DARIEN (TOWN OF)

COASTAL AREA MANAGEMENT PROGRAM

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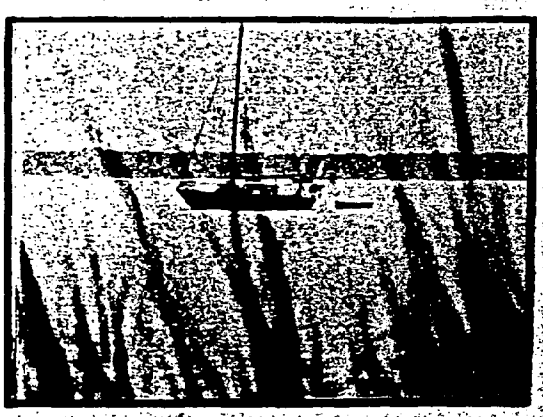
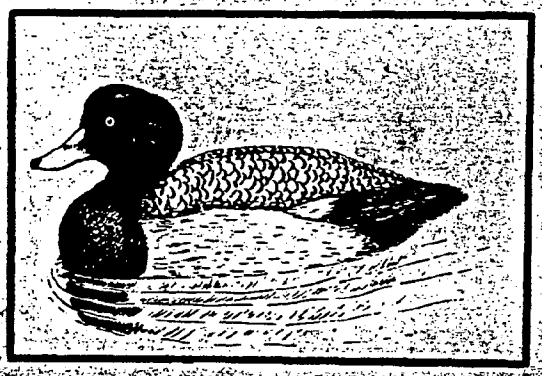
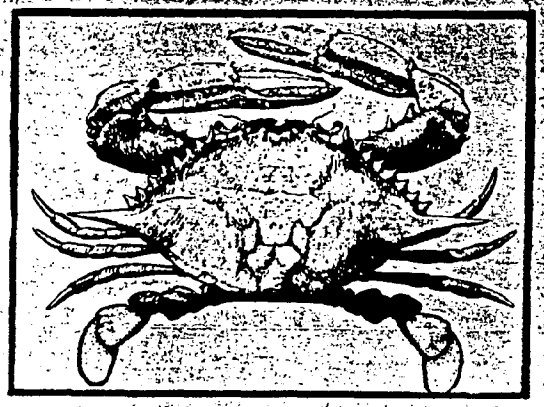




ADOPTED FEBRUARY 7, 1984

COASTAL AREA MANAGEMENT



TOWN OF DARIEN

PLANNING AND ZONING COMMISSION

MUNICIPAL COASTAL PROGRAM

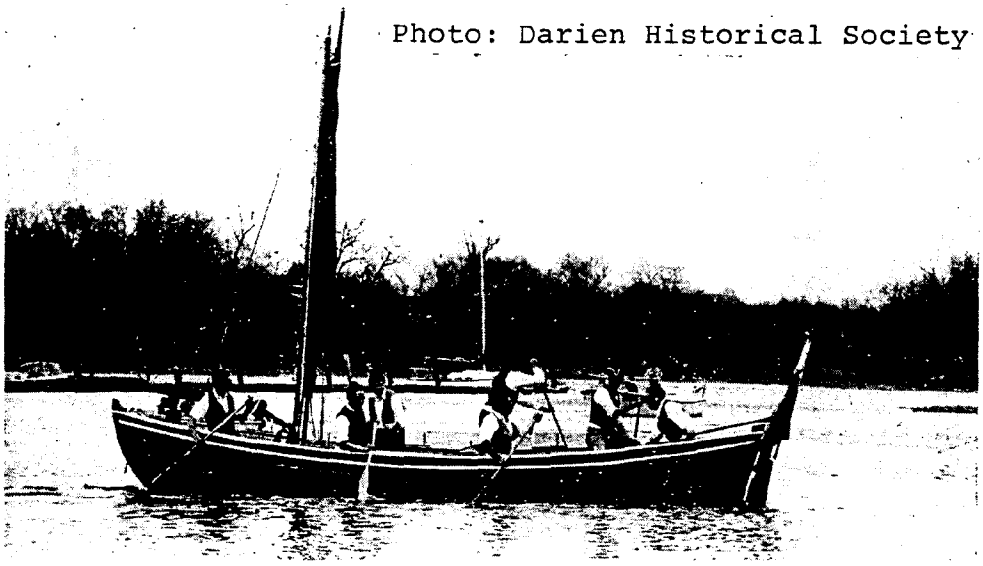


Photo: Darien Historical Society

Whaleboat "MIDDLESEX"

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EXECUTIVE SUMMARY

This report presents an inventory and analysis of Darien's coastal resources, together with a comprehensive review of the various elements of a Municipal Coastal Program. Based upon the findings from these studies, recommendations are advanced for amendments to the Town Plan of Development.

The study is set forth in eight chapters as follows:

1. Background of Municipal Coastal Area Management Program

   Review of the history of the legislation establishing the Federal Office of Coastal Zone Management; implementation by Connecticut under Public Act 79-535; establishment of the Darien Coastal Boundary; procedures for the mandatory Coastal Site Plan Reviews; development of the municipal program.

2. Land Use and Development of the Darien Coastal Boundary

   Actions taken under existing Town Plan of Development; current land use and environmental regulation; application of subdivision regulations to the Coastal Boundary; analysis of current land values; existing land use patterns.

3. Coastal Resources

   Overview of the fourteen CAM Program coastal land and water resources, as found in Darien.

4. Detailed Resource Data for Coastal Zone

   Inventory analysis of the 16.5 miles of Darien coast, divided into sixteen geographical areas with summary and conclusions for each area.

5. Identification of Coastal Issues

   Discussion of the major issues facing Darien which require either administrative action, capital expenditure, enforcement of existing regulations, or further study. Included in this chapter are discussions and recommendations for: improvement of boating opportunities; coastal hazard and flood damage prevention; preservation and enhancement of tidal wetlands with special reference to seven critical areas requiring special effort and permanent protection; shellfishing policies for both recreational and commercial activities; dredging policies for new or existing navigational channels; protection and enhancement of wildlife habitats; proposal for reclamation of Tokeneke Trail marsh, protection and preservation of the shoreline through public and quasi-public ownership, open space declarations, and

conservation easements; improvement and expansion of physical and visual public access; identification and control of sedimentation and erosion; policies for controlling coastal structures and filling; mitigation of coastal development impacts; management of tidal ponds, and preservation and enhancement of cultural resources.

6. Proposed Amendments to Plan of Development

Discussion of seven objectives to be incorporated in the updated Town Plan of Development: improve physical access to Long Island Sound; preserve and enhance visual access; expand recreational boating opportunities; improve recreational shellfishing opportunities; preserve and protect key shoreline resource areas; enhance degraded natural systems; improve educational opportunities.

7. Proposals for Revising Local Regulations

Review of existing regulations: specifically Sections 431.11, 482, 486, 488, and 489 of the Town Zoning Regulations; the Town Subdivision Regulations and Coastal Site Plan Review. Recommendation that no further amendments needed until updated Plan of Development is adopted and recodification of Zoning Regulations completed.

8. Summary and Conclusions

High visual, aesthetic, and ecological value of Darien coastline; need for educational programs to accomplish objectives detailed in Chapter 6; use of CAM program for the protection, preservation and wise management of the existing shoreline and coastal resources; use of staff and various regulatory agencies in carrying out respective programs. Also listed are the additional work elements of the Program: base maps within Coastal Boundary; resource inventory maps; 35MM slide inventory with slide presentation and index maps.

TABLE OF CONTENTS

Executive Summary
Table of Contents
Listing of Figures

Page

1.0 Background of Municipal Program 1.

1.1 Legislative Action . . . . . 2.
1.2 Description of Darien's Coastal Boundary . . . . . 3.
1.3 Intent of Municipal Coastal Program. . . . . 5.

2.0 Land Use & Development of Darien's Coastal Zone. . . . . 7.

2.1 Existing Town Plan of Development. . . . . 9.
2.2 Current Land Use and Environmental Regulation. . . 12.
2.3 Subdivision Regulations . . . . . 15.
2.4 Non-Residential Land Use . . . . . 16.
2.5 Existing Land Values . . . . . 19.
2.6 Existing Land Use . . . . . 20.

3.0 Coastal Resources . . . . . 21.

3.1 Overview of Resource Base . . . . . 22.
3.2 General Resources . . . . . 24.
3.3 Bluffs and Escarpments . . . . . 24.
3.4 Rocky Shorefront . . . . . 25.
3.5 Dunes and Beaches. . . . . 26.
3.6 Tidal Wetlands . . . . . 27.
3.7 Freshwater Wetlands & Watercourses . . . . . 29.
3.8 Intertidal Flats . . . . . 31.
3.9 Coastal Hazard Areas . . . . . 32.
3.10 Developed Shorefront . . . . . 33.
3.11 Islands . . . . . 33.
3.12 Shorelands . . . . . 34.
3.13 Shellfish Concentration Areas . . . . . 35.
3.14 Coastal Waters & Estuarine Embayments . . . . . 37.
3.15 Air Resources & Air Pollution . . . . . 39.

4.0 Detailed Resource Data for Coastal Zone . . . . . 40.

4.1 Five Mile River . . . . . 42.
4.2 Contentment Island . . . . . 49.
4.3 Fish Islands . . . . . 52.

Table of Contents (continued)

Page

4.4 Scotts Cove . . . . . 55.

4.4(a) Contentment Island Cove . . . . . 55.
4.4(b) Tokeneke Brook . . . . . 59.
4.4(c) Tokeneke Trail Cove . . . . . 62.
4.4(d) Delafield Island Cove . . . . . 65.
4.4(e) Salem Straits . . . . . 68.

4.5 Sargent's Cove . . . . . 72.
4.6 Long Neck Point . . . . . 76.
4.7 Pear Tree Point . . . . . 78.
4.8 Darien River . . . . . 81.
4.9 Gorham's Pond . . . . . 86.
4.10 Noroton Bay . . . . . 90.
4.11 Holly Pond . . . . . 94.
4.12 Noroton River . . . . . 98.

5.0 Identification of Coastal Issues . . . . . 102.

5.1 Improvement of Boating Opportunities . . . 103.
5.2 Coastal Hazard/Flood Damage . . . . . 107.
5.3 Preservation and Enhancement of Tidal Wetlands . . . . . 109.
5.4 Maintenance of Recreational Shellfish Opportunities and Establishment of Commercial Oystering Policy . . . . . 111.
5.5 Local Policies on Dredging of New and Existing Navigation Channels . . . . . 112.
5.6 Protection and Enhancement of Wildlife Habitat . . . . . 114.
5.7 Project Analysis and Proposals for Specific Coastal Areas . . . . . 115.
5.8 Protection and Preservation of Shoreline . 115.
5.9 Improvement and Expansion of Physical and Visual Public Access . . . . . 117.
5.10 Identification and Control of Erosion and Sedimentation . . . . . 118.
5.11 Establishment of a Policy for Coastal Structures and Filling . . . . . 120.
5.12 Mitigation of Coastal Development Impacts . 122.
5.13 Management of Darien's Tidal Ponds . . . . 123.
5.14 Preservation and Enhancement of Cultural Resources . . . . . 126.

6.0 Proposed Amendments to Plan of Development . . . . 128.

6.1 Improve Access . . . . . 129.
6.2 Protect, Preserve, and Enhance Visual Access . . . . . 129.

Table of Contents (continued)

Page

6.3 Expand Recreational Boating Opportunities . . . . 130.
6.4 Improve Recreational Shellfish Opportunities and Maximize Commercial Operations . . . . . 130.
6.5 Preserve and Protect Key Shoreline Resource Areas . . . . . 131.
6.6 Improve Natural Systems . . . . . 131.
6.7 Provide Substantially Improved Educational Opportunities . . . . . 131.

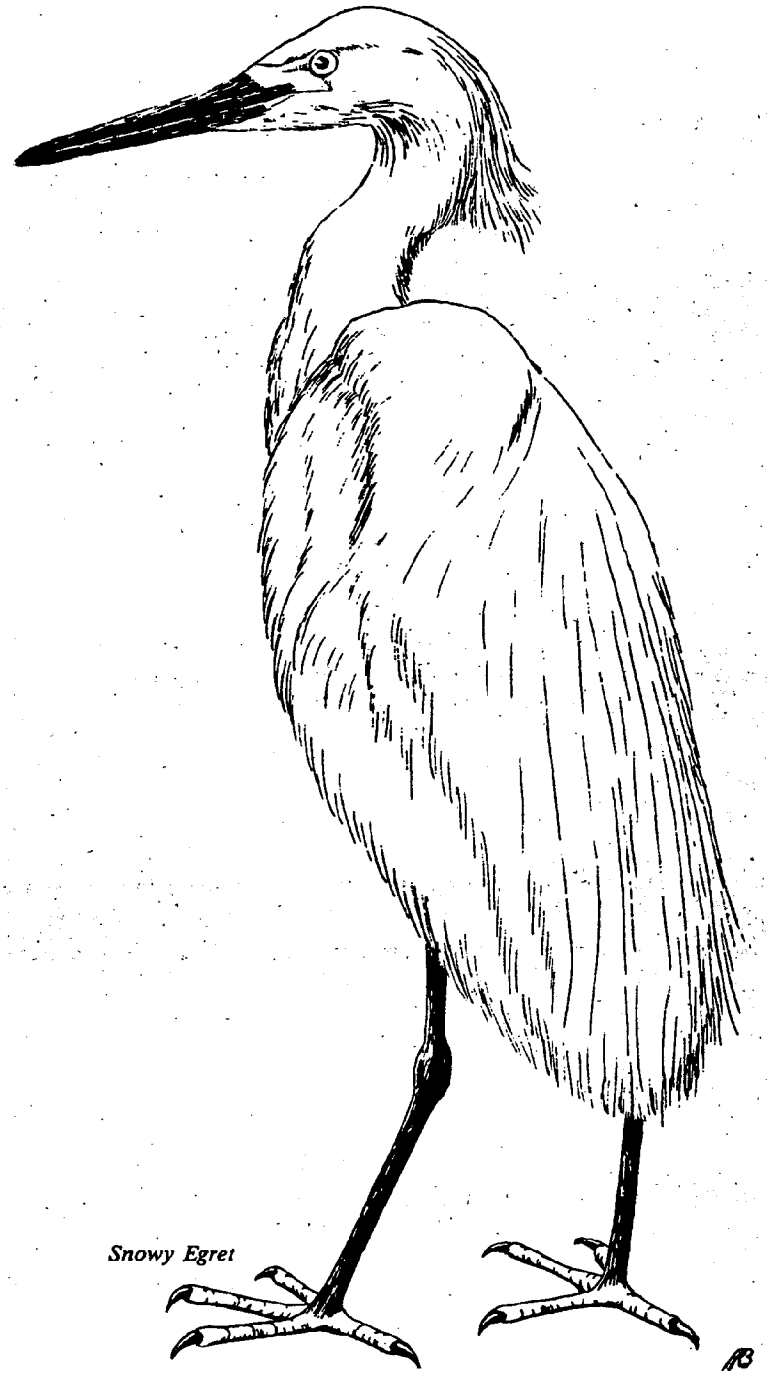
7.0 Proposals for Revising Local Regulations . . . . . 133.

7.1 Zoning Regulations . . . . . 134.
7.2 Subdivision Regulations . . . . . 137.
7.3 Inland Wetland Regulations . . . . . 138.
7.4 Coastal Site Plan Review . . . . . 138.

8.0 Summary and Conclusion . . . . . 141.

LIST OF FIGURES

Figure		Page
1.	Coastal Boundary Map	4.
2.	Coastal Area	8.
3.	Plan of Development	10.
4.	Zoning Map	14.
5.	Non-Residential Land Uses	18.
6.	Regulated Wetlands and Watercourses	30.
7.	Study Areas Map	41.
8.	Five Mile River	47.
9.	Contentment Island	51.
10.	Fish Islands	54.
11.	Scott's Cove	56.
12.	Contentment Island Cove	58.
13.	Tokeneke Brook	61.
14.	Tokeneke Trail Cove	64.
15.	Delafield Island Cove	67.
16.	Salem Straits Cove	71.
17.	Sargent's Cove	75.
18.	Long Neck Point	77.
19.	Pear Tree Point	79.
20.	Darien River	84.
21.	Gorham's Pond	89.
22.	Noroton Bay	92.
23.	Holly Pond	97.
24.	Noroton River	99.
25.	Flood Map	108.



Snowy Egret

1.0

BACKGROUND TO MUNICIPAL PROGRAM

1.1 Legislative Action

In 1972, Congress passed the Coastal Zone Management Act. This action was taken in response to a growing recognition of the need to protect the Nation's shorelines. The legislation applied to all thirty coastal states plus five coastal territories and it offered the specific opportunity and financial support to develop and establish comprehensive management programs for their respective coastal areas. The basic goals and objectives set forth were to:

- Identify, protect and enhance critical coastal resources
- Better coordinate governmental activities which affect coastal areas
- Encourage meaningful local governmental participation in the coastal management process
- Build strong working partnerships between the states and the Federal Government in the management of coastal areas
- Strengthen ongoing governmental programs, streamline coastal regulatory processes, and consolidate coastal permitting activities.

The first step was to form an agency at the federal level to organize and administer this new program. Accordingly, an Office of Coastal Zone Management was established within the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. It was the mission of this Office to deal with each of the coastal states and territories, and assist them in implementing the Coastal Zone Management Act.

The State of Connecticut began its Coastal Area Management Program (CAM) in 1975, in response to the initiative provided by the federal action. Approximately four years were spent in developing and promoting a State program and, in 1979, a final proposal was completed by the Coastal Area Management Unit of the State Department of Environmental Protection. Their work ultimately led to the adoption by the General Assembly of the required enabling legislation during the 1979 session. The new legislation, Public Act 79-535, became known as an "Act Concerning Coastal Management", and its fundamental purpose was to implement a comprehensive coastal management plan within the State of Connecticut. The new legislation became effective on January 1, 1980, and pertained directly to all 36 coastal communities within the State.

Connecticut's CAM Program specifically identified two major shortcomings within existing management systems being followed currently within the State. These were:

- a lack of coordination among agencies having jurisdiction over coastal concerns.

- an inadequate consideration of natural resource capacities in the process of reviewing and permitting coastal activities.

In an attempt to rectify these situations, the Act set forth statewide policies to guide both conservation and development of coastal resources. It also defined the coastal area, and detailed the regulatory system to be followed in the coastal areas of Connecticut. The established policies were to be considered by all communities in the development and implementation of their respective local programs. Further, it was mandated that local communities institute a procedure which incorporated what were termed "Coastal Site Plan Reviews" within their permitting processes. These Reviews were intended to require each coastal community to consider all impacts of development proposals upon coastal resources, within the defined coastal boundary area.

Immediately following the effective date of Connecticut's Coastal Area Management Legislation, the Darien Planning and Zoning Commission assumed its responsibilities for coastal planning and program administration. Necessary procedures were established to process Coastal Site Plan Reviews, and work was initiated on preparing the necessary amendments to the Zoning Regulations for allowing the processing of Administrative Permits.

