

Cooperative Science Services, LLC Dolphinfish Research Program

April 2015



The Odyssey of Dolphin GHOF-01

On June 3, 2014, Capt. Michael Mattson invited DRP staff to ride along on a fun fishing trip off Charleston, South Carolina, aboard *My Three Sons*, as guest of Hunter Edwards, the boat's owner. The idea was that if they got into some big dolphin, we would deploy two satellite tags. Capt. Mattson did find the big fish and we were able to deploy two satellite tags. These archival tags were programmed to monitor the fish's movement for six months, instead of the 30 days that our previous satellite tags had been programmed.



Don Hammond, director of the DRP, prepares to release the dolphin, GHOF01, 60 miles southeast of Charleston, SC after it was fitted with a satellite tag.

These satellite tags represented the start of the second phase in the DRP's use of these high-tech instruments to study dolphin behavior. This research effort was made

possible by a grant from the **Guy Harvey Ocean Foundation**. The study is directed at mapping the routes that dolphin travel along the eastern seaboard and down to the Caribbean. Considering the difficulty of finding a dolphin that could survive for 30 days (only three out of 18 previous tags), hoping to track one for 180 days seemed a dream. This dream was not helped by the fact that the second fish fitted with the tracking device that day was eaten by a predator just 36 hours after being released.

GHOF-01's archival tag released itself from the fish on December 2, 2014, and made first contact with a satellite on December 3, approximately 44 miles northeast of Punta Cana, Dominican Republic. It would spend the next 23 days downloading data via the ARGOS satellite system as it drifted through the Mona Passage between Puerto Rico and the Dominican Republic and headed southwest into the open Caribbean Sea.

In an effort to provide a smoother movement track, the daily positions of the fish were established using the average of multiple positions recorded for the fish each day. The distance between the averaged positions from one day to the next was considered the daily distance traveled

Observed Movements of Dolphin GHOF-01

Month	Monthly Distance (Miles)	Daily Maximum Distance*	Daily Average Distance*
June	982	138	35.7
July	1,335	152	43.1
August	1,571	129	50.7
September	1,539	132	51.3
October	1,238	68	39.9
November	1,654	119	55.1
December	110	44.4	36.7

(*miles)

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and was measured in statute miles. This distance could also be viewed as speed of travel in miles per day. The maximum distance noted between days was 152 miles for the period of July 12 to July 13. The preceding table summarizes the daily distances recorded for the fish each month. This travel does not account for the other two dimensions of movement, lateral and vertical, so the fish actually travelled significantly farther than what is shown.

