

Joe C. Moseley II

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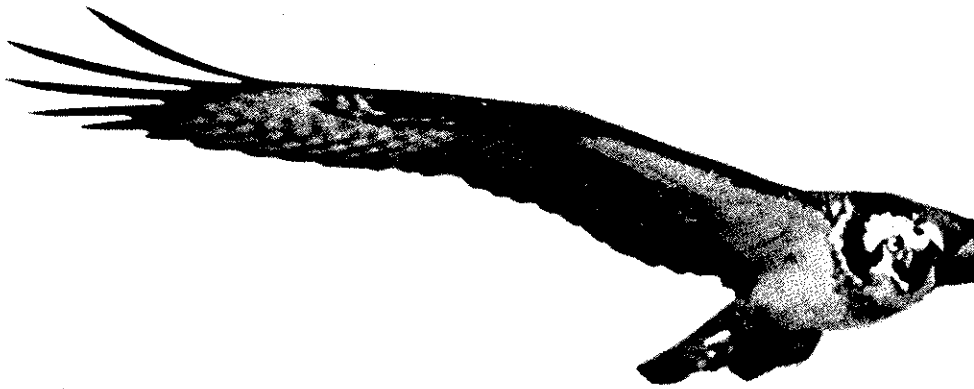
202 Questions for the Endangered Coastal Zone

Edited by

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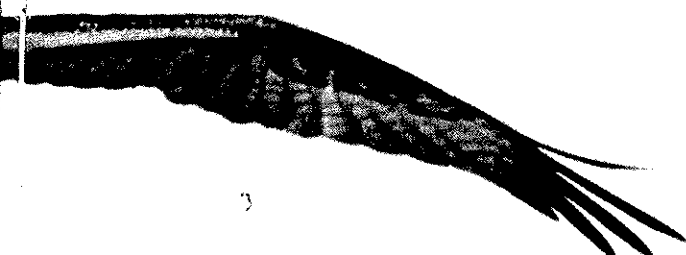
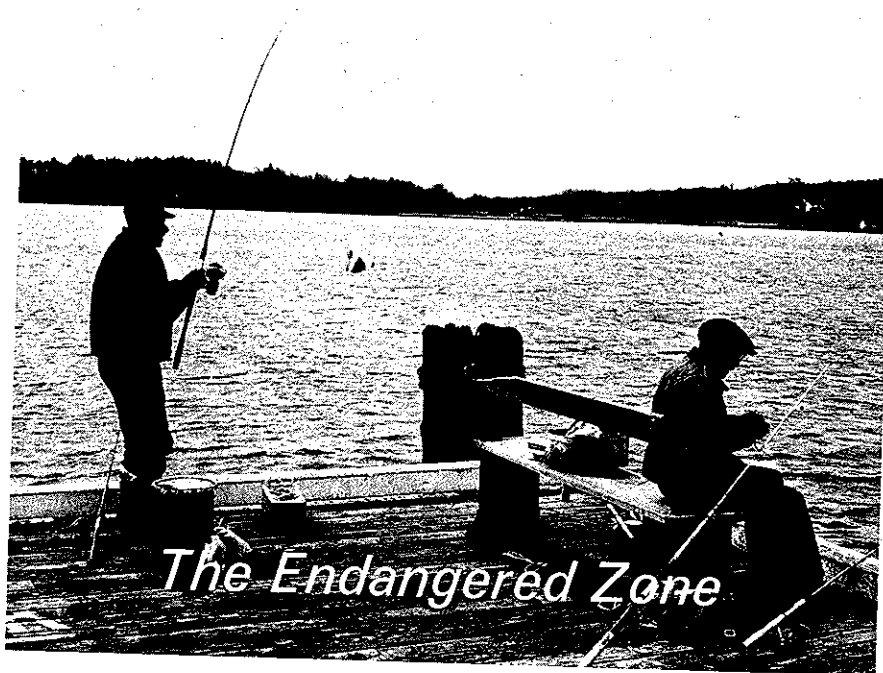


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Fish cannot live just anywhere in the water. Like deer, rabbits, and bees, each species of fish lives in a definite habitat. Most salt water fish live close to us, in tidal rivers or bays along the coast. Without these vital close-in shelter areas, the fish will perish . . . it is a sad fact that our estuaries are not being maintained in good condition — instead they are being systematically demolished, altered, or poisoned . . . continuation of this damage can be averted without halting progress if those who authorize the work are made aware of the ruinous effects caused by many shore projects.

“Fish and Man—

Conflict in the Atlantic Estuaries”

by John R. Clark

There is conflict in the coastal zone between man's selfish or ignorant (some call it natural) drive to conquer nature and accumulate its wealth on the one hand and the needs of fish for that same coastal land and water for survival on the other. What marine life demands for survival, man uses for waste disposal, landfill sites, roadways, housing, airports, and industry. There is no question that there are fewer fish, fewer clams, fewer crabs, fewer wading birds, and fewer places for enjoyable fishing, swimming, boating, and nature walking because of man's badly planned actions.

The ocean's productivity is concentrated in the coastal zone, from the tidal rivers seaward to the salt marshes of the bays and estuaries — where the rivers meet the sea — out along the beaches and including the waters on the continental shelf. Productivity is high here because basic nutrients, the minerals and organics washed down river from land, feed plants and animals at the base of the marine food chain. By weight, about a thousand times more food is caught or harvested from the coastal zone than from the open ocean. To put it another way, most fish, shellfish, crabs, and lobsters are caught within sight of land.

Like all wildlife, marine animals establish themselves where conditions for life are most favorable—plenty of food, areas for spawning, and freedom from predators. Some 70 percent of the valuable sport fish depend on estuaries for survival. They have evolved through time as have the estuaries; they will not survive if their coastal habitat is destroyed.

The major threats to coastal zone life and its habitat are:

- (1) destruction of bay bottom,
- (2) destruction of tidal marshes and edges, and
- (3) water pollution.

