Study: Exposure to crude oil from the Deepwater Horizon disaster causes swimming deficiencies in juvenile mahi mahi

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Evidence is mounting that BP's oil harmed millions of large fish

Crude oil spreads across a wide swath of the Gulf of Mexico during the 2010 Deepwater Horizon oil disaster.

By Summit Voice

FRISCO — Along with fouling beaches and wetlands along the Gulf Coast, the 2010 Deepwater Horizon oil spill also had profound impacts on the open ocean and deep sea environment. The four million barrels of crude oil that spewed into the Gulf of Mexico from BP's failed oil drilling operation potentially exposed millions of fish and other ocean organisms to highly toxic compounds.

That includes many commercially and ecologically important open-ocean fish species such as bluefin and yellowfin tunas, mahi mahi, king and Spanish mackerels. In one of the most recent followup studies on the impacts of the spill, researchers with the University of Miami Rosenstiel School of Marine and Atmospheric Science found that exposure to the crude oil resulted in decreased swimming performance in young mahi mahi.

Other recent research has showed how oil exposure causes heart defects in bluefin tuna, as well as fundamental defects at the developmental level. Researchers have also documented serious health impacts to dolphins in Barataria Bay. One of the studies concluded that, "losses of early life stages were likely for Gulf populations of tunas, amberjack, swordfish, billfish, and other large predators that spawned in oiled surface habitats."

Mahi-mahi, also known as dolphin fish, is highly sought after for sport fishing and commercial fishing. Fertilized eggs of mahi-mahi float near the surface of the northern Gulf of Mexico, an area coinciding with the spill zone, where they are believed to remain during their early stages of development.

“What our study shows is that even a relatively brief, low-level exposure to oil harms the swimming capabilities of mahi-mahi, and likely other large pelagic fish, during the early life stages,” said Edward Mager, UM Rosenstiel School postdoctoral associate and lead author of the study. “If you harm a fish’s ability to swim you also harm its ability to perform actions that are critical for survival, such as catching prey and evading predation.”

The tests were done at the university’s experimental fish hatchery, where the researchers used oil collected from surface slicks during the spill.

Two groups of mahi-mahi were exposed to crude oil alongside controls exposed to clean seawater. One group was exposed for 48 hours during the embryonic-larval stage and then raised in clean seawater to the juvenile stage, while the other group was raised in clean seawater to the juvenile stage and then exposed to oil for 24 hours. The 48-hour embryonic-larval exposure group resulted in a 37 percent decrease in swimming velocity as juveniles, while juveniles exposed for a 24-hour period had a 22 percent decrease in swimming velocity.

“The study demonstrates how careful measurements of physiological performance may reveal subtle, yet highly significant impacts of environmental contamination,” said Martin Grosell, Maytag chair and professor of ichthyology at the University of Miami (UM) Rosenstiel School and a co-author of the study.

Swimming performance in fish is important for foraging, predator avoidance and migration. Physiological impairment of swimming ability may decrease fish survival, and result in a decline in fish population levels for a period of time. Researchers suggest that a similar impairment in swimming performance may have occurred in other large, pelagic fish that reside in the Gulf of Mexico.