

CAN THE BARRIER

Ecologists, government agencies, private organizations and citizen groups are attempting to save those exquisite and endangered islands and points of land lining the coast of North America. But can they move as swiftly as campers and condominiums?

BY JOAN AREHART-TREICHEL

Numerous low-lying islands and fingers of land skirt the eastern coast of North America and wrap around Florida and the Gulf Coast to the tip of Texas and into Central America, with the U.S. East Coast south of New York having the best and most continuous chain of such islands of any similar stretch of coast in the world. These fragile strips of land, called "barrier islands and spits," or simply "barrier beaches," are endangered (SN: 2/25/78, p. 126). And should they be destroyed, more will be lost than beach-front property. The barrier beaches claim an ecological diversity unmatched by many other areas of North America.

Take those spits off the coast of Labrador, which were first referred to 1,000 years ago by the Vikings, and where even today the only footprints you see in the spits' lush, rich grasslands are those of bear. Or take those spits further south off the coast of Newfoundland, which are mostly rock and sand. Or those islands off New England, rich in black oak, sassafras and huckleberry and home to seals, weasels and voles. Or Assateague Island, Md., a fragile sliver of sand and grassland pounded by the hooves of wild ponies. Or islands off Georgia with savannahs that look like those of East Africa. Or Cape Canaveral, Fla., which, in spite of the John F. Kennedy Space Center, still boasts pristine beaches and jungles of palmetto palms. ... You get the picture, and it shouldn't be hard to guess what's happening to many of these islands and spits.

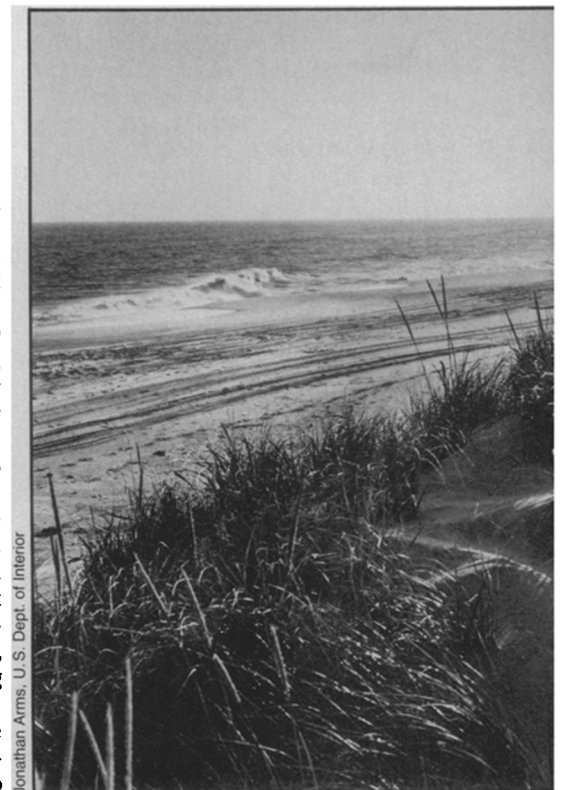
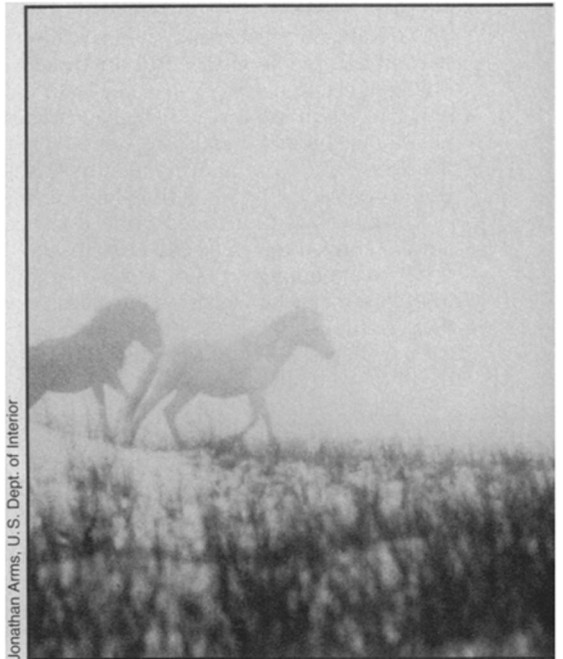
The barrier beaches are being increasingly threatened with campers, condominiums, hotels, marinas, roads, subdivisions, shopping malls and airports, not to mention umpteen human bodies. A large colony of sea birds at Jones Beach, Long Island, for instance, has been forced to retreat to a strip of grass between a road and a parking lot at the beach. Wild ponies on Assateague Island now have to compete with two million tourists a year. It's not unusual for them to trot down the beach past sunbathers listening to music on portable radios. Will the barrier beaches, in all their natural splendor,

eventually be wiped out by overdevelopment or overuse? Possibly, unless ecologists learn enough about the barrier system, and unless government agencies, private organizations and citizen groups move fast enough to halt or at least slow down the ravage.