We have gone about inhabiting and using the coastal zone on misguided faith in the resiliency of nature, rather than after careful study of what the effects of our modifications might be. This book stresses the importance of study before action by providing the reader with questions that deserve answers. Elected and appointed officials should learn to expect these questions and they in turn should ask them of those who plan any estuarine modification. The burden of proof should lie with those who plan change. It is up to them to show that their work will not have an adverse effect on the coastal marine environment. Barring that proof, applications for approval to begin work should be denied out of hand.

Unfortunately, in all too many cases quite the opposite happens — plans are given cursory approval because those who hold jurisdiction over the coastal zone are either unable or unwilling to exercise authority. They do not know the ecological values of the zone they preside over and may not know the boundaries of the zone itself. In the absence of contrary evidence or of public concern, they take the path of least resistance which usually means approval of the project.

Asking questions is the best way to get those who exercise jurisdiction in coastal zone management to take their jobs seriously and to focus public attention on their activities.

This question guide will help you emphasize the natural biological productivity and the recreational use of estuarine land and water. What follows is a series of questions that you as a conservationist, a builder, an industrialist, a factory operator, a farmer, a marina owner, a government official, or an interested citizen should be asking yourself and all those



A net cast in any estuary will reveal its value as a nursery ground for marine fish. Here in Florida there will be juvenile snook, tarpon, trout, and croaker, elsewhere bluefish or striped bass. Some 70 percent of coastal sport fish species depend on estuaries for survival.

whose decisions affect the future of the coastal marine environment.

One rule of thumb: in general, coastal (tidal) waters are considered navigable and are thus under the jurisdiction of the U. S. Army Corps of Engineers, who should heed these questions; all waters within three miles of land involve state questions also, so state departments of environment, conservation, public health, natural resources, or conservation and economic development (state organization varies) should heed these questions; lastly coastal zone questions usually involve county or municipal government, and these also should heed these questions.

When checking through the following categories, remember that more than one category can often be applied to a project you are questioning. The questions are presented in the present tense, but questioning should begin as far in advance of the modification as possible.



Channels are dredged deeper and wider so that boats won't run into each other or run aground, and until the day comes when (1) no more boats are built, (2) they don't increase in length, beam, and draft, or (3) moving water stops dumping silt into channels, they will continue to be dredged. Since none of the three conditions is likely, it is important to ensure that dredging is done with minimum damage to the estuarine ecosystem. Dredging should be permitted only after thorough consideration is given to its effects.

Dredging can damage by tearing up marine habitat, by releasing silt which smothers shellfish and cuts down penetration of sunlight into the water, and by changing water current patterns. If dredging creates deep holes in otherwise shallow and even bottom, it can create detritus traps and low oxygen conditions. Most important, the dredged material, called spoil, is often dumped on productive marshland.

Thus, while dredging is often considered a routine operation for the betterment of boating, it should demand great care. In almost all cases, it involves public land (or bay bottom) and navigation; this is why permit systems have been established by state and federal bureaus. As more is understood about the biological effects of dredging, these agencies now call, or should call, for advice from marine biologists when considering applications for dredging permits. Unfortunately, neither these investiga-

tions nor monitoring of dredging after the permit has been granted has been administered effectively.

To question a dredging project, you need to find out who is doing the dredging, who is checking on the dredger, and what damage is threatened. It is important to discover costs (including costs of damaged environment), because these must be balanced against benefits.

1. Who operates the dredge? Under contract to whom?
2. Is the dredge working under a permit? From whom?
3. Was permit applied for and granted before work began?
4. Is permit from proper issuing agency?
5. What is the purpose of the dredging?
6. Where is the dredge spoil going? To cover valuable tidal marsh?
7. If so, does runoff cause siltation?
8. Is marshland diked to prevent siltation?
9. Is spoil being dumped into the water?
10. If so, is the water muddy?
11. Who owns the island or marsh where the spoil is going?
12. Does he know it is being used as a dump site? Or is he paying for fill? (Maybe he should be: the dredge spoil is public property.)
13. If damage is being done, is there a better place to put the spoil?
14. What is the nature of the bottom being dredged? Is it productive for shell fish there or where spoil is settling out?
15. If the dredge has permit to work in a defined area, is it staying within its proper bounds?
16. How deep is it allowed to dredge?
17. Is the depth necessary?
18. Are boundaries and depths being monitored?
19. By whom? How often?
20. Are results of monitoring public?
21. Does permit provide for stopping operation and for penalties if conditions are not met?
22. If dredging is in navigable waters, have (a) Department of Interior, (b) Corps of Engineers, (c) State conservation department and Bureau of Navigation, and (d) municipal authorities been notified?
23. Have they granted the permit? If so, under what conditions?
24. If dredging appears to be damaging, have state or federal authorities been notified to stop it?



Coastal Zone Mining and Drilling

The major resources now mined in the coastal zone are oil and natural gas, phosphates, and sand, shell, and gravel. Drilling operations can be performed with minimum topographical damage, the major threat being the leakage of oil and gas up through the drill pipe and into the water.

Phosphate mining (a particular threat in the Carolinas, Georgia, and Florida) can destroy vast marshland acreage, and by-products from phosphate refining — silts and chemicals — can damage wildlife. Sand and gravel mining will increase along the coastline as these materials are needed for construction and for beach replenishment.

Up to now, offshore drilling and mining has been concentrated along the Gulf Coast and off California, but companies and the federal government are showing increasing interest in the mineral deposits on the Atlantic Coast shelf. There will be more leasing of offshore rights from the states and the federal government in the future.

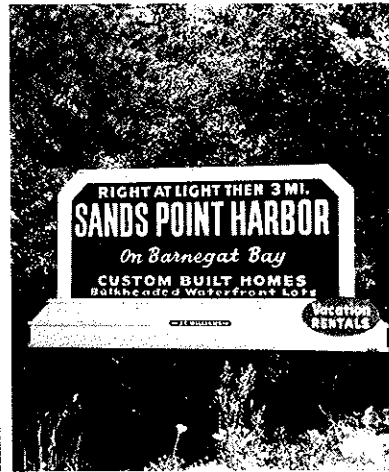
Many of the questions about navigational dredging apply here, but because mining entails selling what is dredged or piped up, there are additional questions:

1. Who owns the bay bottoms being mined? Private or public?
2. If private, how and when acquired? Through proper procedures?
3. If public, is it federal, state, or local?
4. How much per yard is public owner receiving?
5. Is price competitive?
6. How many yards contracted for?
7. Who monitors number of yards dug?
8. Is silty overburden being dumped back into water to get at mineable material?
9. Is material layered with silt which will be freed as operation continues?



