

to assess. In a sense, the participants took what was probably the easiest decision under the ambiguous circumstances. The consequences of a failure to vaccinate followed by a pandemic of swine flu seemed far worse to most decision-makers than the consequences of a vaccination campaign that later turned out to be needless. "We're betting dollars against lives" became a byword of the participants. Moreover, many of those who joined the bandwagon would find a vaccination campaign congenial for professional or institutional reasons. The health bureaucrats in charge of the war would enjoy an infusion of funds in-

to their agencies and the spotlight of public attention; the scientists would have a chance to test immunization theories and new vaccines; the drug industry would reap profits and perhaps develop a broader market for future vaccines; and the politicians could champion the public health. That does not mean that the decision-makers were primarily acting from base motives, merely that a vaccination campaign would be easy for them to adopt. By contrast, those who criticized the campaign thought they had something to lose. The Nader group, for example, acting as representative for the vaccinees, worried about side effects

needlessly imposed. And the state health officials were concerned that they would have to divert resources from other important programs to administer the vaccine. Most of the critics had been left out of the decision-making.

Health officials won't know until next fall or winter whether a large outbreak of swine flu actually occurs. If it does, they will look prescient. If not, the grumblings may be expected to rise, especially if those who have been vaccinated against swine flu come down with some other flu strain against which the vaccine provides no protection.

—PHILIP M. BOFFEY

## Wetlands: Denial of Marco Permits Fails to Resolve the Dilemma

To the satisfaction of environmentalists and to the dismay of many developers, the U.S. Army Corps of Engineers on 16 April truly "bit the bullet" on the question of coastal wetlands preservation by denying two dredge-and-fill permits requested by the Deltona Corporation for the next phase of its huge Marco Island project in southwest Florida. The proposed dredge-and-fill project, which was to have involved the excavation of 18.2 million cubic yards of material, is the largest "finger-fill" waterfront housing project ever to come before the Corps of Engineers for permits. In reaching its decision, the corps faced a dilemma because some of the policies under which the permits were to be denied are relatively new and thus are catching the Marco project—begun nearly 12 years ago—in mid-course.

The corps knew that denial of the so-called Barfield Bay and Big Key permits (see map) could have bad consequences for Deltona, which already had sold more than 4000 lots in these two permit areas. Unless the company could overturn the corps decision in federal court, it would probably have to make refunds to purchasers totaling tens of millions of dollars as the result of its inability to deliver on its sales contracts. Also, the retirement plans of many purchasers—mostly well-to-do Northerners—would be upset.

On the other hand, if the permits were

granted, the massive alteration of Marco Island would continue with a vengeance. Viewed from the air, the island—or at least a good part of it—already looks as though it has been stamped out by a giant cookie cutter. The mangrove swamps that once lined the northeast side of the island along the Marco River have been replaced by an intricate system of canals and fingers of land, with each finger divided into expensive waterfront lots.

Destruction of the mangroves means the loss of much food and habitat for marine fauna. It also eliminates a buffer against violent storms—indeed, Florida old-timers say there is no better place for a small boat to ride out a hurricane than in a sheltered moorage up a mangrove creek. And it wipes out dense mazes of prop roots that trap much of the sediment suspended in tidal waters and thus make the waters cleaner. Now, if the Barfield Bay and Big Key permits were granted, another 2100 acres of mangroves eventually would be gone, not to mention the disturbance of several hundred acres of grass-covered bay bottom which would be used as a source of land fill.

What clearly was lacking in the decision-making scenario was some way to bring about a redesign of part of the Marco project to accommodate the same number of people as originally planned, yet without destroying wetlands on any-

thing like the scale previously contemplated. Redesign proposals were in fact advanced by the Environmental Defense Fund (EDF) and some other groups that opposed issuance of the permits.

These proposals focused largely on a third and less environmentally sensitive permit area, known as Collier Bay. The hope was that Collier Bay could be redesigned to have duplexes, townhouses, and low- to medium-rise condominiums replace single-family detached homes and thus accommodate in that one area the 14,000 people who were to have originally been spread out over all three permit areas. But the permit for the Collier Bay area was granted without any change from the original plans having been made or demanded.

Situated almost due west of Miami on the opposite side of the Florida peninsula, Marco Island has long been recognized as one of the most promising resort properties any real estate developer has ever come by. The wide Marco beach, made up of fine white sand and stretching for some 5 miles along the Gulf of Mexico, is one of Florida's best. Little imagination has been needed to see this magnificent strand lined by posh high-rise condominiums and resort hotels. Nor has it been hard to envision golf courses built on the island's higher ground as centerpieces for a handsome development of single-family homes for upper-income retirees.

