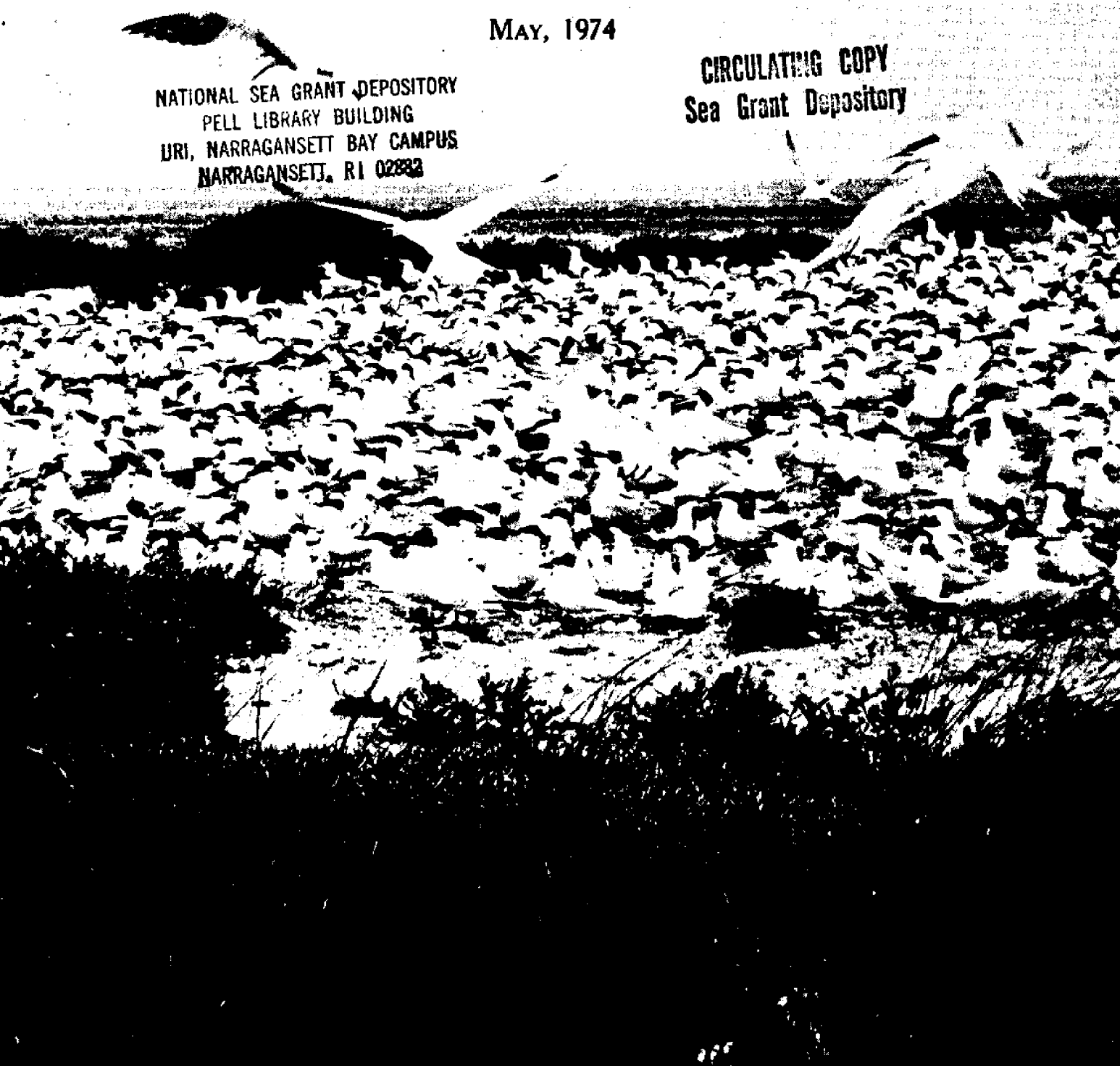
PROCEEDINGS OF A CONFERENCE ON MANAGEMENT OF DREDGE ISLANDS IN NORTH CAROLINA ESTUARIES

MAY, 1974



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OF A CONFERENCE ON

MANAGEMENT OF DREDGE ISLANDS IN NORTH CAROLINA ESTUARIES

30-31, May 1974

Atlantic Beach, North Carolina

Edited by

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INTRODUCTION

The process of removing substrate materials from navigation channels has resulted in the creation of many small estuarine islands. While the dredging process that creates these islands is generally considered detrimental to estuarine ecosystems, recent research has shown that dredge islands are valuable as nesting sites for many coastal birds. This conference was designed to bring the results of this research to the attention of the agencies and organizations with responsibilities and interests in the estuaries and to explore the possibilities and problems of managing these islands for wildlife, particularly nesting colonial birds.

Speakers were selected to cover the major aspects of management and to represent the views of the agencies that would be directly or indirectly involved in such a management program.

The conference was held at Atlantic Beach, North Carolina on 30 and 31, May 1974. Sponsored jointly by the North Carolina Sea Grant Program and the North Carolina Agricultural Extension Service, the conference brought together over 70 people from 24 state or federal agencies and private organizations.

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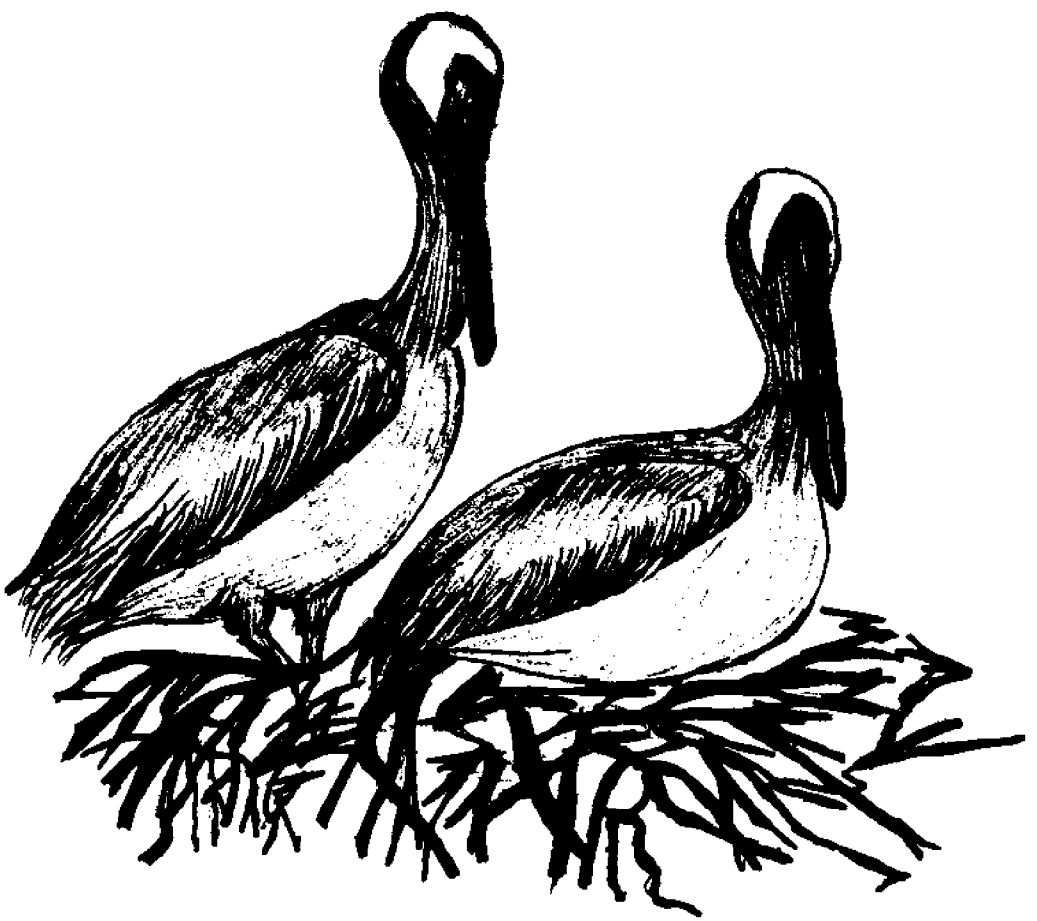

INTRODUCTION TO THE NATURE OF DREDGE ISLANDS AND THEIR WILDLIFE IN NORTH CAROLINA AND RECOMMENDATIONS FOR MANAGEMENT

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What we would like to do today is to introduce you to dredge islands and to a little of the biology of dredge islands. This discussion, was designed to give you some idea of what you will be seeing on the field trip this afternoon and to give you a feeling for dredge islands, their plants and animals. Tomorrow the sessions will be more specific and we will get down to the details at that time.

Dredge Islands have been a part of the estuarine system for a long time. The U.S. Army Corps of Engineers apparently received its first authorization in the early 1800's. I do not have adequate information on hand to know how extensive the process was until the early 1900's. In North Carolina the Intracoastal Waterway was built between 1912 and the late 1930's. So by that time we began to get

the extensive deposition of dredge spoil into the estuaries of this state. Since then the deposition of dredged material has been a common occurence, as harbors have been maintained, and waterways opened and maintained. Dredged material has been deposited in a variety of situations in the estuaries,and dredge islands have become an important part of the estuarine environment.

There are several kinds of dredge islands in North Carolina. As the Intracoastal Waterway was dug through the estuary, especially in southeastern North Carolina a series of islands was constructed usually to the seaward side of the waterway. From about Morehead City southward to the South Carolina line the Waterway is bordered almost continuously by a series of such islands. I have not counted them but there are certainly hundreds.

As boat channels are maintained around inlets and through the open sounds, and as material is removed from these passageways, series of isolated islands, generally not associated with the mainland, have been established. They are usually small and often isolated or in small groups.

This is an extensive process. These islands are not only built but are maintained, and thus they may be dumped on repeatedly over the years. The timing depends on how often the channels fill. So if a channel fills up every three or four years the associated islands may be dumped on every three or four years. If silting back into the channels does not occur, the islands may be 30 to 40 years old having been constructed and never touched again.

Dredging in North Carolina is by a variety of methods. Hopper

dredges, side caster dredges, and pipeline dredges may be used. Most of our dredging is done by pipeline dredges. That is, hydrolic dredges pump the material from the channel via pipelines to some adjacent site. The material sorts itself out to some degree as it flows back down the slope and creates islands with sandy domes. The substrate will vary depending on what is being moved. Generally in eastern North Carolina the substrate is mostly sand, althougn some silt is often present, and in river channels or along the waterway from the Cape Fear River south finer materials may dominate.

In the past this material has been deposited by running the pipeline up to the highest point on the island, dumping the material there and letting it flow back down the natural slope. This has resulted in islands with a dome in the center with sides sloping gradually to the water's level and with shallow water surrounding the island. (Figure 1). Most of the islands have looked essentially like this whether they were larger or smaller and of various configurations.

In the last year or two the process of diking the spoil has become utilized, and much spoil is now being placed behind dikes. This prevents the loss of fine materials back into the channels and into the marshes as readily as before, and it actually makes a rather different sort of island and one that we have not yet had time to evaluate adequately in terms of the succession of plants and wildlife.

This whole process has been quite controversial, as all of you know. There have been concerns about a variety of damages to

Fig. 1. Fresh dredge material flowing down slope of island.

the estuary. We will hear more about that tomorrow, but until we began looking at the terrestrial life on these islands, as far as we can determine, no one had ever really made an effort to find out what the natural pattern of succession of plant and animal communities was. No attempt had been made to evaluate their importance to animal life in the estuary. The research that we have completed and some of the things that we are going to talk about now relate to a study called Community Succession on

Dredge Islands. It was designed to evaluate the succession of plants and the associated vertebrate communities. We have discovered that birds are the major vertebrate users and that dredge islands are much more important to birds than to other vertebrates.

We would like to lead you then through the succession pattern of plant life that will take place on a newly deposited dredge island in North Carolina. Figure 2 shows a new island located in the lower Cape Fear River near Wilmington. We should point out in the very

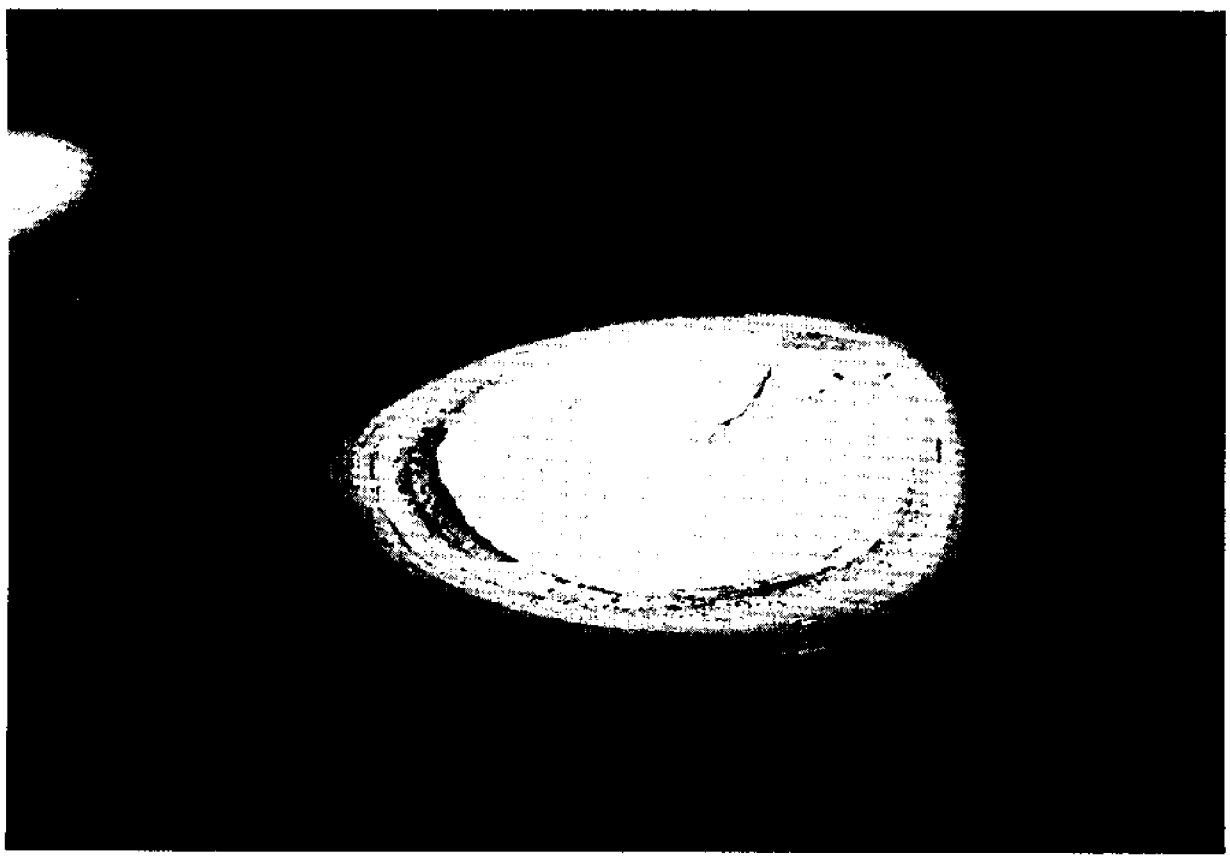

Fig. 2. New dredge island in open water.

beginning that I am talking about, for the most part, ideal situations starting with a new island. If dredge materials are deposited on old islands where vegetation is already established the vegetative successional pattern will differ and I will comment on that later. Given a dredge island deposited in an estuary with some tidal range we notice that two things happen that are significant and very characteristic. Two drift lines will form, one at the spring tide mark and one above this at the storm tide mark, if there was a storm tide during the year and there usually will have been. So we get two piles of drift material encircling the island above the daily high tide mark (Figure 3). These will consist primarily of dead plant stems and debris; but mixed in with that drift material will be the seeds of the pioneer plants that are going to first become established on these islands. Sea rocket (Cakile harperi) is one of the plants that characteristically becomes established in eastern North Carolina this first year. Very quickly then a band of vegetation develops along each of these drift lines, (Figure 4), and by the end of the first growing season these are usually well marked.

A number of other species are also important during the first year. They are salt grass (Distichlis spicata), three-square (Scirpus americanus), beach pea (Strophostyles helvola), seabeach orach (Atriplex arenaria), the panic grass (Panicum amarulum), and saltmeadow cordgrass (Spartina patens). The seeds of these appear to be water transported and all become established first

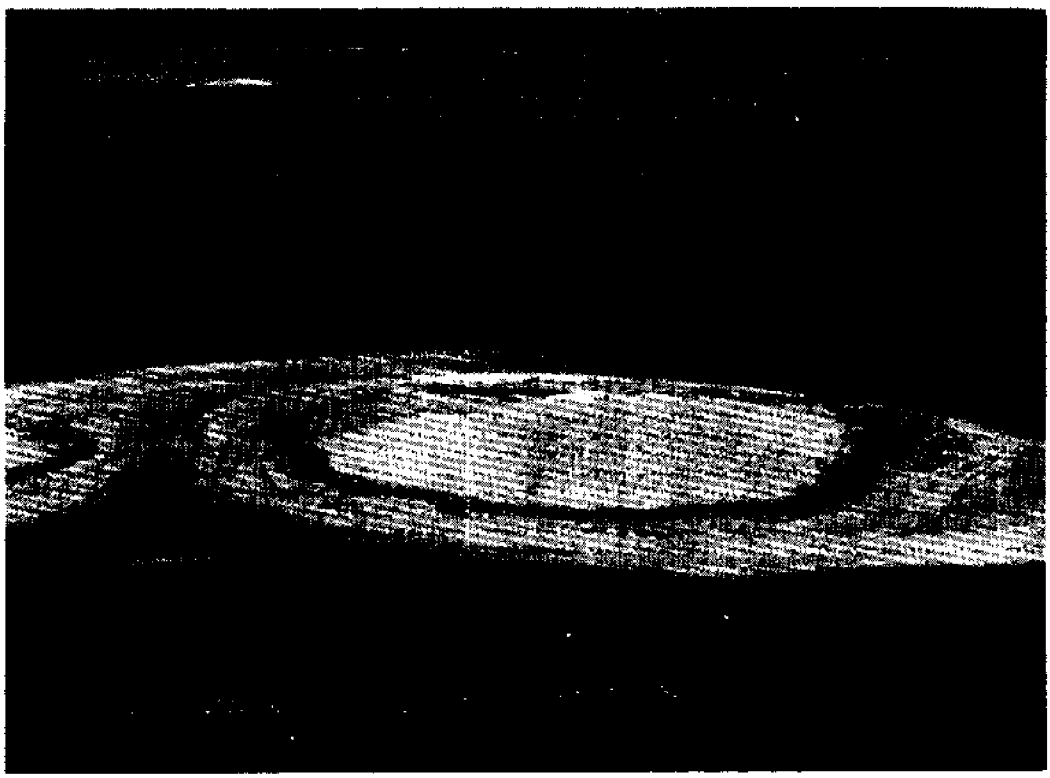

Fig. 3. Vegetation beginning along drift ridges.

Fig. 4. Vegetation on drift ridges at end of second year.

on the drift ridges. Invasion of plants on the dome is a much slower process (Figure 5). During the first growing season the vegetative coverage was less than one percent. The most important species in order of importance were seaside spurge (Euphorbia polygonifolia), sand spur (Cenchrus tribulorides), seabeach orach and sea rocket. At the same time smooth cord grass (Spartina alterniflora) may be becoming established below the high-tide mark. But we have been concerned primarily with what happens on the

Fig. 5. Six year old island showing nearly bare dome (bare strips are herbicide study plots).

uplands not down below high water. Dr. W.W. Woodhouse of North Carolina State is here today and this is his field of expertise. You will get a chance to ask him some questions later on if you are interested in what happens below the high tide mark. The next thing that begins to happen is that the swale between the two drift ridges begins to fill in, primarily by runners from the plants that are already there rather than by seeding. The most important plant contributing to the increase in coverage in the swales was three-square. Rather quickly, over two or three years, a rather dense band of vegetation becomes established around the perimeter (Figure 6). At the same time some plant species will be becoming established on the sandy slopes above the drift ridges. This will be an entirely different group of plants becoming established in a different fashion. Their seeds are apparently primarily wind borne. Horseweed (Erigeron canadensis) is one of the common plants. If you have studied succession inland you know that horseweed is a pioneer in many places. It is also important on the dredge islands, usually first becoming established on the lower slopes and working its way up the domes. A very small group of plants species invade this dry situation. Horseweed, seaside spurge, sand grass (Triplasis purpurea), camphorweed (Heterotheca subaxallaris), beach grass (Ammophila breviligulata), and one of the evening primroses, (Oenothera humifusa) are dominant. These plants are always present. They are the dominants, and really not many other species will establish themselves on this dry slope during the early years.

Fig. 6. Dense vegetation on lower slope (fourth growing season).

At the end of year two and on into the third year there will be a band of vegetation around the edge of the island that is becoming relatively dense and a much less dense vegetative covering moving up the slope. Reed (Phragmites communis), may become important in the upper and lower swales and when present it usually becomes the dominant plant in these vegetation zones. Often the dome remains sparsely vegetated for several years.

Next the permanent grasses, with saltmeadow cordgrass usually dominant, begin moving up the slope replacing the herbaceous vegetation.

This is accomplished primarily by sending out runners and moving gradually upslope.

