When Disaster STRIKES

On April 20, 2010, BP's Deepwater Horizon mobile drilling rig exploded in the Gulf of Mexico. Two days later, the rig sank and oil began to gush—35,000 to 60,000 barrels of crude flowed up from about a mile deep each day, seeping into waters south of the Mississippi River delta. For weeks, the saga topped headlines and captivated audiences around the world. It served as a wake-up call regarding the dangers of deep-water oil extraction, not only to marine and coastal species and ecosystems, but also to the lives and livelihoods of the people who depend on a healthy sea and coastline for fishing, tourism, and recreation.

Yet, when disaster strikes, we often see glimmers of optimism in our humanity. The intense need that the BP oil spill presented for wildlife response brought together scientists, conservation workers, and rehabilitation specialists from around North America and even the Pacific. Here are two accounts of these response efforts from the inside, as given by Blair Witherington and T. Todd Jones.

GULF DIARIES 1:

Of Falling Trees, Oil at Sea, and Floating Little Turtles

By BLAIR WITHERINGTON

A tree falls in the forest, and no one is there to hear it. Does it make a sound?

Like trees falling in obscurity, some events are difficult to draw into our personal experience. Many aspects of this event, I thought, would be like that. The "event" was the largest marine oil spill in history—the blowout following the sinking of BP's Deepwater Horizon in the Gulf of Mexico. For nearly three months, oil rose to the surface and spread over a vast, remote area … remote to us, that is.

The effects from all this oil are only beginning to be measured and may never be fully understood. But it seems likely that among the natural resources of the open Gulf, juvenile sea turtles could be among the most profoundly affected. Why? A beginning glimpse of those young turtles comes from a research program I've undertaken with colleague Tomo Hirama through the Florida Fish and Wildlife Conservation Commission (FWC), work funded by the National Marine Fisheries Service (NMFS). In our work, we've found young turtles to be patchily distributed within the most productive surface habitat of the open Gulf. The patches, as discrete as desert oases, are the Gulf's convergence zones—surface water that brings organisms together along downwelling fronts. These focal points for life include the surface community anchored by the floating, golden-brown alga, *Sargassum*.

In the open Gulf, masses of cobalt-blue water carry golden clumps of *Sargassum*. As water masses collide with one another and with greener coastal waters, they push *Sargassum* and other drifters into distinct frontal lines, just as weather fronts assemble clouds at their leading edges. Clinging to the algal rafts are many animals that are found no place else, including crabs, shrimps, hydroids, moss animals, gastropods, and tube worms. Other animals are just passing through but have important ties to convergence zones. Among these are the sailors—bubble-rafting purple sea snails, blue buttons, and by-the-wind sailors. And pressed into these oases by the same oceanography are little sea turtles—juveniles in their oceanic (deep-sea) life stage.

In the *Sargassum*-lined convergence zones of the eastern Gulf, we've dip-netted pelagic juveniles of four species—Kemp's ridleys, green turtles, hawksbills, and loggerheads, each turtle remarkably similar in size to a mature coconut. The vast majority of those turtles are found floating no more than a meter from the nearest *Sargassum* clump. And from samples of material the turtles have ingested, we've learned that their diet is drawn from the rich *Sargassum* community, including the jellies and whimsically named sailing animals that blow through it.

In mid-April 2010, this was the world into which oil began to flow. Although original reports were lower, current estimates are that, during the first month of the event, the Gulf received the volume of three Exxon Valdez accidents. Yet, as the first month of the spill passed, little oil had reached land. It was a relief to many. The source was 70 kilometers (43 miles) from land, and although the oil's extent could have covered an area the size of Ireland, the oil's effects were seemingly invisible to those of us not at sea.