Phosphate mining in North Carolina tears open tidal marsh to expose mineral beds. Effluent from processing is piped to settling basin shown in picture on opposite page, stifling estuarine bottom.

10. Have core samples been made?
11. If so, by whom, and what do they show?
12. If oyster shell is being mined, is this stripping bottom of future settling areas for oyster larvae?
13. What is value of undisturbed bottom as marine habitat versus mineable material?
14. Are provisions made to return live shellfish to water during operation?
15. Where does the mined material go?
16. For what use?
17. What is done with the money received by the public agency?
18. Will deep sediment traps result from mining project?
19. What will be the effects of mining on fisheries resources?
20. What has been the past history of the companies involved, as far as care for marine ecology?
21. If mineral rights are to be leased, what jurisdictions are involved in the leasing decision — federal (Corps of Engineers, Bureau of Sport Fisheries and Wildlife, Bureau of Commercial Fisheries), state, and local?
22. What guarantees can be made that operation will not harm wildlife?
23. What procedures have been adopted to prevent or cope with oil spills, well blowouts, other accidents?
24. Are companies involved in work liable for damage to fish, birds, beaches, boats, in case of accident?
25. What effects will operation have on aesthetics of area?
26. Will there be unsightly equipment off the beaches? Odors? Water discoloration?
27. How long will operation continue?
28. Will site be left in good condition?





This includes residential housing, industrial development, boat basins and marinas, highways and airports, and recreational areas. Development usually involves three basic steps — placing of bulkheads either at the edge of the tidal marsh or out into the tidewater area, dredging or pumping tidelands on the seaward side of the bulkhead, and using dredged material to fill land behind the bulkhead.

These projects damage estuaries three ways: (1) by destroying marine habitat on the bottom, (2) by destroying salt marsh, and (3) by polluting water with silt. In general terms, these operations are done best if at all when they disturb natural conditions least. This entails such considerations as dredging when the least amount of silting would take place (at slack tide), dredging so that bottom grades would be regular, filling only land well above mean high tide, and eliminating bulkheads or at least permitting water circulation into salt ponds and marshy areas. Contractors should be encouraged to seek advice on how to conduct dredge-and-fill projects with a minimum of harm to the ecosystem, and state and local governments should be encouraged to enforce existing regulations and establish new legislation, if necessary, to protect wetlands.

In many cases involving wetland filling, public rights to the waterways and riparian land are swept aside in the interests of private development because public rights are either misunderstood or ignored. The general rule is that any land washed by the tides is public.

In these dredge-and-fill operations, many of the questions above about dredging apply, plus the following:



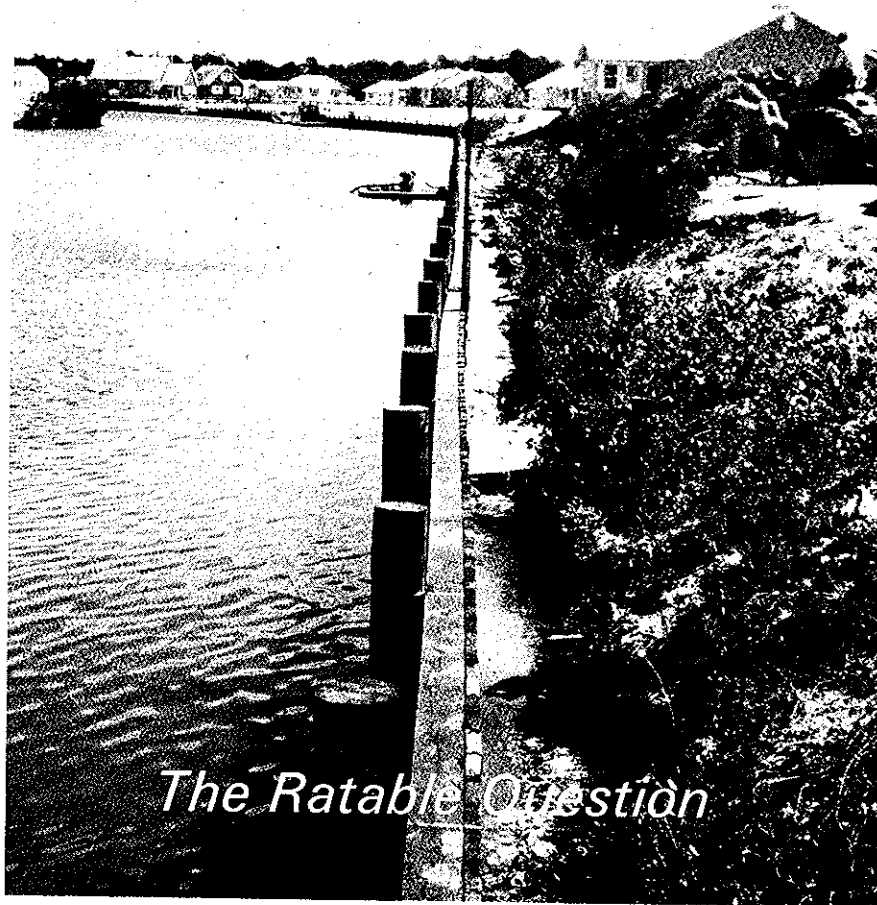
This is typical tideland lagoon development procedure—dredging bay bottom on top of salt marsh for house lots. Such a procedure destroys bottom, suffocates marsh, and degrades water quality (especially at dead ends of lagoons at top of picture). Natural marsh shows up as dark islands at right.