Equally evident has been the rich opportunity for the developer presented by Marco's extensive mangrove swamps, which once covered nearly half of the island's 10 square miles, occurring especially along the Marco River and Caxambas Pass. By use of the dredging and filling techniques well known in Florida ever since the creation of Miami Beach

early in this century, the mangroves could be obliterated to create premium real estate.

In the early 1960's, before the present development got under way, the principal settlement on the island was at the village of Marco, made up of a few scattered groups of weathered frame houses, a general store, a clam cannery, and the rambling white frame Marco Island Inn. In the lobby of the inn, tarpon scales, larger than silver dollars, were pinned to the wall to commemorate the taking of exceptional fish. The sports fishermen had discovered Marco early in the century, for tarpon, snook, redfish (channel bass), mangrove snapper, and sea trout were extraordinarily abundant in and around the mangrove flats.

In 1964, the Mackle brothers of Miami, founders of the Deltona Corporation, began the development of Marco in a joint venture with the family that had owned nearly all of the island since the 1920's. Ultimately Deltona took over the the venture entirely and acquired thou-

sands of additional acres in the vicinity of Marco.

Although the Mackles had in some instances engaged in poor land disposal and development practices in the 1950's, they had since adopted community development concepts more enlightened than those of most other large Florida land developers. The Mackles enjoyed an excellent reputation, and their name was associated with some of Florida's most prestigious developments, including that of Key Biscayne, where Richard Nixon eventually bought a vacation home.

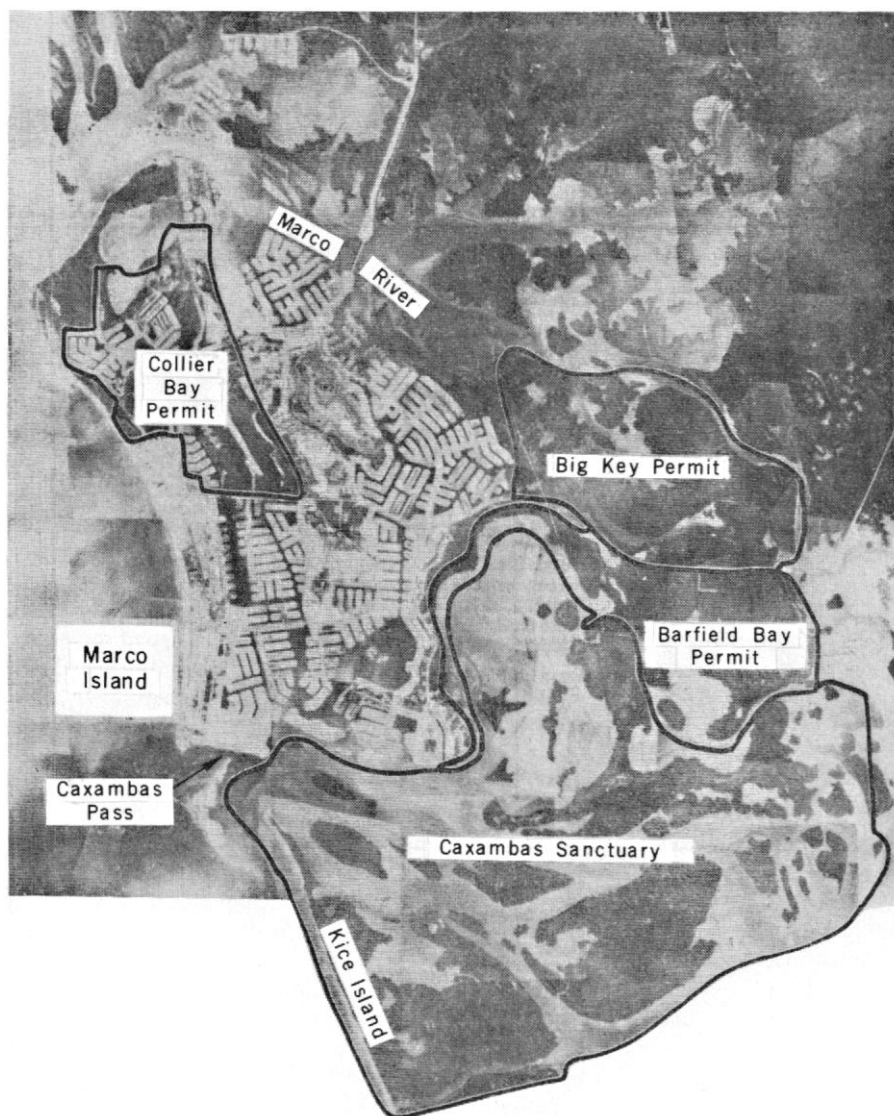
The sales campaign for Marco was carried on by Deltona's extensive marketing organization in the United States and abroad. By 1971, nearly 25,000 people had come to Marco on "sponsored visits" (with Deltona picking up much of the tab), and almost 11,000 lots had been sold, most of them bulkheaded waterfront properties selling (in 1970) for an average of about \$13,400 apiece. In fact, by then, 90 percent of all the lots platted were gone.