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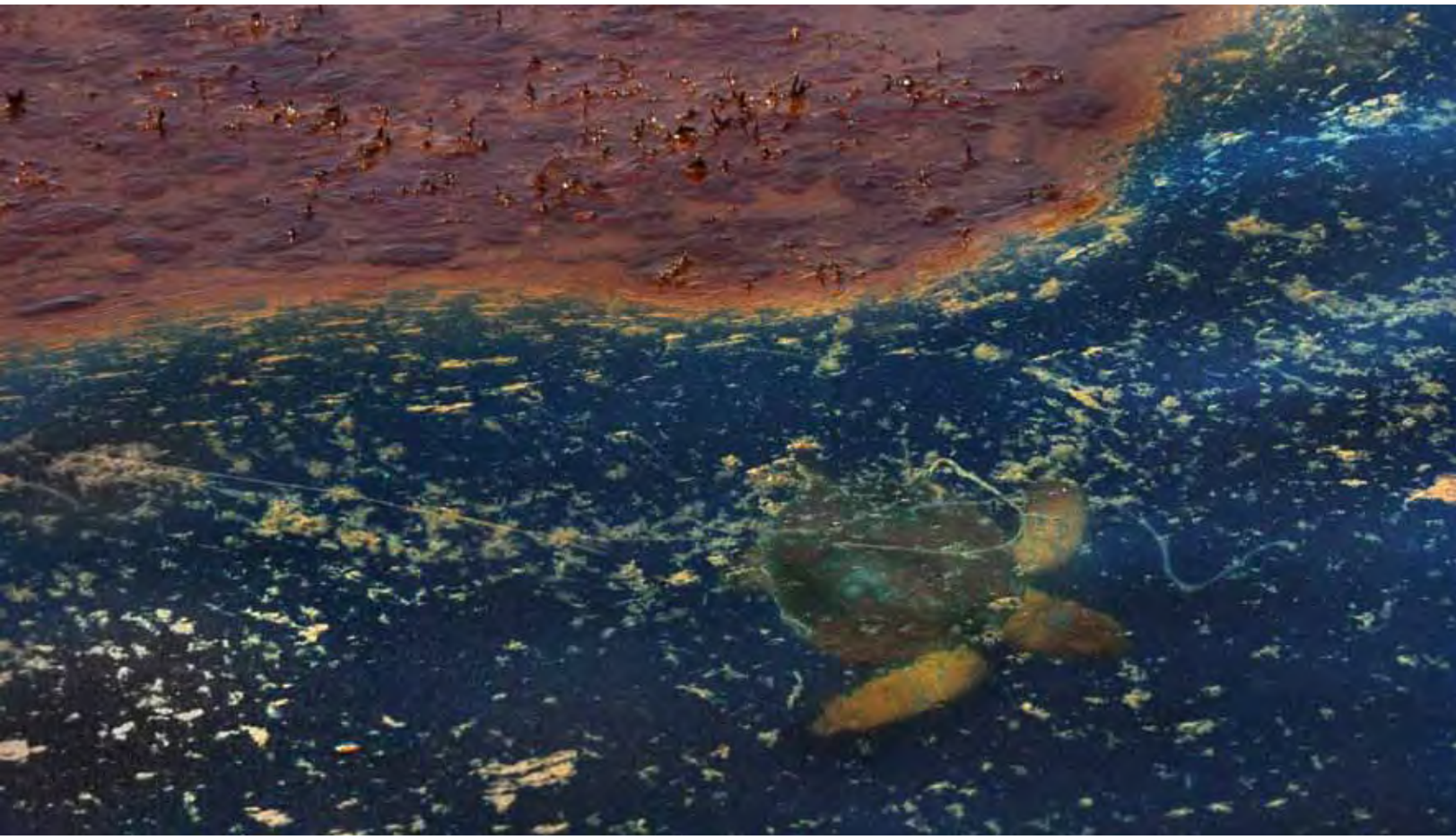
In mid-May, when Tomo and I threw our bags onto bunks at a camp near the southern end of the Louisiana Delta, there had been almost no oiled wildlife brought in. Yet, we felt certain that oiled turtles were out there, as did Barbara Schroeder (National Sea Turtle Coordinator, NMFS), who began working tirelessly to manage the logistics of a search-and-rescue effort. Working within the spill's Unified Command and using vessels operated by the Louisiana Department of Wildlife and Fisheries (LDWF), Tomo and I left shore May 17 on the first search by vessels for turtles at sea. It was a dual effort—to bring oiled turtles back for rehabilitation and to search for them in a measured way that would allow estimates of how many were missed.