The next step then is the addition of shrubs to the community. These first become established along the drift line usually after the grasses have become relatively well established (Figure 7). Sea myrtle (Baccharis halimifolia), marsh elder (Iva frutescens), and wax myrtle (Myrica cerifera), are the three species that most commonly become established at this time on our coast. This will

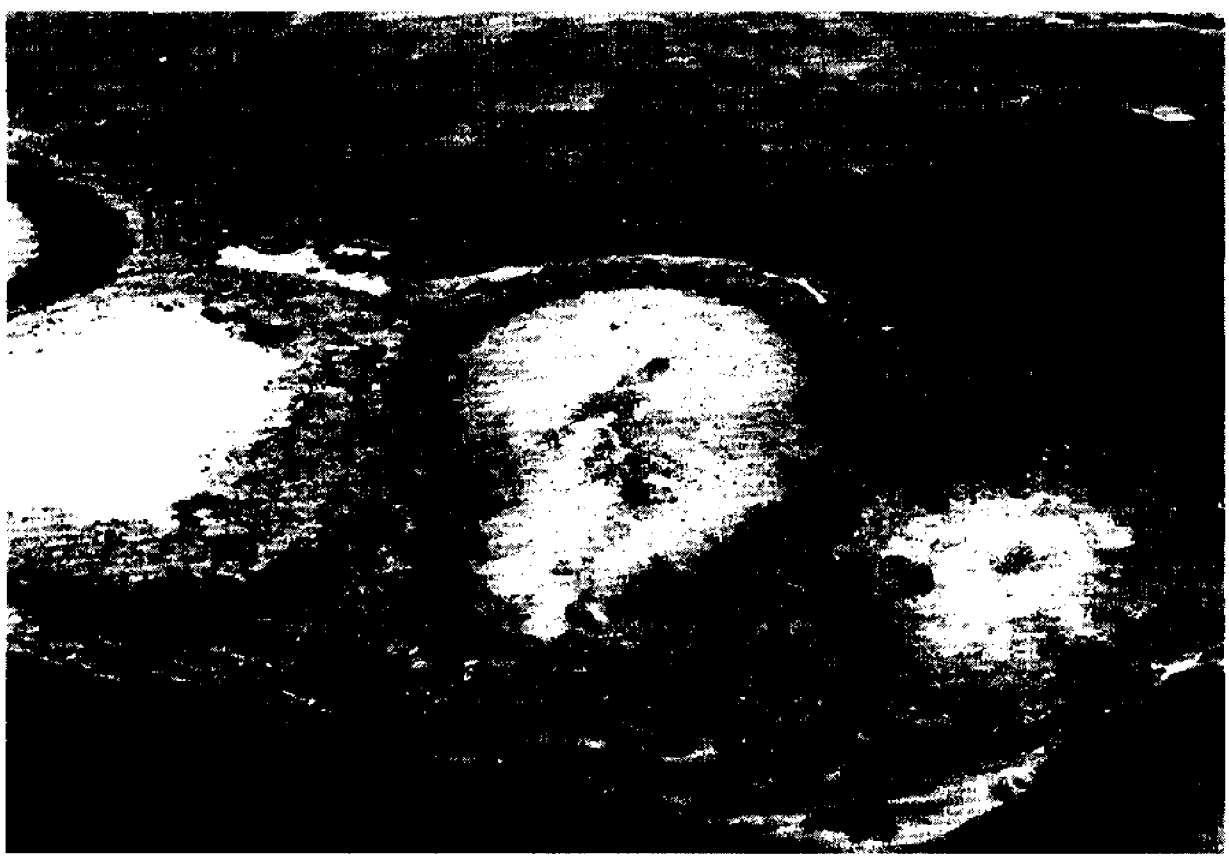

Fig. 7. Shrubs becoming established on lower slope of island.

usually be in years three to five. These first appear as seedlings scattered through the grasses in the swale between the drift ridges. They grow very rapidly and the development of a border of shrubs begins along the drift lines. As did the grasses, the shrubs begin to move upslope, the seedlings apparently needing the protection of the grasses. After becoming established in the dense grasses they gradually shade out the grasses and produce dense shrub thickets.

The rapidity of this whole process depends very much on the elevation and size of the island. The higher the elevation the slower the process. This is apparently due to the lack of water held in the coarse sands of the domes. This summarizes the idealized pattern of succession. It happens over and over again, assuming no subsequent deposition of spoil. If at any point during that sequence new dredge material is deposited on the island, the sequence reverts back to bare sand and starts over again. The sequence then depends very much upon how much dredge material was deposited. If the covering was thin, sprouts may come up through the new dredge material, and the process may be very much speeded up the second time around. If it is a very deep deposit it may essentially start back over from year zero. If only half of the island is deposited on there is a much more ready source of seeds and runners, and the succession may be very rapid. There are actually several things that can modify the ideal pattern that I have discussed. Figure 8 shows a situation where new dredge material has been deposited, but the dome of the old island was left without fresh dredge material. Obviously this is going to

Fig. 8. Spoil being deposited on a portion of an existing island.

revegetate more quickly now than it would have normally, and you get a mixed age situation. If material is deposited over standing trees and shrubs, quite often the new deposits are not deep enough to completely kill these back, and the trees and shrubs sprout quickly. In this case an impenetrable thicket forms in just a year or two, and the early stages are omitted. Sometimes pockets are left as you can see in (Figure 9). Several pockets of vegetation were not killed, and that island will re-vegetate very quickly.

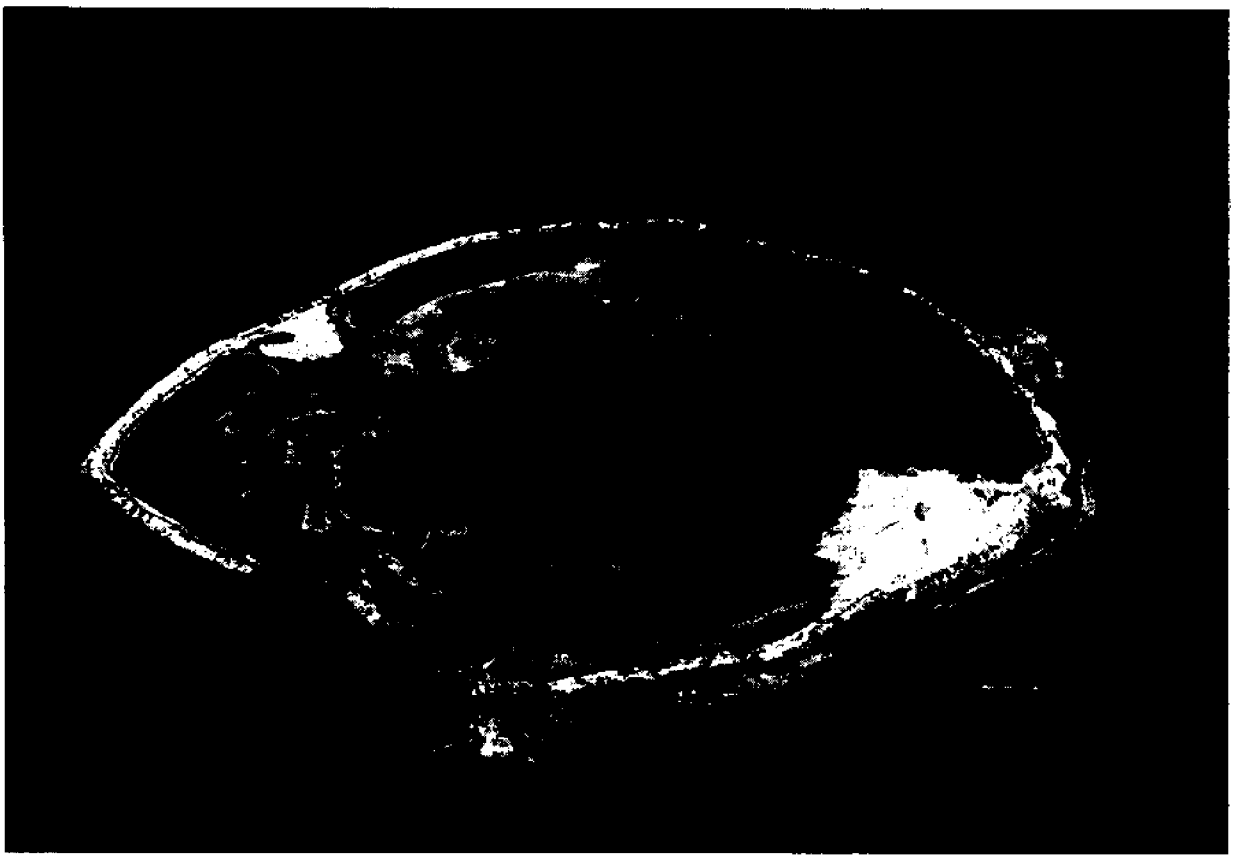

Fig. 9. Standing shrubs killed by dredge spoil.

One other factor that changes the normal pattern considerably is the presence of giant reed grass (Phragmites communis). If Phragmites becomes established it rapidly dominates the island forming a dense stand (Figure 10). It thus eliminates most of the early herbs and grasses. Eventually shrubs will become established, and the final stages will be the same.

There is still much that we do not know about the successional pattern. A major factor that has not been elucidated is the process of diking (Figure 11). Most new dredge deposits will be

Fig. 10. Dense stand of Phragmites communis.

Fig. 11. One-year old dike showing invasion of plants.

diked, but we have not yet had time to study succession on diked islands. First indications are that diking will speed up vegetative succession, but much further work is required.

Very closely associated with the succession of plants on dredge islands will be a successional pattern of animals. We have studied the patterns of vertebrate succession and have found that the islands are heavily used during the nesting season by a variety of birds. The habitat requirements of these birds vary considerably and relate quite well to the pattern of plant succession that we have been discussing.

If we begin with a bare island completely devoid of vegetation we may find it utilized by Royal Terns (Thalasseus maximus), Sandwich Terns (Thalasseus sandvicensis), perhaps Least Terns (Sterna albifrons), and the non-colonial nesting Oystercatcher (Haematopus palliatus), (Figure 12).

As plants become established on the drift ridges and as the scattered herbs cover the slopes the Royal and Sandwich Terns generally abandon the island in favor of other bare or nearly bare sites when they are available. The Least Terns may linger to be joined by Common Terns (Sterna hirundo), (Figure 13), Gull-billed Terns (Gelochelidon nilotica), Black Skimmers (Rynchops nigra), Wilson's Plovers (Charadrius wilsonia), and Willets (Cataptrophorus semipalmatus).

As the lower slopes begin to be densely vegetated with grasses and as the horseweed and other herbs of the dome begin to be replaced by permanent grasses the Least and Gull-billed Terns,

Fig. 12. Royal Tern nesting colony on bare dome.

Fig. 13. Typical nesting habitat of Common Terns.

Black-Skimmers, and Wilson's Plovers leave. Common Terns and Willets may linger until the grasses become relatively dense.

As the density of grasses increase, Willets continue to find the islands attractive and nest regularly in the Spartina patens communities that develop. As density increases the Common Terns leave, and the islands become suitable for Laughing Gulls (Larus atricilla) which prefer dense stands of grasses and herbaceous plants as nesting cover. (Figure 14).

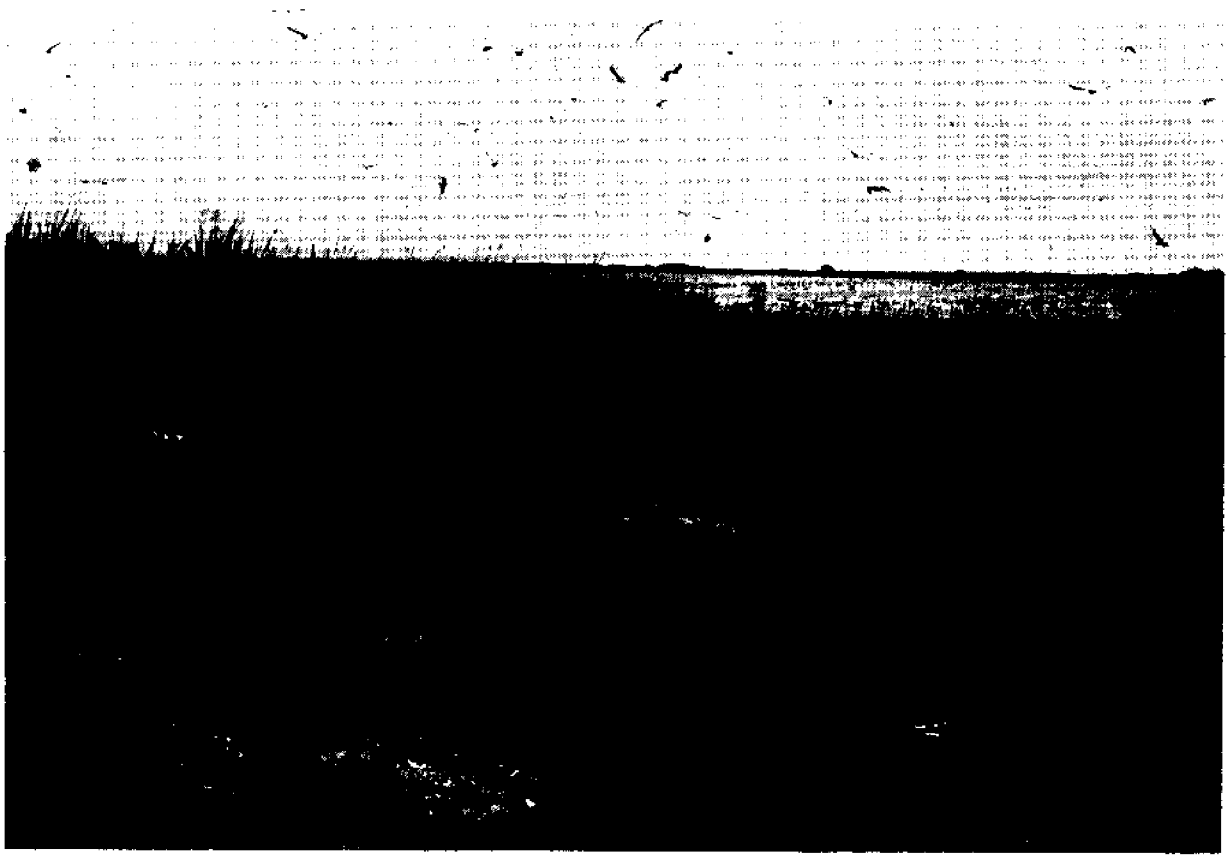

Fig. 14. Typical Laughing Gull nesting habitat.

As shrubs begin to emerge along the drift lines they are immediately selected as nesting sites by Red-winged Blackbirds (Agelaius phoeniceus), and as shrub thickets develop, Willets and Laughing Gulls are replaced by colonies of Boat-tailed (Cassidix mexicanus) and Common Grackles (Quiscalus quiscula). These thickets of marsh elder and wax myrtle are also used as nesting sites for several species of herons and egrets. These birds usually congregate in nesting colonies of from a few hundred to several thousand pairs (Figure 15). Such colonies may persist for many years.

Fig. 15. Large heronry in Myrica cerifera thicket.

Thus from bare new islands to old forested islands there may be constant use by a variety of birds. Obviously, no island will have all species present in its succession, but all successional stages are used. In a given locality certain stages may be abundant while others may be scarce or absent. What we hope to do is to establish an awareness of the needs of each group of birds and to discuss the possibility of managing dredge islands to maintain an adequate amount of the desired nesting habitat for each species of birds using the coastal environment.

In discussing management a first question we should ask ourselves is: Why should we manage dredge islands to provide habitat for birds? Even a casual observer on the North Carolina coast knows that land development and recreational activities on the barrier islands have eliminated most of the suitable nesting habitat that once existed there. Beach cottages now occupy space once utilized by such birds as the Least Tern (Figure 16). Even on those sites which appear to be otherwise suitable for nesting, human activity drives the birds away.

We have established in our research that the seabirds nesting along the North Carolina coast do utilize dredge islands for much of their breeding activities. Our work has also shown that nesting mortality is often much higher on natural sites. This is a result of the generally lower elevations found on the natural sites and the resulting vulnerability to storm waters. On the larger barrier islands the presence of ground predators and increased human activity also are important limiting factors.

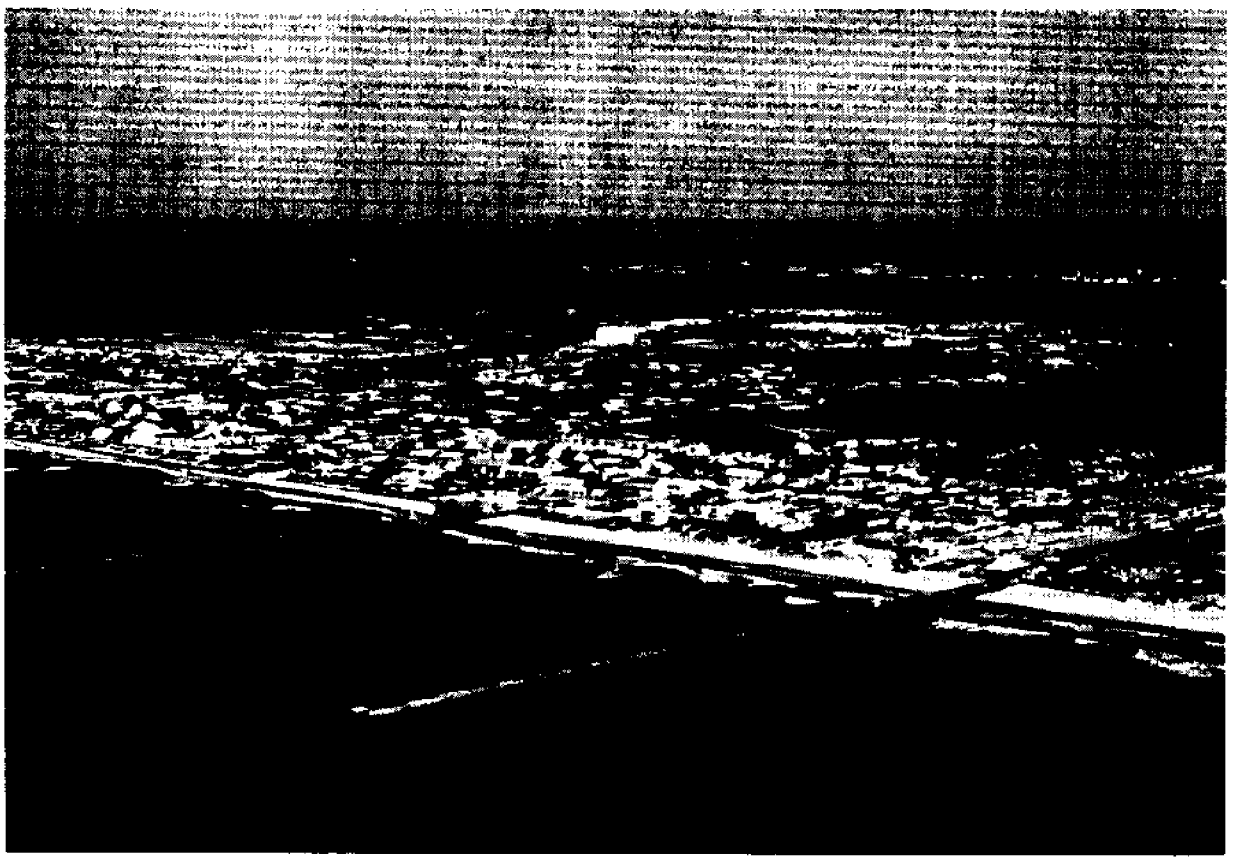

Fig. 16. Beach development on the North Carolina coast.

While the dredge islands are not important for nesting land birds, they may be important resting and feeding areas for them during migration. They will become more important for this purpose as development continues along the coast. Heaviest usage by land birds occurs during fall migration, and the dense grass-scattered shrub habitat has the greatest usage. As indicated earlier the only land birds using the islands extensively as nesting sites are the Red-wing Blackbird and Boat-tailed Grackle.

If one decides to embark upon a management program several things should be taken into consideration. First, one should consider the breeding biology of the species to be managed. Pre-nesting activity, incubation period, and duration of time to fledging must be taken into account. Excessive disturbance during any of these periods may either cause abandonment of the island or mortality among the eggs and/or young. For example, Royal Terns begin to nest and perform courtship displays at their nesting site several weeks prior to laying eggs. Once the eggs are laid it takes about 30 days for them to hatch. The young require another 30 days of development before they can fly. The nesting period is further extended due by late subcolonies moving into the nesting site. This species may require over three months on an island to complete its reproductive cycle.

Second, the social organization and behavior of the species should be considered. It would be more practical and easier to manage for a colonially nesting species than for non-colonial species. For example, Willets, Wilson's Plovers and Oystercatchers do not nest in colonies. Any management program providing nesting habitat for these species would require considerable land area. The other seabirds, as well as the herons, egrets, and ibises nest in colonies, and land area required for management would be minimal. For example, the 35,000 Royal Terns nesting in North Carolina in 1973 comprised only nine colonies. The social behavior may also prove to be important. This was found to be true for the Sandwich Tern which invariably nest in Royal Tern colonies.

Third, the utilization of dredge island nesting sites compared to other sites should be included in the decision making process. In North Carolina all of the nesting species of colonial seabirds carried out more than 50 percent of their reproductive activities on dredge islands (Table 1), but there is no reason that management techniques could not be applied to natural sites as well as dredge islands.

Finally, the present status of the species populations need to be known to determine if management is necessary or even desirable. Those species already on the endangered or threatened list should be given priority. Unfortunately there is inadequate baseline data on populations of most species.

There are a number of things which can be considered in a management program. A simple management tool would be to program dredging schedules to avoid the nesting season of the species in question. While there is variation in the nesting season among the species present in North Carolina, deposition of dredge spoil on heavily utilized islands should generally be avoided from early April through July. With the cooperation of the Wilmington District of the U.S. Army Corps of Engineers, we have already been successful in the use of this technique. Presumably such cooperation could be obtained in other Corps Districts.

