of thumb when descending: use one pound of weight for every five pounds of fish. Some devices have pressure-sensor releases that aid in releasing the fish at the right depth.

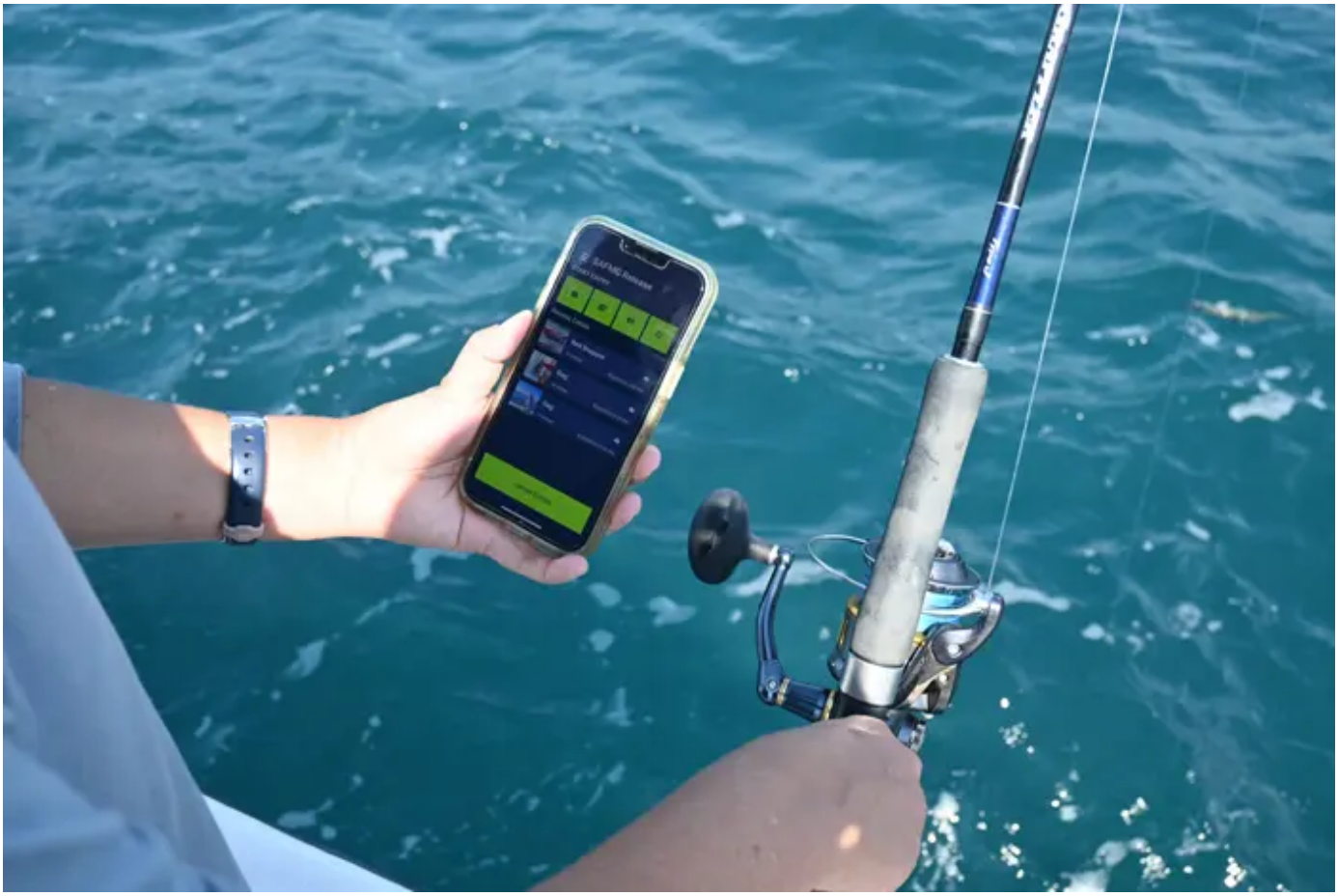
A descending device. Photo by Erica Hussey, S.C. Sea Grant Consortium.

For a fish elevator, the principles are similar in aiding the recompression of the swim bladder, but the device is essentially a weighted container with an open top (like a milk crate) that is flipped upside down. The fish is placed in the upside-down container and guided to its home depth. When the fish reaches its depth, it simply swims out.

At a minimum, the descending device must be attached to a 16-ounce weight and fish returned to its original depth or a minimum of 60 feet.

The Regulatory Amendment 29 of the Snapper-Grouper

Management Plan also makes it mandatory to have devices onboard *and ready*. This rule applies to all fishers in federal waters from North Carolina to Key West. The purpose? To increase catch and release survival rates of species that are prone to barotrauma.



Example release logging on the SciFish app—the main component to SAFMC Release. Photo by South Atlantic Fishery Management Council.

"That is why the regulation states that descending devices must be 'readily available.' The less time handling and spending time out of the water, the better. Additionally, the fish's chances of survival can worsen the more time spent at

the surface," says Byrd.

A takeaway: make it habit.

Whether it's descending devices, limiting the handling of fish, or participating in data collection through the SciFish app, these habitual actions contribute to the shared goal of preserving species and mitigating barotrauma.

Make releases matter by participating in SAFMC Release.

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