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Excessive Dredging Threatens Florida Marine Life

Investigative Series: 1 of 3. [Read Part II][Read Part III]
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By Terry Gibson

Some "beach re-nourishment" projects may really be acts of marine genocide.



Offshore dredge vacuums up fill material. Little is known of the long-term effects on bottom-dwelling organisms, but turbidity and collision impact on nearby coral reefs are well documented. The product, in short supply, often has more in common with mud than the polished quartz found on natural beaches.

Four hurricanes don't hold a candle to the potential fish habitat disaster funded in the name of "shoreline protection."

In the wake of last season's storms, a panic-driven number of shoreline-armoring projects and so-called beach nourishment projects are proceeding throughout the state.

Bulldozers are burying famous pompano beaches of Martin County. The wonderful snorkeling reef at Phipps Park in Palm Beach County is doomed. Dredges are on the way to Sanibel and Captiva islands' legendary snook beaches, among many others.

Meanwhile, marine scientists, environmental groups, veteran anglers, the dive community, the surfing community, and tax-dollar watchdogs such as Taxpayers for Common Sense say that much of the coastal armoring and sand dredging needs to be curtailed, if a goal is to protect biological diversity and abundance as well as outdoor recreation along Florida's coasts.

These voices, it seems, are being drowned out by special-interest lobbyists from the American Shore & Beach Preservation Association (ASBPA) and the Florida Shore & Beach Preservation Association (FSBPA). Largely comprised of dredging contractors, coastal engineers and consultants who specialize in coastal construction, ASPBA/FSPBA has consistently maintained that beach nourishment causes only short-term turbidity with short-term environmental impacts. The majority of peer-reviewed scientific literature and anecdotes from anglers and divers contradicts this position. Due to the gravity of the threats, a three-part investigative report will run in the April, May and June issues of Florida Sportsman. We are examining the environmental legacy, the politics of and sustainable alternatives to seawalls and massive dredge-and-fill projects euphemistically termed by proponents as "beach nourishment projects." Many experts say that in many cases there are better ways to save our beaches.

Some "beach re-nourishment" projects may really be acts of marine genocide.

"Erosion isn't a problem for beaches, just for buildings." That famous and comprehensive statement came from Dr. Orrin Pilkey, renowned Duke University professor and author of *The Corps and the Shore*. Without condos stepping on the dunes, and without jetties to stop the natural longshore migration of sediments, Florida's barrier islands would simply be reshaped rather than destroyed by storm events such as hurricanes and nor'easters.

But with buildings in place and sea level rising ineluctably, coastal engineers first responded with seawalls, jetties and groins, collectively termed "shoreline armoring." Those hard structures only exacerbated erosion, so, by the 1970s, coastal engineers began promoting the "re-nourishment" concept as an environmentally friendly alternative to shoreline armoring. In the mid-'90s, the U.S. Army Corps of Engineers released a 3-foot high, 15-pound document

called the Coast of Florida Erosion and Storm Effect Study. Many thousands of pages thick, the study devotes one paragraph to the potential cumulative environmental impacts of the hundreds of shoreline-protection projects it proposes over the next 50 years. And, the paragraph concludes that only "cumulative benefits toward the natural coastline would be realized by all projects under the Coast of Florida Study." This after vast segments of coral and nearshore reefs were destroyed by Dade County projects, and in other locations throughout the '80s.

"Siltation and indirect burial from re-nourishment projects was largely to blame for the death of shallow coral reefs along Miami Beach," acknowledged Steve Blair, who runs Miami-Dade's beach nourishment program. "But, the technology has come a long way since then."

Today's full-scale beach restorations require the mining of up to two million cubic meters of offshore sediment, usually in 20 to 50 feet of water close to offshore reefs. The material is then pumped on the beach and in the surf zone. Advocates say mapping technology and innovations in fill placement can reduce reef impacts. Critics counter with a litany of environmental woes attributed to dredge-and-fill projects waged with heavy equipment in extremely sensitive areas.

Contractors hired by the Corps use cutterhead or hopper dredges for excavation. Almost all seafloor-dwelling marine life occurs in that 6-inch margin of "topsoil," and the dredge kills all manner of organisms— shrimp, crabs, mollusks, worms, seagrasses and more—across square kilometers of the continental shelf.

"The prevailing wisdom has been that the soft-bottom dwellers come right back," said Phil Flood, Environmental Manager for the Department of Environmental Protection (DEP) Office of Beaches & Coastal Systems. Marine scientists and other observers (e.g. divers) doubt the validity of that assumption. For perspective, I conducted a thorough search, but failed to find any peer-reviewed studies of borrow-site impacts. That's alarming.



Junvenile snappers, grunts and other important species require exposed hardbottom habitat. This particular limestone outcrop (among acres of similar ones in Martin County) is now covered by the kind of fill material often used in dredging.