The Mackles were, of course, selling the majority of the lots before they physically existed and even before dredge-and-fill permits had been obtained. Furthermore, circumstances were such that, at best, it would be nearly a decade between sale and delivery of many lots. For one thing, the cost of dredging and filling, bulkheading, and putting in streets and utilities would be large—totaling more than \$70 million through 1975—and would have to be kept in balance with cash flow. Sales were on installment, with payments spread over 2, 4, 5½, and 8½ years, depending on the terms of the particular contract.

Even had there been no financial constraints, the land development would have had to be spread over a number of years simply because of the huge scale of the project and the nature of the state and federal permitting process. In the first years of the Marco project, the Florida Cabinet, made up of the governor and six other independently elected officials (such as the attorney general, the state treasurer, and the commissioner of education), was still issuing dredge-and-fill permits more or less routinely. And the only real concern of the Corps of Engineers, as it then understood its duties under the Rivers and Harbors Act of 1899, was not to allow dredge-and-fill projects to interfere with navigation.

Nevertheless, while the permits necessary to begin the Marco development could be easily obtained, they were good for only 3 years—barely time enough even to make a major start on an undertaking that would be several times larger than the dredge-and-fill project that had made Miami Beach possible. As a result of these various considerations, the Mackles had divided the island into five different permit areas and first applied for permission to begin the dredge-and-fill work along part of the Marco River. Other applications would be filed later, as dictated by the pace at which the dredge-and-fill work could be performed. Although the risks were poorly understood at the time, this piecemeal permitting process was eventually going to mean bad news for Deltona.

Already, in a number of places around the nation such as south Florida and the San Francisco Bay area, there were strong stirrings among marine biologists and conservationists about the need to protect coastal wetlands from dredging and filling. Now, it only remained for this issue to be put on the public agenda, and 1967 was to be the year that this would happen. A bill to require that state action on all dredge-and-fill projects be preceded by biological surveys—a kind of pre-



cursor to today's environmental impact statements—was pushed through the Florida legislature. And, in Washington, the Department of the Army, responding to pressure from Congress, formally agreed not to issue dredge-and-fill permits in cases where the Department of the Interior was opposed without first consulting the secretary of that department.

That same year, the corps, in a decision heavy with portent for Deltona, denied a permit to applicants Zabel and Russell who wanted to fill in 11 acres of tidelands in Boca Ciega Bay near St. Petersburg to create a site for a mobile home park. In 1970, when this permitting decision was upheld by the U.S. Fifth Circuit Court of Appeals, "Zabel-Russell" was immediately hailed as a landmark case.

Efforts to obtain greater protection for coastal wetlands—or at least to obtain strong declarations of policy for wetlands protection—enjoyed some important further successes after 1967. Notably, in section 404 of the Federal Water Pollution Control Act Amendments of 1972, Congress gave the Corps of Engineers the responsibility of issuing permits for proposed disposals of dredged or fill material that could affect the physical and biological integrity of the nation's waters.

As a consequence, in 1975, after a lawsuit and much controversy, the corps published regulations that applied not only to dredging and filling below the mean high-water line but also to wetlands above that line which are periodically inundated by saline or brackish waters and are characterized by salt-tolerant vegetation. The corps' jurisdiction over wetlands was thereby more than doubled.

And, in 1974, the corps promulgated a new wetlands policy which itself had disturbing implications for Deltona and many other developers of waterfront home sites. This policy recognized that some intrusions upon valuable wetlands might be justified for the sake of marinas and other facilities that require a waterfront location; but, "unless the public interest requires," wetlands would not be sacrificed for development that is not clearly water dependent.

In view of these shifts in official policy, it might seem that the Mackles and Deltona behaved irresponsibly in continuing to sell lots that could not be delivered unless state and federal dredge-and-fill permits were forthcoming. This view has in fact been argued forcefully, and with some cogency, by EDF and other environmental groups opposing such per-

mits. But, when one examines the Mackles' side of the question, it is apparent that the corps has not laid down a clear, consistent policy over the years in regard to the Marco development.