It would also be fairly easy to deposit the dredge spoil in a manner that would make an island more attractive to nesting seabirds. For example, deposition of the spoil in a manner that would decrease the slope of the dome would create better nesting

TABLE 1. ESTIMATED NUMBER OF NESTS OF COLONIAL SEA BIRDS OCCURRING IN NORTH CAROLINA DURING THE BREEDING SEASON OF 1973*.

Species	NESTS		TOTAL
	DREDGE	NATURAL	
BROWN PELICAN	30	0	30
HERRING GULL	94	5	99
LAUGHING GULL	7,137	6,257	13,394
GULL-BILLED TERN	399	121	520
FORSTER'S TERN	557	289	846
COMMON TERN	2,968	353	3,321
LEAST TERN	655	77	732
ROYAL TERN	32,760	2,574	35,334
SANDWICH TERN	251	3	254
BLACK SKIMMER	1,696	184	1,880
TOTALS	46,547	9,863	56,410
% OF TOTAL	82.52	17.48	

*These estimates should be considered minimal since most of them are based on one observation in May or June and do not include subsequent nesting.

habitat since steep slopes are often unstable and not suitable for nesting sites. When depositing on older islands covered with shrubs or trees, it would be better to either cut down the vegetation or push it over with a bulldozer prior to dumping on it. Subsequently the downed vegetation can be covered with the spoil. As the spoil is presently deposited, dead trees and shrubs which were killed by the spoil project above the deposit. We have found that seabirds will not utilize these islands as nesting sites. (Figure 17).

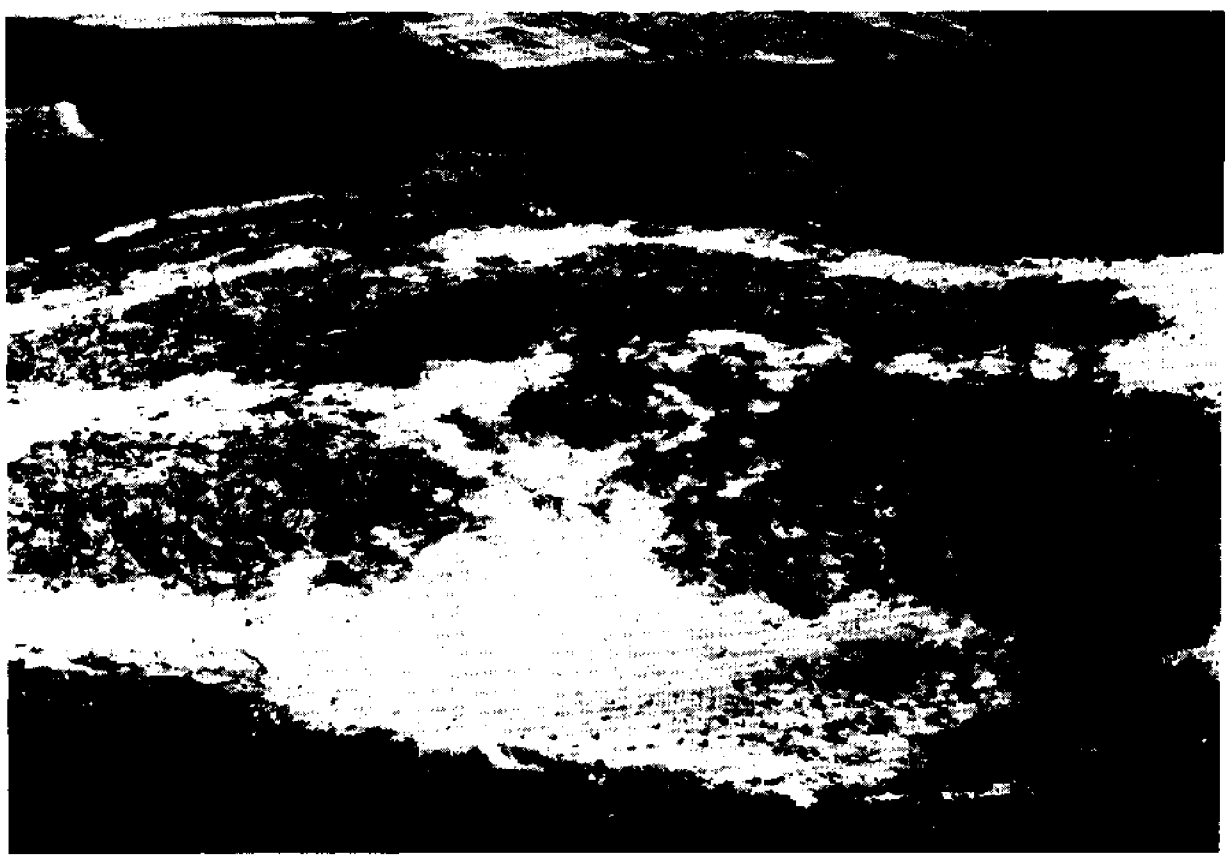

Fig. 17. Dead stems projecting above fresh dredge deposit.

Often islands heavily utilized by nesting birds are located in water subjected to wind, tidal currents and wave action from boat or ship traffic. Heavy damage due to erosion usually takes place. When no other nearby islands are available it would be desirable to repair these heavily utilized ones by the selective deposition of spoil and the planting of Smooth Cordgrass (Spartina alterniflora) to help stabilize them. For example, the only island utilized by Brown Pelicans in North Carolina is gradually eroding away. In this case the bird in question is an endangered species, and, in my opinion, it would be desirable to do repair work on this island. The island supporting the largest nesting colony of Royal Terns in North Carolina has been eroded to half of its original size. In this case the bird involved is not endangered, and there are other islands available in the vicinity. It probably would not be practical to repair this island unless dredging was going to be done in the adjacent channel as a part of regular channel maintenance. Of course the effect of spoil deposition on other estuarine species must be taken into account in any of these management programs.

Since we have already established that the species of birds nesting on the islands vary, depending on the type of vegetation present, it might be desirable to manipulate the vegetation to maintain or provide nesting habitat. Several ways to do this include timing of spoil deposition, use of herbicides, burning, and planting. When many islands are available for the deposition

of dredging spoil it would be a simple management tool to selectively avoid those islands in desirable stages of plant succession and dump on those with less suitable stages. Most of the seabirds select islands in early stages of succession. Those species such as the Laughing Gull and wading birds utilizing later stages of plant succession appear to have adequate sites available in North Carolina. This may not be true in other coastal states.

Dredging is infrequent along some parts of the Intracoastal Waterway. Thus, plant succession is not maintained in the early stages in many areas. In such areas the vegetation on selected islands can be controled by the use of herbicides. Dr. A.D. Worsham of the Crop Science Department of N.C. State University has been working with us on testing of soil sterilant type herbicides to recreate or maintain bare and sparsely vegetated nesting habitats for birds. Substituted urea-containing herbicides have been found to be promising.

We have not tested the use of burning as a management tool, but observations of fires accidentally set led us to conclude that this would not be a useful technique for maintaining bare sites as vegetation quickly returned to burned over areas, apparently from roots which were not killed by the flames. This technique may be usefull for maintaining sparse grass cover for Common Terns, or eliminating encroaching shrub thickets in maintaining dense grass cover for Laughing Gulls.

In some cases it may be desirable to provide grassy areas,

especially on large bare islands. Gull-billed Terns and Common Terns prefer sparsely vegetated sites. Part or all of a bare deposit may be made more attractive to them by planting certain grasses. Techniques for such plantings have already been perfected by Dr. W.W. Woodhouse and his co-workers at N.C. State University.

Suppose there are no islands in an area that otherwise appears to be suitable for sea birds. A dredge island could be constructed. Bare domes, sparsely vegetated areas, dense grasses, and shrub thickets could be established and maintained. Dump Island located in Core Sound (Figure 18) is an island which has most of the nesting habitats found in North Carolina and appears to represent an ideal island.

Isolation is an important factor and new islands should be far enough from shore to discourage mammals and predators. Finally, human usage of islands occupied by nesting birds should be regulated. Many people are ignorant of the damage done to nesting colonies when they stay on islands for long periods of time. While the adults are frightened away, the eggs may over heat or become chilled depending on the weather. People often release their dogs during their visit thus compounding the problem. The less isolated an island is from population centers the greater the usage by people. Unfortunately, both humans and seabirds prefer to use islands in early stages of succession. The islands are utilized by people as a base for water skiing, sunbathing, fishing, camping, clamming, and hunting sea shells. When asked why they use the islands the most frequent answer is: "We like the isolation from the more

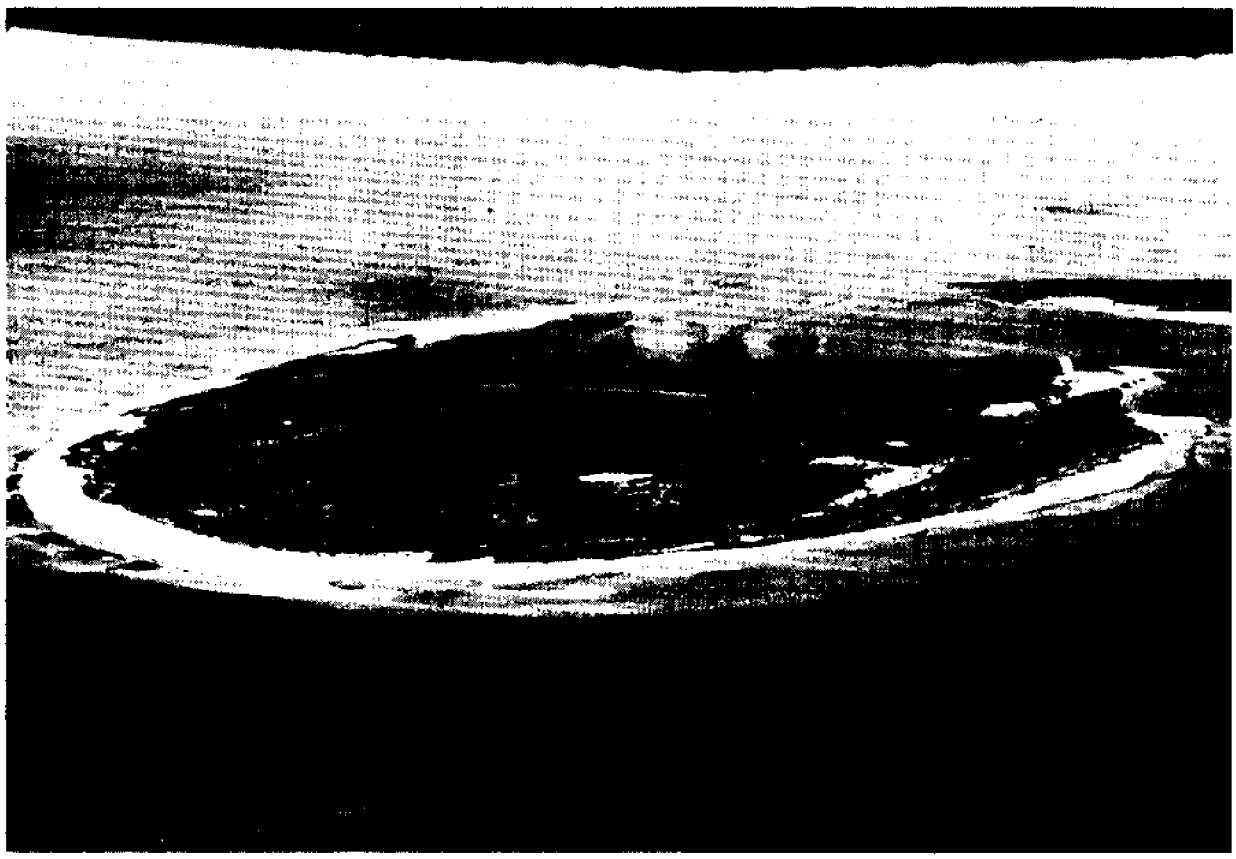

Fig. 18. Nearly ideal island with nesting habitat for several species.

crowded public beaches." Of course this is the same reason many of the birds utilize the islands.

Several things have been suggested to alleviate this problem. Placing warning signs on the islands, erecting fences, patrolling the islands, and educating the public have all been suggested. The main problem is that there is no agency responsible for the management of these birds, therefore not even the simplest management program can be put into effect. Hopefully out of this meeting will come some suggestion as to who should have the

responsibility for management.

Are there any questions?

QUESTIONS

Frank Dunstan: From a practical management standpoint, would it be easier to work with a number of islands rather than trying to create suitable habitat for all species on one island?

Bob Soots: I think someone from the Corps might be able to answer that better than I can.

James Wells: It is generally easier to build separate islands, but it depends on each individual case and location. To give you a politician's answer 'It all depends'.

Soots: The island along our coast which has the largest bird population on it demonstrates the multiple species use situation. We flew over it recently, and there are probably 30,000 birds on the island.

Barry Foelsch: What type of substrates are we talking about? Does the sand have to be efficiently shelly? I know the Corps pumps a lot of silt. Are we talking just about the really coarse shelly sand, or will the fine sand do?

Soots: You also know that most of that silt sorts out and goes down to lower elevations. It moves from the portion of the domes that birds preferentially select. We are talking about birds now which use primarily bare or sparsely vegetated sites.

James Parnell: If it is a silt island, the birds just simply are not going to use it.

Soots: Yes, that is right.

Foelsch: Well, I am just thinking that some study should be made on substrate. Because, there is no point on you going to the Corps and saying "Let us manage for birds here" and then the dredging people go in and find out that all you are pumping is silt.

Soots: I have just stated that we have looked at the islands with silt on them and the birds generally do not use them, while nearby islands with coarser material are utilized.

Ray Herrman: Where you are managing a spoil island for some ideal level of bird population, what is the present situation of the birds? Is it a healthy population, an improving healthy population, backsliding population?

Soots: The answer is easy yet difficult. It is easy simply because there is not enough known about bird populations along the Atlantic Coast. We do not have good base line data on our coastal populations. We do know that along our coast some species are increasing and some seem to be stable. For example, the herons and egrets appear to be increasing. Laughing Gulls appear to be increasing, based upon the fact that more and more colonies are spreading farther and farther south. Common Terns may be increasing. We just do not have the baseline data for good evaluations.

?? : Why could this not be figured from reproduction rates?

Soots: Our project was not designed to gather data on reproductive success. I can tell you, however, that success was highly variable. For example, in 1972, the only species that had a high degree of

success along the North Carolina Coast was the Royal Tern. The weather was cold and rainy. I do not think Least Terns produced a single bird during that season. In 1973 there was good weather, and birds were all over the place. So far this year things are looking good.

Paul Buckley: One of the troubles with the local seabirds is that their productivity is so variable. Some years some species will be very successful, other years the same species will fail, and there is often no relationship between the species. This is also one of the reasons we are particularly concerned about dispersing the colonies. The more colonies you have, and, generally speaking the smaller, the less likely they are to all suffer a wipeout in a given year. The more sites you can afford, the more colonies you will probably have and the safer the species will generally be in a given year.

Soots: The birds have a built in mechanism here. They will try renesting but only up to a certain time.

Tom Quay: Bob, do you not have some percentage figure of the total nesting of these birds in North Carolina that occurs on the dredge islands?

Soots: I showed slides of that.

Quay: I know, but that was nesting sites. Was it based on the sites alone or the total population?

Soots: I have those figures but I do not have them with me.

Quay: You pulled something out of your head, some subjective figure some time ago.

Soots: I would say that we are talking about close to 90%.

Quay: That is with the total population considered?

Soots: Yes.

Buckley: We had 95% for Hatteras.

Bob Downing: I would like to say in regard to the need for signs that we could use these all over the country not just in North Carolina. It could be a sign by some agency, probably not even an identifying agency, but by some agency that does not want or need protection by federal law. While we are on the subject, I would like to know just how far these birds are protected? What if you have a significant colony on private land? What is the landowner's status if he wants to move in and start developing in a colony of protected birds? What is the status of that?

Soots: Tom Kane, what is your opinion on this?

Tom Kane: I think he can do it, unless it requires some kind of a permit, or some government just brings it to a grinding halt and ties it up for a few years in administrative processes. If it does not require a permit for what he wants to do on the land, he could do it. That is why it would be necessary on the dredge islands to get a lease or to buy.

Parnell: These birds are protected by Federal law as migratory species. You can not go out and shoot one.

Kane: That is true. You might not be able to go out and shoot one, but you might be able to go out and do something to chase them away.

Buckley: You cannot interfere with the birds, their nests, or their

eggs and that is in the treaty.

Kane: You are, of course, talking about during the nesting season.

?? : We need to redress that a little bit. In the case of the Bald Eagle, for instance, when the young and adults are in the nest a guy cannot go cut his tree down even if it is on private property. As soon as the birds leave there is no way you can keep that property owner from cutting down that tree, even though you know that the eagle might return there the following year and that you might be reducing its habitat that way.

THE SIGNIFICANCE OF DREDGE SPOIL ISLANDS TO COLONIALLY NESTING WATERBIRDS IN CERTAIN NATIONAL PARKS

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When in 1967 we began our studies of Royal and Sandwich Terns--work that led directly to our interest in dredge spoil islands--we had no idea of the role they play in providing habitat and nest sites for vast numbers of colonially breeding waterbirds along the Atlantic Coast. We were not far into our studies, though, when we began to appreciate that role, and hoped to be able to return in the future to the management of these islands. Now associated with the National Park Service, the agency having responsibility for long stretches of coastline harboring thousands of breeding waterbirds and many dredge islands, we are in that position.

Today we shall talk about the relationship of dredge islands and waterbirds in three National Parks with which we are very familiar, having been afield in two of them since the early 1950's, well before their establishment as units of the National Park Service.

STUDY AREAS

Fire Island National Seashore (abbreviated FIIS) is a narrow

barrier beach on Long Island's south shore, fronting on the Atlantic Ocean and separated from mainland Long Island by Great South Bay. While its width in some places is only one quarter mile, and never exceeds one mile, it has long served as the site of some 20 mixed year-round and seasonal communities interspersed with natural areas. The Seashore includes both developed and undeveloped sections, and runs some 30 miles from Moriches Inlet on the east not quite all the way to Fire Island Inlet on the west. Owing to the pressure of human development in the communities and its attendant beach buggy traffic, coupled with a seriously eroding beachfront following manipulation of various inlets on Long Island's south shore, there is very little suitable habitat available for nesting waterbirds on the body of the barrier beach. There also happen to be very few natural bay islands behind the beach. Inasmuch as waterbirds tend to concentrate at and near inlets where water exchange and bottom upwelling normally lead to highly productive waters and marshes teeming with fish, several spoil islands thrown up for navigational dredging at Moriches and Fire Island Inlets soon became major sites for large colonies of gulls, terns, skimmers and wading birds.

Recently established Gateway National Recreation Area (abbreviated GATE) embraces coastal portions of urban New York City for the most part, excepting New Jersey's Sandy Hook, not to be discussed here. It, too, has a dearth of suitable natural beach habitat, but here resulting from (1) urbanization (houses are built up to the high tide mark in some immediately adjacent, non-park

areas); (2) the emplacement of large fields of groins starving the beaches of sand, and (3) beach clubs and public swimming areas that abound in or adjacent to the area. However, behind the barrier beach (properly known as The Rockaways) lies famed Jamaica Bay, site of New York City's own Wildlife Refuge, now administered as the Jamaica Bay Unit of GATE. Here, on islands also emplaced in the marsh-filled bay following navigation channel dredging, exist moderately sized colonies of gulls and wading birds, all foraging on Jamaica Bay's resources, especially the large freshwater impoundments known as the East and West Ponds. The 9000-acre Wildlife Refuge is virtually the only unurbanized portion of coastal New York City, except for Breezy Point, a small piece of Rockaway's beach at Rockaway Inlet.

Cape Hatteras National Seashore (abbreviated CAHA), is in some ways at the opposite end of the spectrum running from GATE through FIIS. CAHA is a 55-mile long, largely natural-appearing barrier beach forming the bulk of North Carolina's Outer Banks. [We say "natural-appearing" here as we should for most of the beaches in these three parks, because they have all be altered by man and man's activities--some in subtle but important ways not readily apparent, others in dramatic ways when cities and communities have been erected on them.] On CAHA there are only six small communities, formerly fishing villages along Albemarle and Pamlico Sounds, virtually island-free large bodies of water between the narrow Outer Banks and mainland North Carolina; the remainder of the long barrier island has no development. Thus, one might expect large

numbers of colonial waterbirds to breed directly on the beaches. They do not, despite the seemingly perfect, unspoiled habitat, except in one area, Ocracoke Island, which we will discuss later. Instead, they teem on the various dredge islands put in the sounds following navigational dredging or sometimes shellfishing, at the three CAHA Inlets--Oregon, Hatteras and Ocracoke.

During our work at CAHA, and from earlier experience on Long Island at FIIS and GATE, we soon realized the significance of these islands in controlling waterbird population sizes in these parks. Consequently, we decided to attempt as complete a survey of these birds in each of these parks as possible, taking care to record how many of which species were nesting on dredge islands and how many on beachfront or natural island sites. We further decided to assess, insofar as we could, the entire waterbird population of Long Island, a feat not previously attempted or completed. These data were needed for us to place the waterbird resources of FIIS and GATE in a larger, more regional perspective, essential for National Park Service evaluation of their significance to the whole area. The data in themselves had additional value in that they would allow, if recorded faithfully over the years, early detection of population declines and evaluation of general colony health. Finally, our survey would also show the significance of dredge islands to all of Long Island's colonially breeding waterbirds, not just those of its two National Parks. On the Outer Banks, though, CAHA occupies the entire major portion of the functional waterbird "region," so censusing of a larger area would have been of less value than on Long Island.