What kind of information are ecologists obtaining about the barrier beaches that can help save them from further destruction? Offroad vehicles, for one thing, destroy sand dunes on the islands, and as J.M.B. Brodhead and P.J. Godfrey of the University of Massachusetts at Amherst have found, it may take dune vegetation several years to recover from even modest abuse—say, being run over twice a day for a month by one vehicle. And some species of plants growing on the dunes are even more sensitive to vehicles than others, they report.

Offroad vehicles also interfere with sea birds nesting along island beaches, report P.A. Buckley and Francine Buckley of the National Park Service in Boston, who for 10 years have been studying terns, herons, black skimmers, pelicans and other water birds living on barrier islands off New York, New Jersey and North Carolina. Artificial dunes placed along the beaches also force the birds to nest elsewhere, as do too many people on the beaches. Then where do the birds nest? Often in salt marshes. "Terns would be extinct in New Jersey and Long Island if it weren't for the salt marshes," the Buckylys claim. The problem with the birds nesting in the marshes, though, is that they are in danger of being wiped out by high tides.

Another danger to birds using the marshes for nesting or wading (as do herons) is the artificial closing of inlets to barrier islands, the Buckylys continue. While marshes form behind closed inlets, the marshes can deteriorate if the inlets do not open up again for a long time. And conversely, chopping an island in half can alter water salinity and interfere with fish spawning, according to Robert Livingston of Florida State University in Tallahassee. Livingston has studied St. George's Island off the north coast of Florida and, as he

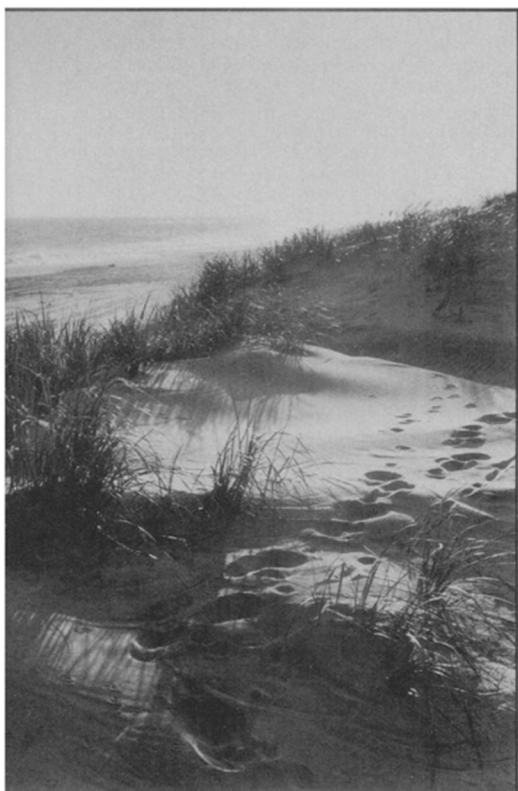


Although the wild ponies of Assateague Island now have to compete with sunbathers and portable radios (top left), and Fire Island is being swamped by overdevelopment (top right), not all barrier beach ecology has been ruined, as Cape Canaveral's largely untrammelled beach (directly above) indicates.

BEACHES BE SAVED?



Robert Perron, New York City



explains, the island was severed so that Gulf shrimp boats could pass through it and proceed on up the Apalachicola Bay. While this saved the fishermen time, it increased the salinity of water on the mainland (marsh) side of the island and reduced the number of blue crab and other fishes being spawned there.

Altering the vegetation on barrier is-

lands can be another cause of adverse ecological effects, because vegetation diversity determines animal species diversity, say Raymond D. Dueser and John H. Porter of the University of Virginia at Charlottesville. Vegetation diversity, especially of woody plants, is even more crucial than wind, water, island size and some other physical factors in determining how many animal species live on an island. So, what if one island's vegetation and animals are reduced? Won't the same animals be found the next island over? Possibly not, because, as Dueser and Porter point out, species differ from one island to another. James D. Lazell of the Massachusetts Audubon Society in Lincoln agrees. While raccoons, rabbits, snapping turtles, hog-nose snakes and some other animals are ubiquitous to all the islands, he explains, other species, such as seals, mink, otter, voles and water snakes, live only on specific islands. In fact, the Muskeget vole of Massachusetts is the only full species of mammal that has evolved on a barrier island.

Another compelling feature of the barrier islands that must be respected if they are to be saved is that they are dynamic natural systems. For instance, as Godfrey points out, building seawalls harms the shoreline of barrier islands, because the shorelines no longer have the flexible nature that tolerates wave energy. And if a seawall is built around a salt marsh, thus cutting it off from the sea, the marsh food web, upon which water birds and fiddler crabs depend, will be adversely affected.