1.2 Coastal Boundary

The required coastal management systems, and implementation of the established coastal policies, apply primarily to an area which is delineated by a thousand-foot setback from the mean high water line, or a thousand-foot setback from tidal wetlands or other coastal resources, whichever is the farthest inland.

The State authorized local municipalities to refine this Boundary if they chose to do so. It was specified that the geographical area encompassed by the State-established Boundary could not be reduced, but a community was permitted to realign the precise lines to follow physiographic or geographic features. This permitted realignment which avoided administrative difficulties in determining whether a use or activity was, or was not, within the defined Coastal Boundary.

This option was pursued by Darien shortly after the legislation was put into effect. The Planning and Zoning Commission conducted the necessary analysis to refine the local boundary and held the requisite public hearings to review it with interested townspeople. It was determined that both the amendments and the refinements were necessary to facilitate the processing of CAM Permits within the community. The redesigned Boundary followed centerlines of existing streets, centerlines of streams and water bodies, and property lines where no other reasonable alternative

COASTAL BOUNDARY MAP
Town of Darien, Connecticut

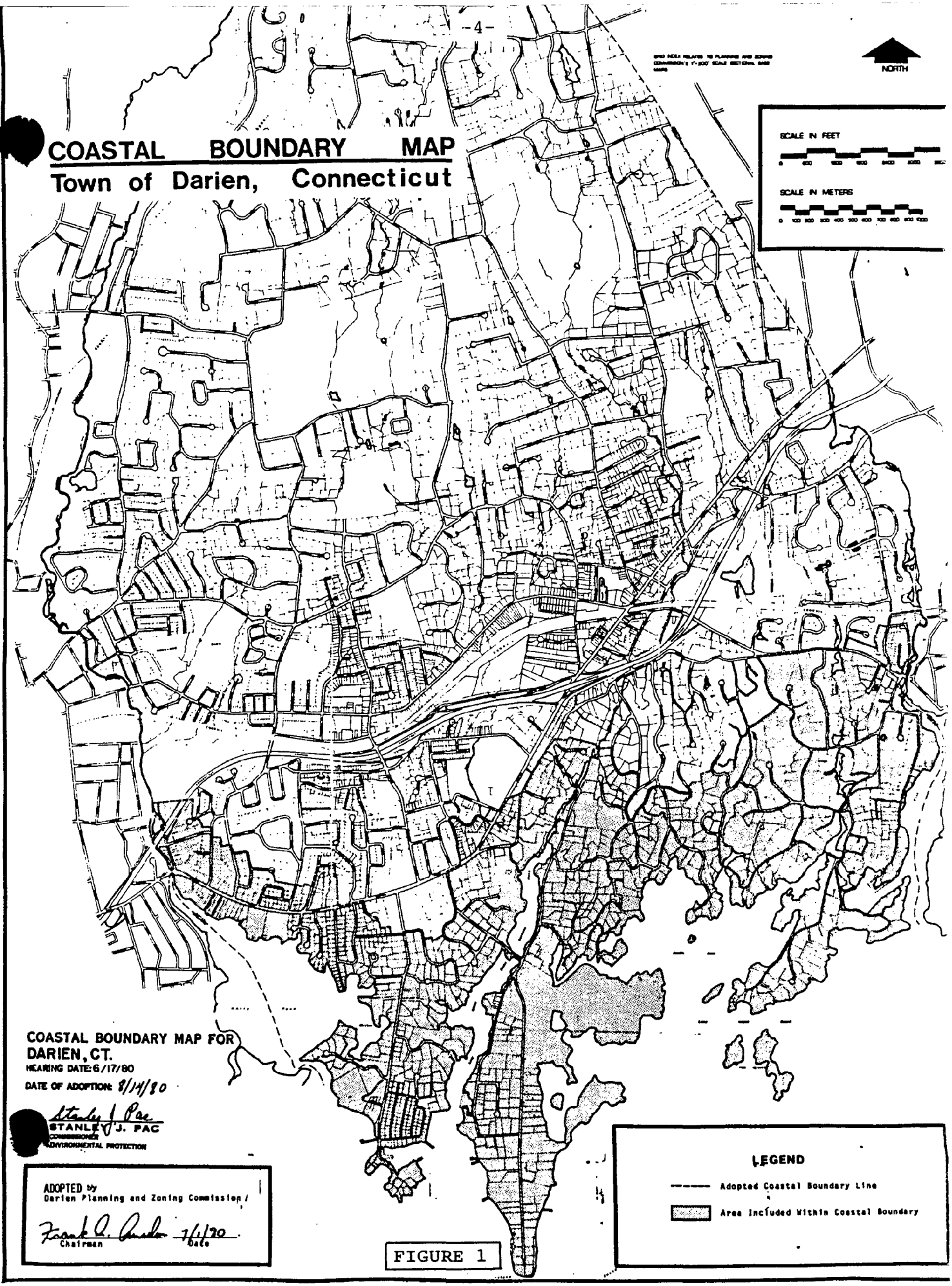


FIGURE 1

was available. The new Boundary was subsequently approved by the Commissioner of the DEP and was put into effect officially on August 14, 1980.

Local planning and zoning commissions and zoning boards of appeal are required to review all development proposals within this defined Coastal Boundary on a case-by-case basis to determine that coastal resources are being properly protected, and to determine that there is consistency between the proposed activity and the applicable coastal goals and policies.

1.3 Intent of Municipal Coastal Program

As stated above, this State coastal management approach involved a mandatory Coastal Site Plan Review system. It also incorporated procedures for the voluntary preparation of a Municipal Coastal Program.

Coastal Site Plan Review:

The State legislation required each community's Planning and Zoning Commission, and Zoning Board of Appeals, to review any application falling within the defined Coastal Boundary under specified CAM procedures. The intent was to determine if involved coastal resources are capable of supporting that particular project without sustaining any major negative impacts. These agencies are also responsible for determining if the proposed use or activity is suitable for the particular coastal location. Authority is given to approve, deny, or attach conditions to any approval of the applicant's proposal. Also, a review of consistency with the coastal policies set forth within the Coastal Area Management Act is specifically required. The legislation authorized municipalities to exempt, by regulation, various minor development activities within the Boundary as well. These may include additions to existing homes, or even the construction of a new house, where it is not located within 100 feet of a tidal wetlands area or a beach. Darien took advantage of this authorization, and adopted such a procedure on March 10, 1980. The Town's objective was to allow such minor activities to be processed as quickly as possible, while still maintaining adequate control within Darien's valuable Coastal Boundary area. During the first year, some 50 Administrative Permits were handled in this manner.

Municipal Coastal Program:

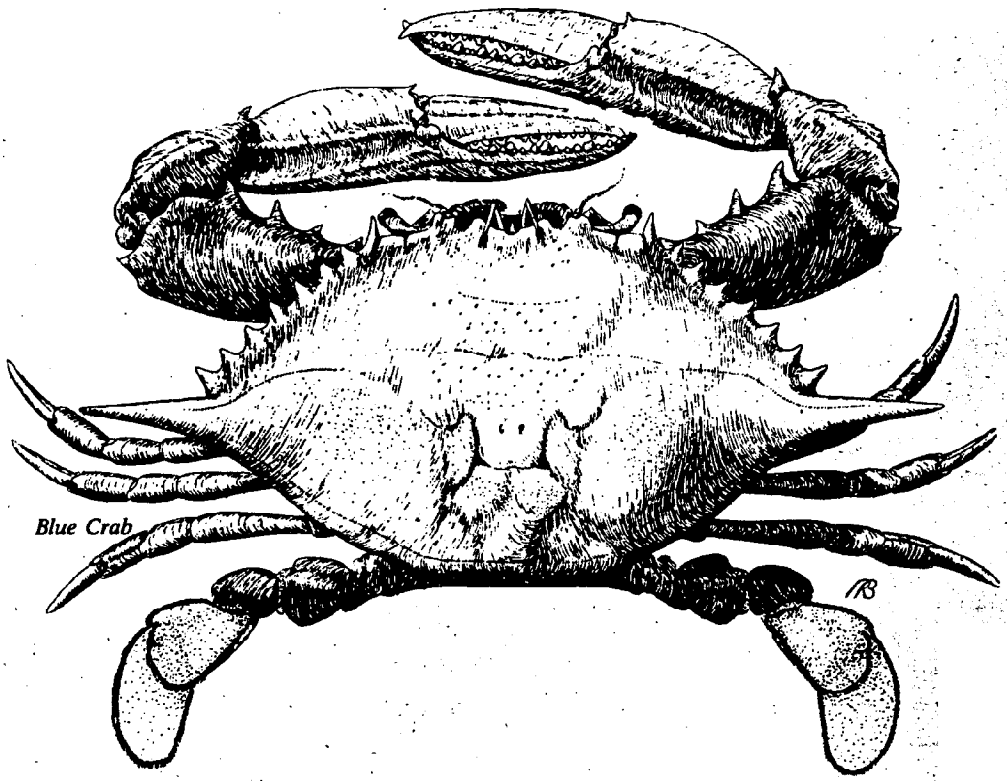
The State CAM legislation authorized and supported a reasonably flexible voluntary planning program. The intent was to enable a coastal community to undertake necessary inventories, analyses, and policy development which would lead to desirable revisions to the community's Plan of Development, and adoption of necessary amendments to the local zoning regulations and other land use controls. This program is designed to provide a long-range plan for coastal development and conservation within the community,

and guidance for coastal property owners and developers relative to the community's position on coastal matters. In its initial phase this planning work involved the identification of major coastal-related problems and issues facing the community. Subsequent work is designed to meet those specific needs. Implementation of the Municipal Coastal Program occurs primarily through the existing regulatory and development programs at the local level within the Coastal Site Plan Review process.

Ultimately, the Town Plan of Development must include full consideration of:

- coastal problems and issues
- the nature and location of coastal resources
- future water-dependent development opportunities which exist within the Coastal Boundary

This report, together with all the work involved in its preparation, comprises Darien's effort to establish a sound coastal management system for the protection of the Town's most valuable physical asset, its shoreline.



2.0

LAND USE & DEVELOPMENT OF COASTAL ZONE

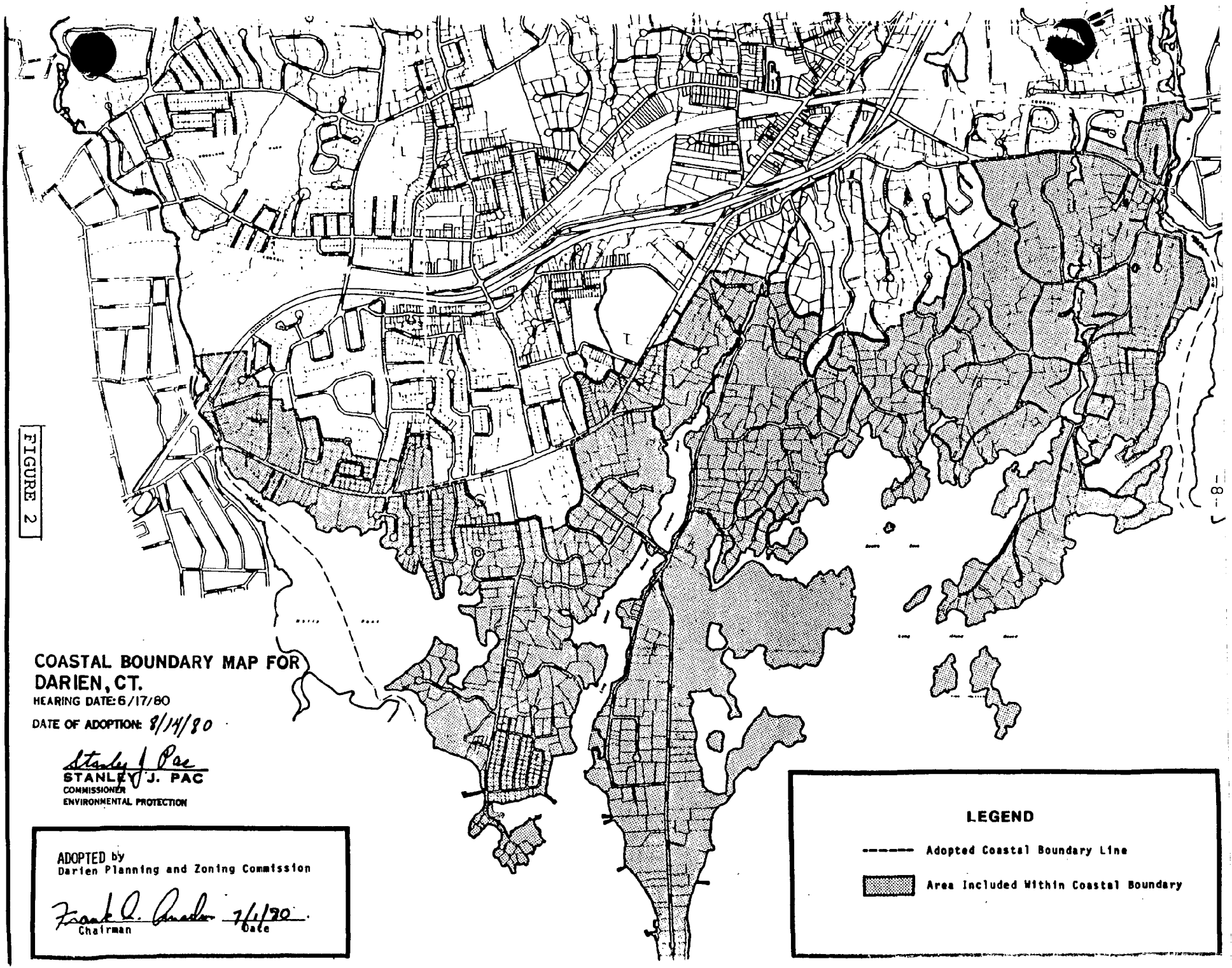

COASTAL BOUNDARY MAP FOR
DARIEN, CT.
HEARING DATE: 6/17/80
DATE OF ADOPTION: 8/14/80
STANLEY J. PAC
COMMISSIONER
ENVIRONMENTAL PROTECTION
ADOPTED by
Darien Planning and Zoning Commission
Chairman
Date
LEGEND
Adopted Coastal Boundary Line
Area Included Within Coastal Boundary

FIGURE 2

2.1 Existing Town Plan of Development

The Plan of Development currently in effect was adopted by the Planning and Zoning Commission on December 1, 1967. In many respects, this original comprehensive plan has become outdated and obsolete. However, much of what is contained within this document pertaining directly to the Town's coastal areas is still valid and this CAM Program is designed to augment and expand much of that earlier, more general thinking.

The document declares that: "Particular attention should be paid to conserving the character and natural beauty of the shoreline, interior streams, and other areas of natural beauty through regulation of development." Several other sections of the Town Plan also strongly recommend similar types of action to protect and preserve the Town's key resource areas, first and foremost of which is the shoreline area.

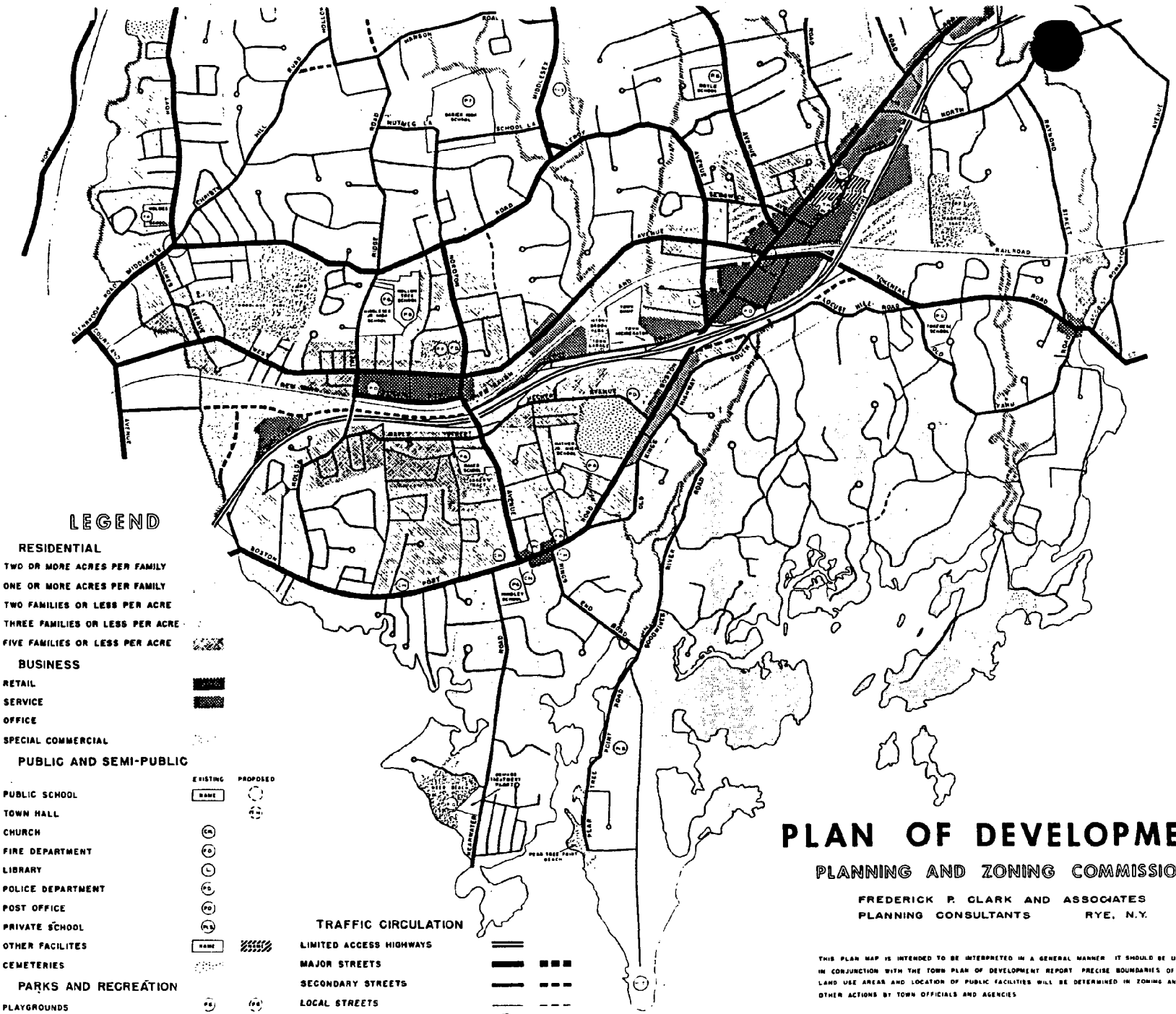
The Plan suggested several options available to communities for achieving this. These included:

- the preservation of open spaces by acquiring the title to such lands
- the receipt of open space lands as gifts from private individuals or organizations, or their acquisition by such private interests which would maintain it as open space themselves
- the establishment of permanent open space areas through the subdivision review process
- the acquisition of certain legal rights or interests in open space land. For example, the Town could retain the sole rights to develop such parcels, or could obtain scenic, drainage or other types of easements to preserve key lands against development.