1. Have biologists established the basic productivity of the area?
2. How recently?
3. Who did the study?
4. What are its findings?
5. Does development conform to zoning laws and master plan?
6. Are the laws and plan effective?
7. Are they legal?
8. Has your state or municipality established bulkhead lines in the area?
9. Are they at the low water mark? High water mark? Somewhere else?
10. Has a survey been made to establish lines?
11. By whom?
12. Does bulkhead conform to lines?
13. Does person or firm doing dredging and filling have (a) riparian rights to land being developed below high water line? (b) dredging permit, including approval of state? Department of Interior? Corps of Engineers?
14. Does permit include conditions to prevent silting?
15. Are these conditions being met?
16. Is any provision made to preserve plant life or is area to be bulldozed?
17. What sewage treatment facilities are planned?
18. If septic tanks, where will overflow go?
19. How soon will septic tanks begin leaching into waterway?
20. If sewage treatment plant is planned, where will sewage solids be dumped?
21. Where will sewage effluent (liquids) go?



A second dredge-and-fill development, burying marsh grasses under sand. This halts exchange of plant energy between land and water, an exchange critical to the natural function of tidal marsh.

22. Will filled land be subject to flooding during high tides?
23. Will this have an effect on septic tanks and treatment plants?
24. If buildings are near the beach, will dunes be destroyed, or used for fill?
25. Are buildings close enough to ocean to be threatened by extreme weather?
26. Who will pay for protection, if house owners occupying houses close to water appeal for bulkheads or jetties?
27. Will public have access to beaches or water after bulkheads are constructed?
28. Who will own the bulkheads and jetties?
29. Will traffic (foot and motor) to beach erode protective dunes?
30. If plan includes marina, boat basins, or finger piers, does lagoon design allow for any circulation of water into nearby marshes or is entire marine edge bulkheaded?
31. How deep is basin being dredged? Deeper than natural bottom?
32. How will this affect natural water circulation?
33. If finger piers, does design provide for water circulation, or do lagoons end in cul-de-sacs?
34. Is water flushed by tidal action, or does it stagnate?
35. Are provisions made to discharge boat wastes into treatment plants or holding tanks or do boat heads flush into lagoon?
36. What provisions are made for oil and gas spillage? Litter?
37. Is boat basin activity causing muddy water?
38. Does your municipality have a wetland ordinance? Is it being violated?

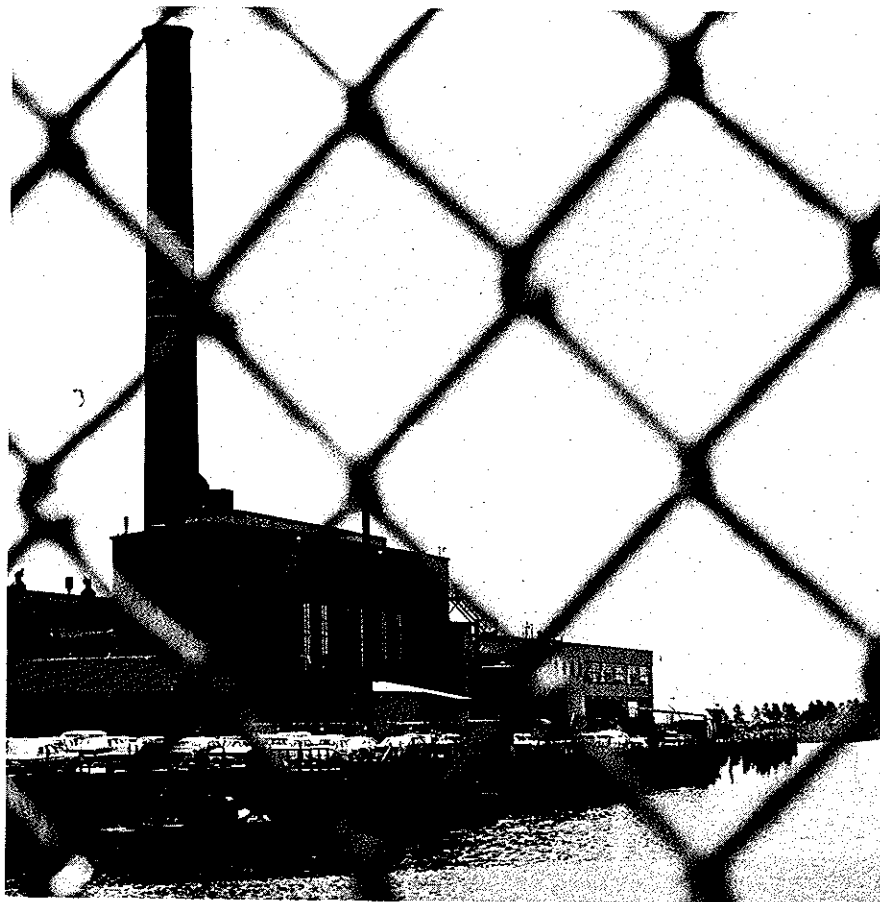


The Ratable Question

Residential housing can be a very poor tax ratable, when the income it generates for a municipality is measured against the cost of services it demands. In simplest terms, if it costs the town \$500 to educate each child in its schools, and if new houses will each have two children, then the town must realize \$1,000 in taxes from that home to break even, ignoring the service costs for sewerage, trash pickup, police, fire, road maintenance, and so on.

An industrial ratable must be measured against how it might downgrade the community by polluting or by simply looming over the very things which bring people to a shore community in the first place.

If a real estate development or industrial park is planned on tidelands in your vicinity, the following ratable questions should be raised:



Few communities win the race for ratables because new construction so often costs taxpayers more than the ratable produces, or because the ratable blocks off useful open space. New industrial or residential construction in the coastal zone bears careful scrutiny.

1. Does the added tax revenue cover added costs of services the municipality must furnish? Sewers? Roads? Water? Police? Fire Protection? Schools? Parking?
2. If industry, is it locating there to use a natural resource? Minerals? Cooling water?
3. What is the loss of natural beauty balanced against the claimed ratable?
4. What are the financial and aesthetic effects on surrounding land?
5. Will industrial development mix with residences? Open space?
6. Will industrial development cut off access to natural areas?
7. What has the industry's or house builder's record been in other areas?