It was not possible to survey virtually untrammeled and presently uninhabited (except seasonally) Cape Lookout National Seashore, immediately adjacent to CAHA west of Ocracoke Island, although we were sure it would have yielded fascinating data; we know numbers of seabirds nest directly on its main barrier beach. We hope to make an initial reconnaisance of this area in June 1974. In June 1973, then, we made our first Long Island and Outer Banks surveys, by boat, Coast Guard LARC, canoe, outboard, fixed-wing aircraft and helicopter.

Once we had finished the 1973 censusing we looked into the legal status of dredge islands, and found that a maze of conflicting jurisdictions, ownership and protection existed, in some cases possibly jeopardizing major waterbird colonies. We began enquiring of our collegues and discovered that other investigators and land managers were also gaining new appreciation of the significance of dredge islands to coastal biological systems. The present meeting is a result of this sudden convergence of interest.

RESULTS

In the area of Fire Island National Seashore (including some non-Park lands immediately adjacent to Moriches and Fire Island Inlets, and hence functional parts of the FIIS area), we recorded some 5724 pairs of breeding waterbirds, of which 1924 pairs (about 34%) were using dredge islands. When the species-group totals are examined closely, however (Table 1), it was apparent that while only 7% of Herring Gulls are using spoil islands, about half of all terns

TABLE 1.

Species and numbers of pairs of waterbirds breeding at
Fire Island National Seashore and Gateway National Recreation Area in 1973

Species	Gate ##	## & %% on spoil		FIIS ##	## & %% on Spoil	
Great Egret	--	--	--	50	50	100%
Snowy Egret	30-40	30-40	100%	50	50	100%
Cattle Egret	--	--	--	--	--	---
Louisiana Heron	--	--	--	6	6	100%
Little Blue Heron	--	--	--	20	20	100%
Black-crowned Night Heron	20	20	100%	200	200	100%
Glossy Ibis	30-40	30-40	100%	100	100	100%
Herring Gull	500	500	100%	2245[4]	145	7%
Great BB Gull	10	10	100%	146	71	49%
Common Tern	--	--	--	2500	1100[1]	44%
Roseate Tern	--	--	--	50	25 [1]	50%
Least Tern	--	--	--	127	52 [2]	41%
Black Skimmer	--	--	--	230	110 [2]	48%
TOTALS	590	590	100%	5724	1924	34%[3]

[1] but all the rest are in <u>one</u> colony

[2] but all the rest are in only <u>two</u> colonies

[3] but see group breakdown, especially gulls: they account for low figures

[4] 2100 are in <u>one</u> colony

nest on them, as do all wading birds. Of the 2245 pairs of Herring Gulls not on spoil, 2100 are in one colony; similar clustering occurs in terns. The implication is that should some catastrophe eliminate a major colony of these birds, virtually all the remaining pairs would then be nesting on spoil islands.

At Gateway National Recreation Area, traditional terneries on the beachfront at Breezy Point disappeared in recent years for unknown reasons. Two heronries do exist on mid-bay dredge islands, but being perhaps 25 years old, these are now too heavily vegetated to support the terns formerly using them. Gulls still nest there, however. Thus, in 1973 there were no known terns breeding in the New York portions of GATE, and dredge islands were providing habitat for 100% of the 590 pairs of gulls and wading birds breeding at Jamaica Bay Wildlife Refuge.

Regionally, the significance of Long Island's dredge islands to waterbird resources is diminished only slightly below that of FIIS: 700 pairs or 33% of wading birds, 2500 pairs or 43% of gulls, and 4000 pairs or 33% of terns are nesting on dredge islands. These figures, significant enough in themselves, take on added dimension when it is realized that of the 8000 pairs of terns nesting on beaches, 7470 pairs or 93% are found in only three major colonies. Thus the "scattersite" effect introduced by many small dredge islands adds another measure of protection for these birds from catastrophic wipeout of single, large colonies.

At Cape Hatteras National Seashore (Table 2), we found about 6626 pairs of nesting waterbirds. Despite the apparently pristine

TABLE 2.

Species and numbers of pairs of waterbirds
breeding at Cape Hatteras National Seashore in 1973

Species	Total # Breeding Pairs	# Breeding Pairs on Main Barrier Beach*		Dredge Spoil Islands
Brown Pelican	35			35
Little Blue Heron	1			1
Snowy Egret	151			151
Louisiana Heron	210			210
Black-Crowned Night Heron	3			3
Glossy Ibis	1			1
**American Oystercatcher	103			103
**Wilson's Plover	10	10	(10)	-
**Piping Plover	2	2	(2)	-
Herring Gull	4			4
Laughing Gull	851			851
Caspian Tern	2			2
Royal Tern	3600			3600
Sandwich Tern	450			450
Gull-billed Tern	65	19	(19)	46
Common Tern	624	104	(100)	521
Forster's Tern	119	3	(3)	116
Least Tern	115	115	(60)	-
Black Skimmer	280	71	(65)	209
TOTALS	6627	324	(259)	6307
		(5%)	(78%)	(95%)

*figures in parentheses are # of pairs breeding on main barrier beach of Ocracoke Id.

**not colonial, but still typically beachfront nesters

or at least less-disturbed nature of the area and its beaches, only 324 pairs of waterbirds (5%) were nesting on the CAHA main barrier beaches, whose every mile we covered in 4-wheel drive vehicles. This breeding bird evidence supports the findings of coastal ecologists that most of the beaches at CAHA have been severely disrupted by man. Of those 324 pairs nesting on the beachfront, 254 pairs (78%) were restricted to one place: Ocracoke, the island least disturbed, most difficult to reach, and in the most natural state, with extensive overwashing flats, broad beaches and low dunes, especially near Ocracoke Inlet. Ocracoke still sustains large numbers of breeding waterbirds, even though affected by moderate vehicular traffic. An important disclaimer is needed here, though: we have no statistics on waterbird nesting success, which, if data from other areas on the Eastern Seaboard are comparable, should have been severely reduced by vehicular interference. The most important finding at CAHA is that 6307 pairs of breeding waterbirds, representing 95% of those in the area, have been forced off the beaches, and are now restricted to sound-side dredge islands.

Moreover, at FIIS and CAHA, most of the dredge islands supporting large waterbird colonies, some with such endangered species as Brown Pelican and Blue-listed species as Least and Gull-billed Terns, are actually outside the boundaries of the parks of which they are such typical and ecologically important inhabitants.

CONCLUSIONS AND RECOMMENDATIONS

It can be seen that dredge spoil islands play a major role in

supporting vast numbers of waterbirds important in the ecology of the estuaries they inhabitat, and to the natural history interpretation of the parks in which they occur. Nonetheless, this has only been recently recognized, and immediate steps need to be taken to secure protection of these islands not only from misuse, vandalism or development, but also, as we have personally witnessed, from deposition of liquid dredge spoil right on top of incubating birds. Finally, to preserve dredge islands at the right stage of plant succession, they need to be managed as any natural resource, matters being addressed by other speakers at this conference.

We therefore suggest the following steps be undertaken by any Federal, state or local agencies under whose jurisdiction dredge islands fall: (1) annual inventories of all colonial waterbird resources; (2) annual habitat use-inventory of all dredge islands, including cataloguing of stages of ecological succession and all dredge island topography variables, quantified wherever possible; (3) region-wide cooperative inventories of breeding waterbirds to place each park or other local unit in a proper regional resource perspective; (4) enumeration of species or groups of birds not presently occurring in the subject area due to loss of or unavailability of habitat; (5) inter-agency agreements for joint management, multiple use (when appropriate), posting or protection of dredge islands in overlapping jurisdiction; (6) consideration of creating protected dredge island habitat where none presently exists (especially at inlets), in order to attract new species to the area, to disperse large, vulnerable colonies (especially of single species), or to

increase numbers of marginally rare, or endangered species; (7) coordination of all dredging and spoil deposition projects in the region so as to provide spoil where needed, and to prevent disruption of on-going colonies; (8) preparation of resource management plans for all extant dredge islands; (9) incorporation of dredge islands into interpretive or educational programs whenever feasible; and (10) pursuit of an ecosystem approach to all dredge island management programs.

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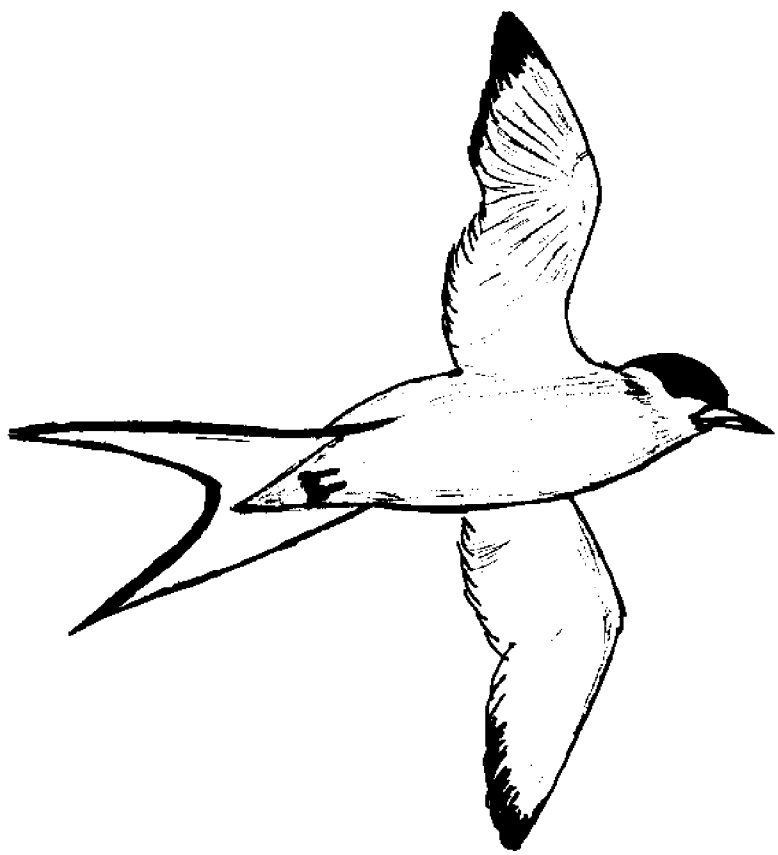

LEGAL CONSIDERATIONS OF DREDGE ISLAND MANAGEMENT

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In discussing legal rights and ownership rights to dredge islands, I assume that you are talking about completely artificial islands. I do not know how it could be anything else if it is a dredge island, but there is a possibility that existing islands may have grown as a result of dredging. So I do not know what your perspective is exactly, but I am going on the presumption that you are talking about islands created. They were not islands before and now they have been created. There is, interestingly enough, a North Carolina statute which says that if an island is by any process of nature or act of man formed in any navigable waters, title to such island shall rest in the state, and the island shall become part of the vacant and unappropriated lands of the state. If it is a part of the vacant and unappropriated lands in North Carolina that means that it can be sold. Provided, however, that if during any process of dredging by either the state or the federal government for the purpose of deepening any harbor or inland waterway, or clearing out or creating the same, the deposit of excavated material is made upon the lands of any owner the title to which at the time is not vested in the state or federal government that person shall get title to it.

If he owns the bottom, he owns land underlying navigable waters, and there is some argument. The state owns below mean high water as a general rule. But if, for example, he or she owns below high water, and spoil material is dumped on that particular area the individual will own it according to this statute in North Carolina. Thus it becomes critical as to who owns the land. When talking about land below mean high water, you can either be talking about open water where an island may have been created, or you may be talking about marshlands below mean high water, or you could be talking about marsh above mean high water occupied by Juncus roemerianus and similar species. Let us start with the open water owned, as a rule, by the state. In Massachusetts I think that the state owns below low water or lower low water or it is 100 rods distance from the shoreline or something like that. In the state of Florida there are also instances where you can own the submerged land. In North Carolina you can not, but you can. Back before the Revolution, in the days of the Lord Proprietors, actually land below high water was given to individuals, or it may have been deeded or granted out of the state itself after the formation of the Union. But it still may not be owned, and the reason for this is that the courts are arriving at the position that they do not care what the state did back then. They made a mistake. They can not really convey such areas. Some courts are not going along this easy. In 1965 a statute was enacted in North Carolina which called for anyone who claimed any ownership of lands below mean high water to file with the state prior to January 1, 1970, a survey claiming ownership. It was not exactly stated in those terms. It was stated

that anyone who claimed fishery rights and/or ownership of lands underlying navigable waters should file. It said that if you did not do it by this date that your title to such exclusive rights to the ownership of the land was null and void. That portion of the statute has been interpreted by the Attorney Generals' office as being clearly unconstitutional, because if somebody has property rights in this country you do not say you must do something in relation to those property rights or you are going to lose your rights. It is just not done. Even if you do not pay your taxes it does not happen that easy. At least they have to foreclose for your taxes. But what does this statute say? It really did not do any more than give the state an inventory or at least give them the information from which they could derive an inventory. Fisheries people then took the information that was filed by these owners and plotted it out on aerial photographs. It was very interesting. We found that many people claimed the same land. This indicates that there may be a basis for ownership to land underlying navigable open waters. If that is so, and if a particular individual owned the land, and dredge material was put on it, with or without his permission; under this statute in this state, and I would think generally under Riparian law, he would get ownership of that island.

The second example I gave you concerned marsh land. That is, it is not open water. There has been a lot of confusion in the different states as to whether this is navigable or non-navigable waters. This is the Spartina alterniflora marsh that is below mean high water. Now consider the question of whether or not this is navigable water.

If it is navigable water, the state of North Carolina and most other states are now arguing that it belongs to the state in trust for the people. In North Carolina there are some interesting cases. A case in 1932 dealt with some land at Wrightsville Beach. There were actually three cases, the first case said the marshland which at high water had water depths of less than 18 inches was not navigable in fact, and therefore was not navigable in law, and therefore was privately owned. In 1952 they said it was not privately owned, the courts were getting enlightened, as the environmentalists would say. Then in 1954 they said well it really is not public again. So it left North Carolina in the situation where we did not know whether marshland was privately owned or not. We proceeded to argue in my three and one half years with the Attorney Generals' office that such areas belonged to the state. It was state land because of the mean high water line and the ebb and flow of the tide. We used all kinds of common law from England and other theories to explain why the state of North Carolina owned the marshland. So there is a question right now as to whether Spartina alterniflora marsh is privately owned or publicly owned.

Such marsh can be owned outright by the land owners, it can be owned outright by the state, or it could be in trust for the citizens of the state, or it could be owned by the private individual, holding it in a private public trust.

What happens to this marsh if a man owns it and it is a private public trust, that is privately owned but held for the public. This is a theory that is not that novel. It has been talked about for

a number of years. We are talking about individuals owning marsh, but perhaps they own it in some kind of public trust for the people because of the value of the area to the public. Assume such an area is owned in this state. It is owned by an individual but he owns it in trust. What happens if it is filled in by dredging? I think the trust would be destroyed and the private owner would be cleared of any trust; because the trust purpose, its need for fisheries and wildfife purposes, has been destroyed. That would be an example where you may have some areas below mean high water that could be privately owned if they became filled in.

Refer back to the open waters for a moment. This recent statute had called for people to register their claim. It did not say they owned it. It just said you must register, or your claim is null and void. That only indicates that there could be private ownership in open water below mean high water. As a general rule such areas are owned by the state, and I would say that the general rule was more probable. So a dredge island created in open water would belong to the state.

Now consider high marsh, covered by Black Needle Rush (Juncus roemerianus). It is really not an island if the spoil is placed on marsh above high water, but I think maybe there is some legal interpretation that indicates that if Juncus marsh was filled right in the middle with some dredge spoil that it would create an island. It really is not an island because it was not raised up from below mean high water, and that is my definition of an island. An island is one that sits above mean high water and is completely surrounded by water. Maybe we are not talking about the same thing, but at any

rate you know my basis for discussion. Black Rush is really above mean high water, it gets flooded by wind tides; but it is above mean high water, and that is generally the test for where navigable water stops and private ownership starts. So if you are thinking of a dredge island put on high marsh; first of all I do not think it would be an island, and second, I think it would be privately owned.

Now let us discuss the avenues that are open to the state to obtain control of islands not owned by the state. There are a number of different ways of course. The state could accept a gift donation or purchase with the approval in North Carolina of the Council of State. Each state has its own unique provisions of how to go about this. The state can acquire, if they get permission from the Governor and Council of State, and that is usually a formality. You may ask why would there be any problem if somebody wanted to give land to the state. Well we had a situation where there was an estate worth a million dollars given to the state of North Carolina, and thank goodness somebody studied it carefully; because it was going to cost the state $300,000 a year to maintain it. This is why the Governor and Council of State get to look and see what free gifts the state agencies think they want to accept. If a land owner gave land to the state obviously he could get some tax credit for it and rightfully should.

The state could also acquire a lease to the island but again would have to get permission from the Governor and Council of State. In North Carolina the Council of State means the elected cabinet officials.

Finally of course you can condemn land in the state of North Carolina. There is a statute which provides that the Department of Administration is authorized and impowered to acquire by purchase, gift, condemnation, or otherwise twelve different types of land, or property, or buildings. Twelve different, they are restricted to that. They can not go beyond that, but two of the types the state is authorized to acquire are lands necessary for public parks and forestry purposes or for the development and preservation of the estuarine areas of the state. I think that may very well cover islands utilized by birds. Here is one example of what has been done recently. I have been doing some work for Carolina Cape Fear Corporation at Bald Head Island where we have been in the process for the last 6 months of donating a great deal of land to the state. There is an island called Battery Island, and there is another called Striking Island in the Cape Fear River which we are donating to the state and restricting to use as a rookery. Of course the Corporation expects some tax credit, and as I say, rightfully so. They are giving up some valuable coastal land.

If the state does not already own the island in question, I think there is no problem if they can purchase it or if they can talk the people into giving it to them. Really there is no problem if they want to condemn it, but it is time consuming and very expensive. When you get to the stage of condemnation the person does not want to give up his land, and he is not going to give it up without a fight. He will talk to a jury of his colleagues in the community and will say you know that darned state is condemning my land. It would only be a governmental entity that could condemn

it; private citizens could not nor could private foundations. Generally it ends up being expensive when it goes to the jury. At least that is what we have found in the eastern part of North Carolina.

So these are ways land can be purchased if it is not already owned. The first thing you need to do is to make a determination of ownership. Generally it will be either privately or state owned. The federal government generally has no claim, irrespective of the fact that they may have been the ones, for example the Corps of Engineers, to come along and dredge the Intracoastal Waterway putting the spoil on the land on the side. The federal government of course had to acquire some rights. They acquired easements, and in some areas they acquired fee-simple estates. Twenty years later they conveyed it back subject to their easement. So generally from Maine to Florida the Corps owns an easement, but they do not own the property that was created out of all this spoil that was dredged out in creating the Atlantic Intracoastal Waterway. So, generally we are talking about the state. The state owns the submerged lands if any governmental entity does. The local counties and cities may have jurisdiction over water areas or in some instances counties and cities jurisdiction stops at the high water mark of the Atlantic Ocean. That is not ownership, and there is a big difference. So determination of ownership needs to be made first, and then the desirability of acquiring it by whatever means, gift, lease, purchase, donation, or condemnation can be considered.

Questions

Earl Pearson: I was under the opinion that there is one exception concerning intracoastal waterway in the area conveyed where the state of North Carolina conveyed an easement to the Corps of Engineers in the area from the Virginia line down to about the Coinjock Bridge, and there is another area from around the Cape Fear River down to the South Carolina line where there is a state statute that says that islands created by dredge by the Corps would be deeded to the Corps.

Thomas Kane: Well there is a statute which created the authorization for the Corps to do the work. When the federal government came in and built the Intracoastal Waterway, first they approached the State and said do you want it. Then the State through their Congressman approached the Federal Government and said yes, this is very desirable. Well the state passed legislation that authorized the creation of the waterway. I have not looked at that particular statute in some time, but I do not recall the provision that you mentioned, but I will not disagree with you. It would be a very limited area.

Earl Pearson: It is two small areas.

Ray Herrmann: You stated that the law about ownership below the low water line was now being considered unconstitutional.

Kane: Just one provision, not the law itself, just the provision that said it is null and void.

Herrmann: Could this law not be used in the sense of a reverse condemnation proceedings?

Kane: No it could not because according to the statute you lose it.

You see the state, by its constitution and the restrictions of the federal Constitution, can not make a statute which takes land unless it provides for just compensation. This law does not provide for such. So it would be automatically unconstitutional. I do not know any lawyer that I have ever talked to that thought that particular provision of this law was constitutional. Even when I was with the state, and I was trying to justify this law, I did not try to justify that particular provision that said if you did not record it you would lose it.

Herrmann: Could you in fact use this as a reverse condemnation?

Kane: It could be. You could argue if it was ever upheld, but I think the easiest way to attack that particular thing would be as to its constitutionality. It could be said that a legal provision of the state is just inverse condemnation then the court would of course have to award some compensation.

Robert Soots: If you were going to investigate a management program and you needed to know who owned the islands that you were interested in, how would you go about finding out?

Kane: Go see Lloyd Freely of Sport Fisheries. His office is in Morehead City. They have plotted the claims made by private citizens. Now that does not mean the citizens own it because the state may claim it. I suppose you could also write the State and ask them whether they claim it or not.

Frank Dunstan: Are taxes paid on this submerged land, if they are privately owned?