It should be noted that many of the coastal policies and recommendations set forth within that 1967 Plan have been implemented as proposed. For example:

- the Town has acquired additional shoreline area.
- valuable open space lands have also been secured through gifts from private individuals, such as the conveyance of marshland within, and in proximity to, Scott's Cove. Private property owners have conveyed such lands to the Land Trust of Darien in accordance with the recommendations.

FIGURE 3


NUTMEG LA
SCHOOL LA
MIDDLESEX
CHURCH
HOLMES
BOSTON
POST
NEW HAVEN
RAILROAD
NORTH
STREET
RIVER
POINT
PEAR TREE POINT BEACH
SEAWATER
PLANT
LEGEND
RESIDENTIAL
TWO OR MORE ACRES PER FAMILY
ONE OR MORE ACRES PER FAMILY
TWO FAMILIES OR LESS PER ACRE
THREE FAMILIES OR LESS PER ACRE
FIVE FAMILIES OR LESS PER ACRE
BUSINESS
RETAIL
SERVICE
OFFICE
SPECIAL COMMERCIAL
PUBLIC AND SEMI-PUBLIC
EXISTING
PROPOSED
PUBLIC SCHOOL
TOWN HALL
CHURCH
FIRE DEPARTMENT
LIBRARY
POLICE DEPARTMENT
POST OFFICE
PRIVATE SCHOOL
OTHER FACILITES
CEMETERIES
PARKS AND RECREATION
PLAYGROUNDS
PLAYFIELDS
PUBLIC PARKS AND RESERVES
PRIVATE RECREATION AREAS
TRAFFIC CIRCULATION
LIMITED ACCESS HIGHWAYS
MAJOR STREETS
SECONDARY STREETS
LOCAL STREETS
MAJOR INTERSECTIONS NEEDING IMPROVEMENT
RAILROAD AND LIMITED ACCESS HIGHWAY LANDS
NOTE: PUBLIC PARKING AREAS ARE SHOWN ON THE SEPARATE DRIVING
PLAN OF DEVELOPMENT
PLANNING AND ZONING COMMISSION
FREDERICK P. CLARK AND ASSOCIATES
PLANNING CONSULTANTS RYE, N.Y.
THIS PLAN MAP IS INTENDED TO BE INTERPRETED IN A GENERAL MANNER. IT SHOULD BE USED IN CONJUNCTION WITH THE TOWN PLAN OF DEVELOPMENT REPORT. PRECISE BOUNDARIES OF LAND USE AREAS AND LOCATION OF PUBLIC FACILITIES WILL BE DETERMINED IN ZONING AND OTHER ACTIONS BY TOWN OFFICIALS AND AGENCIES.
THE PREPARATION OF THIS MAP WAS FINANCIALLY AIDED THROUGH A FEDERAL GRANT FROM THE URBAN RENEWAL ADMINISTRATION OF THE HOUSING AND HOME FINANCE AGENCY, UNDER THE URBAN PLANNING ASSISTANCE PROGRAM AUTHORIZED BY SECTION 701 OF THE HOUSING ACT OF 1954, AS AMENDED, UNDER THE SUPERVISION OF THE CONNECTICUT DEVELOPMENT COMMISSION.
THIS BASE MAP WAS REPRODUCED IN FEBRUARY 1959 FOR THE DARIEN PLANNING AND ZONING COMMISSION FROM 18 SECTIONAL BASE MAPS PREPARED BY FREDERICK P. CLARK AND ASSOCIATES, GEORGE A. SEMILLIP, P.E.

- following adoption of the 1967 Plan, the Town Subdivision Regulations were amended to require that a minimum of 10% of the land involved within a subdivision be set aside as permanent open space. In many instances, this open space has involved coastal resource areas which have been deemed to be of particular importance to the community.

- the Town has established procedures to encourage the granting of conservation, scenic, and other types of easements designed to permanently preserve and protect fragile areas including, in particular, the types of lands defined within the Plan.

The existing Town Plan also set forth more specific objectives, many of which have been implemented over the past fifteen years. For example, it was recommended that Weed Beach Park be expanded. The Plan referred to needs to increase the beach area in a northerly direction, provide more parking facilities, expand the picnic facilities, and do other related work to improve access to, and enjoyment of, this shoreline area by all townspeople. Most of this work has been completed.

Another example of a specific recommendation which has been implemented was to provide improved boat launching facilities at Pear Tree Point Park. Again, additional land was acquired, and a modern, convenient boat ramp replaced the marginal facility in existence at the time the Plan was prepared.

As another objective, the Plan recommended that, "The narrow bankside strip fronting on the Darien River, along the westerly side of Pear Tree Point Road from Ring's End Bridge, southerly to Pear Tree Point Park, and except for the peninsula containing several residences, should be acquired to preserve the view and great scenic beauty of this waterway." A substantial section of this strip of land has since been acquired, and will assure that the superb water views continue to be available to the townspeople, and that a portion of this strip can be available for passive recreational purposes.

Another 16,150 feet of shoreline has been permanently protected through the use of conservation easements, open space declarations, or other similar means. The vital distinction is that the latter designations do not, in most cases, incorporate any public access, and could not have been secured had they provided for such.

A comprehensive revision of the Town's official Plan of Development is now underway. The work performed under this Municipal Coastal Program will be part of this effort, and proposals will be integrated within the Town Plan.

2.2 Current Land Use and Environmental Regulation

Except for the very small Neighborhood Business (NB) commercial area of White Bridge, on the Five Mile River, all of Darien's Coastal Boundary is zoned under residential categories. Most of this area is within the Residential - One Acre (R-1) District. This relatively low density requirement has been a major factor in the protection of the Town's valuable coastal resources.

There are non-residential uses or activities which are deemed under "Special Permit" procedures, to be compatible with the Town's residential areas. They include facilities such as private recreational clubs and churches. These have not had any major, adverse impacts on the coastal areas, and only eight Special Permit uses are located directly on the shoreline. Of these, five provide water-oriented recreational uses. The remaining uses are a religious retreat, and two non-conforming uses, including a restaurant and a gasoline service station.

The Commission believes that Special Permit types of uses are being adequately controlled largely through the use of the extensive and detailed findings which must be made prior to granting any such new use, or an extension of an existing one. The implementation of improved environmental regulations has made this level of control even more effective.

Significant progress has been made over the past decade in establishing improved regulations on activities conducted within what is now recognized as the Town's Coastal Boundary. A major step was taken in 1973, when the Planning and Zoning Commission adopted a new section for its Zoning Regulations entitled, "Section 486." Special Regulations for Protection and Conservation of Land, Wetlands, Watercourses, Tidelands, Flood Plains and other Natural Areas." These Regulations govern all activities within a prescribed distance of either the Mean High Tide line, or the mean waterline, as specified. In the case of coastal areas, the regulated area applies to a strip 100 feet wide along the Mean High Tide line. Activities covered include excavation; earth removal; regrading; filling; other alterations of the natural contour; dredging; obstruction; channeling; piping; any type of pollution; and the construction of any form of structure.

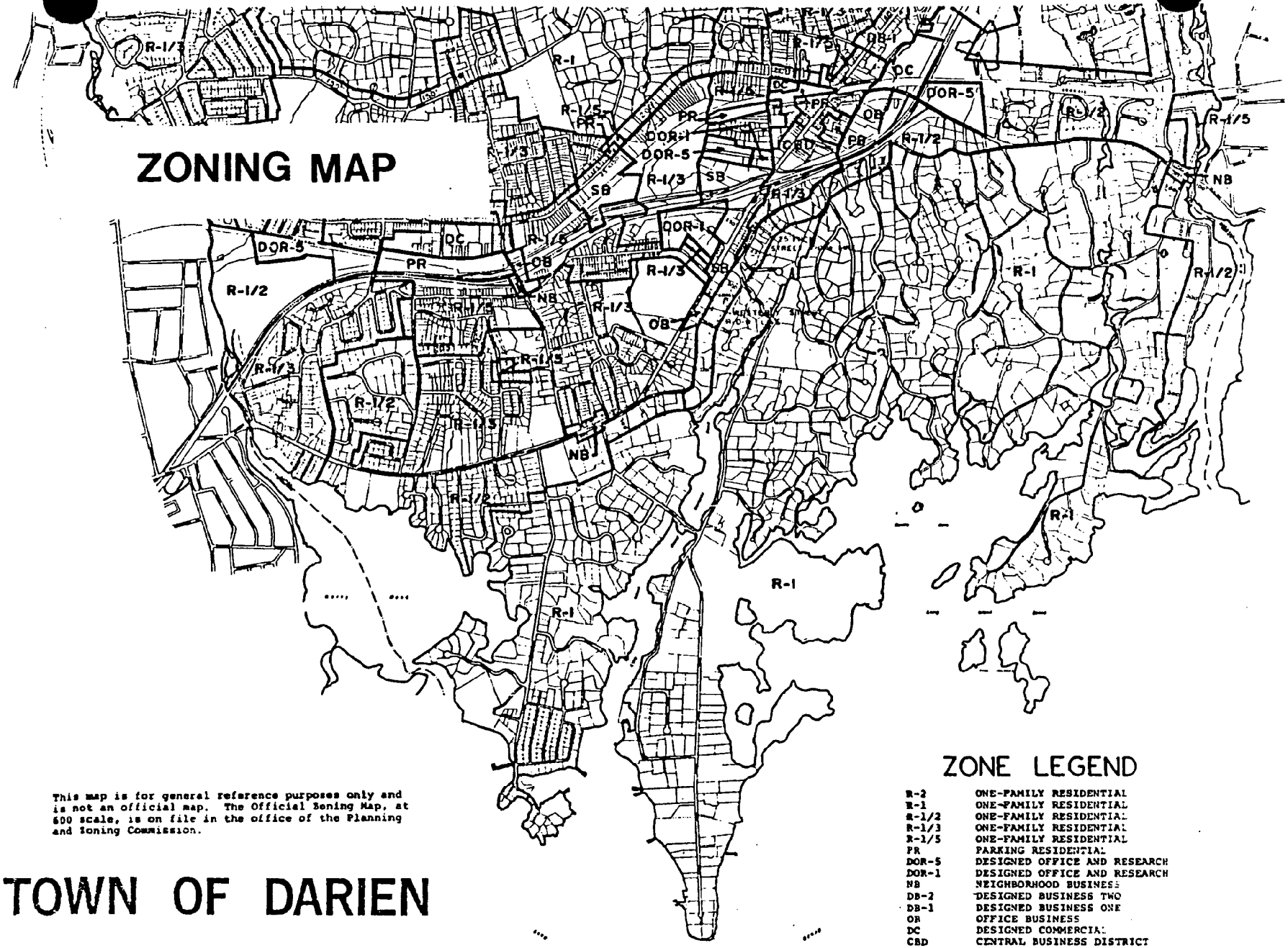
In the spring of 1981, the Planning and Zoning Department began to develop a coastal area management planning program and emphasis was placed on planning as the major thrust of Darien's efforts. One of the basic reasons for this was that the Planning and Zoning Commission had already been processing permits for development activities within the shoreline area as part of the 1973 regulation. Since that time, the Town has been requiring the issuance of a Special Permit for all activities within 100 feet of Mean High Tide. Under CAM, the jurisdictional area has been increased significantly, and the process, together with its critical concerns along the water's edge, has continued, but with some procedural modifications.

In order to gain approval for conducting shoreline-related activities, it is necessary to submit a formal application to the Planning and Zoning Commission. The degree of detail required must be consistent with the type of activity being proposed. For example, in the case of a major project it is necessary to submit, along with the letter of application, detailed site plans, environmental impact assessments, necessary hydrological or other engineering studies, and other related work. The Planning and Zoning Commission then processes the application through a public hearing, and is required to make a series of declared determinations. In addition to the findings required by the regular Special Permit procedures outlined in the Zoning Regulations, the Commission must also find specifically that the proposed regulated activities will not adversely affect the natural resources of the town, or the environmental character of the surroundings of the site. These findings are made formally before any Special Permit can be approved under this section of the Zoning Regulations. In granting any such Special Permits, the Planning and Zoning Commission attaches necessary limitations or conditions which it deems necessary to conserve and protect the soil, water, air, vegetation or other natural attributes of the site and its general area. Conservation restrictions, or easements, are one of the principal tools used by the Commission to provide for the permanent protection of particularly fragile or valuable natural areas.

Two other major sections have also been added to the Town's Zoning Regulations. These two new sections involve the Coastal Area Management requirements, which were put into effect on March 10, 1980, and the Flood Damage Prevention Regulations, which were made effective on December 28, 1980. Both of these were implemented in response to established Federal programs, but the design of the requirements, and the method of administering them, are totally consistent with the recommendations of the Town Plan. Other minor amendments have also been made to the Town's Zoning Regulations to help achieve improved protection and preservation of key resource areas. The Coastal Area Management Program will significantly assist by providing definite direction, based on predetermined resource conditions or values.

FIGURE 4

ZONING MAP



This map is for general reference purposes only and is not an official map. The Official Zoning Map, at 500 scale, is on file in the office of the Planning and Zoning Commission.

TOWN OF DARIEN

ZONE LEGEND

R-2	ONE-FAMILY RESIDENTIAL
R-1	ONE-FAMILY RESIDENTIAL
R-1/2	ONE-FAMILY RESIDENTIAL
R-1/3	ONE-FAMILY RESIDENTIAL
R-1/5	ONE-FAMILY RESIDENTIAL
PR	PARKING RESIDENTIAL
DOR-5	DESIGNED OFFICE AND RESEARCH
DOR-1	DESIGNED OFFICE AND RESEARCH
NB	NEIGHBORHOOD BUSINESS
DB-2	DESIGNED BUSINESS TWO
DB-1	DESIGNED BUSINESS ONE
OB	OFFICE BUSINESS
DC	DESIGNED COMMERCIAL
CBD	CENTRAL BUSINESS DISTRICT
SB	SERVICE BUSINESS
PB	PLANNED RETAIL BUSINESS

NOTE: For order of restrictiveness refer to Section 320 of the Darien Zoning Regulations.

2.3 Subdivision Regulations

The major amendment to the Town's Subdivision Regulations, accomplished since the adoption of the Town Plan, has been the incorporation of requirements for the preservation of open space land as part of any subdivision involving a land area equal to or greater than, three times the minimal lot size for the zone in which it is located. In such situations, it is required that the property owner dedicate, as a permanent open space preservation, land not less in amount than 10% of the aggregate area of the subdivision tract. This procedure has been followed consistently by the Planning and Zoning Commission since March 18, 1973. It is noted specifically in the Regulations that dedicated open space land must be provided in addition to all land required by both the Zoning and Subdivision Regulations in meeting minimal lot, street, accessway, or other development requirements. Also, it may be required in addition to any other lands which are protected under conservation restrictions. The opening statement in the open space section of the Subdivision Regulations reads, "An essential purpose of these Regulations is the preservation and conservation of land in a natural condition for perpetuity, in order to create buffers against noise and air pollution, and to protect natural environmental systems, vegetation, wildlife, climate, scenery, natural history, areas of archeological significance, residential privacy, and natural resources, including, but not limited to, edges of watercourses, lakes, and ponds, wherever they occur within Subdivisions." This purpose has been achieved directly.

In virtually all cases, the Commission has required that open space declarations and conservation easements be used to protect natural shoreline areas. Legal instruments establishing the ownership and maintenance responsibilities of the open space areas have been made a part of the subdivision application, and each is specifically approved by the Planning and Zoning Commission to meet particular needs. They are then filed in the Darien Land Records to become permanent, binding conditions.

With some modification, it is assumed that the land use regulations currently in effect will be sufficient in a legal/technical sense to carry out the objectives of the Coastal Area Management Program. The effective application of these regulations will benefit from the detailed data on resources furnished by this coastal area study.

2.4 Non-Residential Land Use

As noted in Section 2.2, only eight privately held and two public non-residential uses are currently located directly on the shoreline. Of these, five private and two public provide access to Long Island Sound for recreational purposes. These uses are described below and their location is shown on Figure 5:

1. Tokeneke Beach Club, Butler's Island
   - private social/recreational club
   - 5.04 acres, 680 feet of shoreline
   - sand beach, floats, bathhouses, sailing program
   - clubhouse with dining room
   - swimming pool
   - 17 tennis courts
   - parking for 143 cars
   - 325 member/families

2. Noroton Yacht Club, Noroton Bay
   - private yachting club
   - 2.23 acres, 570 feet of shoreline
   - clubhouse
   - docks, piers, launch, drydock storage
   - 3 tennis courts
   - parking for 100 cars
   - 200 member/families

3. Darien Boat Club, Darien River
   - quasi-public boat club, open to all Town residents
   - 0.48 acres, 650 feet shoreline
   - club building
   - accommodations for 259 boats, average boat length 20 feet
   - parking as part of Pear Tree Point Park (limited)
   - 525 members, waiting list for boating facilities

4. - Young Men's Christian Association, Holly Pond
   - full YMCA facility
   - sailing program, other water-related activities
   - 7.344 acres, 795 feet shoreline
   - parking for 126 cars
   - 5,000 members, 60-65% adults

5. Noroton Bay Association, Noroton Bay
   - residential association beach
   - 0.7 acres, 904 feet shoreline
   - sand beach, wharf, sailing program
   - no on-site parking
   - 90 member/families

The remaining private uses are:

6. Convent of St. Birgitta, Scott's Cove
7. Twin Faces Restaurant, Holly Pond
8. Chevron Service Station, Five Mile River

Public facilities on the shore include:

9. Weed Beach Park
   - public beach and related facilities
   - 22.2 acres, 1,810 feet shoreline
   - bathhouse, concession stand
   - parking for 250+ cars
   - 6 tennis courts, 5 paddle courts
   - picnic area and related facilities
   - sailing program

10. Pear Tree Point Beach Park
   - public beach
   - 6.9 acres, 850 feet shoreline
   - bathhouse, concession stand
   - parking for 240 cars
   - boat launching ramp
   - small picnic area