It was a sobering scene. Beyond coastal waters into the deeper Gulf, the oceanography was familiar but the biology was not. Recognizable lines of floating material assembled, but there was little life. The convergence zones we were accustomed to had become the crevasses into which oil had settled. Although broad areas were covered by a glassy, rainbow sheen, the densest liquid and semisolid oil had concentrated within the *Sargassum* drift community. Along those linear fronts, the floating *Sargassum* had browned and was visible mostly as a roughened texture to the swirls of black, brown, and orange oil in



THIS PAGE: A Kemp's ridley turtle swims out from under an oil slick as rescue workers attempt to capture the animal for rehabilitation. Unfortunately, this turtle could not be successfully captured. © CAROLYN COLE / LOS ANGELES TIMES AT LEFT: One of 10 heavily oiled Kemp's ridley sea turtles recovered near the site of the Deepwater Horizon explosion. © CAROLYN COLE / LOS ANGELES TIMES PREVIOUS SPREAD: On April 20, 2010, an explosion occurred on the Deepwater Horizon oil rig off the coast of Lousiana, U.S.A., that caused oil to spill into the Gulf of Mexico at an alarming rate—35,000 to 60,000 barrels per day. The oil continued to flow for months before the well could be successfully capped, causing untold damage to the marine and coastal environment. © CAROLYN COLE / LOS ANGELES TIMES

various stages of weathering and emulsification. Most convergence lines smelled like the drain pit at a Jiffy Lube; others had the noxious, throat-burning smell of fresh gasoline. Many lines were almost all petroleum, ranging from thin liquid to viscous grease.

With the first oily, nut-sized turtle head that slowly poked above the surface, we knew that they hadn't all perished. The oiled convergence lines had lost most of their familiar life, but little turtles were indeed there, although difficult to detect. With their surroundings adhering to them in greasy camouflage, they were often no more than oily lumps in a sea of lumpy oil.

Help for the search grew; over the next three months, teams recovered oiled turtles by dip-net hours from land, transported them to shore, and drove them to rehab facilities for de-oiling. The rescue effort began out of the delta port of Venice, Louisiana, and expanded with additional vessels from Alabama and Florida. Teams searched as far out as one can in a 14-hour day, typically staying within 130 kilometers (81 miles) of land. Dozens of eminently qualified biologists served within this rescue fleet, representing FWC, NMFS, LDWF, the Georgia Department of Natural Resources, Inwater Research Group, Riverhead Foundation, and the University of Florida. Behind the scenes, an army of others arranged for vessels run by local captains, for aerial operations to locate oiled *Sargassum*, and for solutions to thorny logistical and bureaucratic obstacles. To leave these heroic folks unmentioned is an unfortunate consequence of editorial brevity.

The search teams brought aboard more than 350 oiled turtles of four species and transported them to rehabilitation facilities. Nearly all turtles found at sea were alive, although some were coated so as to be barely recognizable as turtles. For those, rescue changed their fate. Thick, tenacious oil covered their eyes, clogged their nostrils, coated their mouths, and lined their throats. Even after the mid-July capping of the well that had gushed for so long, oiled turtles continued to be found. But by mid-August, individual cases of oiling had clearly grown less severe, with many turtles having only smudges and smears or no sign at all of external oil. By the end of August, with the total effort reaching more than 500 turtles collected and examined, no turtles gave signs that they were in need of rehabilitation.

With rescue urgency diminished, the difficult assessment of damage began. How might one assign a measure of harm to the turtles? The oiled turtles observed must represent many more that were unobserved, but how many? And what does it mean to be an oiled little turtle, or an oiling survivor, to live in previously oiled habitat, or to depend upon oil-exposed food items?

Over the millennia, remoteness has protected young sea turtles during their most vulnerable years. From a scientific perspective, this obscurity has also maintained a veil of mystery. Despite our advancing technology and our increased efforts to study the open-sea realm, scientists have made only meager progress in understanding these animals at sea. Yet, although our grasp may be meager, our reach is not. Some unintended consequences of human actions span the planet and seep deeply into formerly isolated wilderness. Perhaps little turtles may show us how grand our presence on the planet has become, as well as how inextricably connected to everything else we truly are.