Kane: Taxes are paid on such lands even if they are not privately owned.

Dunstan: Would that be a way of assessing if they are privately owned?

Kane: No. Because in North Carolina, and this is true in most states, when you are talking about ownership of land there are certain things that aid in finding out who owns. The courts in North Carolina, and they are not alone in this, have said that paying taxes is only one indication of ownership. It is not conclusive. Because a person could run down and pay taxes for a few years and have no more claim than that. So that is not the sole indication of ownership. But I will say this, most of the Spartina type salt marsh below mean high water is on the tax rolls. The state is saying at the same time that is is not owned privately, but is publicly owned. That is going to come to a head one of these days.

Paul Buckley: If dredge spoil islands are built up within the statutory limit of a national park or a fish and wildlife service refuge, who owns such islands after the operation is finished?

Kane: Are you saying the National Park Service acquired a refuge and then an island was created?

Buckley: No, I am saying that there is either a U. S. Sports Fisheries and Wildlife Refuge boundary or a Park Service boundary, and within these boundaries the Corps throws up some dredge islands.

Kane: That is a good point because it would depend on what the park or refuge got when they first got the property. This question was raised when the Park Service was restoring part of the beach up around Cape Hatteras. Some ocean front had eroded, and the state either came back or is going to come back and restore it by a beach restoration project. Somebody raised the question as to who owns

that land. Well under Reparian law when the land erodes away title is lost. Say there are two lots. One is on the water, and it erodes away so that the owner to the landward becomes the reparian owner. If you build back that land, and if it isn't governmentally owned, the original owner is not going to get it back. So your question would go back to the question of whether or not the Federal reserves were given just the high land or were they also conveyed the submerged land? This is an important question. You will find that land is defined generally in terms of high water or meets and bounds. If it goes to high water, and you do not have ownership below or jurisdiction over the water, then I would say that if it was state owned, it becomes state land.

Doug Ringer: How far down in the earth does a person's property extend?

Kane: Down to the center. It used to be that private land ownership extended to the center of the earth and the sky above it. Then the airplane came along. That created a little problem because people were flying through other people's land. So they reduced it, and really ownership of land now is generally such that it is 50 feet above your land or 50 feet above any structure on your land. In some states your land does not go all the way down because of mineral and oil rights. There are places where such rights exist and people knew they existed. They did not convey mineral rights. Lets say I conveyed a parcel of land, but I may have reserved all mineral, oil, etc. rights.

Ringer: Well suppose I owned some land connected to water and the top of my land washed away. Is what is left down there below the

water still mine?

Kane: No, that is the riparian doctrine of erosion and ecretion. One justifies the other. Erosion is when it erodes away by a natural process. This is not when a hurricane does it. That they call evulsion. If your land was torn away by a storm and completely submerged after that storm, title is not lost because land was lost through evulsion. But if it is lost through erosion what they call a gradual imperceptible disappearance of land, then title is lost. Now ecretion is when land is adjoined on yours. It is eroding up at John Jones', and you are getting his land. Well as it attaches to your land, as your land grows through ecretion, you get title to that land which grows. Under common law they said one was the justification for the other. You lose title to eroded land, and you gain title to that which is ecreted.

J. A. Meadows: Suppose they put a groin up on this land and collected the natural flow of sand.

Kane: There is a difference in some states and there is some law on this. I do not remember right now but there is some law on artificially versus naturally ecreted land. In some instances maybe where the groin is present you do get title. Now there are some statutes in North Carolina for example that say when the state, federal, and local governments rebuild a beach it becomes public property because public funds went into it. Now that is provided for specifically by statute so that artificially ecreted land, put in there by a bulldozer or put in there by a dragline, is not privately owned and would be publicly owned. That makes sense because it was publicly paid for.

Meadows: After the 1955 storms they brought in a bunch of sand on my beach at Neuse River. They ad a dredge out there and dredged it up. Is this privately owned beach?

Kane: It is yours now, yes sir. They did it without your permission?

Meadows: No, I gave them permission.

Kane: You should not have done that. You blew it. You had it until you said that.

Bob Simpson: I am very much interested in public land and public use. Does the public ever acquire land by use? I know about squatter's rights, and I know there are fishing rights on beaches, etc.; but if the general public has been using a piece of land for a long time do they acquire ownership?

Kane: Are you trying to advocate public access to beaches?

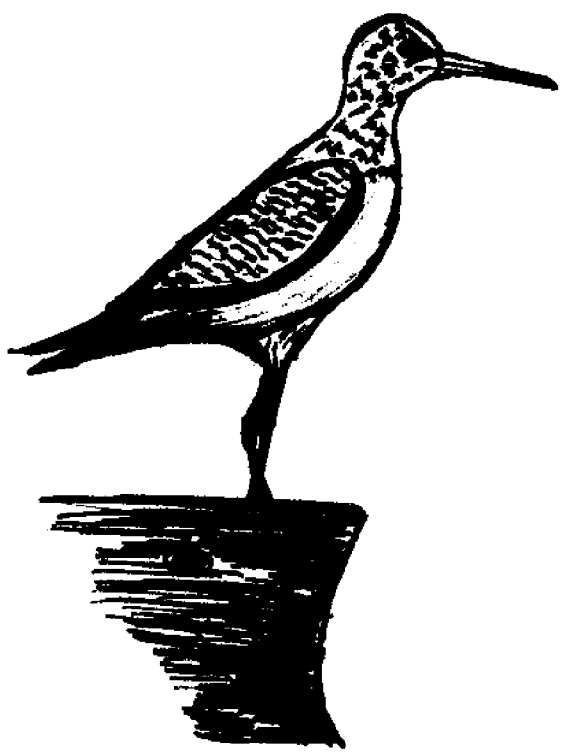
Simpson: No, I am not, but this is how it gets started.

Kane: Yes, it would be implied dedication. For example suppose you build a development or you build a little house and you put a road down to it. If it comes to the time where the city wants it or you want to give it to the city and they are willing to accept it, you do what they call dedicate it to the city. There is a procedure you go through to dedicate it. There is implied dedication and there is adverse possession, really it is not possession it is adverse use by the public and will ripe some title in the public.

Simpson: If fishermen or fishing groups have habitually been using these islands does this mean they are public. This is what I am trying to get at.

Kane: It may or may not. It would take a court case to determine

that. But there is a chance, and eastern North Carolina is particularly unique there, because eastern North Carolina is virgin territory compared to other places. People have been keeping people off their beach, and off their islands, and off their property in relation to water for years and years, but not in eastern North Carolina. Here thousands of acres was often owned by one individual, and he did not throw people off. The court can read that as implied dedication. It could also read it as mere license, that the landowners merely allowed these people to use their land. That is something that is going to have to be tested. There are instances where public access to beaches may be implied. This business of public beaches started in Oregon. They determined there that the public had used the beaches for so long that the high water mark was not the test of private ownership anymore. The vegetation line was. The public had the right to go between high water and the vegetation line. It was a landmark case. There are going to have to be some similar test cases in North Carolina.



ENGINEERING CONSIDERATIONS IN THE BUILDING AND MANAGEMENT OF DREDGE ISLANDS

James Wells, Dredging Coordinator
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Wilmington District
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I am going to comment briefly on various kinds of dredging and dredge spoil disposal. I think mainly what this group is interested in is the Atlantic Intracoastal Waterway. In the Wilmington District there are 1,500 miles of inland waterways, of which 308 miles comprise the Atlantic Intracoastal Waterway. It stretches in our district from Little River, S. C. to the Virginia line. Even the easements there are now being questioned but up until two or three years ago dredging was no problem as far as disposing of the material went. It was all a matter of economics. You got a dredging contract and piled the dredged material wherever convenient. It was not to help the birds, it was not to help the marsh grass or anything else it was strictly economics. And then we became aware of the value of the marsh, and we are now becoming aware of the value of the birds. Pipeline dredging is what we use on the inland waterway. Usually a 12 to 18 inch pipeline dredge, that is the diameter of the pipe that is discharging the material. We found that to economically pump this material to an area, by rule of thumb, you would not like to exceed 5,000 feet. If you go beyond 5,000 feet

then you need to put in a booster which doubles your cost. The normal cost a few years back, when we were going along on economics alone, was anywhere from twenty to thirty-five cents a yard. Today it costs one dollar or better a yard, depending on the location and how far the material has to be pumped. It also depends on the type of material of course.

We have certain restrictions placed on us by the Fish and Wildlife Service and other agencies. There are seven agencies that we coordinate our work with. In doing this of course we can not cover up any marsh grass. In the Wilmington district we have been very fortunate and have not had to cover up any marsh grass. We deposit primarily on those marsh islands that you saw in Dr. Parnell's slides yesterday. In those slides you saw a lot of diking. Now we have been diking for some time. In coordinating with the Fish and Wildlife Agencies, both State and Federal, and the Environmental Protection Agency, we have been able to go, in some instances, to what we call control of effluent. A specific case is at Shallow Bag Bay which is a string of islands in northeastern North Carolina running from Wanchese down to Oregon Inlet. There we set up a dredging program a year ago. About a year and one-half ago we had a contract to go out, but all bids were excessive. We wanted to reject them, but in this business the contractor has the right to protest the government estimate, which he did. He lost his protest, but it delayed the job a year, because by the time all the hearings had been held we were into another dredging season. Then by the time we could get that job scheduled, advertised, and out for bids we were running close to the nesting season for the birds, as we found

out from Dr. Parnell. We went out with bids in February and were going to start work in early March. I think it is about the 15th of April that birds begin to nest on these islands. Dr. Parnell came in to see us about 10 to 12 days before the bid opening. We had made no provisions in the contract for specifications to protect the birds. We immediately issued an amendment to the specifications stating that the contractor could dredge in the area that the birds were expected to use until the 15th of April, but if he had not finished the work on that particular section of the job by 15 April he would stay out of that area until a certain time. Well it turned out that the 15th of April was the magic day. Tucker Russell, chief of our navigation branch, went up to inspect the dredging at that time and said that on the 15th of April here came the birds--right on time. The contractor had one island left to go. What we did on these islands was this. The original plan called for all the islands to be diked. That was right expensive. I think it cost about $60,000 to do the diking alone. Then dredge contractors, they get in on the ecology act too, said that if they put the spoil behind dikes it would cost more money. We went back after we had this contract rejected and took a closer look. One of the foremen with Fisheries inspected the site and said that the eel grass behind these islands was not as close as they thought and if we would not allow anything to go onto the back side of the island but rather bring any material back towards the channel then we would not have to dike the whole island. So that is where we come to what we call control of effluent.

By doing that we tell the contractor that he must not allow anything to flow into the estuary behind the islands. He will direct the entire flow of the effluent towards the channel. This builds a little larger island and perhaps a better island for the birds. So we have done that and we have been very successful. We did not hurt any of the nesting at all.

Now on the Cape Fear River channel dredging job, the State did not want to pay the cost of diking to begin with. We worked it out where we would have this same control of the effluent on some islands. We determined the critical part of the river, where the shrimp were or where it would cause damage if any effluent came back into the river. Another problem was that there were several islands in our easement where if we deposited too close to the back side of these islands then they might be joined and property owners might claim ownership. That would knock us out of a future disposal area. So we took both matters into consideration and worked control of the effluent there with some diking. We checked with Dr. Parnell and avoided the parts of islands that birds were using.

In working with Dr. Parnell we have found that our putting this dredged material on these islands is often good; but it is only good if we do it in certain ways. What we have planned right now, and this is at no additional cost to taxpayers, is to work with Dr. Parnell and Mr. Soots at Drum Inlet where about a 30 acre island was created last year. This research will help to determine whether or not dredging can be used to build islands more suitable for birds.

We now come to the question of how flexible can the dredging schedules be in relation to the breeding biology of the birds. I would say that it could definitely be worked to where even though we are dredging during a certain season we can work around the birds like we did at Manteo Shallow Bag Bay.

We dredged the Inland Waterway last fall and spring and across from Phillips Island at Morehead City, we discovered a heronry on a disposal island. Now this is another thing. We are now aware of where these things are going on. It is right bad when you have not been made aware. And that is where this meeting is really good. People are becoming aware of things. We had a disposal area on the island, and Don McCrimmon from N.C. State University was studying herons there. We never knew anything about it. He came to see us, and I think we were able to do the dredging without bothering the birds at all. In the same area there was an eel grass study going on that we knew nothing about. We should have known about it, because we worked with all the wildlife people, and everybody assumed everybody else knew about it. It would have been very simple to direct the contractor away from these study areas. There would have been no problem whatsoever. So we learned, and fortunately I do not think anything was hurt. The only problem with Don McCrimmon's study area is that after putting the dredge material on the island the wind is blowing sand back into the trees, and there are no federal funds to be used to stabilize that sand. The main point I am trying to get to here is that most of the problems you are talking about with the birds and with marsh grass is mainly a matter of looking at it ahead of time and

working the problems out together.

The Wilmington District is a little different from other districts, in fact I think we are the only district in the division that has a dredging coordinator. My job is to go out when we plan a dredging project and immediately bring wildlife agencies and other interested parties into the planning process. We sit down eyeball to eyeball, and we work out the problems. Then when other agencies get the plans and specifications it is a matter of agreeing by return mail. They have been in on the project from the beginning.

A major question is, what procedure should be followed to obtain the Corps' cooperation on the management of dredge islands. I would say that you should start off by going through the District Engineer in the districts where your experiments are occuring and where you want to start maintaining the dredge islands.

What would we do about moving spoil if it were not needed for maintenance on the waterway? I would think that we would be prohibited from doing that by law. In other words, you would have to go to Congress and get some special kind of thing set up, a study started, and a special type of dredging program going for that. After all, the Corps of Engineers is a consulting firm for Congress. We do not go out and start projects. We get our instructions from Congress. We do not have any authority to start anything.

Questions

Francine Buckley: I wish the Wilmington District was proselytizing with the north within the Corps of Engineers and would alert other

districts to the fact that there are these problems and that there are ways around them. They are not insoluble. If the Corps could just make public a little bit about what they are doing perhaps and get more help and cooperation from the wildlife biologists that are working out in the field. I think the major problem is communication. I think you said you did not know people were there.

James Wells: Right.

Francine Buckley: The problem is that the biologists that were working did not know there was anybody that they could tell that the birds were there. I also have one question about the diking. How much of the sandy shallows does the diking leave in the water? In other words how much of a slope do you get out of the water?

Wells: Very little except by erosion later. For economic reasons and to keep the contractor from losing his dike, we state in our specifications that the toe of the dike will be one foot above mean high water. Refering to these islands that we talked about along the waterway, as Mr. Kane brought out, they are not dredge islands. We have a 1,000 foot right of way in most cases, rule of thumb. Usually it is 750 feet to the ocean side and 250 feet back to the land side. Now these islands that we are talking about dumping on are owned by someone else. If we go past our 750 foot line we have to get permission from the owners. Also when we put spoil material on these islands, if that man wants to go take that material off he is welcome to go get it.

Paul Carlson: I was wondering if you had had any experience with altering the shape of the islands so that they last longer. Down in

Florida it appears that all the islands that were elongate seemed to survive the current a whole lot better.

Wells: We have not tried that. We have talked a lot about this in the vast open water areas. In the Wilmington district along the waterway we have a fair number of places where we can put spoil. You may have to join a few islands or take in a small amount of marsh to get a big enough area to last for a long period of time. In the vast open areas like Core Sound and further north we have not tried to change any shape. We made an attempt at this at Drum Inlet, after the fact. We had already let the contract, and had not told the contractor specifically what to do, and we did not come up with too good a shape.

The next step might be the use of the nylon bags which you see used for groins. If you have been down to Long Beach, N.C., they run these nylon bags out in the ocean. We are thinking in terms of trying to use bags to shape island configuration. If we pump in open water then that will confine the material to a certain area. In other words it does not wash away all over the sound. I think we can do it that way, but we have not done any as far as I know in this district. We have not made any attempt to shape islands.

Carlson: It seems like this could be a critical factor not only for the birds, well indirectly for the birds, by altering the vegetational succession, because that dike in some cases will present considerable problems to the influx of water borne seeds. Just this one final note, Dr. Buckley and I were talking yesterday,

and it seems that several people have seen that a central depression extending a bay back into the center of the island, both promotes vegetational growth, by trapping water and silt, and also seems to encourage certain kinds of birds.

Wells: Well, that would be good. It does not cost any more to get everybody in on the act and come up with the best solution than it does to go off kind of half-cocked and just do what you want to do.

Jean Hunt: Is there a law in North Carolina that you have to dike if you deposit on an island, or do you have some options for management?

Wells: No, like I say we have not diked all islands, and the option depends on each specific area. You may have eel grass in one place and something else in another, and we rely on the wildlife people to tell us what is in the area and to give us some guidance in what we should do there. In other words it is not just an arbitrary diking situation.

Bob Simpson: We hear about the pipe dredging all the time. There is a very controversial alternate type of dredging that is that sidewinder. Would you make a comment?

Wells: We are now coordinating the side casting dredge with the wildlife agencies. You are talking about Barden's Inlet or similar places. We had a meeting in the district office about three months ago after the side-cast dredge started working Barden's Inlet. It seems that in an active zone near the inlet where you have heavy currents the side cast dredge is not too upsetting to too many people. Before the side-cast dredge goes anywhere we notify the State Wildlife agencies and we tell them where we are going to

dredge and how long we will be there. What we have done is take a close look at the areas where this kind of dredge will operate. I think probably the most controversial one is Barden's Inlet. There are certain areas where they can dredge but the wildlife agency people would like to know where it is and when it is. Does that answer your question?

Simpson: I thought it should be brought out because it is a very controversial thing, and I feel as if people should be aware of it. This is the only dredge of its kind I believe

Wells: Well, yes. It is just a regular boat with a long pipe that extends about 50 to 75 feet out to the side. It is like a big vacuum cleaner. The reason for having this dredge is to operate in very dangerous places such as narrow shallow inlets that are constantly shifting. Oregon Inlet was dredged up to the one-mile buoy back in January. There were 13 feet of water in the channel at Oregon Inlet at the end of January. Well, Congressman Jones called the office recently and talked with Colonel West and said, "I get reports from the fishermen that there are only five feet of water at the one-mile buoy". "What can we do"? Well a pipeline dredge can not even get out there. It would be very dangerous out there anyway. There are two side casters, one of them is the Merritt and one is the Schwitzer. The Schwitzer is a little larger than the Merritt, so the Schwitzer will be dispatched to Oregon Inlet in a couple of weeks, and he will work around this one-mile buoy, which is out in the fast current. Nothing is out there anyway that it would bother. And he will just run along and pump the sand right

out to the side. It will wash back into the channel eventually, but hopefully the swift currents will take the sand on out to sea and sort it out. These pieces of equipment are for use around inlets only. Now the Hopper dredges are the larger dredges and they suck sand up just like a side caster. They are tremendous. They put the material in the hold, and then they go out to sea and open the bottom up and dump everything out at sea in selected and marked areas. Now the EPA does not like that. But we are working things out.

T. L. Quay: Have the NEPA requirements for impact statements influenced you any or put any requirements on you in regard to where you are continuing your dredge activities?

Wells: Yes sir, we are going to have impact statements on all maintenance projects very shortly. This environmental impact statement will be a quick report, gotten up in very broad terms. Following that will be a comprehensive study that will take about three years. It is right interesting to know that while we have maps of the 308 miles of waterway nobody has ever put together an aerial mosiac of the waterway from one end to the other. That is being done now in the Wilmington district for this quick report. In the comprehensive study we will expand on it. We are going to take aerial photography from the Soil Conservation Service. It is very good photography, and we get it very inexpensively. We will put it on reproducible sheets. Then we will reduce that down, and it will all go into one fllder. You can pull it out and here is the waterway. Of the 308 miles of Inland Waterway only about 100 of them are where we do regular dredging. You can count on

dredging yearly behind each inlet. Now this material can either go to a dredge island, or it can go to the beach, or it can go on the mainland. You can figure what it is going to cost you to put it on the mainland. So you really have two options to work with.

Quay: With the Phillips Island rookery at Morehead City you did not have to have any particular environmental statement? You just had to negotiate locally and go ahead?

Wells: Now we did not put any material on Phillips Island. It was the island across from it. It was a mistake. That will not happen anymore.

Quay: When you put your spoil over there on the annex island as we call it in McCrimmon's work, you did not have to do anything but negotiate locally and go ahead. This is different from the thing in the morning papers that Mr. Kane mentioned. Mr. Henderson, the State of North Carolina, Colonel Costanza, etc., may or may not have to have an environmental impact statement to put in that marina at Smith Island.

Wells: No, up until then we did not have to, we could proceed with maintenance dredging without an environmental impact statement.

THE EFFECTS OF MANAGEMENT OF DREDGE ISLANDS ON THE ESTUARINE ENVIRONMENT

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I am with the division having responsibility for the continuation of the fishery resource which we have in the estuarine areas. This resource takes several facets into consideration. We have a commercial fishing industry in North Carolina that has a raw product value of at least ten million dollars. Handling, processing and retailing of this raw product which includes shrimp, clams, crabs, fish, oysters, etc. would expand this ten million dollars at least five times and perhaps seven times. Each year we have a large influx of sport fishermen into North Carolina estuaries and beaches. A 1970 census, I believe, by the Bureau of Sport Fisheries and Wildlife indicated that between 400,000 and 500,000 individuals came annually to North Carolina to fish in salt water. These people spent approximately $130 each for bait, tackle, lodging, boat rental, guides, and other related products. This indicates another fifty million dollars in value for our estuaries. We have a large unestimated resource in water related recreation, boating, swimming, and skiing which adds to the monetary base. Eastern North Carolina

is thus dependent on estuaries for a large portion of its income. All of these resources can be adversely affected by the practice of in-water disposal, the creation of dredge spoil islands. The Division is charged with the continuing enhancement of estuarine resources. For these resources we need some basic things in North Carolina. We need suitable habitat for the fish and shellfish and this usually means open water wither shallow or deep. We need nutrient input such as primary productivity from marshes, submerged vegetation, and phytoplankton in the water. All of these things taken together make a system on which these fish, shellfish, and crustaceans are dependant.