It is known that the best protection against storm wave damage to structures is the beach itself and the dunes behind it. Unfortunately, we have used too much dune sand as fill for construction, we have seen homes built too close to the ocean's edge, and we have used beach sand catchers (groins, bulkheads, and jetties) that actually destroy beaches rather than protect them.

Now resort areas search for new sand to replace beaches that have been washed away, and they are turning to estuaries to find the sand. It should first be realized that most beach replenishment schemes will provide only temporary relief, because the processes which eroded the original beach are present to erode the new one. Realizing that, a town may still wish to replenish a beach if the benefits of beach replenishment (more revenues from beach usage, higher taxes, better home protection) outweigh the costs. What is not usually measured in this figuring is the damage caused to the estuary if it is dredged indiscriminately for sand.

The questions here focus on the need to uncover *all* costs of beach replenishment programs, and to encourage municipalities to look to off-shore deposits as sand sources, if beach replenishment is necessary.

1. Is beach being eroded?
2. What do early records show about erosion extent and speed?
3. What are sand transportation patterns in the area?

4. Is the erosion caused by man's activities?
5. If so what? Destruction of sand dunes? Building too close to the ocean? Cutting paths through dunes? Sea wall, jetty, or bulkhead construction? Changes at inlets?
6. How can this man-made erosion be halted?
7. If beach is eroded can it be replenished?
8. Is sand to replenish to come from bays behind beach?
9. In what ways will this disturb the ecology of the bay?
10. Can sand come from offshore more safely?
11. What are the costs? What offshore resources — clams, fishing grounds — should be protected?
12. What beach life might be threatened by replenishment?
13. What is best time of year to replenish?
14. Who will pay for replenishment?
15. Will public funds be used to rebuild private beach?
16. Will public have access to publicly rebuilt beaches?
17. Are there reasonable alternatives to beach replenishment?



When the storm comes—and it will—owners who build too close to the water call for bulkhead protection. At whose expense? Better to build back of the dunes so that storm erosion is less a threat to manmade structures.



To generalize, water of good quality should be clear (so sunlight can penetrate), contain proper amounts of dissolved oxygen, be the right temperature (or change temperature slowly), and be free of pathogenic organisms and harmful chemicals. Water is polluted when one or more of these conditions is not met. Solid human wastes introduce pathogens, decrease dissolved oxygen by taking oxygen out of the water for decomposition, and turn water murky. Apparently healthy looking water can be lethal because it is too warm or contains poisonous chemicals, and polluted-looking water can be healthy if discoloration is caused by normal amounts of plankton.

Estuaries are particularly vulnerable to pollution for two reasons: (1) their natural populations are in delicate balance, easily upset by pollutants, and (2) they become the repository for most of a river's pollution load as the river meets the estuary, slows down, and dumps its material.

Three major water pollutants are domestic sewage (human wastes), industrial sewage (primarily chemicals), and thermal pollution through addition of heated water to rivers and estuaries. Special water pollution problems, such as farm wastes (duck farms, livestock, fertilizers), pesticide pollution, and oil spills can fall under several of the three major categories.

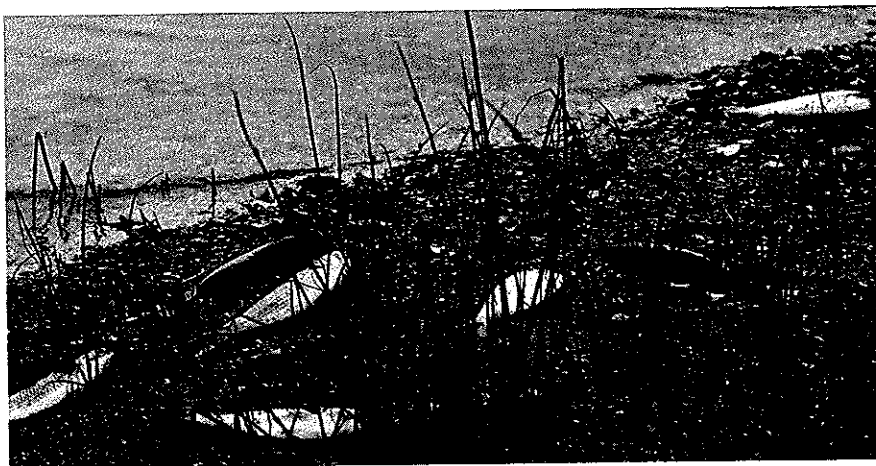
DOMESTIC SEWAGE

Domestic sewage — the wastes from homes — is 95% water, 5% solids, and creates two disposal problems: What to do with the liquid? What to do with the solids? The liquid waste from a sewage plant is called effluent. The solids are usually called sludge. Depending on the type of treatment plant and its efficiency, the effluent can range in quality from drinking water, free of phosphates and nitrates, to rank, septic-laden water, relieved only of some of its floating solids. The sludge can be foul and septic, or almost odorless and safe.

1. What are the sewage sources? Septic tank seepage? Effluent from sewage treatment plants?
2. Where do treatment plants dump liquid effluent?
3. How much per day?
4. Are storm sewers hooked up with domestic sewers (overloading treatment plants after heavy rains)?



These Massachusetts clam beds, and many other acres along the coast, are off limits to both commercial and recreational shellfishermen because clams concentrate viruses and bacteria from human sewage and can cause illness or death when eaten.



Fish kills through water pollution—low oxygen, pesticides, oil spills, toxic industrial wastes—can indicate coastal water sickness. Effluent which kills fish is untenable and probably illegal.