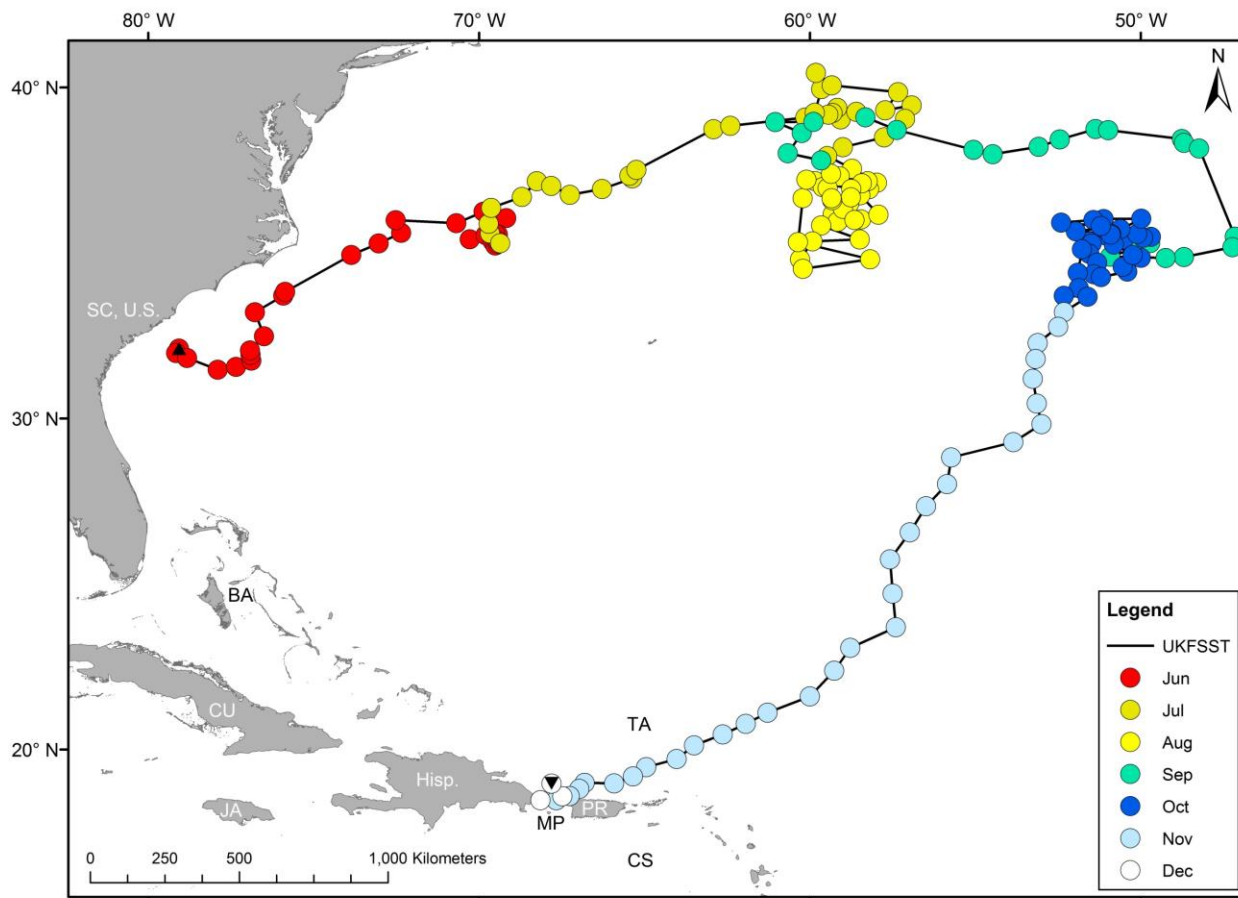
The amazing distances traveled each month were foretold by the track of the GHOF-02 satellite tag, deployed the same day, which recorded travel of more than 1,200 miles during its 30 days of drifting after the fish to which it was attached was eaten by a predator. After passively drifting for one month, that instrument wound up 550 miles east of Ocean City, Maryland. The very much alive and actively swimming GHOF-01 was located 493 miles off Ocean City, Maryland, after 30 days, with only 87 miles separating the two satellite tags. This is a clue to how much ocean currents affect dolphin movements. Even recognizing the important role of ocean currents on the transport of these fish, it is still mind-boggling that this

fish traveled more than 8,000 miles in six months (see figure below).

This fish did not start its travel in the anticipated fashion. When released, it did not head north, it headed east. It traveled easterly for four days to a point 190 miles east-southeast of Charleston before turning north (not many fishermen out there). This fish gave recreational fishermen a wide berth. The best shot recreational anglers had was on June 14 when it passed 74 miles off Beaufort Inlet, North Carolina. From this location the fish basically headed east-northeast for open water. It spent the last week of June within fifty miles of a point 340 miles east of Oregon Inlet, North Carolina, probably riding in an eddie.

By the first of July it is well out into international waters and is continuing its trek. In July the fish proceeded another 636 miles to the east-northeast. On July 10 it passed 340 miles north of Bermuda and by July 16 had reached a point 590 miles east of Nantucket Island, Massachusetts. At this point it likely encountered a large rotating water mass. It spent the remainder of July traveling around in a 174-mile diameter circle.

During the month of August this fish clearly showed it was happy where it was. It spent the entire month moving in zigzag patterns, probably in a large eddie, and cutting doughnuts in an area that was 132 miles wide and 227 miles long, located 680 miles southeast of Nantucket Island. The fish achieved 12 miles net travel to the east.



The above figure tracks the route of the bull dolphin GHOF-01 for the six months following its release on June 3 off Charleston, South Carolina. Figure prepared by Dr. Wess Merten.

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On September 4 “our fish” returned to an easterly track that carried it 663 miles to a point that was 1,175 miles east-southeast of Nantucket Island. At this point the fish turned south traveling in a 263-mile diameter arc to the west. At end of the month it found a place it liked, because it spent the last three days of the month traveling in a loose zigzag pattern. In the end it gained 472 miles to the east.

The place the dolphin found at the end of September was definitely to its liking. During most of the month of October, it would travel more than 1,200 miles zigzagging up and down in a rectangular area that was 122 miles wide and 164 miles long. This major feeding area lay 1,390 miles to the east of Cape Hatteras. In the last four days of the month, it appeared to begin breaking away from the zigzag life it had been enjoying, heading in a more southerly direction. As the month closed, it had gained only 126 miles to the south.