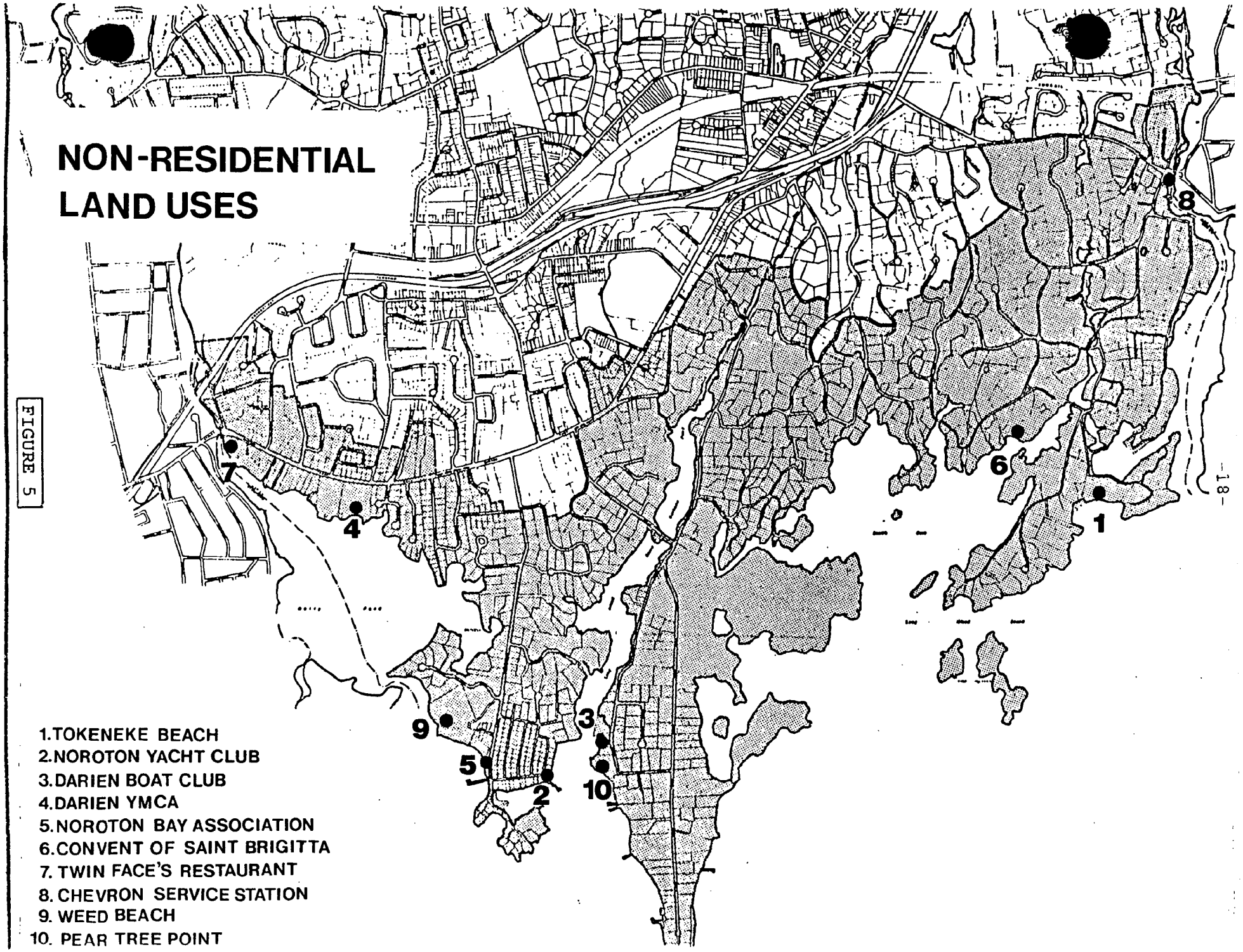

NON-RESIDENTIAL
LAND USES
1
2
3
4
5
6
7
8
9
10
1.TOKENEKE BEACH
2.NOROTON YACHT CLUB
3.DARIEN BOAT CLUB
4.DARIEN YMCA
5.NOROTON BAY ASSOCIATION
6.CONVENT OF SAINT BRIGITTA
7. TWIN FACE'S RESTAURANT
8. CHEVRON SERVICE STATION
9. WEED BEACH
10. PEAR TREE POINT

FIGURE 5

2.5 Land Values

During the 1960's and early 1970's, coastal properties were not in demand as they are today. Values of shoreline properties skyrocketed in the late 1970's, and it can be anticipated that they will continue to increase.

In 1967, at the time the original Plan of Development was adopted, one-acre building lots located directly on, or in immediate proximity to the shoreline, were being sold for approximately $75,000 to $80,000. A relatively modest home on a third- or half-acre lot with a coastal orientation, such as those located in Noroton Bay, was selling for $70,000 to $75,000. A more substantial home, such as one located on Butler's Island, cost in the range of $150,000 to $200,000.

Since that time, values along the shoreline have multiplied five-fold. For example, remaining one-acre building lots on the water's edge now command whatever the market will bear. Depending upon location, a one acre building lot on the water's edge would now command from $350,000 to more than a million dollars. That same modest home located in Noroton Bay is now selling for more than $225,000, and the more substantial home is now costing over one million dollars.

The presence of Long Island Sound and the shoreline areas also have other significant effects on property values. For example, where a view of Long Island Sound is available from the property, it is estimated that something in the order of 10% to 25% of added value can be applied. Accordingly, it can be made clear that protection of views from interior properties, and protection of coastal resources which are directly part of shoreline properties, are of particular significance to individual owners, since anywhere from 20% to 50% of their investment may be involved. Bulkheading, docks, piers and related types of facilities can also add substantially to the value, so there is a fine balance between needs to preserve and desires to develop the shoreline. This only accentuates requirements for a sound data base on specific resource areas and needs.

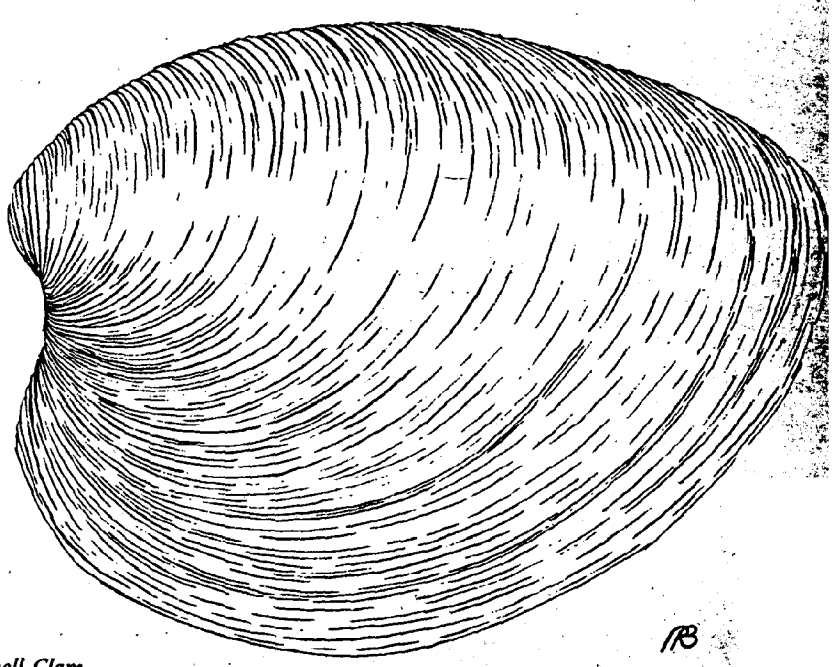
In a more general sense, the inclusion of a portion of Long Island Sound within Darien adds to the overall property values of the community. The existence of the Town beaches and boating opportunities, together with visual access, are reflected in all home prices. Consequently, the need to properly address coastal issues from an economic perspective is not restricted solely to shoreline property owners. The Sound has much to do with the quality of life in Darien and thus, its land values.

2.6 Existing Land Use

Within the defined Coastal Boundary are 1,802 acres of land. Of this total, the following numbers of acres are allocated to specific land uses:

	Acres
Single family	1,136.0
Local road right-of-way	234.2
Vacant (including islands)	223.9
Permanent open space	47.5
Agriculture	40.5
Public parks/recreation	25.2
Two family	23.0
Semi-public institution	22.0
Private recreation/preserves	11.7
Public/private school	8.8
Highway right-of-way	4.7
Miscellaneous uses	14.5
Total acres	1,802.0

As can be noted, the dominant use within the Coastal Boundary is single-family residential, occupying 64% of the total land base. Much of the 13% of the still-vacant land involves wetlands, steep slopes and other areas having restricted development or use opportunities.



Hard-shell Clam

3.0

COASTAL RESOURCES

3.1 Overview of Resource Base

The Town of Darien has long appreciated the value of its shoreline. While it has been recognized that the coastal areas provide a very valuable and fragile natural resource base, the Town has not had the expertise available to make a comprehensive inventory and, consequently, adequate analyses of specific resource areas have not been made. Accordingly, it was concluded that such an effort would become the major part of Darien's Municipal Coastal Program planning effort.

It is a declared policy of Coastal Area Management to preserve and enhance coastal resources in accordance with the policies established under the Act. Coastal resources are defined as "the coastal waters of the state, their natural resources, related marine and wildlife habitat, and adjacent shorelands, both developed and undeveloped, that together form an integrated terrestrial and estuarine ecosystem." (Source P.A. 79-535, sec. 3(7)).

In order to meet the requirements of the State CAM Act, and establish the necessary inventory of coastal resources within the Town of Darien, a shoreline survey was undertaken during the Summer of 1981. This survey was instrumental to the preparation of four work products: 1) the Darien Coastal Area Management Report; 2) four Darien Coastal Resources Maps: Five Mile River, Scotts Cove, Darien River, and Holly Pond; 3) three volumes of 35 mm color slides which depict the entire shoreline as of October 1981, and are keyed to the Coastal Resources Maps; and 4) a working knowledge of coastal issues and problems.

The Planning and Zoning Department engaged the services of the professional staff of the Long Island Sound Task Force of the Oceanic Society to make this inventory, and to participate directly in the development of the Town's Municipal Coastal Program. The consultants walked along the intertidal shore, on rock shorefront and in cordgrass marshes wherever possible, documenting such factors as the precise locations of tidal marshes, noting potential impacts upon nearby shellfish areas, and documenting in detail the location and type of every structure located along the Darien coast. Areas particularly valuable for habitat purposes were also identified, along with areas which were considered to be particularly fragile. Where access was otherwise impossible or damaging to the habitat, a 14-foot Zodiac was used.

Another part of this inventory process involved the use of existing aerial and infrared photography, together with the Darien Planning and Zoning Commission's base maps. The inventory involved a complete on-site analysis, and the photographing of the entire shoreline, beginning above the White Bridge over the Five Mile River on the Darien-Norwalk town line, and proceeding approximately 16.5 miles west along the coast to the Noroton River on the Darien-Stamford town line.

Thirty-five mm color slide film was used. The purpose of doing this was twofold. First, these slides could be used in public presentations on coastal concerns and secondly, they would prove to be an effective tool in the enforcement of the Town's regulations over coastal areas. Another consulting firm, F. P. Clark and Associates, was engaged to map all the resource data on sectional base maps of Darien's coastal areas. Index maps for the slide inventory were also prepared as part of this second phase. A complete record now exists of all facilities and resource conditions as of the summer of 1981.

During the performance of this work, efforts were pursued to discuss coastal issues and needs with various interests within the community. Based in part upon the findings made from the inventory, certain problems and opportunities were reviewed with appropriate Town Officials and involved townspeople. This approach helped in identifying issues needing early attention.

Previous plans prepared by the Town which applied to shoreline areas and conditions were also reviewed in detail, and work was specifically designed to address issues raised by these documents. The intent of the CAM effort was to take this prior work and incorporate it into this program centered specifically on shoreline areas. This more comprehensive approach provided a solid base for necessary amendments to the Town's Plan of Development regarding changes needed on the Town's land use controls and, most importantly, for improving day-to-day actions necessary to protect Darien's shoreline and taking advantage of opportunities as they appeared.

The Connecticut Coastal Area Management Program specifically defines fourteen different coastal land and water resources:

3.2 - General Resources
3.3 - Bluffs and Escarpments
3.4 - Rocky Shorefronts
3.5 - Dunes and Beaches
3.6 - Tidal Wetlands
3.7 - Freshwater Wetlands and Watercourses
3.8 - Intertidal Flats
3.9 - Coastal Hazard Areas
3.10 - Developed Shorefront
3.11 - Islands
3.12 - Shorelands
3.13 - Shellfish Concentration Areas
3.14 - Coastal Waters and Estuarine Embayments
3.15 - Air Resources and Air Quality

The status of these coastal resources within the Town of Darien is as follows:

3.2 General Resources

The coastline of Darien, directly on the northern shore of Long Island Sound, extends in an east-west orientation only 2.7 linear miles. However, if one were to walk the actual shoreline the distance involved expands to approximately 16.5 miles. This is due to a variety of features typical of the New England glaciated coast. Viewed from the middle of the Sound, the major coastal feature in Darien is a line of rock bluff and escarpment. There is the major rock bluff toward the easterly Town border, guarding the approach to the Five Mile River. Rock bluff and modified escarpment extend from there to the westerly tip of Contentment Island. Directly to the west is the mouth of Scott's Cove (approximately 0.4 miles wide) which is studded with rock islands, and forms a break in this rock wall. The coast then continues in a southwest direction with another stretch of rock bluff and modified escarpment, reaching a terminus into the Sound at Long Neck Point. This rocky aspect continues along the westerly shore of Long Neck Point, across Darien Harbor, to the entrance to Holly Pond. This "armor plating" accounts for a third (approximately 5 miles) of the actual coastline, and allows the remainder of coastal habitat areas to flourish.

Behind this protection from storm surge and wind-driven waves lie several extensive tidal marshes, ranging from vast cordgrass (Spartina alterniflora) stands fringed with a hint of high marsh (dominated by S. patens), as found in Scott's Cove, to luxurious mats of high marsh complete with a seaward complement of alterniflora, as found on the southeastern shore of Holly Pond. In addition to the marshes, sand beaches, cobble beaches, and wooded shoreline, all exist within the coves and estuaries, and in breaks in the rock face.

Major natural features of the Darien coast include the Five Mile River, Scott's Cove, Ziegler's Cove, the Darien River, Gorham's Pond and Holly Pond. The Town has approximately five miles of rock bluff and escarpment; 76 acres of tidal marsh; 0.3 miles of sandy beach and numerous islands ranging from small rock outcroppings, exposed only at low tide, to larger vegetated islands such as the Fish Islands.

3.3 Bluffs and Escarpments

"Naturally eroding shorelands marked by dynamic escarpments or sea cliffs which have slope angles that constitute an intricate adjustment between erosion, substrate, drainage, and degree of plant cover." (P.A. 79-535,sec.3(7)(A)).

Using CAM Coastal Resource maps (Base Map: U.S.G.S. 7 1/2 minute quads) together with on-site inspection, it was established that Darien lacks sections of true escarpment, as defined under CAM. Historically, natural escarpment was probably found along both shores of Long Neck Point, however, these areas are now stabilized through the use of seawalls and revetments, redefining the area as "modified escarpment."

The term "modified escarpment" is used as a catch-all for coastal areas marked by unconsolidated slopes which have been stabilized or altered in some manner. Along the Darien shoreline, modified escarpment is found interspersed between rock shorefront and beach front. Depending on the definition, many other areas of Darien could be considered modified escarpment. For example, many of the areas delineated on the CAM Coastal Resource maps as regulated tidal wetlands are bands of alterniflora (cordgrass) backed by a seawall or revetment. The lower tidal range of the area is tidal wetland, while the upper range is modified escarpment. Backed by some form of shoreline protection, this cordgrass band is the single most common coastal resource found.

For the purposes of this study, these marsh/seawall areas will be covered in the Tidal Wetlands section of this report. However, it should be emphasized that the actual shoreline has been modified by the placement of a seawall or revetment. Such shoreline structures, if properly designed, control shoreline erosion and drainage, while the cordgrass band offers marsh habitat to various marine life and wading birds, and also affords the seawall some protection from wave energy.

Primary concerns in escarpment and modified escarpment areas are erosion, unregulated building, construction of poorly designed seawalls and revetments, and lack of required maintenance.

CAM sets forth the following policies appropriate for consideration in Darien:

1. Manage coastal escarpments so as to preserve their slope and toe.
2. Disapprove uses that accelerate slope erosion.

3.4 Rocky Shorefront

"Shorefront comprised of bedrock, boulders, and cobbles that are highly erosion resistant, and are an insignificant source of sediments or other coastal landforms." (P.A. 79-535, sec 3(7) (B)).

As stated above, the Town of Darien presents a southern exposure which is predominantly rocky shorefront. Broken by the mouths of coves and rivers, this rocky shorefront ranges from solid rock bluff, as found at the western side of the entrance of Five Mile

River, to individual rock outcropping as found on the southern slope of Pratt Island. There are five major rocky shorefronts; the south shore of Butler's Island; the south shore of Contentment Island; the south and east shores of Great Island; the south and east shores of Hay Island; and the south, east, and west exposures of Pratt and Nash Islands.

The presence of these rocky shorefronts enables the tidal marshes, mudflats and sandy coves to exist and allows the richness of habitat found elsewhere along the Town's coastline.

The rocky shorefronts serve several important functions. Among these, they: resist erosion, form attachment substrate for marine organisms such as blue mussels, barnacles, and rockweed; and provide food and refuge for a number of coastal shorebirds.

The rock bluffs and promontories also offer spectacular views of Long Island Sound, Long Island, and the surrounding areas. In some cases, the bluffs rise approximately 50 feet, offering dramatic views from both the water and the bluff.

Because of the natural protection they offer the shoreline and their erosion tolerance, rocky shorefronts do not raise the same management concerns as other resources like tidal marshes and escarpment. Management concerns for these rocky shorefront areas would include: 1) establishing setbacks from the head of the rock area for all building; 2) preserving vegetation on top of rocky bluffs and adjacent to rocky shorefronts; 3) discouraging construction of steps, ramps, and docking facilities in these exposed areas, because they ruin the natural appearance of the shorefronts, and are subject to storm drainage; and 4) where construction is involved, encouraging use of materials and design which blend well with their surroundings. Finally, it should be noted that in many cases throughout Darien, rocky shorefront is backed by stands of hardwood forest on lightly developed or undeveloped properties. These areas form important roosting areas for wading species of birds such as the black-crowned night heron, snowy and common egret, and blue great heron. In addition, the rocky shorefront backed by hardwoods can give the boater and resident alike the feeling of being "in Maine" without ever leaving Darien. This is considered by many to be an important quality of life factor.

3.5 Dunes and Beaches

"Beach systems including barrier beach spits and tombolos, barrier beaches, pocket beaches, land contact beaches and related dunes and sandflats." (P.A. 79-535, sec. 3(7)(C)).

There are approximately eight distinct and separate sand beaches to be found along the Darien shoreline. Each of these is located between or behind rocky shorefront and/or islands, and none can be considered a major beach. However, the three largest beaches are used actively for recreation. Pear Tree Point and Weed Beach are Town beaches for public use, while the third, Tokeneke Cove, is reserved for use by members of the private Tokeneke Beach Club and the riparian owners.

While Darien lacks true barrier beaches and dunes, the Town does have several examples of offshore islands with associated beaches found in their lee. A good example of this is the Fish Islands, where the largest island provides protection to a pocket beach on Contentment Island. In addition, several tombolos (sandbars connecting an island with mainland or another island) are found in Scott's Cove and other coastal areas.