By that way of introduction I would like to get to some of the questions that Dr. Parnell and Mr. Soots were kind enough to supply. They asked that I state the role of the Division of Commercial and Sport Fisheries in the regulation of the deposition of dredge material. Since 1970 this state has required a permit before any dredging or filling or draglining project occurs in North Carolinas' estuaries. This is in the State laws of North Carolina, G. S. 113-229. It says very specifically, "Before any excavation or filling project is begun in the estuarine waters, tidelands, marsh lands or state-owned lakes, the party or parties desiring to do such shall first obtain a permit from the North Carolina Department of Conservation and Development". These permits for individual projects can be denied by the Department of Natural and Economic Resources. There are five basic reasons on which this denial can be based.

1) That there will be significant adverse affects of the dredging

or filling on the use of the water by the public or 2) that there will be significant adverse affect on the value and enjoyment of his property by any repairian owner and 3) that there would be any significant adverse affect on public health, safety and welfare and 4) any significant adverse affect on the conservation of public and private water supplies and 5) that there would be any significant adverse affect on wildlife, freshwater, estuarine, and marine fishes. Speaking specifically about disposal of the material from dredge activities, Section one of the law states that all material excavated pursuant to such permit, if a permit is granted, regardless of where placed, shall be encased or entrapped so that they will not move back into adjacent waters. It is our opinion, and it is our present policy that we will not allow any in-water spoil deposition for a permitted project in North Carolina. The U.S. Army Corps of Engineers is not subject to our permit laws. We work with the Corps of Engineers very closely, with Mr. Wells the Dredging Coordinator, in finding areas which are now high land areas for the deposition of materials excavated during the dredging of the Intracoastal Waterway and connecting channels. These high land areas are, as Jim Wells has already stated, of three basic types, mainland areas, existing dredge spoil islands, or beaches. We do not actually regulate what the Corps does, because the Corps can do more or less what they want to do except for all the outcry we raise sometimes when they do things that we do not think are quite right. The Fish and Wildlife Coordination Act does dictate that the Corps receive comments from

the conservation agencies before a project is begun. But we are all trying to get along to preserve what we have in North Carolina estuaries. The next question refers to the adverse effects of the occasional deposition of dredge spoil on existing islands. That question is in two parts - without diking and with diking. I am not sure how many dredge spoil islands there are in North Carolina, but there are quite a few. The Division has two float planes, hydrosupercubs with pontoons, and our pilots, myself, and some other members of my group use them for reconnaissance of dredge and dragline activities. We have seen first hand a number of dredge islands that are lining the Intracoastal Waterway, and I think there are a lot of them. I think they are subject to management for birds. I think the manner in which these islands can be managed is like Mr. Soots said - by pushing the trees down. Some of them are quite old and are covered with trees. Now getting back to resource degradation from in-water spoil disposal. First, you have overt destruction of habitat, perhaps submerged grass beds, perhaps marshes. These submerged grass beds are primarily eel grass in this area. They are primary nursery areas for various aquatic species of sports and commercial importance. Scallops, and I understand everybody ate scallops last night, are associated very closely with these eel grass beds. They do not normally exist where this grsss is not present. Yesterday we went to Cape Lookout and saw the spoil islands there. We are quite certain that when these islands were placed there they were placed on eel grass beds. There is the highest concentration of scallops at Cape Lookout this year that has ever been seen.

You can also cover existing oyster rocks and existing sand flats containing clam populations. Or you may simply replace open water habitat with high land such as dredge spoil islands. This is in itself detrimental. I think fish are much like birds. You can not crowd birds up too much, or the population will be adversely affected. Fish are the same way. They must have areas in which to live, breed, and feed. Along with the overt destruction of habitat areas you have covert destruction that could be very far-reaching indeed. When these spoil islands are first pumped up a lot of them, such as the ones we saw yesterday, contain a high percentage of sand. This sand is highly subject to erosion by lunar tides, storm generated waves, or wakes of passing boats. When these sand particles get into suspension in the water column the tides or storms can transport them to other places. This sand moved to other parts of the sound or bay may have insidious or sub-lethal affects on shell fish populations or submerged grass beds very far from the original island. In many cases in North Carolina mud, silt, and clays are dumped along with sand onto these dredge spoil islands. Muds and clays go into suspension a lot more readily than the sand, and that being the case, they are more apt to be transported to other areas, other very environmentally sensitive areas. Mr. Russell can correct me if I am wrong, but a dredge pumps about 60 to 70 percent water to transport a relatively smaller amount of sand or solid materials. So when you place a dredge pipe in a body of water and pump this material it is already in suspension, and it is subject to go

away from there. As has already been mentioned, the silts and clays sort themselves out, and by sorting themselves out they go to other places. We are not sure how far such materials are carried and exactly what kind of effects they have. But we are certain they have adverse affects. If you pump onto an existing spoil island without dikes then the effects would be adverse in that pumped material will return to the water. It will flow off of the island and into the water, and it affects whatever is out there. If you pump on an island and the island is surrounded by a dike, we feel less harm is likely to be done to the estuary, because you contain the material. This assumes that the dikes are built at or above the high water mark and will not erode away. No marsh is involved and no submerged grasses are involved. No habitat area for fish is involved. If you can correlate the dredging between April and August then that would do a good job for the birds too. That is what we are working toward with the Corps of Engineers. We recognize the need to maintain the waterway, because it is a highway. Commerce is traveling on it, and a lot of industries and people in North Carolina are dependent on the waterway to get from one place to another. But we also need to protect and preserve the estuaries

The next question related to the environmental effects of creating new dredge islands in open water. I think I have covered that. A similar question asks where could a new island be placed with the least damage to the estuary. We realize that there are areas in North Carolina where a dredging contractor cannot physically

place this dredged material on an existing high land area. This could be for several reasons. It could be physically impossible because of distances involved in some places in Core Sound or Pamlico Sound. You just cannot pump it to the beach. It could be that all the high land has been used up around where dredging activity is taking place. People build houses, and people build condominiums, or phosphate plants where you need to dig. We do not want the Corps to place this material in the marshes, because we feel that they are very important to existing eel grass beds, clam beds, oyster rocks, etc.. So in these cases we will work with the Corps to delineate areas which are possibly of lesser importance to the estuary in that the resource value is not there.

Whenever you place material in the water you are doing something to the circulation pattern in the sound, bay, river or wherever you are. We are not sure what these circulation patterns mean to the total estuary. So right now we are playing with it. We are playing with it in that we might delineate areas for them to build spoil islands. We pick these areas out. We do not really want the Corps to build small islands here and there, because we feel they could just build one large island and use it again and again for maintenance activities. I am not sure what time span the Corps is working with, but perhaps a 50 year life of the spoil islands is believable. Here again if they have a large island perhaps they can manage it, or others working through the Corps could manage it for different species of birds on the same large island.

The next questions asks about the present trend in regulation of future disposal. That is fairly easy, and I have already said that I think the Division of Commercial and Sports Fisheries will not recommend any disposal in the water where it is not absolutely necessary. We have to protect the fishery resources above all else. In areas where you cannot reach the beach, an existing island, or any high land we will pick out a deposition area where it is least biologically productive.

The final question asks about the role of the Division of Commercial and Sports Fisheries in any program of management of dredge islands. We are biologists and so we understand other people's interests. We like birds ourselves. On a personal basis, I like to see them and watch them, so we would be very cooperative in managing existing spoil islands for bird populations. I am certain that during our conversations with the Corps of Engineers concerning upcoming maintenance activities we can recommend from a personal basis and a departmental basis that they recognize certain critical times which are important to bird populations, times during which dredging is much more likely to be damaging. April to August, would coincide with times that we feel are important biological activity.

Questions

Jean Hunt: What would be your personal feeling on in-water deposition on a research basis, with controled experiments and this sort of thing?

Douglas Ringer: It would depend on the area. I will give that politicians' answer. I think there are enough areas existing that are available for research. I think we can have the same set of criteria. I do not know fully what your criteria are, but I feel that you can have the same set of criteria putting fresh spoil on an existing island.

Jean Hunt: I think I was referring more to an existing island in a non-diked situation.

Ringer: Non-diked? We recommend diking, because our law specifically says all spoil will be entrapped or encased. We have no other alternatives. They will not let us say do not use dikes, because the law says that all spoil should be contained by some method. Now I think there would probably be a good possibility that once the spoil is deposited in a diked area then you might be able to level out those dikes. You could put a slope on the dikes. Now that would contain the material. The adverse effects would be about the same as you would have if you had erosion carrying the spoil material around.

? ? : I have not seen any birds nesting on diked islands yet. This could be that the diked areas are not old enough for suitable habitat to have formed, but they appear to be sort of a wasteland as compared to anything else.

Ringer: That could also depend on the consistency of the material. Birds are not going to nest on mud and I cannot blame them for that. Mr. Soots, what has been your experience in diked areas where you have sandy materials?

Robert Soots: Most of ours are too new to really say. We can say that we have not seen birds on them yet. Islands that are diked may also contain skeletons of trees, and I do not think the birds would use these whether they were diked or not. Until we get some open islands diked and in the right areas I do not think we are really going to be able to say.

Ringer: Tucker Russell, what would be the additional cost of pushing trees down on a spoil island that has a dike on it? Would it be a lot of extra cost?

Tucker Russell: There would be some additional cost but not a lot.

Ringer: If you did, you would have something to say about financing that kind of operation later.

Soots: This is a question that is a matter of curiousity. When I fly the coast, it seems to me that I see the Corps projects with many of the islands being diked. Then when I see State dredging projects they are not diking them.

Ringer: Could you give me an example?

Soots: For example in Hatteras Inlet.

Ringer: I do not know how to answer that. That dredging operation has been going on for years and years, and I agree it should be diked. I think there is some talk now of making them comply. In fact they do not have a permit for that. They have just been doing it. They have worn out one dredge completely, just keeping that inlet open. On every other State project that I can imagine, we dike because we feel that we have to set the example. We can not ask somebody to do it if we do not.

T. L. Quay: Covering up good fishery resources bottoms with silt from the dredge pipe must be a kind of pollution I suppose. Then I also know you have a very large problem with pollution of good fisheries bottoms by pathogenic organisms. How do these two problems compare in your mind, as to percentage loss.

Ringer: You are speaking primarily about sewage pollution.

Quay: That is what you mean when you say you can not fish because an area is polluted?

Ringer: Well in North Carolina we have large areas where you cannot take shellfish because these shellfish may contain pathogenic organisms.

Quay: Do we have a whole lot of commercial chemical pollution from industrial plants, that is not pathogenic or that is commercial chemicals of some kind?

Ringer: The Cape Fear River is about the most polluted river on the North Carolina coast, but still a good number of shrimp are caught out of the Cape Fear River each year. Several anadramous fish species are running up there to spawn in the streams. So we do not have a lot of that yet. We are not advanced enough for it on our coast. Sewerage pollution is an area that is a large problem, and it is probably the largest problem confronting us right now. As we get more and more people, more and more sewerage tanks become overloaded. If there is a sewerage plant existing already, and usually there is not, it is probably operating past capacity. You saw some slides earlier of real pretty sandy rectangular pieces of land out in the water and marshes, with a

canal between them, Florida type developments, or whatever you want to call them. I am not a soil scientist but I would not imagine that the carrying capacity for that sandy soil for sewerage was very large at all. The sewerage gets into the water in a hurry.

Soots: In reference to Dr. Quay's question, I was looking at some of the graphs of the dredge material prepared by the Corps of Engineers. In the Wilmington District, the material dredged up seems to be about the most non-polluted along the whole east coast.

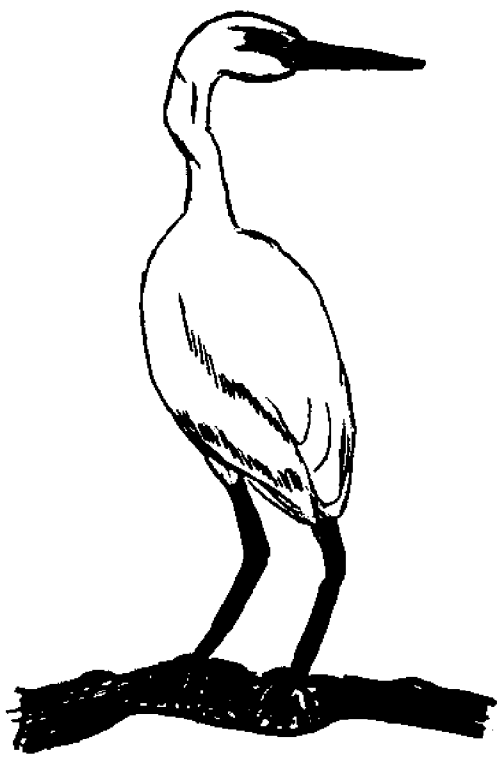
Ringer: I guess we just are not advanced enough yet. We just do not have the industries that other states do, and I think we are very lucky. If a harbor is ringed by plants which have been polluting for many years, then these pollutants must be in the soils in the bottom, and they might be attached to colloidal particles, which are inert or relatively inert. If you dredge them up, you get the whole pollution problem again.

Soots: How do you see the role of your agency in the actual management of dredge islands? I am talking about specifically, say for regulation for example? Suppose we have regulations to keep people off such islands during the nesting season. Do you see some of your people enforcing that, or do you see the Wildlife Commission or possibly the U. S. Fish and Wildlife Service personnel doing this?

Ringer: If you are talking about numbers of personnel, of course we have the largest number of law enforcement personnel in the coastal area. And Dick Hamilton's people and my people all work for the same governmental body. I do not see why there could not be some cooperation in this kind of thing.

Dick Hamilton: How do you see the Coastal Management Act affecting the dredge permits?

Ringer: I do not know. The Coastal Zone Act was accounted as being that act which might bring together all the permits and requirements under one agency. So the person that wants to dig a boat slip out on a creek could go to one person or one agency and say I want a permit. They would supply that man with application forms and get some consent from the adjacent property owners, saying that they did not object to it. Then he could get the permit in a reasonable amount of time. But that does not seem to be the way it is going to work right now unless the administration changes its policy in the next year. The Dredge and Fill Law which is used now in the Division will stand as it is. Then the Coastal Zone Law states that there will be certain areas along the coast designated as areas of environmental concern. Depending upon the size of the development that goes into these areas, a person has to have an additional permit to do work in these areas and that is when the Secretary of Natural and Economic Resources will be involved. Then on top of all that there are some counties which are going to institute permit proceedings for themselves. There is then a strong possibility that in the next year or so a developer would have to get a permit from the county, a permit from us, a permit from the Corps of Engineers and a permit from the Secretary of Natural and Economic Resources.



THE FINANCING OF DREDGE ISLAND MANAGEMENT

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I will talk quite frankly today about what the Wildlife Commission can and cannot do with regard to managing non-game species in general and Jack Donnally will discuss this with you specifically in terms of dredge spoil island management.

There have been several questions today about authority and policy. The part of this discussion concerning finances may be a minor part because of this, and since the questions that were sent to me to answer dealt with policy, enforcement, regulation, and legislation in addition to financing. We need to consider impending legislation and recently passed legislation as it affects non-game species in general and for financing purposes.

I should mention that in 1947 an act was passed by the North Carolina legislature that authorized the creation of the Wildlife Resources Commission. I think the statement of purpose is quite applicable here to the discussion of the Commission's role in non-game species management.

"The purpose of this article is to create a separate agency to be known as the Wildlife Resources Commission. The function, purpose and duty of which shall be to manage, restore, develop, cultivate,

conserve, protect and regulate the wildlife resources in the State of North Carolina and to admister all laws related to the same in order that there shall be provided a sound, constructive, comprehensive, continuing, and economic game and fish and wildlife resources program, directed by qualified, competent, representative citizens who shall have knowledge and training in the protection, restoration and proper use and management of wildlife resources." Now that is a pretty big task to accomplish especially when you must do all this work with revenues received from the sale of hunting, fishing and trapping licenses.

I might define what Wildlife Resources are, just to show that non-game species are included. Wildlife Resources of North Carolina are--"all wild birds, all wild mammals other than marine mammals found in coastal fishing waters, all fish found in inland fishing waters including migratory salt water fish, all inland game fish, all uncultivated and undomesticated plant and animal life inhabiting and dependent upon inland fishing waters, waterfowl, food plants wherever found, all undomesticated terrestrial creatures and the entire ecology supporting such birds, mammals, fish, plant and animal life and other creatures." That is a pretty comprehensive definition of wildlife resources. If there is any question about authority all you have to do is study this charter and you will see that we are charged with the responsibility to protect and manage all wildlife resources. As I have mentioned before we are limited somewhat in accomplishing this charge by the source of our funding. All our activities are supported by the sale of hunting, fishing,

and trapping licenses, and a federal excise tax on the sale of equipment and supplies that these participants use in their activities. The budget for the Wildlife Resources Commission was projected this year at $6,700,000, and its projected income is $6,200,000. We are operating with half a million dollar deficit which will have to be covered by credit balances of profits made in the past. This deficit will just about eliminate the credit balance. The credit balance will be zero. Inflation has caught us just like it has caught everybody. Costs of everything from personnel raises to postage are up.

Sportsmen in the 1930's demanded that particular species with which they were vitally concerned; particularly game species of fish, mammals, and birds; be protected and enhanced. This program would be supported by money that they would contribute in the form of license fees and in the form of a rebate on the sale of fishing and hunting supplies. I think that the time has come which will mark the advent of the non-game species program similar to that initiated 40 years ago for game species. This will require some sacrifices on the part of a fairly affluent segment of the economy that is interested in non-game species management.

There is a sequel of needs that I have heard discussed many times. Until a man satisfies his most basic needs he does not worry about the more aesthetic values in life. A significant portion of our population today has reached the level that they have satisfied their material needs, their needs for food, clothing, and shelter. Now we are aspiring to fulfill a higher need. I think

we are at the level now where we are concerned about ecology and the preservation of non-game species, particulary those threatened and endangered species which hold the forefront today.

The same is true for all non-game species as it is for the shorebirds that we have been discussing during this conference. My regular responsibility with the Wildlife Commission is in big game management. I am in charge of the program for deer, bear, boar, wild turkey, and waterfowl. Through my personal interest I have kept up with threatened and endangered species developments over the last three or four years. Whenever something concerning endangered species came up I would be the one that would brief the administration on current developments. That personal interest is what led me here today. I am a little out of place as a big game biologist, but am very much interested in this program.

The Endangered Species Act of 1973, passed the United States Congress in December and became effective immediately upon passage. I have attended several conferences on this legislation, and it took two or three days alone just discussing the Act. I will not try to cover it in any great detail, but I think it is important enough, particularly to the considerations of non-game or endangered species management work, that we should look at some of the sections. This is law, and I am sure you will be interested in some of its provisions.

The whole purpose of the act is to provide for the protection of ecosystems. It is not solely for the protection of individual animals, but for protection of habitats upon which threatened and

endangered species depend. Therefore this is a little different from any of the other regulatory acts that have been passed and is focused on habitat and the systems approach. I think this is a great advantage. In the definition of a species that can be protected by this threatened and endangered species Act, it goes so far as to say that a species can be protected in any segment of its range. In other words, a population of a species may be endangered. This is a lot further than past acts have gone. Here are two interesting elements that go further toward protecting endangered species in this act than in the past.

Of course the protective regulations are very strict for threatened and endangered species. I will not go into the penalties involved, but they are up in the thousands of dollars for the flagrant taking of protected species. Even jail sentences are provided. The funding provisions are what we should talk about here. Money will be appropriated by Congress in the amount of $10,000,000 to administer the program through 1975. This money has been impounded by the Executive Office; but as I understand it, it may be broken loose by special legislation. This $10,000,000 will be provided to the states on a project basis to finance approved projects on species that are on the federal list of threatened and endangered species. This list is a dynamic list with provisions for change. North Carolina has several species on this list now. It would be in our best interest to petition the Department of Interior to consider including any species on their list that is endangered or is likely to become threatened in any segment of its range. We would then be

eligible to receive funds to support work on those species. These funds can be advanced to the State, but they have to be matched with State money, at a rate of one state dollar for every two federal dollars. This is characteristic of all Federal programs. They hold a carrot and a stick. The carrot is the cost sharing and the stick is preemption of State authority, if the State fails to act. Any citizen or group in the United States can petition in any Federal court to consider the implementation of any phase of this Act, if it is not being complied with by the Department of Interior or by the State.

The Land Acquisition Section, Section V, could be of interest in the endeavor that we are considering now. It takes all limits off of the use of Land and Water Conservation funds. These are funds that are derived from user fees in Federal Parks and in Federal Installations. This fund is administered to all states that have an approved recreation program. SCORP they call it, State Comprehensive Outdoor Recreation Plan of which North Carolina has an approved plan, and we have a functioning committee that administers this plan. To date the money has been used mainly to help in the acquisition of State parks. Priority is going to State Parks and to Urban Recreation Developments and County Recreation Developments. Very little of it has gone for rare and endangered species, but Section V of this act says that it can be used for that purpose if the State administering board sees fit to use it that way. There are no limitations.

Section VII of this act is the interagency cooperation section.