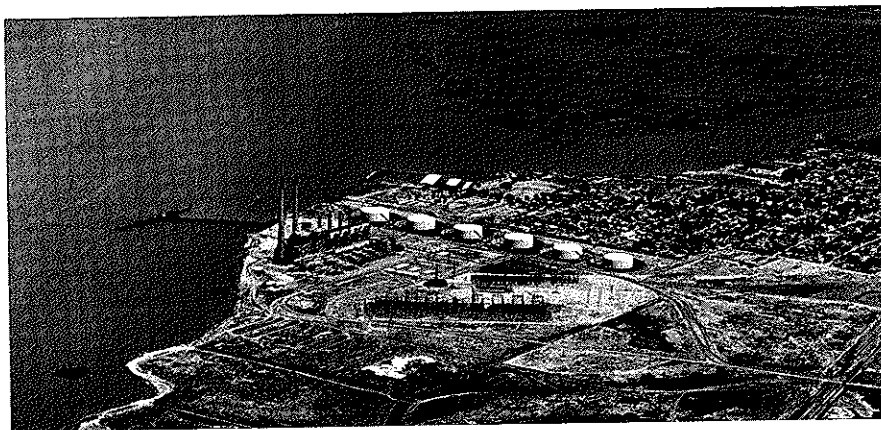
5. What degree of treatment does sewage receive? Primary? Secondary? Additional?
6. Is effluent chlorinated?
7. Where are sewage solids dumped?
8. Is treatment plant operating efficiently?
9. Who operates it?
10. What training do operators have?
11. What licenses?
12. Who checks plant and operators? How often?
13. Is it a tandem system so that one half can operate while the other half is being repaired?
14. If your municipality does not have a sewage treatment plant, how much would one cost?
15. What will be its capacity?
16. What degree of treatment?
17. Who will pay for it? Local? State? Federal?
18. If polluted water signs are posted, who posted them?
19. What tests did they make?
20. How often do they retest water?
21. What needs to be done to upgrade water so it need not be posted?
22. Can shellfish from surrounding waters be eaten raw?
23. Is pollution local or is it coming from upstream?
24. Are local waters overgrown with algae? (This is a prime indication of domestic sewage pollution, caused by nitrates and phosphates, normally not removed from sewage during treatment.)

INDUSTRIAL SEWAGE

1. Are industries dumping directly into local waters?
2. What is the nature of discharge? Metals? Petroleum? Exotic chemicals? Dyes? Organics? Acids?
3. Is dumping legal?
4. If not, has illegal dumping been reported?
5. What penalties are provided?
6. Is industry making an effort to clean up waters?
7. Can they be encouraged to, or forced to?
8. If industry is putting its wastes into municipal sewage plant, can these wastes be handled efficiently?
9. Are there exotic wastes that need special treatment?



Sudden changes in temperature, the introduction of toxic substances, or the depletion of oxygen can kill coastal zone life. Even Carolina blue crabs have tolerance limits.



An increasing number of power generating plants will be planned for estuaries, which provide cooling water. The decision about plant siting is usually made before ecological studies are completed, or even started. Hot water discharges will always change, and sometimes damage, nearby marine resources. This is the junction of the Sacramento and San Joaquin Rivers in California.

THERMAL POLLUTION

Adding heated water to an estuary will change the estuary's ecology. It may benefit some species and penalize others, or it might harm all life. The addition of heated water changes the water's ability to hold oxygen. It changes chemical balances. It changes light penetration. It changes bottom character. As power companies run out of cooling water resources inland, they will turn more to the estuaries for electric generating plant sites.

1. Are plants or generating stations using water for cooling?
2. Are they dumping heated effluent into surrounding water?
3. What is the temperature of water above the plant?
4. Below?
5. What is effluent temperature?
6. How many gallons per minute?
7. Has plant permission to dump heated water? From whom?
8. Is plant cooling water before returning it?
9. Can they be encouraged or forced to?
10. Can you get accurate estimate of cost?
11. What effects of warm water can you observe on fish life?
Plants? Other wildlife?
12. Are chemicals used to scour intake and discharge pipes?
13. What chemicals? How often? How much?
14. Does this effect wildlife?
15. Can other chemicals be substituted?
16. What will be the effects of emergency plant shutdown? Will fish near outlet be killed by return of cooler water?
17. If generating plant is nuclear powered, what are levels of discharge of radioactive material to water?

18. Who sets permitted levels?
19. How are they monitored?
20. How often?
21. Are results public information?
22. Are other contaminants contained in effluent? Such as copper?
23. Is power plant under construction without permit to discharge?
24. What has utility company's record been at other plant sites?

OIL SPILLS

In addition to many of the pollution questions posed before, there are several things you should look into that deal especially with oil pollution.

1. When did the spill take place?
2. What was the extent?



An oil spill killed this pelican in Puerto Rico. Improper treatment of spills with chemicals can be even more damaging to wildlife. But the effects of the more than 1,000,000 tons of oil routinely entering the ocean each year have just begun to be studied.

3. Who was responsible?
4. What local, state, and federal laws apply?
5. How can damage from oil spill be reduced?
6. Can booms or floats be placed?
7. Are dispersants or detergents being used?
8. Are they safe?
9. On the shoreline, can oil be removed mechanically? By soaking? Scraped away? Burned?



Pesticides containing chlorinated hydrocarbons (DDT is the prime example) have decimated the populations of predator birds, including the osprey or fish hawk, by causing thin eggshell in nesting birds. Osprey's salt marsh habitat is also being destroyed.