The main focus of CAM policies on Darien's existing public beaches centers on their protection and enhancement as an important recreational opportunity for the Town's residents. In addition, the beaches also serve as reservoirs for transported sand and act as buffers against coastal flooding and erosion.

Pear Tree Point Beach and Weed Beach form the two major public shore access points for the entire Town. As described later in this report, they are used for both active and passive recreation. In addition, Weed Beach is used for educational purposes by the Darien Nature Center in their programming for local school groups and others. Both beaches are part of dynamic systems. Weed Beach lies at the mouth of Holly Pond and faces its larger counterpart, Cove Beach recreational area in the City of Stamford. Pear Tree Point Beach is located at the head of Darien Harbor and the entrance to Darien River. Smaller than Weed Beach, it is nevertheless part of a dynamic system subject to alongshore and littoral drift, and sedimentation from upstream. Unlike the Holly Pond outlet, the Darien River cut at Pear Tree Point is an active navigational channel which requires regular maintenance dredging.

Many of the smaller pocket beaches and sandbars provide valuable feeding areas for certain shorebird species. While no nesting activity was recorded during the coastal survey, the use of area beaches as nesting grounds cannot be discounted.

3.6 Tidal Wetlands

"Tidal Wetlands means 'wetland' as defined by CGS Section 22a-29." (P.A. 79-535, sec. 3(7)(E)).

The Connecticut General Statutes referred to above define "wetland" as follows: "those areas which border on, or lie beneath

tidal waters such as, but not limited to, banks, bogs, salt marsh, swamps, meadows, flats or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water, and upon which may grow or be capable of growing some, but not necessarily all of the following: salt meadow grass (Spartina patens), spike grass (Distichlis spicata), black grass (Juncus gerardi), saltmarsh grass (Spartina alterniflora) saltworts (Salicornia europaea, and Salicornia begelovii), Sea Lavender (Limonium carolinianum), saltmarsh bulrushes (Spirpus robustus ..."

(The listing of vegetation goes on to name dozens of other species of wetland, or hydrophilic plants).

As the definition clearly illustrates, a tidal wetland is comprised of distinctive vegetation. To delineate wetland boundaries is to outline vegetation types. Darien has a wealth of tidal wetlands along its coastal zone. Three distinct types may be found: 1) the Spartina alterniflora/S.patens marsh, 2) the Spartina alterniflora cordgrass band marsh, and 3) the Spartina alterniflora open marsh.

The alterniflora/patens marsh can be referred to as the "textbook marsh." The cordgrass extends from the approximate low tide line to the approximate high tide line (note: while tide tables are fond of the terms "mean low water" and "mean highwater", in reality such a measurement is extremely variable and difficult to determine). Above the cordgrass marsh, patens or salt meadow grass grows to the elevation of spring high tide. While the cordgrass marsh is comprised of only a single vascular plant species, the high marsh is represented by sea lavender, salt marsh bulrush, saltwort, and other halophytic vegetation. Alterniflora/patens marshes are found in Five Mile River, Scott's Cove, Darien River, and Holly Pond.

The alterniflora cordgrass band marsh has already been discussed in the section on modified escarpment. This habitat normally consists of a band of cordgrass which extends from the mean low water line to either: 1) beginning of modified escarpment, i.e. seawall, revetment, manicured lawn, etc; or 2) bank vegetated by phragmites or other naturally occurring upland vegetation. This cordgrass band is the most common shoreline feature found in Darien.

The alterniflora open marsh is characterized by a large expanse of cordgrass without the associated patens or high marsh. Examples of this type of marsh are found in Delafield Island Cove, Five Mile River, and Coon Point Marsh. In these cases, small strips of patens marsh can often be found, but they are irregular and small in size. The Delafield Island marsh is the largest area of tidal marsh within the Town of Darien.

Geographical survey maps dating from 1836 and other evidence strongly suggest that tidal marshes were once more abundant than at present. For example, tidal marsh once extended unbroken from behind Hay Island, (when it was a true island) along the entire shoreline of Scott's Cove to connect directly with the Five Mile River. Currently, there are no fewer than thirteen different marshes found throughout this area, without including the cordgrass band marsh. Fill operations, like those that connected Hay Island, Great Island, Delafield Island, Contentment Island, and Butler's Island with the mainland, have broken the tidal marsh into smaller disassociated systems.

Tidal marshes contribute in many ways to the marine and human environments. Marshes act as feeding grounds, nursery areas, and habitat for the majority of estuarine species in Long Island Sound. They act as storm buffers, retain and detain storm water runoff, and help filter sediment and other organic material from the water column. In addition, tidal marshes form scenic vistas for visual access; are valuable educational centers; and offer passive recreational opportunities such as wildlife photography.

The most impacted marsh in Darien is the Tokeneke Trail marsh. Here, the construction of a causeway with tidal gates to restrict tidal range has caused the marsh behind the causeway to become overrun by phragmites. The reduced tidal flushing has decreased the area of marsh regularly inundated by the tide, hence allowing the invasion of the reed grass. In place of an alterniflora/patens marsh, there is an alterniflora/phragmites marsh. Remnant areas of patens can be found throughout the phragmites stand.

Darien still enjoys a greater percentage of its tidal marsh heritage than most other Fairfield County coastal communities. The preservation of existing tidal marshes together with restoration of degraded wetlands form the major goals of Darien's Municipal Coastal Program.

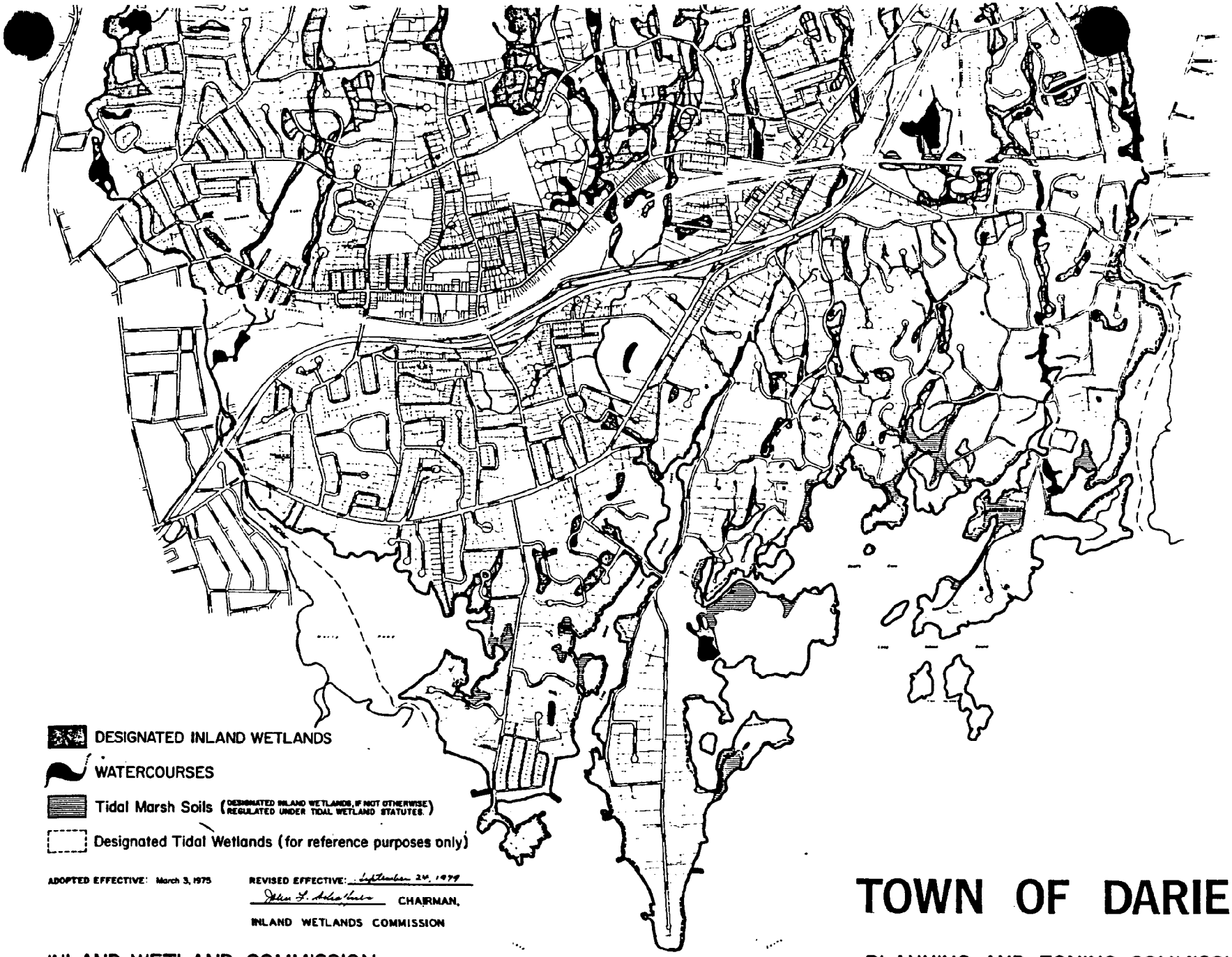
3.7 Freshwater Wetlands and Watercourse

"Freshwater wetlands and watercourses means 'wetlands and watercourses' as defined as CGC Section 22a-38." (P.A. 79-535, sec. 3(7) (F))

The definition of "wetland" under the Connecticut General Statutes was described within the Tidal Wetlands description. However, freshwater species such as cattails (Typha latifolia) pickelweed (Pontederia cordata), blue flag (Iris versicolor) and chairmaker's rush (Scirpus americana) would be examples of freshwater indicator species listed under the Statute.

"Watercourses" can be interpreted to include rivers, streams, and creeks which drain water from inland water bodies and wetlands into Long Island Sound.

FIGURE 6



TOWN OF DARIEN

INLAND WETLAND COMMISSION

PLANNING AND ZONING COMMISSION

REGULATED WETLANDS AND WATERCOURSES

from east to west, the Town has the following watercourses: Five Mile River; Tokeneke Brook, which drains through a series of several ponds before reaching its outlet into Contentment Island Cove; two small streams which feed into the Tokeneke Trail marsh; Goodwives River, which flows into Gorham's Pond; Stony Brook, which also drains into Gorham's Pond; and the Noroton River. Numerous other small creeks and springs drain into the coastal waters, especially during heavy rainfall and extended wet periods.

Aside from Holly Pond, which is considered part of the coastal environment, a number of other smaller ponds have been impounded to restrict tidal ebb: Tokeneke Brook Pond; "Candlewood Lane Pond"; "Great Island Pond"; and Gorham's Pond. These ponds vary widely in salinity, which is a direct result of the amount of inundation by regular tidal cycles. In turn, the level of inundation is a result of the method of impoundment; i.e. dam, functioning or nonfunctioning tidal gates, and so forth.

It is the intent of CAM to protect, preserve, and maintain freshwater wetlands and watercourses by minimizing their disturbance and pollution, and preventing damage from erosion, turbidity and siltation. Consideration of flood protection, water supply, benefit to wildlife, recreational opportunity, and aesthetics should also be part of this process.

The watercourses of Darien provide for stormwater storage and drainage. Any alterations to a watercourse may affect its ability to provide drainage, with resulting flood damage. Also, the freshwater input is vital to the continued productivity of Darien's coastal waters and Long Island Sound itself. Inland wetlands and riverine systems are highly productive, and provide habitat and food for a wide range of aquatic and terrestrial life.

3.8 Intertidal Flats

"Very gently sloping or flat areas located between high and low tides composed of muddy, silty and fine sandy sediments and generally devoid of vegetation." (P.A. 79-535, sec. 3(7) (D)

Intertidal flats are a very common feature of Darien's coastal area. These include mud flats found throughout the tidal marsh systems, and the flats flanking dredged channels and intertidal areas associated with natural tidal and riverine systems.

Intertidal flats are extremely important habitat areas for shellfish, and valuable feeding areas for shorebirds, waterfowl, certain mammals during low tide, and many finfish and invertebrates during high tide. While the value and role of tidal marshes have been extolled in recent years, the contribution of the intertidal flats has been largely overlooked. For example, efforts to restore or enlarge a tidal marsh system have often been attempted

at the expense of adjacent tidal flats. Intertidal flats may suffer irreversible or significant impact from any one of the following: dredging and channelization; discharge of pollutants from sewage outfalls, marine vessels' discharges, or "non-point" sources; construction of tidal gates, dams or groins which alter or restrict tidal flow, tidal range, or sedimentation rates; overfishing of shellfish populations; and salt marsh creation projects.

In Darien, intertidal flats are largely used for shellfish harvesting and bait collecting. Both hard-shell clams (Mercenaria mercenaria) and the soft-shell (Mya arenaria) are commonly found in the Town's tidal flats. The razor clam is also found in the mud flats while blue and ribbed mussels are more commonly found in association with rocks and the tidal marsh. In addition, clam worms (Nereis sp.) are commonly found in the flats, and are a popular bait for a variety of finfish. The recreational take of shellfish is currently restricted to Scott's Cove, with the collection of worms and clams for bait not being restricted.

While several species of terns, gulls, and waterfowl such as black and mallard ducks will be found feeding on intertidal flats, certain species of shorebirds rely heavily on these flats for food. Species of plovers, sandpipers, and herons all use Darien's intertidal flats during some part of the year. Greater yellowlegs, black-bellied plovers, semipalmated sandpipers, snowy egrets, and black-crowned, great blue, and white herons were all seen feeding on the intertidal flats at some point during the coastal survey.

The Town's intertidal flats must be recognized as valuable coastal assets. Established CAM policies should manage the flats as shellfish habitat, while preserving them as feeding areas for a wide variety of animal life. In addition, coastal uses minimizing changes in natural current flow and distribution of sediments should be encouraged, while uses that accelerate erosion or cause significant despoilation of tidal flats should be discouraged.

3.9 Coastal Hazard Areas

"Those land areas inundated during coastal storm events, or subject to erosion induced by such events, including flood hazard areas as defined and determined by the National Flood Insurance Act, as amended (U.S.C. 42 Section 4101, P.L. 93-234) and all erosion hazard areas as determined by the Commissioner." (P.A. 79-535, sec. 3(7) (H))

Tidal flooding along Darien's coast is caused by storms, with the extent of flooding dependent on the tidal cycle and the velocity and direction of the wind. Coastal storms, with onshore winds timed with a high tide, will cause the greatest degree of flooding. All areas adjacent to watercourses within the Town are also subject to flooding.

The greatest floods on record were caused by heavy winds, rainfall and hurricanes. The hurricanes of September, 1938 and October, 1955 caused heavy flooding along the entire north shore of Long Island Sound. Lesser coastal storms, such as the one that occurred in October 1979, also cause a great deal of damage, and must be a major consideration in managing coastal areas. (See Section 5.2 for additional discussion.)

3.10 Developed Shorefront

"Developed Shorefront" means those harbor areas which have been highly engineered and developed, resulting in the functional impairment, or substantial alteration of, their natural physiographic features or systems. (P.A. 79-535, sec. 3(7)(I)).

Under CAM, the stated policy is to promote, through State and local planning and development, the use of existing developed shorefront for marine related uses including, but not limited to, commercial and recreational fishing, boating, and other water-dependent commercial, industrial, and recreational uses.

Darien has little or no developed shorefront as covered under this definition. There are areas within the Town that have undergone extensive engineering but the residential nature and existing land use would more likely bring them under the term of "modified escarpment" than "developed shorefront."

Areas such as Weed Beach and Pear Tree Point Beach, the Noroton Yacht Club, the Darien Boat Club, the Tokeneke Club, and those locations offering good visual access can logically be deemed as developed shorefront in terms of water-dependent use, as well as being covered under their more obvious coastal resource definitions.

The issues of improved recreational boating, shellfishing, and other public access will be discussed later in this report (Section 5.0).

An important aspect of this discussion on coastal management is the enhancement and proper maintenance of waterfront owned by the Town for use by its residents. In addition to shoreline already in Town ownership, such as Pear Tree Point and Weed Beaches, the Town should be prepared to evaluate the purchase of waterfront property which would improve or expand such uses, if it were to become available.

Darien does not really have, and does not need, "developed shorefront" along any part of its shoreline. Therefore, Darien's CAM Program should be desiged to reflect this position.

3.11 Islands

An island is defined under CAM as land surrounded on all sides by water. The Town of Darien has numerous islands along its entire shoreline. These islands range from small outcroppings, with

little or no vegetation other than algae, to large multiple-acre tracts that have long since been connected by causeways or fill to the mainland which, therefore, can no longer truly be considered islands under this Act. Examples of areas that were historically islands, but are no longer, include: Hay Island, Great Island, Contentment Island, and Butler's Island.

The largest true islands currently existing in the Town of Darien are the Fish Islands; a series of five islands lying south of Contentment Island. Unlike many of the islands in Long Island Sound which have come under increased development pressure as a result of their appeal for high-priced development, these islands are relatively small in size, and offer little or no development opportunity.

Under CAM, the stated policy is to manage undeveloped islands in order to promote their use as critical habitat for the bird, plant, and animal species indigenous to such islands, and which are increasingly rare on the mainland. In addition, the policy is to maintain the value of undeveloped islands as a major source of recreational open space. The islands off Darien, ranging from small rock outcroppings to large islands with marsh and upland vegetation, are widely used as feeding and nesting sites for many bird species at various times of the year.

Examples of these species include, but are not limited to: snowy egret, great blue heron, American egret, ruddy turnstone, black-bellied plover, double-crested cormorant, common tern, and two species of gulls. As development pressure increases on the mainland, these islands become increasingly important for nesting and feeding habitat. The majority of the islands off Darien's coast should be managed exclusively for wildlife habitat because their small size makes other development impractical. With the possible exception of the privately-owned Fish Islands, which include a sandy beach on the northern-most island, these islands offer few recreational opportunities, although some are used during the hunting season for the placement of blinds, and jump-shooting for a variety of waterfowl species.

In addition to offering valuable wildlife habitat, these islands afford the mainland immediately inshore of the island protection from wind and wave action. In some instances, the shoreline opposite these islands consists of a sandy beach that offers an abrupt contrast to the adjacent shore. These important aesthetic components of the Darien shoreline are in places more evocative of coastal Maine, rather than an area some 50 miles east of New York City.

3.12 Shorelands

Shorelands may be defined as those land areas within the Coastal Boundary, exclusive of coastal hazard areas, that are not subject to dynamic coastal processes, and are composed of typical upland features such as bedrock, drumlin and hills. For the Town of

Darien, shorelands would include all areas inland of the high tide mark, and south of the Coastal Boundary not covered elsewhere in a coastal resource definition. Under CAM, the policy is to regulate shoreland use and development in a manner which minimizes adverse impact on adjacent coastal systems and resources. The majority of shoreland located in the Town of Darien has little or no link to the coastal resources of the Town because of topography or other isolation from the actual coastline.

