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Concerns Up and Down the Food Chain

By LESLIE KAUFMAN

BRETON ISLAND, La. — As the oil spill from the Deepwater Horizon spreads across the Gulf of Mexico, environmentalists and government officials have been working frantically to protect shoreline habitat like this island in the Breton National Wildlife Refuge, eight miles off the coast of Louisiana.

Breton Island, with its hundreds of nesting birds, has been protected by orange booms, as have many other areas of delicate estuaries and wetlands.

But biologists are increasingly alarmed for wildlife offshore, where the damage from a spill can be invisible but still deadly. And they caution that because of the fluidity between onshore and offshore marine communities, the harm taking place deep at sea will come back to haunt the shallows, whether or not they are directly hit by the slick.

The gulf's deeper water harbors 10 species of threatened sharks, 6 species of endangered turtles, manatees, whales and innumerable fish.

It is also a temporary home for the eggs of dozens of species of fish and shellfish, whose offspring spend their earliest days floating along currents at the surface of the water — the very layer where most of the oil settles.

There, the effects can be devastating, studies from previous spills show, like whales so drugged and disoriented by noxious petroleum fumes that they can drown, and tiny translucent organisms whose bodies are literally burned from the inside out as the sun heats the fuel they have ingested.

“Unfortunately, we’ve had a lot of experience in how oil affects marine life, ecosystems, coastal communities, and fisheries,” said Christopher Mann, with the marine program of the nonprofit Pew Environment Group. “The iconic images of oiled seabirds are just the tip of the iceberg, because oil spills affect life up and down the food chain.”

Take the blue crab, which, along with shrimp, is among the largest fishing crops out of Louisiana. When molting, the crabs are known as soft shells and are immensely popular in restaurants up and down the East Coast. They also serve as food for other sea creatures like redfish and certain species of turtles.

Although thought of as a coastal animal, the crabs breed at sea. As the water warms, females leave the protection of the coast for perhaps the only time in their lives and go out to shoals in the gulf to disperse fertilized eggs. The eggs hatch and billions of tiny crabs invisible to the naked eye drift for 40 days along the currents in the deep sea before ending up back in the marshes.

Many of the shoals favored by the crabs are already covered in oil, said Caz Taylor, a professor of ecology and evolution at Tulane University, who is studying their migration patterns. “It can’t be good,” she said.

Spring is mating and spawning season for almost everything in the gulf: Fill a jar with plankton from the local waters in the spring and it will typically contain the larvae of 80 species. All the eggs and hatchlings are surface dwellers, with almost no ability to swim away from the slick.

“Eggs and larvae that dwell near the sea surface are especially vulnerable,” said Jeffrey Short, Pacific research director for Oceana, a nonprofit organization that works for marine preservation.

The components of crude oil, he added, can produce developmental deformities at low concentrations, and “any such deformities are ultimately lethal to organisms in the wild.”

So far, there have been few documented animal casualties of the Deepwater Horizon spill, though rumors of dead manatees and whales abound. The National Oceanic and Atmospheric Administration said that its planes had spotted numerous species of dolphins and turtles in areas now covered by the slick.

Since Sunday, 30 turtles have washed up dead on beaches in Gulfport, Miss., an unusually high number even for this time of year when they are migrating. But Moby Solangi, executive director of the Institute for Marine Mammal Studies in Gulfport, said that in a preliminary examination, the oil did not appear to be the cause of death. Full necropsies on the animals are being completed.

Still, Michele Kelley, turtle and marine mammal stranding coordinator for Louisiana, said she is worried.

“Sea turtles are more prone to ingest the stuff,” Ms. Kelley said, especially as the slick clumps.

Whales and dolphins that must come up through the oil to get air are likely to suffer skin and eye irritation. In some cases, they may breathe in the toxic fumes of evaporation. In areas where oil is viscous, the marine mammals can risk having their skin and eyes irritated. More rarely, they risk breathing toxic fumes from the evaporating oil, and becoming drugged and sleepy.

The fumes are particularly dangerous when the crude is fresh, because some strong toxins evaporate early. With a onetime spill, the slick gets less dangerous over time, but in the gulf, where the well has not been capped, there is a constant supply of new vapors.

Dr. Solangi said he was worried for dolphins. “They have to be awake to breathe,” he said. “If they become anesthetized, they will die. If they become intoxicated by fumes, they won’t survive.”

Even normal feeding might expose sea creatures to harm from the spill: sea grass and other vegetation covered in oil are ingested by fish that are then eaten by bigger fish and finally by manatees or other marine species. It is this food-chain effect that worries Larry Schweiger of the National Wildlife Federation.

“It is not a question of whether all these species will be affected now. It is when,” he said.