This says that the Secretary of Interior shall review programs administered by him and utilize programs in the futherance of the purpose of this act to preserve threatened and endangered species. And it says also that all other Federal Departments and Agencies shall, in consultation with and with the assistance of the Secretary of the Interior, utilize their authorities to further the purposes of this act. In addition to this, under no circumstances shall any actions authorized, funded, or carried out by any Federal agency jeopardize the continued existence of any endangered species or threatened species or result in the destruction or modification of habitat that is critical to the survival of such species. So here again we see that the habitat as well as the species is protected in all Federally funded or authorized projects. This is a very strong section. It could result in the Department of Interior actually bringing suit against another Federal agency if they fail to comply.

Then there are regulations on the importation and exportation of species that are threatened or endangered in other countries. This is a very strong provision that protects not only resident species but also species in other parts of the world. The intent of this is in keeping with the intent of the international convention that was held several years ago in which many countries came together and tried to stop the sale and traffic of endangered species.

That is just a quick run-down of the 1973 Endangered Species Act, its potentials for habitat protection and its potentials for funding of projects on listed threatened and endangered species.

So we need to get busy developing information on species in North Carolina that appear to be threatened in any portion of their range and to petition the Office of the Endangered Species to get these on the list. If we want to use these Federal monies to set up research programs such as were mentioned this morning, we can take advantage of these funds, provided that they are broken loose from the Executive Branch.

I might mention that the International Association of Game and Fish Commissioners working in concert with the Office of Endangered Species has drafted model legislation for each state to present to its legislature to bring each state into an active program of non-game species management. It provides for all the provisions of the Federal Act at the state level, and it has a funding clause. This was part of the Department of Natural and Economic Resources' proposed legislation, but it never made it to the legislature this year. It will, more than likely, be introduced next year, and it will need the active support of groups like this in order to pass. It rests the authority to manage non-game,threatened, and endangered species with the Wildlife Resources Commission. It defines a species also in terms of its populations. It sets forth the policy of the State to conserve species of wildlife for human enjoyment, for scientific purposes, and to ensure their perpetuation as vital components of ecosystems. So it also takes a systems approach to the problem. It also provides for the protection of plants. I have been mentioning only animals, but plants are also included in both of these acts. The exact procedures as to how the regulations will

be established are not worked out yet, but there is traffiking in plants that is equally dangerous to their existance as it is to animals.

One of the interesting sections set forth in the purposes of this state act is Section D, and that is that adequate funding for the conservation of non-game threatened and endangered species shall be made available by the Department of Natural and Economic Resources by appropriations from the general funds or from other sources to be administered by the Wildlife Resources Commission. In other words this work will be done, not from the revenue derived from the sale of hunting and fishing licenses, but from a separate ear-marked fund to be derived from the general tax funds. This seems quite fair in that the people who benefit would be all the people in the State, and therefore we should all be willing to sacrifice a little and participate in this non-game species work. This work can be done by the North Carolina Wildlife Resources Commission, financed through these general funds. The North Carolina Wildlife Resources Commission will be coordinated with all other State agencies with the same provisions as listed in the Federal Act. No State agencies shall under any circumstances endanger the continued existance of threatened or endangered species, and they shall use their resources to further the purposes of this act. It provides for the purchase of land for land use that would be most beneficial to a particular species in an area and for the management of the land utilizing the resources of the various state agencies. Protective regulations are stringent, although the fines and penalties are not

as high as the federal fines are. The Governor shall review other programs administered by him and programs shall be directed in the futherance on the purposes of this act. The funding section provides that the cost of the program shall be established and borne by the general fund or other sources. We probably will not get enough funds from the General Assembly to do a whole lot at first. We might get enough to match Federal funds and therefore use it as seed money to gain Federal money to do some work on Federally endangered or threatened species. I think the funding section should provide about $100,000 to get the program started and to get some personnel and equipment to do the preliminary work.

Where do you look for other sources of revenue? Other states have looked in various directions. I have a questionaire that was sent out by the State of Colorado to all of the fifty Wildlife agencies in 1972, regarding funds for non-game species work. There were 42 responses. Of the 42 responses only four states had provisions for the funding of non-game species work. They were Connecticut, Michigan, Rhode Island and West Virginia. There were several suggestions as to where such funds should come from. Some of them were quite novel, and I think, quite appropriate. Here is just a general summary of what the state wildlife agencies thought. All the respondees accepted the premise that it was their responsibility and within their authority to do this work. Twenty-two states suggested that general funds and State appropriations should be made available for this type of work. Ten states were contemplating conservation stamps to be sold to non-consumptive users, not to

convey any particular privileges but to simply identify the person as an interested and willing cooperator in the management and protection of non-game species. The cost of this would vary from one to five dollars or in some states it was just on a donation basis, as much or as little as you want. Some of the states considered a special tax, such as the tax on hunting and fishing supplies and equipment. A tax on non-returnable bottles, beer cans, and non-returnable glass cartons would be a good thing to consider. In this state I do not know if we could get it through considering the lobby strength of the soft-drink industry, but eight states said that they were seriously considering this.

User fees are always a good and fair source of revenues. Nine states were considering the earmarking of special use fees on state managed and other areas to be used for non-game species work. Federal funding is always a possibility. Federal aid to wildlife restoration monies can be used for work on non-game, threatened or endangered species. I mean they do not rule it out, but most state wildlife agencies do not rule it in, because they have a special constituency that are active in setting their policies and programs. They do not spend federal aid money for anything but game species. If this Federal assistance program gets off the ground it will be administered through Federal aid. It would be a special add on project in each state, a non-game species project.

One state said that there was a possibility of requiring a license for photography and bird-watching, but I do not think that was a very good idea. The state of Washington had a very good idea

and that was personalized license plates. In other words there would be a distinctive symbol or decal that went on a license plate, and it would cost you an additional ten dollars to get it. This money would be ear-marked to go to the non-game species fund. Right now we have personalized license plates, and that money does go to some special use.

Donations from Conservation organizations can and do help non-game species; however, most of them need all their money to administer their own programs, and their own programs are very important. I do not think that we can look entirely to conservation organizations for support in getting enabling legislation to obtain the resources necessary to have a good program.

You can see that it is just a matter of imagination. The money is available. The question is how are we going to get it. Anything we get must be authorized by the legislature, and is going to have to go through that process to be made available. There is one other source of money that may become available. Recently in the United States Congress there was introduced an amendment to the Fish and Wildlife Coordination Act. As I understand it, there is a lot of support and a very good chance of it passing. The intent is to provide for the input of wildlife concerns in construction projects funded or authorized by Federal Government agencies, such as the Corps of Engineers, SCS, TVA, AEC, FPC, etc.. From the inception of a project, from its planning stages right through its final stages, this amendment to the Fish and Wildlife Coordination Act would provide for the transfer of funds from the Federal agency to

the State Wildlife Agency to conduct investigations and surveys to insure that Wildlife interests receive adequate consideration in the project. Money from the Corps of Engineers could then be made available say for management of dredge spoil islands.

Questions

James Parnell: You have talked about rare and endangered species primarily. Obviously that is the way these laws have been set up, but within the framework of the Commission, do you also visualize a readiness to deal with what we might call important species that may or may not be endangered?

Richard Hamilton: Yes, this provision is in this State legislation for listing of non-game species that need protection or management. They do not have to be endangered. It helps if they are threatened or endangered because then you can get Federal money. If they are just non-game then we can pass regulations to control the taking, possession, transportation, importation and exportation but we can not get federal money to work on them. I might mention that right now every species in North Carolina that does not have an open season is protected by State law. We have about 200 field enforcement officers. Mr. Simpson quite jokingly said this morning that they run around checking licenses all the time. Well they do this because that is the source of our revenue, and we have to instill an incentive in the hunter to buy a license. If you have any problems with anybody illegally taking any species of wildlife in North Carolina contact a Wildlife Protector. It is

against the State Law, and we would be quite anxious to act on any good information.

T. L. Quay: Does that include migratory species or just non-migratory forms?

Hamilton: Both. We have the protection authority for migratory species when they are in the state of North Carolina. We adopt federal regulations on bag limits and seasons. Anything that is federally protected is automatically state protected. You do a lot better in Federal court if you want to make an example of some violation, because their penalties are a lot stronger than state penalties. State cases are a lot easier to bring to court and get prosecutions quickly.

Bob Simpson: You have not mentioned your game management areas that are already in existence. They are what I call multi-purpose, are they not?

Hamilton: Yes, we have several different kinds. We are managing federal lands, private lands, and state lands. Our state lands are open all year.

Simpson: I think the point that I am trying to make is that you are indirectly doing this already. You do have all types of land and all species there are managed directly or indirectly.

Hamilton: Mainly indirectly. We would be managing game species, thereby benefiting non-game species.

Jean Hunt: Are you familiar with the program that is being started up at Patuxent? I think it is on migratory non-game birds. One person out in Colorado has done some work with it. I was wondering

if there was any possibility for funding there. It is federally funded and somehow matched by the states, but I do not know.

Hamilton: I am not familiar with that at all.

Pete Kirby: How large an area would this particular state require before it would step in and start managing. For example, these dredged islands, how would a state become involved in the management of these areas?

Hamilton: Well if it was important to the survival of any particular species, as with a nesting area, I would think we could work on a very small area, ten acres or so. Of course I am not going to steal Jack's thunder. He is going to talk about the difficulties involved in managing these areas. We must coordinate, and I have noticed through the theme of this conference that communication and coordination is a terrific problem between the agencies that are doing the work and those that are reaping the benefits, such as the bird-watchers and researchers. All you have to do in most cases is to ask. For instance I know that if you were to ask the people at Camp Lejeune not to bomb nesting areas during the nesting season, I am sure they would not do it. We get great cooperation from Camp Lejeune. They have one of the best wildlife management and conservation programs in the state.

Kirby: I guess I was not quite clear on the question I asked. Are there certain criteria that have to be met for a state to take an area like an island under its wing, so to speak, as a management area?

Hamilton: Certainly, if it was critical to the survival of one of these species that are listed, and if the resources were available to do it. I will tell you quite frankly, however, right now there are no resources to do any work of this nature in the Wildlife Resources Commission. That is a fact. We are operating in the red. We are going to have to cut services. We can not expand services. We have put out the word that this is going to happen. We have been authorized and compelled by the legislature to do a lot of work that we never did before, particularly in environmental areas. We have asked for reimbursement for this additional work. We did not get it last year. We hope to get it in the future. We are going to have to pull in our horns. If, however, we get the resources to do the job, I know we have the horses to do it. We can develop and manage these areas and have a good program on non-game and endangered species.

AN EVALUATION OF THE PROBLEMS AND POSSIBILITIES OF MANAGING THIS RESOURCE AS VIEWED BY THE PROBABLE MANAGING AGENCY-- THE NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

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You have heard a number of interesting papers today. We all see what the problem is. So if we are going to talk about management the first thing I will say to you is, Do you really want to manage at all? Now that may seem very simple, for people interested in non-game species have not been in the management picture very long. People who work with deer and ducks and quail and rabbits have been in the management picture for a long time. And so again I say, do you really want to manage, because that is the first question you must answer, and it is a difficult one.

Let me give you some examples. Somebody thought that to get rid of the snakes in Cuba they ought to bring in the mongoose. That was a good idea. They ate up all the snakes. Then they ate up all the chickens, and so the people had managed themselves a problem. Well somebody got to reading in Shakespeare and he thought he wanted to have some Starlings too, so he could look at them when he was reading these plays, and now we have Starlings all over the place. Nutria are another good example, and they are

giving us a fit. In New Zealand until very recently the government hired people to kill deer, as many as they could, as many hours a day as they could shoot. They have rabbits in Australia till they do not know what they are going to do. They have even instituted disease as a control.

Sometimes the cure is worse than the original problems you started with. But let us get right down to where my particular interest is, and that is ducks and geese. With geese we have managed ourselves to death. In the old days before we interferred with geese they traditionally would winter in coastal Louisiana. The people in the business usually refer to that particular group as the Mississippi Flyway Goose. Now many of those birds winter as far north as Wisconsin. Well that is where the big problem with management starts, and you see it with geese especially.

At one time many geese wintered in North Carolina, and they did such a good job of management north of us that now all those geese are on the Delmarva peninsula,and everyone feels that they will stop next in New York State. It is even conceivable that you could hold them north of the Canadian line in southern Ontario if you so desired.

Well now to take that one step farther this is the kind of thing you could do with the birds we are talking about. And this is exactly the kind of thing we may do. For example, it is conceivable that we, as it has been suggested, may want to move those birds from the exposed positions where they now are to the

confines of a refuge, park, or wildlife area belonging either to the State or Federal Government. It is probably possible since we have had so much success with other birds. With a little intensive management we could move these birds around like pieces of a checkerboard as we have done with some of these other species.

A number of people, young biologists especially, feel that this is the wrong approach. Let me give you some examples of what you get into. I raise these points because these are legitimate questions that need to be resolved before you even talk about management. One of these, in my own particular case, has to do with waterfowl impoundments. Until the big environmental issues were raised, I was there actually working like a beaver building waterfowl impoundments in Juncus marsh. These areas were flooded to provide what I feel is great habitat for any number of other birds besides waterfowl. This is management. We moved these birds from who knows where to where we wanted them. The Federal Government even operates on a larger scale than we do. But the point I want to make is that now you have these younger biologists especially who do not like management. They think more of preservation, so they tell me when I move these birds into one of these areas where I build a duck pond or whatever you want to call it, that it is the same as building a house on that marsh, and that I am destroying the environment.

To carry this idea one step farther, I was called to Bodie Island to take a look at the large pond that they have for wintering waterfowl and shorebirds. Now this pond is going the way of all

ponds, and it will not be a waterfowl area much longer. In fact it is about gone now. The pond is turning into high land through normal succession. What do we do? I suggested that they needed to take the water out of the pond, oxidize the organic debris, leave it dry for a year or two, and then reflood it. In other words start over the succession at a very early stage when it is very attractive to these birds.

I made these suggestions in response to interested bird watchers and duck hunters who went to the park, observed this problem, and then called me; because this is the kind of thing that I work with all of the time. I flood my ponds, and after three or four years I drain them and start the cycle all over again. The reason I bring this up is becasue the letter we got back from the National Park Service said "we do not believe in management." The gist of the letter said if the marsh turns to pine trees so be it. We are not going to mess around with the natural order of things. In other words, we are not going to manage. We do not want to manage. We are just going to let it go.

This means if you are a biologist with this kind of thinking then if these shorebirds are going to disappear from the dredge islands then so be it. They will be replaced by deer or coots or houses or people. Now these are legitimate questions and many biologists raise them all the time. I have heard some discussion along these lines since I have been here.

Suppose you go ahead and resolve it, and you decide to manage. Well what happens? Let us say, for example, that you are back in

the 1930's and you could do something to help the deer . You killed all the predators, and you have done everything possible in order to make the habitat more attractive for the deer. This actually happened, and the deer were overmanaged to death. This has happened time and time again with wildlife populations. We do such a good job of management that we get ourselves into trouble. We end up with more animals or more plants or whatever it happens to be than the natural environment can handle.

You end up with things like starvation. I knew a man that had a large ranch and had cattle that foraged very well on high desert country. He got the idea that he could increase his weight if he would feed his animals in the winter. So, instead of letting them go the way they normally went he began to feed them in the winter. Then he could not get in to feed them for two weeks because of deep snow and most of the cattle starved to death. The point I want to make is that when you interfere as we do so many times with other animals and we artificially feed, or move them around, or increase them beyond the carrying capacity of their habitat we get in trouble.

Birds can easily be done this way. I have no doubt that we can move birds around with intensive habitat management. I have no doubt that we can probably increase the number of birds, say if we managed every dredge island on the coast and we tried to do the best job that we know. I think from what I hear in the discussions so far that we could do this. Then the question of course immediately arises. Is this desirable? Now I am rather belaboring

this point, because you need to think about it very seriously before we get involved in management. We have been in this a long time with other animals, and I know more bad things that have happened than good things. Let me give you another couple of examples. When I was a young biologist deerfields were the answer to everything. If we were to manage areas we would go in and artificially create openings. We would plant them full of food and then the deer would come in. But then people began asking questions about disease. You have increased the carrying capacity of the land and you have doubled the number of deer on these fields, and so what about disease?

Well that was a very good question, and we have had the same problems with ducks recently. We have crammed all these ducks artificially into very small areas, and we have had disease problems. We have had serious loses both to disease and lead poisoning. So these are some problems you need to think about before you can talk about actual management.

Assume then that you consider all these problems and you decide that you know enough about it or that the problem is serious enough that you must step in and artifically manipulate the environment. In this case, if we are talking about North Carolina, the Wildlife Resources Commission is charged by law to do this work. As it has been pointed out, we do not have any money. We do not have any man power. And we do not have any equipment to do it. I want to emphasize that, because even though the work may need to be done tomorrow, we do not have any way to do it. You need to realize that.

Now are there any questions thus far, because like I said, this is a different kind of presentation than we have had before, and I am just trying to work around some points. So interject comments if you have them.

Questions

Bob Soots: I think you made a good argument but it seems to me that you left out the other side of the story. You say that perhaps we should not compete with the natural order of things, but the fact is, and you know this as well as I do, that the destruction of the natural areas used by these birds in the past is occurring steadily. We say then that maybe the natural order of things is to go ahead and destroy all of these natural areas and let man cover them up with his cabins and then we forget about the birds all together. Let them be eliminated because that is the natural order of things--for man to spread out and cover the earth.

Donnally: The reason I made that argument--I am not trying to defend it of course, is because there are many people who say this, and they are very sincere and believe this. They believe in this type of approach.

James Parnell: I think that we are talking about what we might call preventative management, maintaining a population. I made the point a moment ago that perhaps we wanted to get involved before some species became endangered. But the real idea is probably not, as in the case of game species to provide a supply

of organisms for the taking, but simply to provide the space or the conditions necessary for an organisms to maintain itself.

Walker Rayburn: The point is that these dredge islands in North Carolina will always be maintained as long as there is need for navigation. So we are going to be disturbing these islands. The thing is that we need guidance as to how we can maintain these islands. How can we do our work so that we can benefit the most resources. These islands are going to be managed whether it is deliberate or accidental. It is just a matter of using the most intelligent means of managing as far as we are concerned.

Francine Buckley: We regarded the spoil islands as an opportunity to replace the habitat that we have destroyed that these animals would normally have. We are just destroying and overusing our beaches. They need vast undisturbed stretches of beach. The spoil islands being placed at the right place and the right time provide an area for these birds to go to when we have wiped out their other areas. It is not a question of introducing new species, but maintaining the natural ones that have been in the area and providing a home to replace those that we have already destroyed. Food supply is their problem. We must just supply the habitat that they need. With the fact that we can maintain these spoil islands in the various stages of succession, we can manage to some extent the amount of habitat which stays available for these birds. Through our work with the terns we in no way had any idea of managing numbers or anything. The idea just arose that it would be a wonderful opportunity to replace what we have taken away.

Paul Buckley: Let me disabuse anybody that has the notion that the National Park Service does not manage. We sure do manage. Every unit in the National Park Service either has or is supposed to have a resources management plan which is drawn up by biologists and then goes through the Chief Scientists' Office in each region. We have to manage our resources.

Bob Simpson: I think this is really interesting because we are now bringing out the whole rounded picture. I think we have to look at this in the total system sense. I like the idea of maintaining things. I hate to see anything become extinct you know. It just kind of shakes me when anything is about to become extinct. We have to determine the total picture that we are aiming at. What is the total future of management? What do we want out of this coastal area? Do we want shellfish, do we want channels, do we want birds, do we want wildlife, what do we want? I think this is what we are beginning to come into right now. I think this is extremely good.

Donnally: Are there any more questions? This is what I wanted, and this is why I tried to raise all kinds of points that you might disagree with. These are things that you need to determine. I work in the management realm and I know what can happen. So many times in management the goal is to increase numbers of animals. This just goes with management thinking.

What happens if you build 1,000 nesting islands out there? You were successful doubling the number of terns, for example in this area. I know it is going to be at the expense of some

other species, since there is only so much total energy to be divided among all organisms.

I am raising these points because we need to think about them even though we do not know enough about the problem to discuss intensive management as I am getting at. But I wanted to bring this side of the argument up so you could think about it.

Okay, so let us say that we have decided to manage. I mean we have discussed the other things, and we have decided that we are going to work on dredge islands, and we have the money and the manpower. As you heard today we have to determine ownership. Someone has to go down and see who really owns these areas. The Wildlife Commission is not going to nail up signs unless we know it is State land or we have permission to go on that land. Someone has to take this initial step, and very soon. It would be the first thing that we need to do as we have already heard. Let us say that we have the money, and the ownership is worked out, and we are going to go out there and do some of the things we have heard about already. For example, we are going to add fill to an open water area, or we have decided to add spoil to an old area in order to retard vegetation and provide nesting. You see, when I raised that question a couple of times some biologists attending this meeting objected very strongly. We cannot do that. We have to put dikes around the area immediately even if it costs us the bird life. We have to put dikes around it, because we have to protect the marine environment. Alright then, suppose we stop to talk about soil sterelants or herbicides.

To try to retard vegetation and keep it in the early stages of succession immediately gets a lot of people excited. The only other way is to go in there with bulldozers and push down all the trees and move the spoil around.

But what about the dikes? I am sure, as we all know, the Corps is very willing to do these types of things and be involved in any way they can. They have to dump the spoil, and if they can do it in a way that helps us why that is good, and they will do that. That is not where the problem lies. The problem lies with us. As yet we cannot sit down as agencies and agree where the spoil ought to go and how to put it on the ground.