Since the majority of the shorelands in the Town are reserved for residential use, shoreland policy should center on mitigation of impacts from erosion, new development, runoff into wetlands, and loss of open space which visually enhances the shoreland area, along with other concerns normally covered under the municipal planning, zoning, and subdivision permit processes.

In the case of a proposed major development within the shoreland area, the potential impact on adjacent wetlands or other coastal resources would require consideration under the Coastal Site Plan Review process. Where this was considered to be significant, an application would have to be rejected or modified to protect the coastal resources.

Excluded from the definition of shorelands are coastal hazard areas. Those hazard areas of greater significance are covered under Section 3.9 of this chapter.

3.13 Shellfish Concentration Areas

"Shellfish concentration areas" are defined as actual, potential, or historical areas in coastal waters in which one or more species of shellfish can be found in significant quantities. Under this definition, most of the southwestern shoreline of the State of Connecticut may be considered a shellfish concentration area since one or more species of shellfish is likely to be found in significant concentrations, either currently or historically. The interface between freshwater and seawater which is typical of the estuarine environment, and found consistently from Westchester County through Fairfield County, is extremely conducive to the culture of shellfish. Species of commercial importance that are commonly found include the hard-shell clam (*Mercenaria mercenaria*) and the eastern oyster (*Crassostrea virginica*). In addition to these species, the razor clam and soft-shell clam are found in the offshore waters of Darien but are not considered commercially important.

The eastern oyster is largely a commercial shellfish species, while the hard-shell clam is both a commercial and recreational species. The commercial oyster beds, commonly marked by bamboo stakes, are largely leased and cultivated by Tallmadge Brothers of Norwalk. These beds typically lie in deeper waters than those easily accessible to the recreational shellfishermen. Such beds are found off Pratt Island, the western shore of Long Neck Point,

Great Island and the entrance to Scott's Cove, and the southern shore of Contentment Island. These areas rely largely on the artificial "seeding" carried out by Tallmadge Brothers.

Statistics on annual harvesting in the waters of Darien are not available, but the oyster industry in Connecticut is the largest fishery on Long Island Sound, and has grown greatly in the last several years due to improved water quality and long-term commitment by the industry.

Some conflicts have occurred between the commercial oystermen and the Town of Darien. These conflicts have been largely restricted to noise complaints (when the oyster boats are operating during their early morning hours close to shore), and to concerns about potential impact resulting from a lack of knowledge of the oystering operation. For example, some townspeople are concerned that the oyster boats are poaching on private land when in fact they are working land apparently franchised to them by the Town and the State years ago.

The target of most recreational shellfishing is the hard-shell clam, also known as -- depending on size -- the "little neck", "cherry stone" and "quahaug" clam. The hard-shell clam can be found along the Darien shoreline in various concentrations; however, because of domestic sewage, the only area certified as "clean" in the Town is Scott's Cove. As with the oyster, estimates of hard-clam harvest from a recreational standpoint are not available. Discussions with shellfishermen have indicated that although their efforts are increasing, their take is decreasing. These are the classic symptoms of an overfished or poorly managed resource. Still, this is only hearsay, and is not supported by any kind of research or data. Discussions with the State of Connecticut's Acquacultural Division indicate a willingness to cooperate with the Town of Darien in establishing a shellfish management plan for the Scott's Cove area and expanding shellfishing grounds in the Town. This would involve a complicated process because of the need to certify the water quality of the water overlying any shellfish bed. Further investigations of the opportunities to open up the area off Weed Beach should be initiated by the Town because these areas lie adjacent to the City of Stamford's shellfish beds. Therefore, the certification of water quality would not be as complex as it would be in the case of the Darien or the Five Mile Rivers. From a biological standpoint, shellfish concentration areas are also areas of high productivity for a variety of marine life, including important finfish species such as flounder. Clam habitats such as mudflats, when exposed at low tide, are important feeding areas for a number of shorebirds and wading birds.

Because shellfish are filter feeders, they are highly susceptible to environmental degradation, especially in the form of domestic sewage contamination. Harmful organisms, such as the hepatitus

virus, or bacteria causing gastrointestinitus, are readily picked up by filter-feeding organisms. While no damage may occur to the shellfish, if they are harvested, the person eating the shellfish will very likely become ill. Public knowledge of health factors involved in consuming shellfish, as well as knowledge of areas where shellfish can safely be harvested, are important aspects of shellfish management.

In the discussion of shellfish beds in Section 5.4, following, Darien should move toward the establishment of a shellfish commission or similar body that would deal with both commercial and recreational shellfish management, and would work closely with the newly-established State of Connecticut Shellfish Commission.

It is interesting to note that there is a cooperative agreement between the City of Stamford and the Town of Darien concerning shellfish. Because the City of Stamford receives municipal sewage from the Town, Darien is obligated to provide requesting Stamford residents with one half the number of permits allocated to Darien residents for shellfishing within Darien waters.

3.14 Coastal Waters - Estuarine Embayments

Coastal waters may be defined as those waters of Long Island Sound, and its harbors, embayments, streams and creeks which contain a salinity concentration of at least 500 parts per million under low flow stream conditions. In addition, coastal waters are divided into two definitions: "near shore waters", which comprise those waters and their substrates lying between mean high waters to a depth approximated by the 10 meter contour, and "offshore waters", comprising those waters and their substrate lying seaward of a depth approximated by the ten meter contour. An estuarine embayment may be defined as a protected coastal body of water with open connection to the sea, in which saline seawater is measurably diluted by freshwater, including tidal rivers, bays, lagoons and coves (P.A. 79-535, sec. 3 (7) (G)).

The importance of these waters, and their environmental quality, is undeniable for the Town of Darien. Recreational boating, swimming, and gathering of shellfish, as well as the aesthetic and visual quality of the coastline, are dependent on these waters. Connecticut CAM finds and declares the pollution of the waters of the State is inimical to the public health, safety, and welfare of the inhabitants of the State; is a public nuisance; is harmful to fish, wildlife and aquatic life; and impairs domestic, agricultural, recreational and other legitimate beneficial uses of the water. CAM concluded that control and elimination of water pollution is in the public's best interest, and is declared a matter for legislative determination.

The role of protecting estuarine waters falls largely on State and Federal agencies. The certification of shellfish beds is carried out by the Connecticut Department of Health. The control

of industrial pollution discharges is carried out by the Department of Environmental Protection's Water Compliance Unit, and is overseen by the U.S. Environmental Protection Agency. Control of pollution generally concentrates on two broad categories: "point pollution" sources, and "nonpoint pollution" sources. Point pollution sources may be defined as those activities such as the discharge of industrial wastewater, where the discharge is controlled and placed under permit. Point pollution may also include discharges from boats, and disposal of dredged spoiled material. Darien lacks any known point pollution sources.

Non-point pollution is much more difficult to identify and control. This includes leaking septic fields, disposal of motor oil into local storm drains, illegal dumping, and other chronic discharges into coastal waters. As a result of the largely residential nature of Darien's coastline, the major non-point pollution source would likely be leaking septic fields and municipal sewer tie-ins. Darien is also subject to pollution sources outside its own Town waters because of the estuarine nature of Long Island Sound, and because it shares coastal waters with the Cities of Stamford and Norwalk in the cases of the Noroton River and the Five Mile River respectively.

Currently, Darien's coastal waters are among the cleanest in western Long Island Sound. Certain areas of concern within these waters, however, have been identified. They include, but are not necessarily limited to: the upper reaches of Holly Pond which shows degradation from historical pollution sources along the Noroton River, and contains a historical record of those sources in its sediments today; and areas such as Ziegler's Cove, which, because of high boating pressure during the summer, may become temporarily degraded as a result of sanitary waste discharge. As indicated in the previous chapter, particularly within the Scott's Cove area, any expansion of shellfishing opportunities would rely heavily on improvement and maintenance of clean estuarine waters.

Darien's role in assuring clean coastal waters has two facets. The first is the awareness, monitoring, and enforcement of State and Federal water quality standards. The second is more local in nature. It involves local enforcement of existing water quality regulations, and a realization that Darien's water quality is closely linked to that of Stamford, Norwalk, and other adjacent estuarine communities. The State does not have a comprehensive coastal water quality testing regimen at this time.

This makes it difficult to assess the overall trend and condition of Darien's coastal waters. Where appropriate, the Town of Darien and other coastal towns should recognize this deficiency, and move towards the establishment of a State-wide or Sound-wide coastal water-quality monitoring effort.

Essentially, all tributaries flowing through Darien into Long Island Sound within the Coastal Boundary fall under the definition of coastal waters containing a salinity concentration

of at least 500 parts per million during low flow stream conditions. Continued enhancement and protection of these aquatic systems are also essential to continued vitality in the coastal zone. Specific concerns about dredging, sedimentation, structures, and filling are addressed separately in Sections 5.5, 5.10 and 5.11 of this report.

High water quality is necessary for full utilization and enjoyment of Darien's Long Island Sound waters. These waters provide a habitat for a variety of marine organisms: both those with obvious commercial significance, and those that play a very important role in marine food chains and productivity. In many cases, these same areas provide significant habitant as spawning and feeding grounds for shellfish and finfish. From a social standpoint, Darien's location on Long Island Sound contributes directly to its high standard of living, which in turn is directly linked to the high aesthetic and recreational values of the Sound's waters. Their degradation would not only cause loss of recreational opportunities such as swimming, boating, water skiing and shellfishing, but would also likely lead to the loss of coastal land values, and a subsequent lowering of Darien's quality of living.

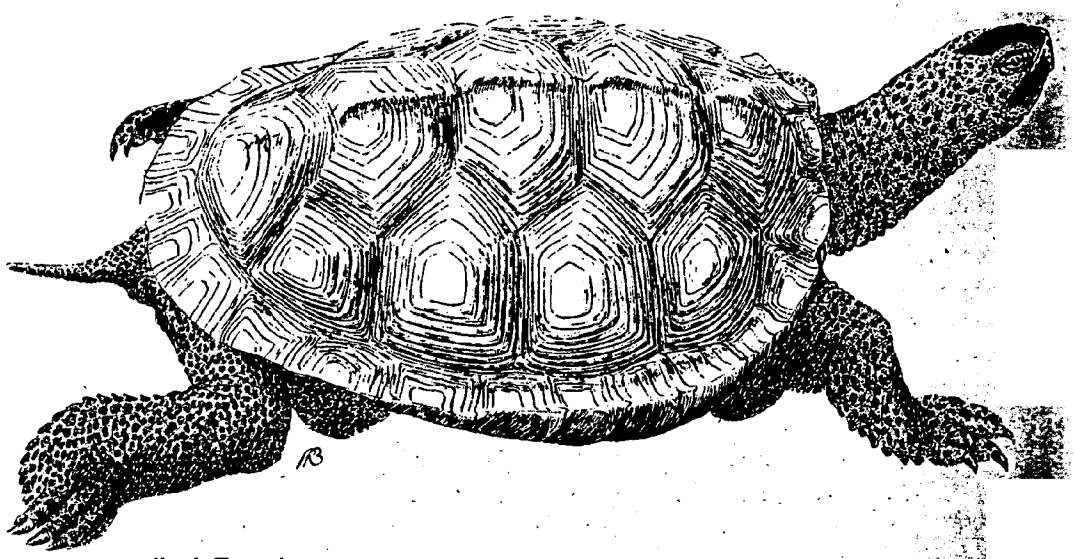
Of all the coastal resources included in this section, the protection and enhancement of coastal waters are the most difficult, both as a result of the size of the resource (extending from the Atlantic Ocean to the upper watershed of the Five Mile River) and the numerous overlapping political and governmental agencies that are involved in the maintenance of water quality. In addition to environmental concerns, economics plays a very important role in determining both water quality and the feasibility of implementing adequate water protection programs.

3.15 Air Resources and Air Pollution

Air pollution means the presence in the outdoor atmosphere of one or more air pollutants, or any combination thereof, in such quantities, and of such characteristics and duration as to be, or be likely to be, injurious to public welfare, to the health of human, plant or animal life, to property, or as unreasonably to interfere with enjoyment of life and property.

While it cannot be denied that air quality plays an important role in the quality of life in the Town of Darien, air resources and air pollution were not directly considered as part of this study. The major origin of air pollution in the Town of Darien is derived from automotive sources, mainly commuting.

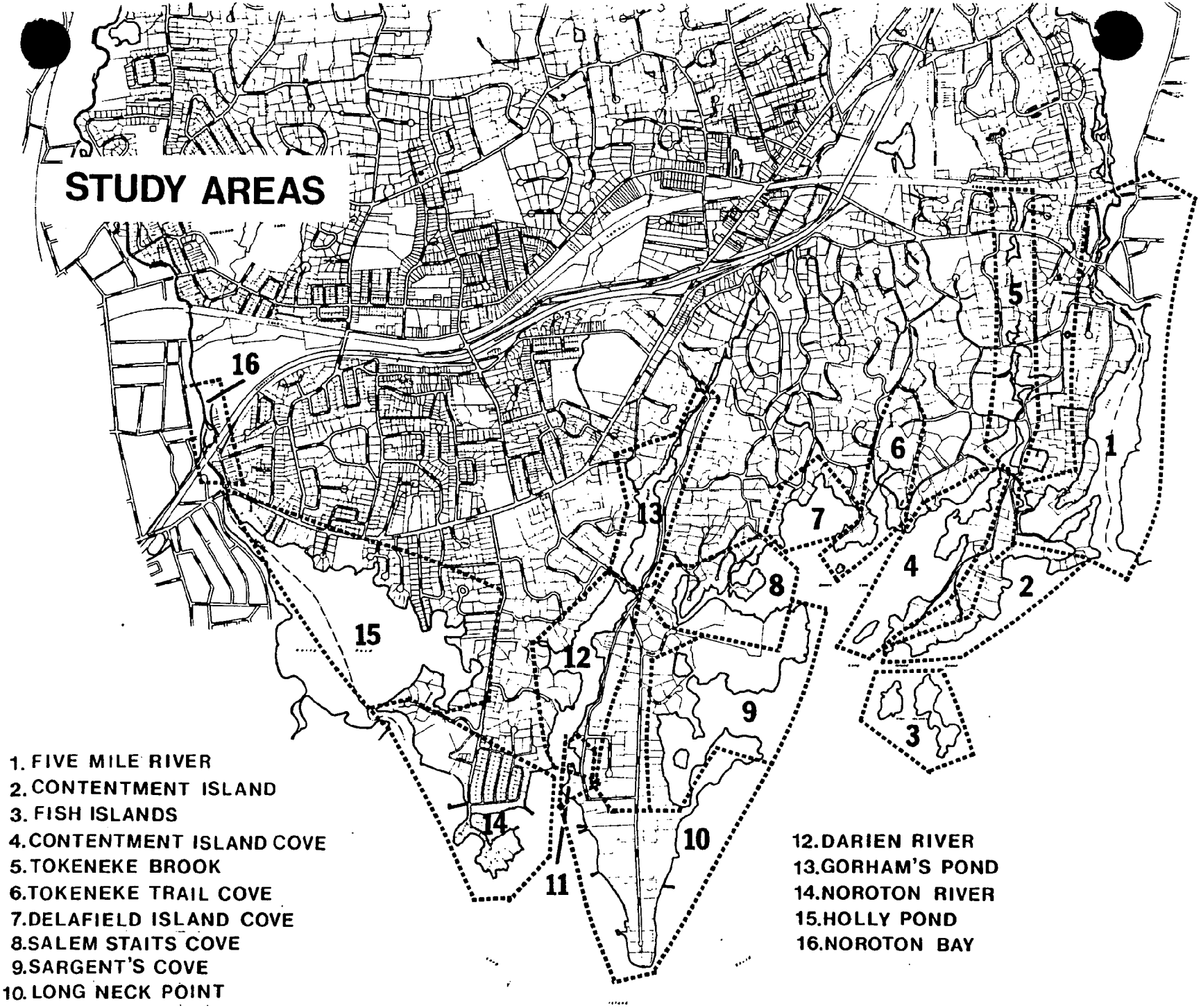
The presence of water-dependent industry, coastal recreation, and other direct uses of the coastal area do not affect air quality in any major fashion and, therefore, are not chief concerns of this program.



Diamondback Terrapin

4.0

DETAILED RESOURCE DATA FOR COASTAL SECTIONS


STUDY AREAS
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1. FIVE MILE RIVER
2. CONTENTMENT ISLAND
3. FISH ISLANDS
4. CONTENTMENT ISLAND COVE
5. TOKENEKE BROOK
6. TOKENEKE TRAIL COVE
7. DELAFIELD ISLAND COVE
8. SALEM STAITS COVE
9. SARGENT'S COVE
10. LONG NECK POINT
11. PEAR TREE POINT
12. DARIEN RIVER
13. GORHAM'S POND
14. NOROTON RIVER
15. HOLLY POND
16. NOROTON BAY

FIGURE 7

For the purposes of this study, and in order to identify major natural systems, the Darien coastline has been divided into the following geographical areas:

4.1 - Five Mile River
4.2 - Contentment Island
4.3 - Fish Islands
4.4 - Scott's Cove
4.4 (a) - Contentment Island Cove
4.4 (b) - Tokeneke Brook
4.4 (c) - Tokeneke Trail Cove
4.4 (d) - Delafield Island Cove
4.4 (e) - Salem Straits Cove
4.5 - Sargent's Cove
4.6 - Long Neck Point
4.7 - Pear Tree Point
4.8 - Darien River
4.9 - Gorham's Pond
4.10 - Noroton Bay
4.11 - Holly Pond
4.12 - Noroton River

4.1 Five Mile River

The tidal portion of the Five Mile River lying within the Town of Darien's Coastal Boundary extends approximately one mile on a north-south axis, from just north of the White Bridge on Tokeneke Road, to the mouth of the River at the southwestern corner of Butler's Island. The full shoreline involves more than 2 miles of land, and incorporates a variety of freshwater and estuarine habitat. The watershed of the Five Mile River originates in Westchester County, New York and flows south through New Canaan, Norwalk and Darien. The entire drainage basin is 12.3 square miles in area with flow levels ranging from a high of 265 cubic feet per second in the spring, to a range of 1.9-6.0 cubic feet per second during low flow periods. The coastal portion of the River is heavily used as a marina and mooring basin. During the summer, some 500 boats, along with all services associated with boating (i.e., fuel, marine supplies, provisions), are located on the Rowayton shore.

The mean tidal range for the Five Mile River estuary is 7.2 feet, with a mean spring tide of 8.3 feet. The flood encroachment area is calculated under the National Flood Insurance Program to be approximately 15 feet above mean sea level within this area.

The coastal portion of the Five Mile River is estuarine. Fresh waters from the upper reaches of the River mix with marine waters from Long Island Sound. Changing values for fresh water input, tidal velocity, and on-shore wind lead to variations in salinity and sedimentation rates. These fluctuations lead to the development of the estuarine community. While the entire waters of Long Island Sound may be considered estuarine, it is the fresh water/marine water interfaces, such as the Five Mile River, where estuarine habitats are most prevalent.