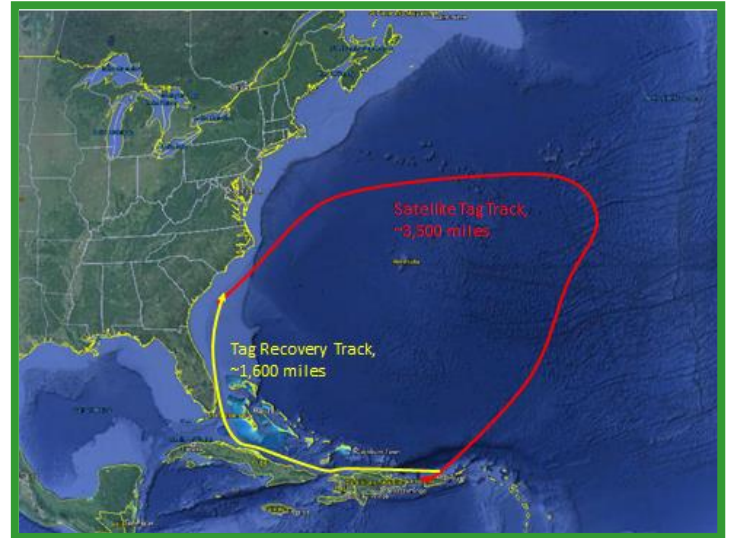
After one last 40-mile jog to the east on October 30, the dolphin decided it was time to head to the Caribbean. On October 31 it turned south and did not look back. By November 30 the bull had covered 1,654 miles, passing just 35 miles off San Juan, Puerto Rico, on November 26. November 30 found the big bull just 27 miles west northwest of Rincon, Puerto Rico, at the entrance to the Mona Passage. It spent the next three days zigzagging back and forth in the North Atlantic at the entrance to the passage between Puerto Rico and the Dominican Republic. Unfortunately, we will not know if the fish would have entered the Caribbean or continued westward in the Old Bahamas Channel toward the Florida Straits because the instrument released itself from the fish.

The route traveled by this dolphinfish is the first documented migration track for the species in the western central North Atlantic Ocean (WCNAO) and probably anywhere else. However, it most likely is not the only route used by the species. It will take many more such documented migrations by dolphinfish to establish their primary pattern(s). When you draw a smooth arc through this track of more than 8,000 miles, you find the fish is moving around an arc of about 3,500 miles.

Having a known route from the U.S. East Coast through the open WCNAO down to the Caribbean islands, we can now combine it with knowledge we have gained from the Dolphinfish Tagging Program for a complete picture of a migratory route. A 2012 tagged fish recovery documented a fish moving from San Juan, Puerto Rico, to Georgetown, South Carolina. This fish was projected to move through the Old Bahamas Channel to the Florida Straits based on other tag recoveries and then up the Eastern Seaboard. This fish was at liberty for 203 days (6.76 months) and travelled a projected route of 1,600 miles. When these two movements are combined, an annual migratory route of roughly 5,000 miles emerges. Now we

have a solid look at one of the migration routes used by dolphinfish found off the U.S. Atlantic Coast.

This gives us a better understanding of the real and potential fishing pressure being exerted on the same stock of fish relied upon by the U.S. recreational fishery. It also raises concern about the two areas where the fish spent extended periods, which if commonly used by other fish year after year, could expose them to international commercial exploitation that would be unknown to U.S. fisheries management.



Smoothing out the track of both the dolphinfish track with a satellite tag and that of a tag recovery movement indicates a migratory path of roughly 5,000 miles.

As a research biologist, I consider this is a dream that came true because of the support received from the **Guy Harvey Ocean Foundation** and recreational fishermen. Thank you.



A 59-pound bull dolphinfish explodes from the water behind the boat My Three Son's after feeling the bite of the hook, showing the awesome power and aerial displays that make the species so popular with fishermen. Photo by CSSLLC.

The Dolphinfish Research Program needs your financial support. No federal funds support this important research. This program exists because of private donations.

Your donations to the Dolphin Study are Fully Tax-Deductible

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HH Reef Foundation/Dolphin Study

Mail checks to the address below.

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Send in Your Photos of Dolphin

The DRP invites you to send in your photos of your trophy dolphin, the ones you tag, and the unusual ones. The program asks that you share the excitement and achievements that you record in photos with this program and other fishermen. Photos of fish caught off other countries are also desired. The best shots will be placed in our photo gallery on our Web site <http://Dolphintagging.com/>.

The photos must be in sharp focus and clearly show the subject of the photo. Photos with a file of 1MB or larger are preferred but photos using the newer cellphones have worked well for enlarging. Photos should be emailed to the DRP at CSSLIC@BELLSOUTH.NET. Please provide information on who is in the photo and on the importance of the subject of the picture.



This lady angler is pleased with her recent conquest of a nice cow dolphin. Photo by David Neblet.

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