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The potential impacts to coral reefs and live bottom are better understood, and project applicants now must provide "reasonable assurance" that coral reefs and live bottom won't be harmed and that nearshore hardbottom won't get buried without mitigation. But depending on who you ask, "reasonable assurance" is a gray area, and mitigation reefs rarely remain uncovered to achieve the specific ecological functions of nearshore hardbottom.



Bulldozer spreads sediment on Dade County surf zone. Top marine scientists and anglers decry the consequential

After decades of reef degradation by dredging, DEP and other regulators now require buffer areas between the dredge sites and reefs, which are federally designated as Essential Fish Habitat and/or Habitat Areas of Particular Concern. But, there are no consistent standards, and as sand supplies shrink, regulators will likely face pressure to decrease buffer distances.

Indeed, it's already happening. A permit issued for four Broward County borrow sites requires the dredge operator to stay only 400 feet from 1,000-year-old coral reefs that contain almost half the coral species found in Caribbean waters. Marty Seeling, DEP Environmental Administrator of the Bureau of Beaches & Coastal Systems says, "The Corps balked at 400 feet, and insisted upon only a 200-foot buffer. But we wouldn't give in." Still, activists who discovered a staghorn coral colony overlooked by the Corps studies say the buffer isn't sufficient, and that the

smothering of gamefish habitat and forage.

sediments will also migrate offshore and bury shallow coral reefs.

"The proposed massive dredge-and-fill project will add chronic silt, sediment and turbidity impacts to coral reefs and hardbottom already stressed by algae and pollution," testified Dan Clark, Director of Cry of the Water, a Broward County coral reef monitoring group, before the Coral Reef Task Force.

Meanwhile, the value of nearshore reefs is becoming better understood. Nearshore hardbottom (a.k.a. worm reef or coquina reef) provides habitat to more than 530 marine organisms, including 320-plus animals. It's home for a variety of post-larval and juvenile snappers, grunts, groupers and wrasses (e.g. hogfish), plus a variety of reef cleaners. An early paper (1989) written by Walter Nelson entitled "Beach Renourishment and Hardbottom Habitats: A Case for Caution," wryly stated that, "Direct burial will be a terminal problem for many of the organisms that live on hard bottoms."

Moreover, wind, waves and tides carry these sediments well beyond the seaward and longshore boundaries of the fill site, burying or scouring additional reefs, snuffing photosynthesis in algae and corals and making it harder for juvenile drums, pompano and other gamefish to see prey in the surf zone. These re-suspension events can last from hours to decades. Dr. Hal Wanless, Chairman of Geological Sciences at the University of Miami's Rosenstiel School explains that it has do with the nature of the sediments.

"Except for shallow shoals where sediments have recently been exposed to wave energy, there really aren't any offshore sediments suitable to place on the beach," Wanless said. "The sediments mined offshore either 'grew' there or migrated there because they're too fine to stay on the beach. Even when the grains are roughly the same size as the polished quartz beach sediments, they won't behave the same in the surf zone. They're hollow, angular shell fragments that have been bored into by algae and microorganisms. Once they're placed in a high-energy environment they break apart, release fine sediments into the surf zone, and migrate rapidly along with the silt component back offshore."

This explains why "re-nourished" beaches erode much more quickly than undisturbed beaches. It also explains the reef impacts, and, in terms of water quality, it explains why the surf zones of disturbed beaches in places such as Juno Beach, Jupiter Island, Fort Lauderdale and Longboat Key turn milky when the tradewinds blow. Most insidiously, it also points to why experienced surf anglers avoid "re-nourished" beaches, and reinforces the findings of a peer-reviewed study in North Carolina that showed an 86 to 99 percent decrease in sandfleas (*Emerita talpoidea*) ten weeks post-nourishment. Subsequent monitoring showed hardly any long-term re-recruitment of this vital forage species on several repeatedly filled beaches in North Carolina, apparently "as a consequence of the poor match in sediment grade." In a survey of 45 South Florida anglers with more than 1,100 years combined fishing experience, the majority of anglers, including three bait & tackle shop owners who sell sandfleas, said that beach-fill projects had reduced or eliminated sandfleas along Southeast Florida beaches. There aren't any monitoring studies of beach-invertebrate impacts under way in Florida; meanwhile, emerging bonefish and permit research gives even more cause for concern for beach invertebrates.

"We now know that permit spawn year round, and that juveniles less than six inches long need windward beaches for habitat," explains Dr. Aaron Adams, a Mote Science Foundation researcher and author of *The Fisherman's Coast*. "New data also suggest that juvenile bonefish also prefer windward beaches."

These juveniles are too small to devour sandfleas, and scientists think they're feeding on micro-invertebrates such as amphipods. (A family of tiny, lobster-like crustaceans.)

"Flats guides in Biscayne Bay, for example, may have a real reason to be concerned about beach nourishment projects," Adams says.

In the May issue, learn why politicians are under so much pressure to fund projects that carry a documented number of negative impacts.

[Read part II]

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