An ecological analysis of this area was undertaken by Professor William Nearing and his associates in 1972. Their findings showed that the tidal marshes associated with the Five Mile River were highly productive, especially when compared to other marshes along the Atlantic seaboard. The productivity of the Five Mile River marshes was found to equal or exceed other viable marsh sites. Twenty different species of plants were found in the area, and the list of associated marsh fauna included more than thirty species of mollusks, crustaceans and birds. The report concluded that the marshes and adjacent mudflats along the south of the River were ecologically viable, and they contributed significantly to the marine productivity of the adjacent estuarine and coastal waters of Long Island Sound.

Along another line, a Federal navigation project is maintained within the Five Mile River. The existing channel, authorized in 1888, provides for a depth of 8 feet extending 6,000 feet upstream to the White Bridge. However, the upper 700 feet was de-authorized in 1978, and the actual depth and width of this part of the channel varies. Historically, maintenance dredging of the Five Mile River has entailed the removal of 47,700 cubic yards of material. The project was last dredged in 1968, and is scheduled for its next maintenance in the near future. The Corps of Engineers, New England Division, projects the need for four projects during the period 1985 to 2035, with an average volume per project of 70,000 cubic yards. Knowledgeable boaters estimate the depth and width of the existing channel to be 7 feet deep and 100 feet wide.

The Five Mile River Commission exercises control over project applications for dredging, the number of vessels moored, and the number and placement of mooring buoys. This Commission is composed of four individuals -- two from Darien, and two from the City of Norwalk -- and concerns itself with the pollution, conservation, and navigation of the Five Mile River. As part of the process of preparing this report, a meeting was held with the Five Mile River Commission. They concurred that it would not be desirable to dredge the Darien side of the River, due to the existing boat congestion and the need to maintain the natural condition of the marsh which offers the benefits of flood protection and habitat value.

The uppermost portion of the River, lying within the Coastal Boundary, is largely freshwater in nature and extends 500 yards south from the point where the Conrail railroad tracks cross the River to a riprap dam situated approximately 350 feet upstream from White Bridge. This section consists of two branch streams of the Five Mile River that join just north of the dam to form a small pool. The stream beds are largely gravel and cobble in nature, and the streams, especially the western branch, are dry during low-flow periods. The surrounding upland areas are largely vegetated slopes backed by private residences. Topography is such that most of this area has little flood potential except at the highest flows.

The coastal nature of the Five Mile River begins downstream of the riprap dam. While some tidal mixing of fresh and estuarine waters may occur in the pool behind the dam, it is south of the dam that true marine nature is evident.

From the dam to the White Bridge (the southern-most of the two spans crossing the River at this point), the Five Mile River is characterized by sand/mud sediments with stony banks. The Darien side lacks any development on the shoreline, with shrubs and other vacant lot vegetation occupying the upper shoreline, and boulder/riprap occupying the tidal zone. During the inspection, a good deal of green algae was present in the riverbed along with a few fiddler crab burrows.

The River from the White Bridge south could be considered a true river from a navigation/marine perspective. As one stands on the White Bridge and looks south, one sees either an extensive area of tidal creek and mudflat, or a body of water from shore to shore, depending on the stage of the tide. Nowhere else in Darien, with the possible exception of Scott's Cove, can such a startling example of tidal influence be seen.

This section of Five Mile River south of White Bridge may be divided into four sections; upper estuary, Five Mile River marsh, Tokeneke marsh and river mouth.

The upper estuary is dominated by a residentially developed shorefront, typically including a lawn extending to some form of shoreline protection. The protection structures range from concrete or masonry sea walls to riprapped revetments. Seaward, the intertidal area is covered by alterniflora, or cordgrass, a marsh fringe which may vary from 1 to 10 feet in width. In the center of the River, a mudflat extends from just south of the White Bridge for a distance of approximately 400 yards.

South of the White Bridge, the shoreline is dominated by a stone abutment for the bridge which extends 200 feet before turning westward along a small drainage creek. A gas station lies immediately inland of this portion, and the riverbed contains numerous pieces of automotive debris and other litter. This is one of the few areas along the entire Darien shoreline where commercial development is adjacent to the shoreline. The stone abutment ends at the head of a small tidal creek and storm drain outlet. A fringe of alterniflora is backed by stone riprap. The lot immediately south of the first tidal creek was vacant at the time of inspection.

Approximately 225 feet south of the first inlet is a second inlet which also terminates at a drainage ditch. This second inlet is used during the boating season as a mooring area for boats which lie on the mud during low tide. Along the southern shore of the inlet, heavy riprap is in place protecting the slope of a private home. The inlet consists of a vegetated upland with cordgrass fringe, and muddy bottom sediments. Along the southern edge, a

riprap revetment begins, and swings south at the base of a house built immediately adjacent to the tidal zone. This revetment shows signs of erosion which the owner claims is due to tidal action and muskrat burrowing activity. South of this location, the shore is dominated by a large stand of phragmites. One hundred and eighty feet further downstream is a third inlet which extends some 100 feet inland.

At this location, Five Mile River swings eastward and narrows slightly. The shore downstream from the third inlet is lawn with a small dock and boat ramp. The remaining distance to the point is vegetated upland with sparse areas of cordgrass fringe.

On the point, the shore is riprapped with a dock. South of the point, the Darien side of the River opens up into a small cove. The northern edge is primarily cordgrass with scrub upland. The middle portion of the cove is a masonry or seawall fronted by cordgrass fringe and gravel sediments. The southern portion is cordgrass with upland vegetation behind. The River swings to the south at this site.

The next area of the Five Mile River marks the head of navigation: i.e., the upper limit of the navigation channel and northern limit for most vessel traffic. From this area south, the Darien shore is marked by docks of various sizes and construction.

Six major docks are found along the next 300 yards of shoreline. The docks are well maintained and serve private residences. They reach out into or near the navigation channel edge. The shoreline is characterized by a cordgrass fringe backed by seawall or revetment. Between the first and second dock, one property lacks structural shoreline protection. The fifth and sixth docks are backed by large rock seawall, and the southern-most dock extends 250 feet back into the northern corner of the Five Mile River marsh -- a major cordgrass marsh system on the Darien shore. This marsh is in sharp contrast to the Rowayton shore, which is heavily developed for commercial and boating uses. The marsh and associated mudflats extend north-south for approximately 530 yards, and lie between the navigational channel and the Darien shoreline, a distance between 65 and 200 yards. As the Nearing report stated, this marsh is an important part of the Five Mile River system. In addition to its biological importance, its role in reducing wake wash from boats and other wave action, along with its scenic value, cannot be underestimated.

Five Mile River Road parallels the shore for most of the marsh's length. This offers one of the best scenic views in the Town of Darien. The shoreline is primarily seawall fronted by the cordgrass marsh. The marsh itself is marked by tidal creeks and mudflats and a number of boats are haphazardly moored in it. One vessel was found tethered to a telephone pole.

Although this marsh is one of the most extensive in the Town, it lacks the associated high marsh or patens marsh typical of many other systems. This is most likely the result of historical grading and land extension resulting in the lack of high intertidal ground suitable for patens growth and associated plant life. The southern border of the marsh swings eastward, and the shoreline returns to the seawall/private dock appearance. In addition to seawalls, a number of rock outcroppings are found in this area. From the southern border of the Five Mile River marsh to the entrance of the Tokeneke marsh, there are five docks and two groins perpendicular to the shoreline. The property on the upper portion of this shoreline segment has a cordgrass fringe backed by a low seawall, and a narrow segment of patens marsh which is backed in turn by a seawall. The middle segment is rocky in appearance with natural rock formations linked together with seawalls. As the shoreline approaches the Tokeneke Creek entrance, the foreshore becomes sandy, and a small sand beach is found at the northern entrance to Tokeneke marsh.

Extending west from Five Mile River, the drainage creek for Tokeneke marsh extends 275 yards before opening up into the marsh proper. The creek averages some 50-75 feet in width. Beginning on the sandy point, the northern shore is predominantly cordgrass with upland vegetation behind. Three docks in various stages of repair occupy the northern shore. As the creek opens up into the marsh, the cordgrass is bounded by a patens marsh. Patens marsh is found inland of the cordgrass throughout the marsh, though not in a continuous band.

Tokeneke marsh consists of approximately 6.23 acres of cordgrass marsh and some 2.66 acres of adjacent patens marsh. No obvious freshwater drainage enters this marsh system, though a freshwater pond does lie a short distance to the northwest. Both the patens and alterniflora marshes appear to be healthy and productive, and a variety of marsh-related life was observed, including fiddler crab, mud snails, and the snowy egret. The patens marsh, however, has been ditched for mosquito control. Human impact on the area included two dock/float structures, some erosion on the south shore of the creek, several abandoned vessels in the creek, and the presence of composition clay from tennis courts deposited in the southwestern corner of the marsh. Discussions with two riparian land owners in the area indicated street flooding problems due to the lack of drainage, especially during high tide coinciding with heavy rainfall. There was also interest shown in dredging the marsh creeks to allow access at other than high tide. Presently, even shallow draft vessels are largely restricted to the main stream of the creek and only at high tide.

The southern shore of the inlet creek to Tokeneke marsh is again predominantly cordgrass, backed by upland vegetation and private home development. Two docks reach out into the intertidal zone, and a "boathouse" also extends into the intertidal area. Some erosion is present along the creek bank, and several abandoned boats are present eyesores. At the junction of this creek and Five Mile River, a wooden bulkhead is in poor repair.

FIVE MILE RIVER

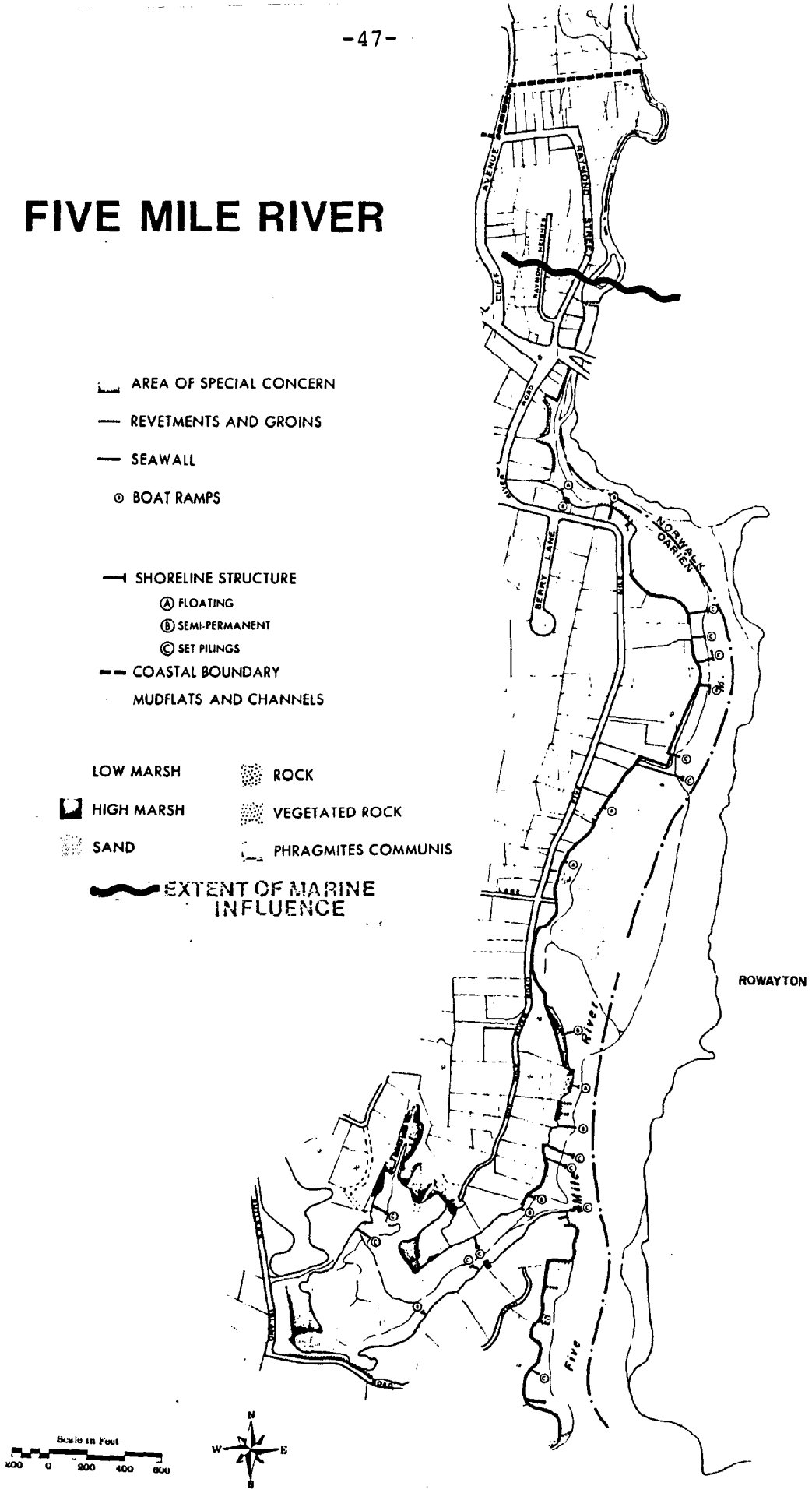


FIGURE 8

The lower reaches of Five Mile River (eastern end of Butler's Island) are bordered by a mixture of sand beach, fronted by fringes of alterniflora, rock outcroppings, and shoreland protection structures. At the southern junction of Tokeneke Creek and the Five Mile River, the coastal appearance is degraded by the presence of bulkheads in disrepair, abandoned power boats, and shoreline erosion. Just to the south, a massive riprapped and filled area exists which is inconsistent with the surroundings.

Downstream of this riprapped area, the shoreline largely consists of cordgrass fringe backed by small bands of sand and some form of shoreline protection. In three places along this portion of the shoreline, stone or concrete groins have been placed out into the intertidal zone. One hundred yards north of the mouth of the Five Mile River, a gazebo is placed on top of a rock outcropping. A small sandy cove lies south of the structure just inside the river mouth. At several places along this portion of the shore, low seawalls have been breached by coastal storms with sand and shells evident inland of the structures. While the River is largely a protected body of water, this lower western shore is its most exposed area. At the confluence of Five Mile River and Long Island Sound, the western shore rises to approximately 35 feet above mean sea level.

Summary and Conclusions - Five Mile River

1. Because of the hydrology and extent of the Five Mile River watershed, water quality of the estuarine section of the River is largely dependent on activities upstream. Protection of inland wetlands lying in the watershed, erosion control, and other mitigation measures will be extremely important to the future quality of the estuary.

2. Maintenance dredging of the harbor should be restricted to the existing federal project. Disturbance of any of the existing marshes by dredging should be avoided.

3. Proposed legislation to end any further Federal funding for this dredging project may have a significant impact on the Five Mile River. The recreational nature of this harbor will make funding of 25%-50% of the dredging project a major financial burden on the individuals involved.

4. Regardless of the status of the Federal Marine Sanitation Device legislation, efforts should be undertaken and maintained to ensure that holding tanks aboard moored vessels are not discharged into the River. Because of the small area, the large number of vessels involved, tidal regime and poor circulation, even minute amounts of discharge could have significant effects on ambient water quality. Public education of the boaters involved should prove helpful in this effort.

5. The Five Mile River marsh must be recognized as a major component of the Five Mile River ecosystem. Dredging and other projects having a major impact should not be considered for this area.

6. The practice of hauling boats across marsh areas, and of tying small boats to stakes and telephone poles, are not deemed to be a major problem, but they do have adverse effects on marsh vegetation and general shoreline appearance.

7. An investigation of the extent and severity of existing flooding along Butler's Island Road and Manor Drive should be undertaken.

8. The Darien side of Five Mile River remains residential with a shoreline that is largely stable. Use of the shoreline is limited to small boats and sailboats which gain access via beach or dock structures. The River is heavily congested with boat traffic, with access and services mostly limited to the Rowayton (Norwalk) shore.

9. The Town of Darien has a major stake in the development of the facing shoreline. Because visual access, mooring access, marine-related supply facilities, and other such businesses are in Rowayton, the course of development there will directly (e.g. lack of marinas or gas docks) or indirectly (e.g. visual appearance) affect Darien.

10. The City of Norwalk is involved in the CAM process. One of the developments advanced as part of this program involves the creation of a Marine-Commercial zoning category which would prohibit the development of non-water dependent uses along the Rowayton shoreline. This approach should be actively supported by the Town of Darien.

4.2 Contentment Island

This area extends from the entrance to the Five Mile River westerly to the tip of Contentment Island. With a shoreline of some 1.1 miles, this coastal region is marked largely by the presence of rock bluff, rocky shorefront, and two sandy beach coves. This location's exposure to strong winds and storm waves precludes the location of private docking facilities except in the two coves that break the rock relief. The area can be further subdivided into three distinct subsections:

- southern coast of Butler's Island
- Tokeneke Club cove
- southern coast of Contentment Island

The southern shore of Butler's Island is marked by rock bluff and rocky shorefront. Running west from Five Mile River for approximately 200 yards, a rock bluff rises some 40 feet above mean sea level. This bluff is modified in places by masonry work, which

part of a home development. It changes to rocky shorefront along the remainder of the 500 yards of exposed coast. Even here, the low points and various other places have been fortified and modified by masonry work. Along most of this section a line of boulders and rock protect the toe of the bluff and rocky shorefront. At the western point, this intertidal protection is lacking, with a masonry seawall being the primary coastal structure. A derelict concrete and steel dock is the only obvious structure, other than masonry work done as part of the landscaping. Potentially, the dock structure could prove to be a safety hazard, and it does degrade the coastal appearance of this area.

Butler's Island and Contentment Island are now divided by a cove, lined with sandy beach. The area is dominated by The Tokeneke Club, a private association of 305 member families. This cove was once directly linked to the Tokeneke marsh behind it as a front beach and storm water spilling area. The Club has fortified the hind beach area, but it is still prone to flooding.

At the southwestern tip of Butler's Island, the eastern shore of the cove is marked with an alterniflora fringe. Rocky intertidal and seawall protection exist landward. Approximately 100 yards to the west, this habitat is altered, becoming sand beach. At the head of the cove, the sand beach is up to 100 feet in width at low tide. Two groins have been erected in an apparent attempt to stabilize the beach. Judging from evidence on the aerial photographs, no major along-shore transport of sand is obvious. The larger of the two structures mentioned projects into the Sound approximately 100 yards beyond midtide. At its end, there is a swimming platform for use by Club members. The other structure extends only to low water. The existing sand beach continues to the west approximately 500 feet, and connects to natural rock. A cordgrass/rock fringe takes over again on the western shore, with several bedrock outcroppings present along its length. A secondary cove lies behind the western point of the larger one. Protected by rock outcroppings and a man-made breakwater, this cove has a small sand beach at its apex. The breakwater, designed to look like part of the rock point, demarcates the western point of Tokeneke cove, and the beginning of Contentment Island's southern exposure.