In the late 1960's one corps permit was held up for 2 years, but was finally issued despite the strong objections raised by the Department of the Interior and its Fish and Wildlife Service. In granting the permit, the Department of the Army unwittingly confused the question of wheth-

er lot sales should continue. Although Deltona was served notice that it could not count on other permits being issued, the company also was told it should not sell any lots in areas below mean high water unless they were within the imaginary "bulkhead lines" already fixed by the Florida Cabinet. Actually, these lines enclosed all of the areas for which dredge-and-fill permits would later be requested, and Deltona would quite naturally seize upon this proviso as a kind of

## Congress Confronts Wetlands Issue

A coalition of environmental groups is now mounting an emergency lobbying effort to kill the recently hatched "Breux amendment" that would repeal the only provision in federal law offering any protection to well over half of the nation's remaining coastal and interior wetlands.

A new package of amendments to the Federal Water Pollution Control Act (FWPCA) of 1972, which was reported out by the House Public Works Committee in mid-April, included one sponsored by Representative John B. Breux (D-La.) to severely reduce federal regulatory jurisdiction over dredging and filling. The Breux amendment does this by redefining the term "navigable waters" contained in section 404 of the FWPCA to include only waters either "presently used" for interstate or foreign commerce or susceptible to such use, including tidal waters lying below the mean high-water mark. This would of course exclude all "high marsh" and river swamp areas subject to only periodic flooding.

In a press conference in Washington on 28 April, John Burdick, executive director of the Citizens Committee on Natural Resources and spokesman for the nine environmental groups opposing the Breux amendment, denounced the House committee for voting to gut section 404 "on the spur of the moment" and without hearing testimony from the public and the two agencies responsible for administering this law, the Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers. Assistant Secretary of the Army Victor V. Veysey, who is responsible for civil works, said recently that the Ford Administration is opposed to repeal of section 404, although he added that amendments are being prepared to clarify the permitting authority and allow states that meet federal standards to regulate dredging and filling above mean high water.

Administrator Russell E. Train of EPA, in a letter to Senator Edmund S. Muskie (D-Maine), the chairman of the Senate subcommittee on environmental pollution, also has expressed opposition to the Breux amendment. He noted that, besides their value to fish and wildlife, wetlands assimilate pollutants, thus reducing the dollar and energy cost of pollution control.

Nevertheless, the Breux amendment clearly enjoys substantial support in Congress. Many development and resource-user interests, such as the mining and timber industries, have feared that their activities would be impeded by federal prohibitions and red tape. In an effort to calm such fears, EPA and the Corps of Engineers have promised to exercise restraint and flexibility in implementing section 404, for instance, by exempting many ordinary agricultural and silvicultural activities from permit requirements.

The Breux amendment possibly will receive House approval soon, but it still has a long way to go before clearing the Congress as a whole. It is just one part of a bill that has some other controversial features, such as a provision for EPA to delegate administration of the huge waste treatment grants program to the states. Given all its time constraints and political pressures, an election year is usually not a propitious time in which to try to pass bills that are hotly controversial and sure to be resisted in one chamber or the other. Senator Muskie is expected to try to kill the Breux amendment in the Senate if this measure is approved by the House—L.J.C.

implied promise that issuance of the permits could be expected.

Also, in 1972, Deltona and the Florida Cabinet came to an agreement whereby the company would give the state some 4000 acres of land to the south of Marco, in the Caxambas sanctuary (see map), provided that all of the remaining dredge-and-fill permits needed to complete the Marco development were forthcoming. The Cabinet could not of course commit the corps to joining in the issuance of the necessary permits, nor could it commit the Florida Pollution Control Board, whose approval of the dredging and filling would be a prerequisite to corps action.

But, as a body made up of the highest elected state officials, the Cabinet's wishes in the matter could be expected to weigh heavily. And, in fact, the offer of the land for the sanctuary represented a real concession for Deltona. It was an arguable point whether the state or the company actually owned some of the submerged lands within the sanctuary, and one could contend that Deltona could be kept from developing all the land below mean high water in any event. But the sanctuary area included Kice Island, a Gulf barrier island with 2½ miles of excellent beach which was clearly a developable and highly valuable property.

As James E. Vensel, a senior vice president of Deltona, has told *Science*, "We look on the sanctuary as our way to catch up." What he meant was that, although the distribution of development and preservation areas would be different if the Marco project were being planned according to today's environmental standards, there probably would not be more mangroves preserved. Vensel may put a much brighter face on Deltona's case than is warranted, but his view of the matter is not entirely unreasonable.