GULF DIARIES 2:

On the Events, People, and Turtles of the Mississippi Shoreline

By T. TODD JONES

Stationed in far-off Hawaii last spring, I felt disconnected from what was happening in the Gulf of Mexico. For weeks, e-mail updates and National Public Radio reports had been as close as I'd come to the events unraveling in the wake of the Deepwater Horizon explosion. All of that changed on June 13, when my supervisor called to tell me that I would soon be traveling to Mississippi to aid the local sea turtle stranding network.

Three days later, I rendezvoused with my colleagues, Dr. Yonat Swimmer and Shawn Murakawa, in Gulfport-Biloxi, Mississippi. The scene was surprising. The oil hadn't yet reached Mississippi's shores, so instead of finding empty, sludge-covered beaches like those on the news back home, I found beaches that were buzzing with summer activity: sunbathers soaking in rays, jet skiers racing the waves, and recreational fishermen casting their lines. It looked as though it were business as usual on this stretch of the Gulf Coast. But it wasn't. Alongside the beachgoers and vacationers were not only hundreds of emergency response workers, but also a great number of wildlife strandings, including sea turtles.

The stranding network that my colleagues and I stepped into was exhaustive, complex, and highly organized. Set up by the National Marine Fisheries Service, the Southeast Fisheries Science Center, and the Institute of Marine Mammal Studies (IMMS), this system united the government, not-for-profit organizations, private industry, local community members, and tourists to monitor Mississippi's 30 miles of coastline. Any wildlife spotted within this stretch of coast was reported to the wildlife hotline and subsequently sent to the appropriate entity for the location and type of animal found.

At the peak of spill activity in Mississippi, the sea turtle stranding team fielded 20–30 calls per day. These days were long, often starting before sunrise and ending well past sunset, and were filled with the foul smell of decay. Fewer than 10 of the nearly 160 turtles called in during my "tour of duty" were found alive. My team's job was to aid the few animals we could and to collect the highest-quality data possible from the rest.

Stranded turtles were identified, swabbed for oil exposure, and photographed before being tagged, bagged, and delivered to IMMS for deep freeze and necropsy. Although none of the Kemp's ridley and loggerhead turtles we responded to appeared oiled to the naked eye, IMMS necropsy results might ultimately help us to better understand the causes of their demise.

Our stranding work brought us into contact with a wide variety of people. In the beginning, when our focus was on turtles that had washed ashore, we frequently encountered the very volunteers and vacationers who had called us in. Later, when our efforts shifted away from land to the scattering of dead and injured turtles floating near shore, we worked with the fishermen, shrimpers, and charters who, no longer able to fish or conduct tourism activities, had been hired to captain their boats to new ends. This fleet set and checked oil booms, analyzed water and air quality, transported people and supplies, and even collected stranded turtles. Everywhere we went, on land and by sea, we met people eager to help.

By the end of my three weeks in Mississippi, the turtle-holding facilities had reached capacity. A tractor-trailer was sent to take the backlog of frozen turtles for necropsies while a twin-propeller aircraft was flown in to transport some of the survivors. I was charged with escorting 11 juvenile ridleys to SeaWorld and Disney's Animal Kingdom, where they were to take up residence. Flying over the Gulf and gazing down at the vast, rainbow-colored oil sheen, I couldn't help but wonder what lay ahead—for the turtles next to me; for the intricate ecosystem of which they'd been a part; and for the fishermen, hotel owners, and beachgoers who called the Gulf Coast home.

It was comforting, at least, to know firsthand how much care had gone into ensuring that quality data had been—and would continue to be—collected. It can be difficult during times of crisis to keep hard facts from being overshadowed by conjecture and hype. Yet although the hard facts may not always make for the most captivating headlines, they are what pave the way for the most promising future. Moving forward, I knew we'd have the data we'd need to learn all we could and to make the best choices possible for the future of the Gulf. ■

THIS PAGE: Drs. T. Todd Jones and Yonat Swimmer of NOAA's Pacific Islands Fisheries Science Center collect data on a dead Kemp's ridley that was reported through the Mississippi wildlife hotline. The data they collect will help establish the oil spill's full impact on sea turtles. © NOAA AT RIGHT: Sea turtles that were rescued from the oil were sent to rehabilitation centers throughout the region, including the Audubon Nature Institute in New Orleans pictured here. © JOEL SARTORE / WWW.JOELSARTORE.COM