Such insights into the barrier islands, of course, won't save the islands unless the

knowledge is applied in a practical manner. And fortunately some of it is being applied, particularly by pertinent government agencies or by such agencies cooperating with university scientists. During the past 15 years, for instance, the National Park Service, through public pressure on Congress, has come to own or administer more and more barrier beaches. The NPS is now developing scientifically based management plans for those beaches. Research conducted by Godfrey and colleagues at the University of Massachusetts, and supported by the NPS, has led to better management of a wild barrier island and new national park — Cape Lookout (N.C.) National Seashore. The National Science Foundation recently awarded a Public Service Science Residency to Dinesh C. Sharma, an environmental resources consultant in Fort Myers, Fla., to study the management of barrier islands off Florida, Georgia, Alabama and Mississippi, many of which are being tremendously pressured for development without regard for their unique natural resources. By designing educational materials and conducting meetings with local civic groups and public agencies, Sharma will help define the problems and issues facing each island. A final public analysis of such issues should provide guidelines for compatible development and conservation on each island.

Private organizations are also using scientific knowledge to save the barrier beaches. In 1967, for instance, the Nature Conservancy, a nonprofit conservation

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... Barrier beaches

group that has saved more than a million acres of endangered wildlife habitats, recognized the exquisite ecosystems of the Virginia barrier islands, replete with snow goose, black duck, plover, the endangered peregrine falcon and the vanishing osprey. At that time the islands were being threatened with plans to turn them into a giant luxurious recreation community with convention centers and a bridge to the mainland. The Conservancy managed to override these plans and, by 1975, had purchased all but one of the 14 islands. Then it undertook, on the islands, one of the most extensive privately funded ecosystem preservation studies ever conducted. This investigation convinced the Conservancy to retain ownership of the islands and to operate them as a preserve rather than to turn them over to the federal government for management. Today the Conservancy allows people to enjoy the islands, but in ways that won't destroy them. Hiking, beachcombing, swimming and surf fishing are allowed, but elements that can damage the ecology of the islands, such as airplanes, cars, campers, campfires and pets, are expressly verboten.

Another example: In May 1976, The Conservation Foundation organized a two-day workshop on barrier island preservation. The workshop was attended by coastal scientists, conservation groups, government officials and interested lay persons. The lay people attending the workshop, in fact, were so inspired by it that they organized a Barrier Island Coalition and Workshop. The coalition and workshop now oversee one hundred volunteers who live on different barrier islands and who keep close watch on management practices that might endanger the islands.

In still other instances, citizen action groups and private organizations are working without the direct help of the scientific community in order to preserve barrier beaches. During the late 1960s, for instance, Congress hoped that Assateague Island's shifting sands could be stabilized and the island converted into a playground for 30 million people living within a 200-mile radius of the island. By 1976, however, after years of lobbying by the Committee to Preserve Assateague Island, Congress scrapped further plans for development of the island and ordered a master plan that must provide "full protection... of the natural resources and natural ecosystems of the seashore." The National Park Service, the Fish and Wildlife Service and the State of Maryland are now drawing up the plan. In Massachusetts, a private conservation organization, the Trustees of Reservations, has been purchasing outstanding barrier beaches around the state, including areas of Nantucket, Martha's Vineyard and Chappaquidick Island.

But the greatest hope for the barrier system lies in an umbrella protection plan based on sound ecological principles.



The Muskeget vole of Massachusetts is the only full species of mammal that has evolved on a barrier island along the Atlantic or Gulf coasts.



Assateague Island is one barrier island that environmentalists are trying to save.

There are indications that such a plan is in the works, at least for the U.S. barrier islands. In his 1977 environmental message, President Jimmy Carter asked the Departments of Interior and Commerce to develop a plan to protect the barrier islands — something that had never been done before. A task force was established, comprised of people from the National Park Service, Fish and Wildlife Service, the Barrier Island Coalition, university scientists and other barrier island specialists. The task force has divided the barrier islands into 300 study units. It is probing the ecology of the islands and examining federal programs affecting their wellbeing in order to draw up a master plan to protect them. The plan should be ready for the President's inspection in early 1979.

But will the plan be adopted by the President? And if so, by Congress as well? And

will it be tough enough to save the islands' ecology, especially those that are not owned or administered by government agencies or conservation organizations? (Some state laws to protect barrier beaches already exist, yet they are currently being tested in the courts by developers. For instance, an important court test is coming up between developers and the state of Massachusetts, in which the state has used its authority under its present Wetlands Act to prevent development of an eroding dune system on Nantucket barrier beach.) Thus, answers to the above questions depend on whom you talk to. According to J.C. Appel, manager of the wildlife refuge on Assateague, "More people are going to come, no matter what we do." P.A. Buckley, however, is more sanguine: "There are lots of problems, but there is hope." □