Nevertheless, the rationale for the decision by Lieutenant General William C. Gribble, Jr., the Chief of Engineers, to deny the Barfield Bay and Big Key permits is clear enough, and many will view it as compelling. In applying its mandate under the pollution control act to protect the physical and biological integrity of the nation's waters, the corps recognized that the filling of hundreds of acres of mangrove flats would represent the total destruction of a significant estuarine resource.

Also, EDF and allied groups, which included the National Audubon Society, Florida Audubon, and the Collier County Conservancy, had argued—and the corps had agreed—that Deltona was yet

to make a convincing case that the public interest required a departure from the corps' new wetlands policy. Furthermore, both the Environmental Protection Agency and the Department of the Interior concurred in the corps' decision.

Perhaps Deltona's best argument in maintaining that the permits should have been issued—and one which it will surely emphasize in its appeals to the federal courts—lies in the 1972 agreement the company reached with the Florida Cabinet. Corps policy holds that overriding a state decision in such a matter should only be done to serve some compelling national interest. In this connection, it is pertinent to note also that, in 1974, the Florida Pollution Control Board gave its approval to the pending dredge-and-fill projects, although in doing so the board acted against the recommendation of its staff and was itself divided.

#### Abstruse Arguments

In trying to show that the national interest does not require denial of the permits, Deltona can be expected to engage the corps and EDF in some abstruse argumentation over the mysteries of estuarine ecology. It is now accepted among marine biologists that the leaf detritus from the intertidal red mangroves—which are present in the Barfield Bay and Big Key areas along with even more extensive stands of black and white mangrove—is a basic energy source in south Florida estuaries.

This article of faith rests in part on the work of a prominent researcher named E. J. Heald. But Deltona has itself used Heald as a consultant and now cites some of his findings to suggest that, at Marco, the role of the red mangrove is less critical ecologically than it is farther south in the Ten Thousand Islands and Florida Bay.

The production of protein through the colonization of bacteria on the detritus is said to be greater in the latter areas because of the seasonal inflow of fresh water into the estuarine zone; at Marco, there is no such inflow. Deltona argues that the fauna in Marco waters depend basically upon phytoplankton, and that the plankton is in turn dependent upon nutrients borne in by tides and currents from the Gulf of Mexico. But, in truth, the terrestrial-estuarine ecology of the mangrove zone is too complex to permit easy judgments.

The common belief that mangroves are ecologically important—at Marco as well as elsewhere—is reflected even in Deltona's own promotional literature. "Cast up close to the mangroves, grass beds, and oyster bars," a brochure advis-

es anglers. "That's where the fish are."

One conclusion that can safely be drawn from a review of the Marco situation is that both Deltona's position with respect to its development plans and the corps' approach to its permitting responsibilities have not been flexible enough to allow a compromise along lines that environmentalists could accept. Were this not the case, Deltona might long ago have tried to persuade its lot purchasers, or at least a substantial number of them, to accept a redesign of the plans for Marco so that future housing development could be relatively compact and thus allow the more environmentally sensitive areas to be left undisturbed. And the corps, for its part, would have made it clear to Deltona that such a basic redesign of the uncompleted parts of the project might be the company's only alternative to failing to deliver property on the island to many of its Marco purchasers. The corps has scarcely done more than hint at the redesign option, such has been its concern not to intrude upon Deltona's private decision-making.

If its court appeal fails, Deltona will be left in a curious position. Although the company undoubtedly will have to make refunds with accrued interest to thousands of lot purchasers, these payments almost certainly will come to a much smaller sum than what it would cost to carry out the massive job of dredging and filling, bulkheading, and installing streets and utilities which would be necessary to deliver the lots. Given inflation factors, the cost of this work could easily run to far more than the \$70 million it took to develop the land for the first half of the Marco project.

But Deltona could suffer grave damage to its reputation from a failure to deliver on its sales contracts. Also, the company would lose the opportunity to build many homes for lot purchasers. In addition, Deltona apparently would have sacrificed Kice Island—the one part of the Caxambas sanctuary to which the state will continue to claim title even if the permits are not forthcoming—without gaining its development objectives.

Spokesmen for EDF and other environmental groups hail the denial of the two big Marco permits as a vital new precedent in the struggle for wetlands preservation. So it may be, but the precedent would be more valuable and important still if the corps and Deltona had come to grips with the key question of how to avoid or limit wetlands destruction while at the same time having development go forward in an environmentally acceptable fashion.

—LUTHER J. CARTER

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