PESTICIDES

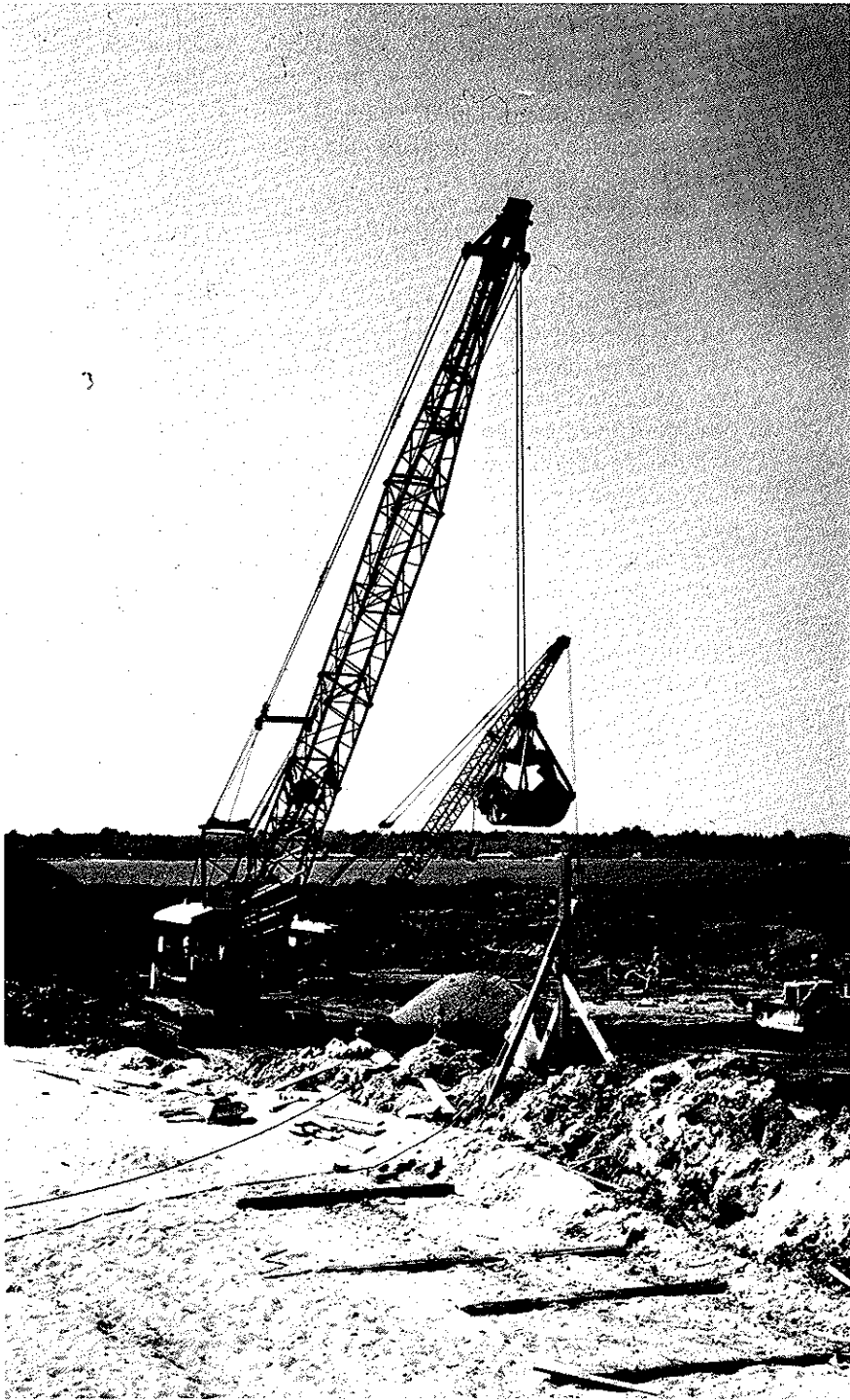
The harmful effects of pesticides — particularly the persistent chlorinated hydrocarbons like DDT — on estuarine life are well-documented. In small concentrations, pesticides have killed crab and shrimp larvae, oysters, and fish. They have decimated osprey populations. They are deadly to plankton, among them the plankton which photosynthesize. Estuaries trap pesticides from rivers and pesticides are applied directly to tidal marshes.

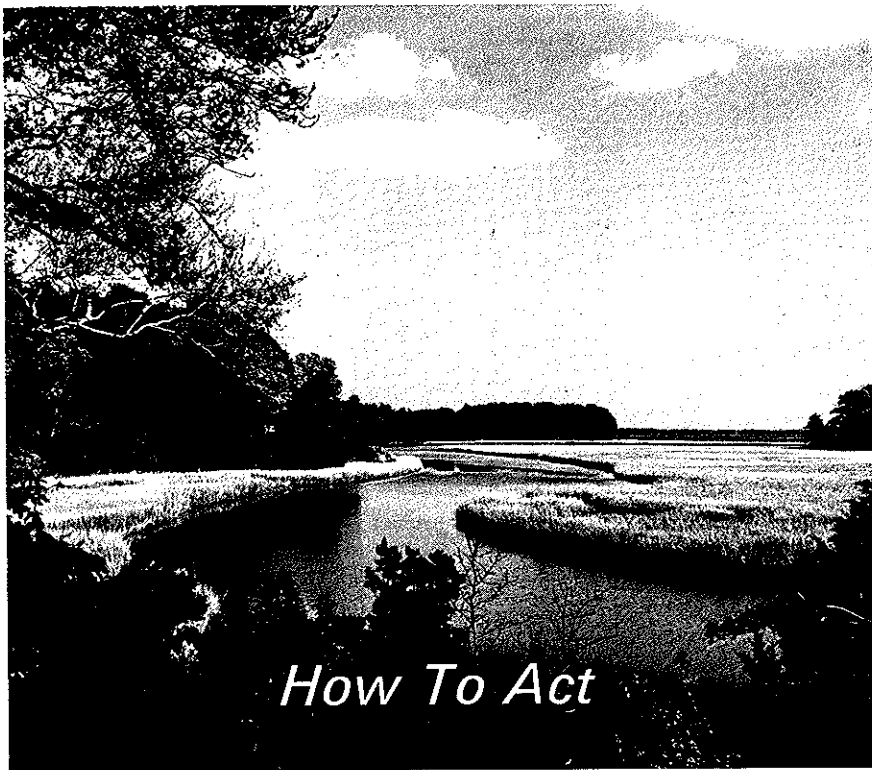
1. What pesticides, in what strengths, are being used, and where?
2. Under whose authority?
3. Does municipality have authority to apply pesticides to private land?

4. Can you request them to stop?
5. How often are applications made?
6. For what insects?
7. Are beneficial insects killed?
8. Do insecticides seem to have any effect on bothersome insects?
9. Is aerial spraying being done?
10. Over how wide an area?
11. By whose authority?
12. Does spray drift to other areas?
13. If over marshes, what are spray's effects on wildlife?
14. Are other pesticides or methods available?
15. Are pesticides long-lived?
16. Can short-lived be used?
17. Is pesticide specific against pest?
18. Can mosquitoes be controlled by ditching and water level control? Water management? Vegetation control?
19. Is ditching designed to protect fish and wildlife habitat while controlling mosquito breeding sites?
20. How long has the spraying been going on? At what cost?
21. Are other methods less expensive?
22. Has anyone considered not spraying?