So what I am getting at is that before we can actually manage we need to get all these agencies, NOAA, State Commercial Fisheries, River Basins, Fish and Wildlife, State Parks and others to sit down and talk this thing out. Can we go out there and dump spoil in an area without dikes if that is what is needed for the birds? Can we knock the dikes down? Just what can we do?

Before the manager, in this case it would be us I suppose, can do anything we have to have these things resolved, and I mean that the administrative level decisions have to be made the first thing. We have to know what we are going to be allowed to do. We have not even approached that yet. Many times we even have trouble deciding among ourselves on some of these projects. We do not agree at all.

Well, to get down to specifics, the Commission has game management people stationed along the coast who could do this work.

They could go out and push down dunes or cut down trees. In addition, our law enforcement section could control trespass if they were instructed to do so. Are there any more questions?

Paul Buckley: I just wanted to make a point that is often overlooked, and that is that one of the most frequently used management tools is doing nothing.

Donnally: Well, this is a valid argument by many people.

Robert Hader: Perhaps just protection?

Donnally: Maybe so, I mean these are administrative decisions which will be made. I do not know yet. I have no idea.

B. J. Copeland: At the rish of preempting my own talk which is supposed to occur sometime between 2:30 and 4:30, you know maybe the key to this management thing is that we are asking the question in the wrong way. I make that point by just saying, "Ask not what we can do for the birds but what the birds can do for us."

???????? : You are talking about a good manager increasing the number of deer. In Virginia all we are trying to do is keep a stablized population of Ospreys, to have enough hatchlings for replacement from year to year. That can be management too. You do not have to care about the increase in number until you have overpopulated the area. You just keep it stable.

Soots: I would like to ask a question. Your Ospreys are increasing. Now are you going to tear down some of your platforms?

???????? : No.

Soots: This is directly related to what Jack was talking about. Where are you going to stop?

T. L. Quay: Jack, I would like to ask you whether you deliberately selected certain cases of the most extreme bad individual species management, to cite as an average case of management in the United States, or just to show that big mistakes could be made if you were not careful.

Donnally: The idea was to stimulate discussion.

Otto Florschutz: Well I was just going to say that another basic management tool is inventory. This is going to be the annual job or responsibility of whom? The Bureau does it? The Park Service does it, or Sea Grant does it?

Paul Buckley: If I can answer that. We are trying to instigate within the Park Service, initially Park wide, then region wide, then service wide, an annual surveying and inventorying of all colonially breeding water birds. There already exists an outfit called the Pacific Seabird Group which does the same thing on the west coast of the United States. It has representatives from all the State, Federal and local agencies, Point Reyes Bird Observatory and so on, and they are pooling all these data into sort of a data bank. Recently a proposal has been made that the Laboratory of Ornithology at Cornell University act as a nationwide center for all these data. Before this can ever be effected we have to start on the unit level, park by park, or refuge by refuge, or state by state, or region by region, and set the ground rules for gathering all these data. That is, I think, the stage we are at right now.

THE NEED AND POTENTIAL FOR EDUCATING THE COASTAL PUBLIC TO THE IMPORTANCE OF MANAGING DREDGE ISLANDS

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I am going to speak in rather general and unscientific terms about the essential need for educating the people of the coastal area. I think the scientists and researchers must first determine what these birds, or whatever the species might be, really mean to the people. If you have established this need then you can begin to develop and implement an educational program. There have been many comments that have brought a lot of things to my mind during today's session. Many of them I have already forgotten, but the discussion of land ownership was especially interesting. I was trained as a forester and worked as a forester for about 20 years before I got into this role. I did a lot of working for, and with, a large paper company. I bought land and timber here in the eastern part of North Carolina. I found it quite interesting, which relates somewhat to education, that people did not know where their boundaries were and what land they did own. Many land deeds went back to grants from the King of

England. Many deeds had no calls or distances on them. We were working with a lot of unknowns. We bought two tracts in Lenior County. When we surveyed out the deeds of the owners, who assumed all their lives that they were adjoining land owners, we found that there was a nice block of 70 acres of beautiful timber that neither one of them claimed. We just ran a line around the entire tract, rewrote the deed, and picked up an extra 70 acres of timber that we did not have to pay for. This is a common thing in eastern North Carolina in terms of land ownership, or it was some 15 or 20 years ago. People got educated, and it is a little more difficult to do this kind of thing today.

We must establish the importance and the desirability of the species; and I think some of this need is for tourists such as people who are interested in watching birds, or artists. There is also a need for these species as indicators of the state of the environment, whether it is healthy or not. This is factual. Scientists in their research back it up. Then we must educate the people to this need. Education, now I am not talking about a classroom environment, is a very slow process. It is the transfer or movement of knowledge from one individual to another. We have to convince people through this transfer of knowledge what is good and what is proper. Actually the guy that lives on Ocracoke could probably care less about the native trout in Buffalo Creek, Caldwell County, or the grouse population on Mt. Mitchell. By the same token he could care less what happens to the shorebirds or even whether or not he knows what a spoil area is. So, when you

talk about what is good for all the people, it does not mean a thing to the guy at the local level, the small landowner who has his own interests and concerns about what is good for him. If you are trying to get people to do what you want them to do you generally have to change their attitudes, and changing attitudes is a slow process. I think an example is the Coastal Management Act. It could probably have passed when first introduced in the legislature if in its inception something had been done to provide for an educational process with the local people prior to the introduction of the bill into the legislature. So often people in research and people in government, particularly research, overlook the attitudes and the feelings of the people at the local level. I do not think it was any great feat for those of us who had regular contact with the small landowner and farmer, the small businessman, or the county store operator, to predict that Jesse Helms and Jim Holshouser were going to be elected. And sure enough it happened. Some people were surprised. Here again we have to realize and accept that no one understands public opinion, and public opinion is not always what Gallup says it is regardless of the sampling. It is not always what the letters to the editor indicate, because they just happen to be the people that take the time to sit down and write. So we do have to know what people are thinking in the communities and in local government before we can be successful in establishing programs. I have had some thoughts about some of the things that the various agencies have done and probably particularly what the Wildlife Resources Commission

has done. I have always felt with the great expertise of the biologists in the Wildlife Resources Commission that it is a shame that they yield to the pressures of politics and the opinion of lay people, who really do not know what is good in terms of management, in setting some of the game regulations. I think that here again we need a strong educational program for hunters and local people as to what really is good. In many areas it has taken years and years to get local people to accept the idea of killing does. Again showing how education can work, I joined a hunting club several years ago which had about 30 active hunters. I was in a minority of about six that hunted with rifles. For the first year or two we were not only discriminated against but were just about ran out of the club. They really were down on rifle hunters. But as the five or six of us dedicated ourselves to educating the rest of the club we have now succeeded in having about five or six shotgun hunters in the club. It was a slow process of demonstrating to them that we were taking more deer and were not losing wounded deer to the extent that they were. We also had to educate them with regard to the safety factors that were involved.

I feel that in eastern North Carolina you have people that have a real concern for what they ought to do and will support you if you can get to them educationally and convince them of the need. But you must show the need. There has to be a concern. When you take an idea, such as Coastal Management Bill, your educational process will differ from the process used on this subject.

You can get large groups together when you want to talk about the Coastal Management Bill, because there is a sense of urgency among the people that are going to be attending. There is a sense of concern about the effect that it will have, and you can hold large meetings for educational purposes. I do not believe this is true when you are going to talk about terns and shorebirds and how you are going to manage spoil bands. If you call a meeting in some areas you might be lucky if you get five or ten there. You might get 15 or 20 in other places. You are not going to get 200 or 300 people like you would for the management bill. So I believe that educationally the kind of job that you are going to have to do is basically on a one to one basis, small groups working with local lay leadership, civic clubs, or youth groups. They are the people that you are going to have to reach and convince that there is a need and desire for management of these banks.

I can relate again, you have to go back I guess and relate somewhat to the experiences you have had, to the experiences I had as a forester. When I first started out it was rather difficult to get a group together to talk about management of trees. It was rather difficult to interest a landowner in thinning, because it was taken for granted that the trees were going to be there, and you were always going to have a supply of them. He had always been able to look out his window and see some trees on the back side of the farm. He took his trees for granted just as you take the shorebirds for granted. When you talked to him about thinning you made very little impression. You talked to him about regeneration,

but he could care less about it at that point in time.

I had one old farmer say, "why thin em, nature will take care of it." "Some will die and fall over and rest will grow on up." You can, however, help nature by thinning. You can help the process of growth, but it took me years to convince some of these people that we could help by management. It took some 15 to 20 years of my time practicing forestry before the landowners began to sit up and listen when we talked about forest management. In some areas you still can not get them to listen. In many of the areas now they do listen, because they see and realize the value. But it was not until the value was established that they accepted it.

I feel that here you have a need. This is what you have established. Now you must determine how to get the people involved. You must consider the economics of it, because this kind of a program can bring a great deal of criticism from local people. When they see you with a bulldozer pushing down the trees that have died, as has been suggested by Bob Soots, they might be critical because they do not understand the economics of it. If this is going to be good, you are going to have to be prepared to explain the economics of using a bulldozer. When they see you putting up posters quite often they will relate this to the regulatory aspects of governmental agencies. The response can be very negative, so again you must be prepared to get a favorable response by letting them know in advance and educating them as to the need for the posters. Somebody mentioned this morning when you were talking about posters that there is always some nut that will not pay any attention

to anything. Do not be too hasty to say that you know that nut will not pay any attention. Maybe he has not been told. He has not had the opportunity to learn. He has not been approached with an explanation of the posters.

We forget sometimes to cooperate and communicate with other agencies, and this has been alluded to today. We need this cooperation between agencies working together to let the people see that there is unanimity among federal and state government and federal and state agencies in trying to carry out a program.

We have learned a few things in Extension, I think, about working with people, and one is if you really want to be successful let the people tell you what they want. Then work with that to mold it and work with them and change their attitudes to develop what is good. My ideas about what they really need may not be so good. It may not be what they want or need really, but my ideas along with theirs may be what is successful. In operating that way Extension has in each county advisory boards made up of lay leadership. We have committees that deal with various subject matters such as tobacco, peanuts, corn, swine, or whatever. It is in working with these people in these groups that we find out what they want. Working with them also affords us the opportunity to say to them that these are the kinds of things that would be good, because research at the University or research at the Experiment Station has indicated that this is what is good. When they accept it in these advisory groups, and with the recognized and accepted leadership of the farmer down the road, then you begin to move with

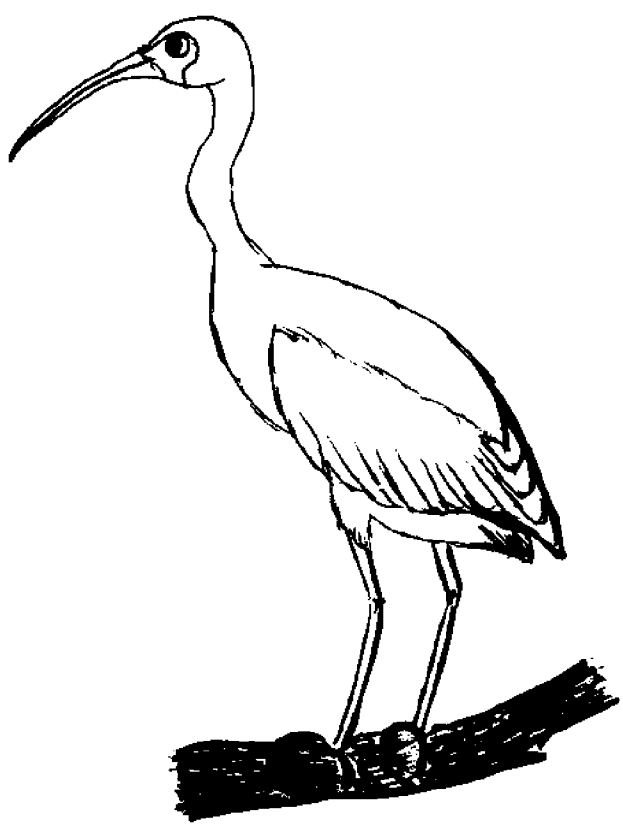
an educational program and an acceptance of a program in a given community.

We work with area development associations, and I am pointing this out because here are some groups that your educational program can go through. These development associations are made up of all lay people. We only serve as advisors to them. They in turn determine the kind of programs that are good in their areas, and they have the opportunity of having an input into what happens that affects them. Civic clubs are a real good source of people to reach. One of our chairmen mentioned this morning that it would be real good if he could be provided with a group of slides dealing with this subject, slides that he could develop to fit his own way of presenting a program and use to get across some of the ideas that have been expressed here. Use them at civic clubs, and do not overlook the youth groups, such as Boy Scouts, 4-H Clubs, or any youth group that you have an opportunity to work with. These young people today are somewhat idealistic but they are thinking. They are looking at the environment. They are looking at the total management programs that we have. This is a real opportunity to get these concepts across through an educational process and having them accepted not only for their generation but for the generation that comes after them.

Quite often we have to be careful in working with local people that we do not turn them off or alienate them by citing the regulations, by giving them the law, and by telling them

what they have to do. Recently at a meeting a fellow from state government who was talking about animal waste made the comment that people were going to have to do such and such in these low lying counties that had large swine operations. A very influential farmer made the remark after the meeting that nobody from Raleigh was going to tell him what he could do on his land, and if he sets foot on my property he will find out who owns it. The man from state government could have probably told this fellow what was necessary if he had taken the opportunity of establishing a line of communication and discussed it with him rather than telling him what the law said that he was going to have to do. In the educational process we have to be very careful how we approach the people and how we present our thoughts and ideas on the subject.

There are many ways of reaching an individual in the community. I feel that the process is not what this particular group does or says in this room, but rather what you say out there. The groups that you approach, the people that you talk to, and the manner in which you present your ideas are what is important. Let us not be forgetful about where we are, what we have to sell, or what we have to convey. We must approach this with the understanding that we must get through to the local people and get them to accept it. We accept these ideas, but if you get the people to accept your ideas you will have a successful management program.



SUMMARY

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Fist of all I want to express my appreciation to Jim Parnell and Bob Soots and to the Extension Service of North Carolina State University for organizing this conference. As Tom Quay, who has commented at the end of every paper so far today, said a while ago, three to five years ago we could not have done this. He is right, we could not have then, but today we can. I also want to thank all the people who have attended this conference and have participated, because I think the participation has been very good. I have been very impressed today with questions that have been asked, the comments that have been made, and the obvious involvement of all of you in what everyone has had to say. As J. C. Jones just stated, this is where education starts. This is a way of education. We must understand one another and we have to change some attitudes. I think we have done that.

Secondly, I appreciate the opportunity to be here today because this is the way the Sea Grant operates. Sea Grant is in the business of trying to do in the coastal zone and marine environments what

land grant did over 100 years ago with land resources. They approached this by doing realistic research and then going the next step (which is what we are all afraid to do sometimes) and putting that research to work in the realm of action. Sea Grant has allowed us to dare to become involved in a meaningful development, a meaningful way of utilizing resources of the seas and coasts, and to dare (from the University standpoint) to become involved in commercial operations. That is a no-no for ivory tower researchers. You cannot be involved in anything except something esoteric. Sea Grant's thrust has allowed us to get outside the esoteric realm and into the realistic realm.

One thing came through today while listening to the presentations and having talked to Jim and Bob through the years that I have known them and been involved with them. They, in effect through their own personal stamina, have management going on these dredge islands. They have done a tremendous amount of work identifying the problem and identifying what the potential is for utilizing that problem in resource management. Jack asked in his question, "Do we want to manage?" I do not think that is the question. The obvious real question is how do we manage?

One point arising today that bears talking about is that Jim Parnell and Bob Soots in their work with the dredge islands and the management of bird habitat are involved in a University program of research. They have identified the problems and the needs. The University must, at this point, move aside. We are in the business of trying to apply our research expertise to answering

questions about problems such as this. We need to be able to turn this aspect over now to a state, federal, or local agency, whichever it is, that has the statute responsibilities for seeing this work put into action in a management form. Now, we have heard many people, representing many agencies, talk about their own hang-ups. I do not question that, nor do I condemn them for that. They have statutory responsibility for that hang-up. The fellow from the Division of Commercial and Sports Fisheries, for example, has the responsibility for managing and protecting the fisheries and shell-fisheries of the State of North Carolina. They have to approach it from the standpoint that they think is necessary to protect those resources and to obey their statutory responsibilities. We heard people from the Park Service who are charged with a responsibility, and they get on with that responsibility. Jim and Bob are charged with a responsibility because of their relationship with the University, and they have gotten on with that responsibility. Now we need to have one agency who is responsible for pulling these things together, to maximize or optimize in some meaningful way, so that we can now proceed to manage this resource in a realistic manner. We cannot, for example, turn the management of dredge islands over to the Divsion of Commercial and Sports Fisheries who are charged with removing dredge islands from the water. At the same time, we cannot turn managing dredge islands over to Jim and Bob who are personally committed to protecting birds. We cannot give the management of dredge islands over to the United States

Army Corps of Engineers who are charged with the responsibility of making dredge islands so that we can run boats up and down channels and bays. We should not argue with those responsibilities (they are charged to do so, and they are all important), but we need to have some agency or commission to maximize the management of those areas. The same thing has been done with other kinds of resource management, so that they too became realistic.

All these agency spokesmen today, everyone who spoke, said that his agency was willing and would bend over backwards to do what was right. Now who is to say what is right? So perhaps we need some enabling legislation (or it may be in resolutions or other legislative actions) to cause this to go forward. That is where you, and I, and the local people (J. C. Jones' clientele when he talked about those local folk out there) can make that a possibility.

In the final analysis, in order for any of this to be a reality we must affect a realistic, exciting, and innovative educational program to cause the local people to know what the issues are, what the alternatives are, what the trade-offs are, so that we can then proceed to make something realistic out of it.

QUESTIONS

Bob Simpson: I would like to make a statement. I think we are sort of winding these things up. First of all, I think that we are very lucky in this area. Despite my criticism of the Corps and many others' criticism of the Corps we have had better cooperation,

I believe, with the Corps of Engineers than any other region in the United States that I have known of and worked in. I am very appreciative of the Corps for this outstanding cooperation. I wanted that stated publicly so it was on the record. Now, that gives me the right to criticism. I did want to suggest the possibility, as I have to a few individuals, that we do have a system right now where these areas could be managed. This is under the State Park Service. They are acquiring land. They do have funds, and such land can be managed for the best use. It can fit in almost every category from recreation to scientific management. They are already set up where the parks could probably do this with the Department of Natural and Economic Resources handling the Management. By that I mean both the Fisheries and Wildlife branches being charged with cooperating in the protection of these areas. I think it would have to be a neutral agency, and perhaps the Parks is not it. Such areas do not fit in any single category unless they could be considered scientific research areas. I hate the word preservation because preservation indicates that islands will be preserved in exactly that category, and I do not believe this can be done, I think they have to be kept in a dynamic state.

Walker Raburn: I do not want to sound like I am arguing with Dr. Copeland, but we must remember that these are dredge islands. They are created by dredging, and as long as they are actively needed for dredging their primary use should be for the deposition of dredge material. How they are managed for other resources is open for debate, but if you fellas get to where you preclude the

disposing of dredge material on them you must find another area to dispose on or close down the waterways. This is a type of resource where you have a primary use and any number of secondary uses. We must keep that primary use in mind.

Parnell: There is no problem. There are enough islands to go around.

Copeland: I think this is the very point. If we had a mechanism whereby the interests in these kinds of things could be coordinated and maximized, these islands could still be used for dredge disposal. At the same time they could be used in such a manner that they would be available for other resource utilization as well.

Raburn: Another point that we were talking about was the need for money and personnel to manage these areas. Since the primary use is going to be disposing dredge material, most of the work can be incorporated as part of Corps projects, hopefully at no additional cost with the proper coordination. I think that this would be something that the Corps in the Wilmington District could try to do.

Simpson: I believe this is what I was trying to say in a round-about way. I do think there should be a coordinating program. There could be a very broad cooperative type program where everyone could benefit.

CONFERENCE PROGRAM

Thursday 30 May 1974

8:00 a.m. Registration.

10:00 a.m. Introduction to the nature of Dredge Islands and their wildlife and an overview of their importance.
James F. Parnell and Robert F. Soots

11:00 a.m. The significance of spoil banks to colonial seabirds in certain national parks.
Paul A. Buckley and Francine Buckley

11:30 a.m. Lunch.

1:30 p.m. Field trip by boat to a series of Dredge Islands with nesting colonies of gulls and terns.

7:00 p.m. Social Hour.

8:00 p.m. Dinner.

Friday 31 May 1974

A series of discussions on the major aspects of the potential management of Dredge Islands.

8:30 a.m. Legal considerations of Dredge Island management.
Thomas E. Kane

9:00 a.m. Engineering considerations in the building and management of Dredge Islands.
James Wells

9:30 a.m. The biology of the nesting birds in relation to management.
Robert F. Soots

10:00 a.m. Coffee break.

10:30 a.m. The effects of the management of Dredge Islands on the estuarine environment.
Douglas Ringer

11:00 a.m. The financing of Dredge Island management.
Richard B. Hamilton

11:30 a.m. Lunch.

1:00 p.m. An evaluation of the problems and possibilities of managing this resource as viewed by the managing agency-The N.C. Wildlife Resources Commission.
Jack A. Donnally

1:45 p.m. The need and potential for educating the coastal public to the importance of management of Dredge Islands.
J.C. Jones

2:15 p.m. Coffee Break

2:30 p.m. Summary of the findings of the workshop.
B.J. Copeland

3:30 p.m. Adjournment of workshop.

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