Ditching to control mosquito breeding sites is an alternative to pesticide spraying, but ditching, if badly designed, can decrease basic salt marsh productivity.





How To Act

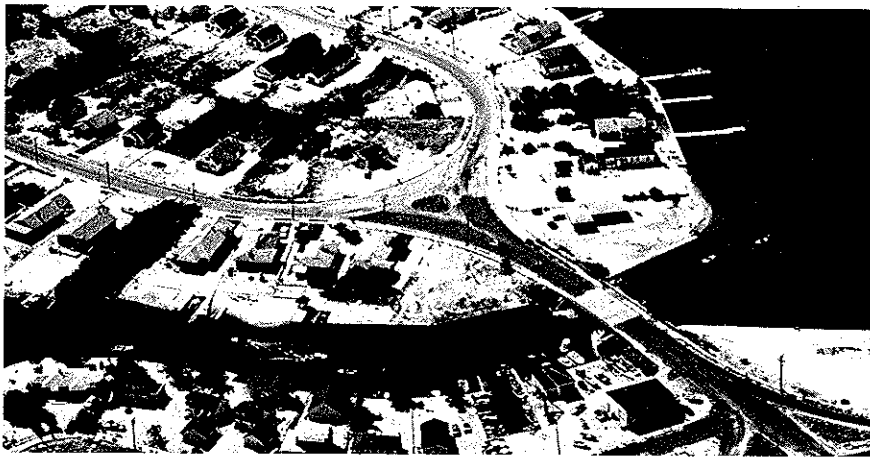
Action to protect a tidal marsh, estuary, or other coastal resource should be taken before a proposed project is started. By the time stakes appear on a marsh or there is the overnight arrival of a dredge or heavy earth-moving equipment, it may be too late to stop a destructive project. So look for earlier signs that something is planned — a story in the paper about a Corps of Engineer permit application (these notices are public information and newspapers should be encouraged to print them), the assembling of parcels of land by a developer, applications for a zoning variance or subdivision approval, or advertisements for bids on a project.

To illustrate the steps in questioning a proposed project, let us suppose that Shoreview Housing Company plans to build 200 homes on estuarine salt marsh by dredging out lagoons and placing the dredge spoil on tidal marshes for building sites.

In addition to obtaining approvals from municipal boards (planning, zoning, etc.), Shoreview must apply for:

- (1) a riparian grant from the state, which owns tidelands.
- (2) dredging permits from both the state and from the federal government (Corps of Engineers) to dredge in navigable waters.

It is illegal to begin work in tidelands without state and federal permits.



Coastal zone exploitation continues unabated, a bit here and a bit there. Such development should be halted until its effects on coastal ecology are known. The best way to discover these effects is to ask questions.

RIPARIAN GRANT

The state's right to make a grant of tideland should be questioned on the grounds that the state holds tidelands in trust for the public who benefit from its contribution as open space, for recreation and as an ecosystem critical to marine life. Riparian questions under "Tidelands Real Estate Development" apply.

DREDGING PERMITS

Both the state and Corps of Engineers must issue permits before dredging begins. The federal permit application notice will include the following paragraph:

The determination as to whether a permit will be issued will be based on an evaluation of all relevant factors including the effect of the proposed work on navigation, fish and wildlife, conservation, pollution, and the general public interest. Comments on these factors will be accepted and made part of the record and will be considered in determining whether it would be in the best public interest to grant a permit.

The wording may vary between Corps district offices, but the meaning is clear; comments on environmental effects of the project are sought and will be weighed in the Corps's determination.

The Corps of Engineers office which acts on Shoreview's permit application should be informed of all possible environmental hazards threatened by the project. In the absence of hard fact, the Corps should at least be questioned about possible effects. In practice, the Corps will consult with the state department of conservation; thus, questions should also be asked of the state. Questions under "Tidelands Real Estate Development" and "Channel Dredging to Aid Navigation" apply. Barring satisfactory answers

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About 10 percent of the nation's valuable coastal zone habitat has been lost to development because the wants of the people conflict with the needs of marine life. The values that attract people to the shore are threatened by development.

to the questions from both state and federal officials, the permit application should be denied. Copies of correspondence should be made available to the press, to state and federal representatives, and to local officials.

Then, at every possible public forum and through letters, telegrams, and phone calls, continue to pose the questions relevant to Shoreview's project, and insist that elected and appointed officials face the questions that you raise. The basis of your questioning should be: Have the ecological values of the area in question been considered? You must make every effort to place the burden of proof (that the project will not damage the environment) on those who plan or support the project. It should not be up to you to prove damage; it should be up to them to prove no damage.

Even if Shoreview is granted federal and state permits, there is still recourse through municipal government. Questions under "The Ratable Question" and "Water Pollution" apply. Construction can be delayed through actions by the board of health or on recommendation of the conservation commission. To prevent development of tidelands, it might be necessary for the town or a private organization to purchase the threatened land. And, finally, action in court might be necessary to prevent estuarine damage.

If the planned development is to be contested, try to ally with an already established organization which has been active in local environmental issues. This can be a municipal conservation commission, a county organization, sportsmen's or women's clubs, or a high school or college science club. Most successful conservation actions have been accomplished by the coordinated activities of many people.

As a citizen you have the right to ask 202 questions and those in charge have the obligation to answer.

The American Littoral Society was founded in 1962 to encourage the study and preservation of aquatic life and its coastal zone habitat. Its journals and newsletters record the status of the zone and suggest specific action to protect it.

Society membership is diverse, from the fisherman or diver, curious about salt water life, to chemists, teachers, marine biologists, and ecologists. Members of the Society receive a quarterly journal, UNDERWATER NATURALIST, special publications, and newsletters, recording the status of the coastal zone and suggesting specific action to protect it. The Society also offers field trips and seminars and can help its members find local sources of information. For a membership application, write to Society headquarters.

Additional copies of this publication are available for one dollar.

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