The cove is used for mooring of several small boats, largely restricted to outboards and small centerboard sailboats. In addition, the offshore waters are regularly farmed for oysters by Tallmadge Brothers of Norwalk.

Contentment Island's border is largely comprised of rocky shorefront. A maximum elevation of approximately 25 feet is reached midpoint along this 800-yard coastline. The shorefront is broken in numerous places by tiny coves and beaches measuring only a few feet across. This area is largely in a natural state, with existing residential development allowing the bluff and the vegetated berm to remain. However, one major case of erosion is present. In this area there is no rocky shorefront, and storm

CONTENTMENT ISLAND

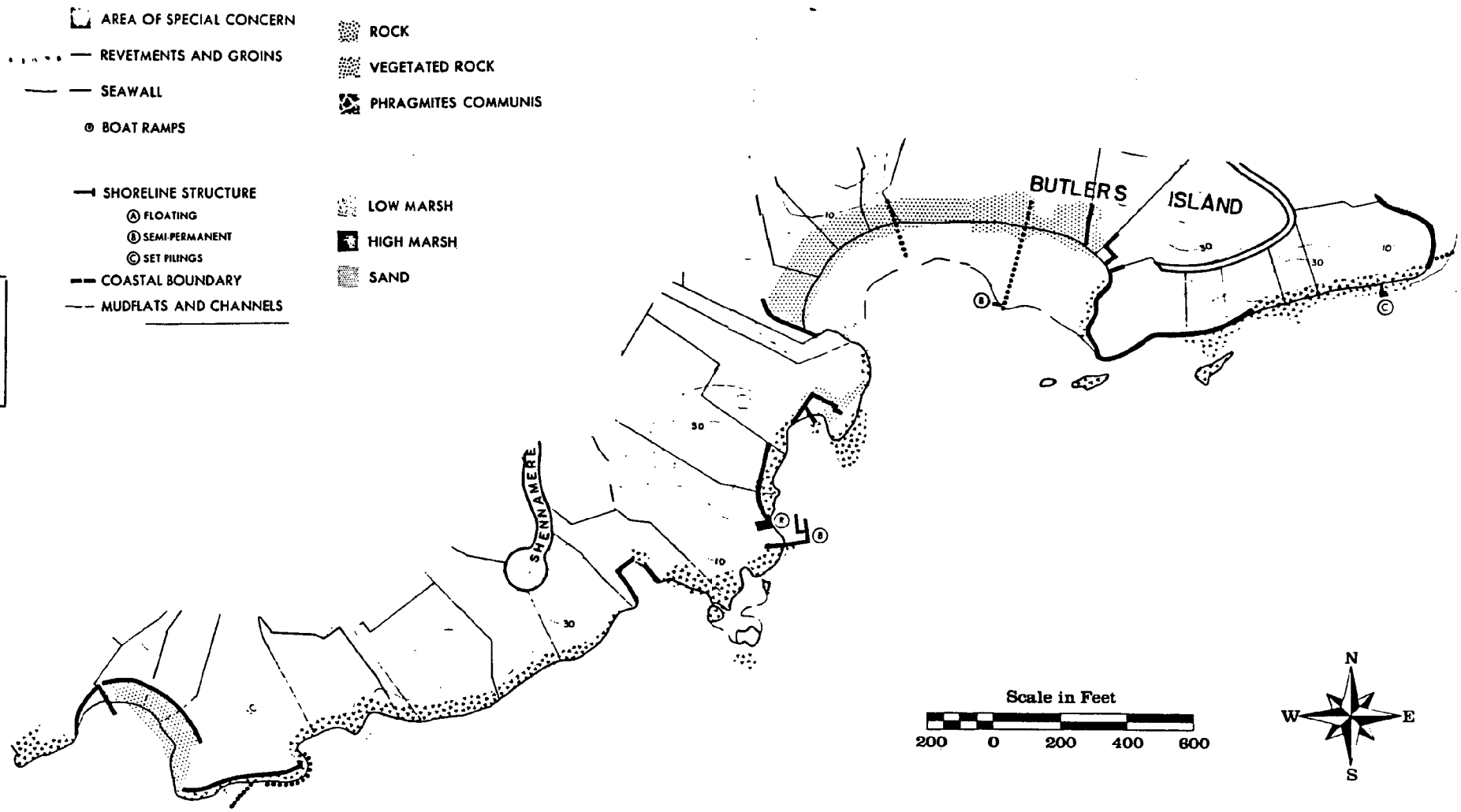


FIGURE 9

action and existing land uses have established an exposure of unconsolidated material. It is unclear from field investigation whether the existence of rough cobble is natural, or has been dumped onto the site in an attempt at erosion control.

The exposed bedrock and uneven bluff character changes some 200 yards before the end of Contentment Island. At this point the topography flattens, and a cove with associated sandy beach prevails. The mouth of the cove is 150 yards wide, and protects a beach area of similar size. Currently, this beach is protected landward by low sea walls, and is used as part of a private residence. During the summer months, this cove is cordoned off by a buoy area, apparently to prevent any encroachment by boats.

The continued existence of this cove is, in part, due to the offshore Fish Islands, which lie approximately 170 yards offshore, and offer protection to both the small cove and the entrance to Scott's Cove. The passage between the Fish Islands and Contentment Island is posted with a six knot speed limit to prevent wake damage.

Summary & Conclusions - Contentment Island

1. The fortified nature of this area restricts water access uses to the coves along its shore, but allows excellent visibility of the Sound and Long Island to land owners because of its relatively high elevation.

2. The majority of the area is highly fortified and resistant to erosion. However, in at least one segment, erosion is a relatively severe problem, and flooding and associated damage are of concern in the low-lying areas.

3. Tokeneke cove is heavily used for swimming by a private association, and some small boat access and mooring is present.

4. Tokeneke cove bottom lands are used for the commercial harvest of oysters, and the beds are marked by stakes. Concern has surfaced recently over the extent of Town-leased grounds in the cove, noise from auxiliary pumps, and the oyster boat's proximity to shoreline properties. These are cited by residents as key problems. The actual harvesting of oysters has no apparent adverse impact on either the cove's water quality or productivity.

4.3 Fish Islands

The Fish Islands are a group of privately-owned islands lying 170 yards off the southwest corner of Contentment Island. Seen at low tide, there appear to be two main islands surrounded by scattered rocks. At high tide, however, the eastern island appears to be three separate islands. They are connected by sand shoal, but there is no continuation of vegetation among the three.

The largest of the Fish Islands is the one most inland. A sand beach is situated on the northwest corner, and this area has long been a favorite picnic spot for boaters. Some impact from the activities of visiting boaters is evident. Litter, fire pits, and minor disturbances to the high marsh were visible. A recently constructed, stone-encased "No Trespassing" sign is situated on the Island. The remainder of the island offers a complete variety of marine habitat. Beginning with low marsh mixed with rocky intertidal, the habitat moves to high marsh with open water "ponds". A stand of phragmites claims the hind marsh, and an upland area complete with a few hardwood trees dominates the center of the island.

The middle island in this archipelago is dominated by intertidal vegetation, which is visible on this stepping stone to the third island.

Dominated by exposed rock with a cluster of hardwoods centered in its middle, the third island is the outermost of all the Fish Islands. Both high and low tidal marsh are found there.

To the west of these three islands lies the "second" island. Unlike the islands described above, this one lacks obvious upland habitat, and is instead dominated by marsh vegetation scattered amongst the rocks.

Other multiple-rock outcroppings surround these Islands. The main benefit from this group is for bird-roosting habitat, especially at high tide when feeding activities of many species are restricted. Birds likely to be found on these islands include two species of gull, four species of heron, the common tern, ruddy turnstone, and double-crested cormorant.

Summary & Conclusions - Fish Islands

1. The main characteristic of the Fish Islands is intertidal vegetation. On two of the islands, associated upland habitat is present.

2. The major land use is recreational, with the existing sand beach on the largest island attracting visitors via boats for picnicking, swimming, and related activities. The land is posted.

3. Both the Fish Islands and the smaller outlying rocks are important habitat for numerous shore and coastal bird species which utilize them heavily for feeding and roosting.

4. Structural development on any of these islands is impractical, and would require major engineering, fill, and bulkheading.

FISH ISLANDS

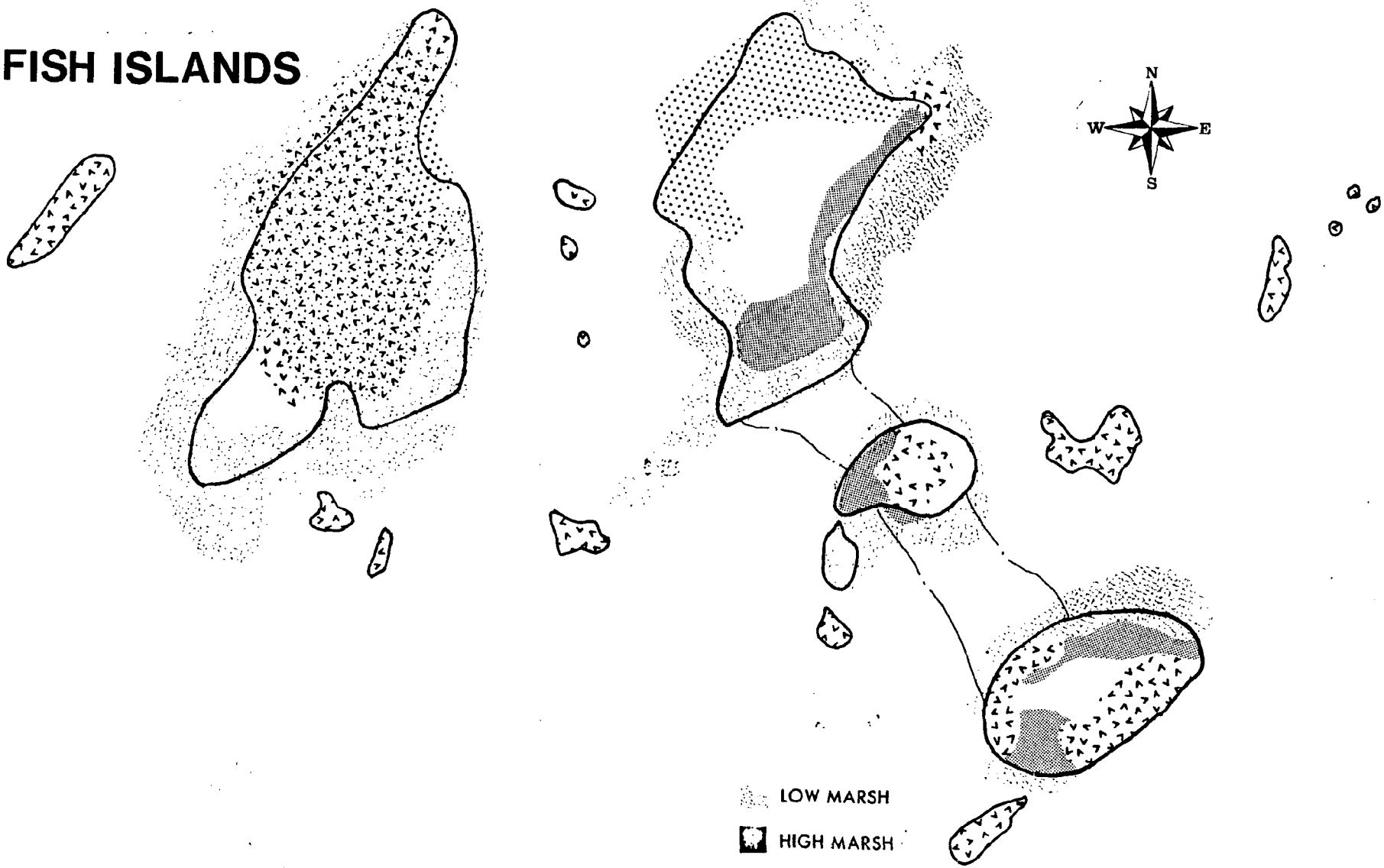


FIGURE 10

4.4 Scott's Cove

This area is the most irregular of any coastal segment along the Darien shoreline. A complex array of tidal marsh, mudflats, inlets and open water lies behind the opening to Scott's Cove, which stretches a little over 400 yards from the tip of Contentment Island to the eastern edge of Great Island. Several islands and exposed rocks narrow this opening further. Behind this stony entrance, 5-1/2 miles of protected cove unfold. This Cove can be further broken down into five smaller segments.

4.4 (a) - Contentment Island cove
4.4 (b) - Tokeneke Brook
4.4 (c) - Tokeneke Trail cove
4.4 (d) - Delafield Island cove
4.4 (e) - Salem Straits cove

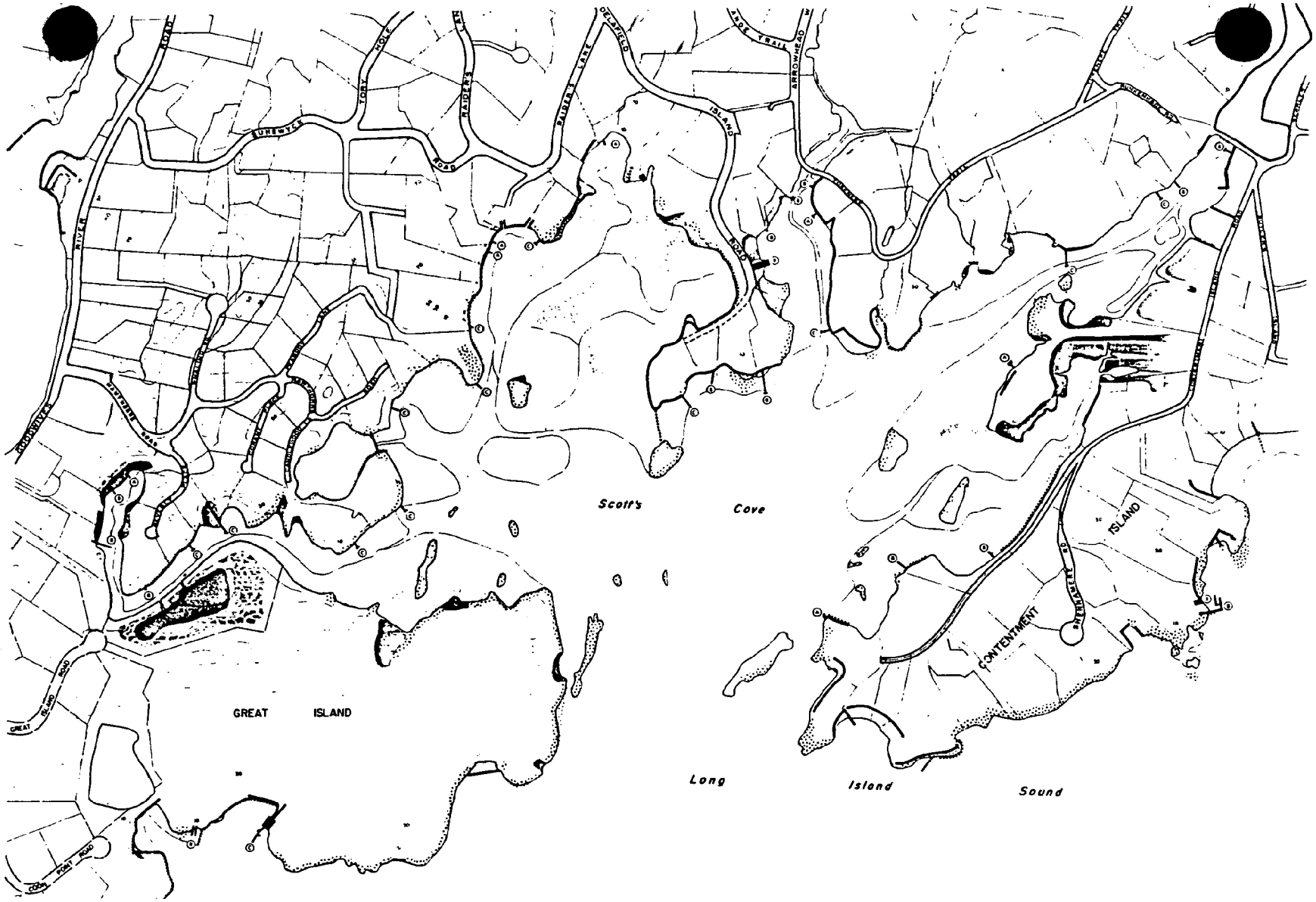
4.4 (a) Contentment Island Cove

This section of the Town's shorefront includes 1.3 miles of the northwestern shore of Contentment Island, and 0.45 miles of the Tokeneke shore. At the head of the cove, a brackish water pond exists which receives salt water at high tide, and is fed by an upland watershed via a series of ponds and the Tokeneke Brook.

Starting at the tip of Contentment Island, the coast is oriented on a north-northeast axis. The first 200 yards are characterized by low sloping bedrock and a cordgrass fringe, protected on the landward side by seawall. The adjacent upland areas are just above mean high tide. To the north, a point of exposed rock is connected by a sandbar to a long finger island which juts into the Cove. The island is comprised mainly of rock and cordgrass, with some phragmites, alder, and upland vegetation at its center. From this point north, the coast is under the protection of the Cove, and the cordgrass fringe becomes wider with less exposed bedrock being visible. The shore redirects to the northeast and extends some 700 yards to terminate at the high marsh system. The coastal resources involved along this section are largely mudflats and "hummocks" of alterniflora. Along the shore, cordgrass forms an unbroken border, and in most cases, seawalls lie landward. Contentment Island Road runs alongside a stretch of this shoreline, providing good visual access to Scott's Cove.

As this inlet narrows, the cordgrass stands become more dominant and, at the apex of this inlet, an extensive high marsh system exists. Covering approximately 3.50 acres, this high marsh bears the parallel scars of mosquito ditching. Likely once part of a larger system that extended approximately 200 yards to the north, this patens marsh appears to be highly productive, and forms the most extensive patens marsh to be found anywhere in Scott's Cove. A fringe of phragmites lines the upland borders of the marsh, and an access road forms its northern border.

FIGURE 11



SCOTT'S COVE

Scale in Feet: 200 0 200 400 600

N W E S

LOW MARSH
HIGH MARSH
SAND
ROCK
VEGETATED ROCK
PHRAGMITES COMMUNIS
AREA OF SPECIAL CONCERN
REVETMENTS AND GROINS
SEAWALL
SHORELINE STRUCTURE
(A) FLOATING
(B) SEMI-PERMANENT
(C) SET PILINGS
COASTAL BOUNDARY
BOAT RAMPS
MUDFLATS AND CHANNELS

Facing this apex, the opposite shore widens to a point 230 yards into the southwest. This shore exhibits similar vegetation to the facing shoreline, but inland of the cordgrass fringe, a band of high marsh extends to the point. Inland areas are dominated by hardwood forest.

The coast then orients again to the north. The band of patens marsh tapers out, while the fringe of cordgrass continues. A masonry stonewall protects a residence on this point. A pocket patens marsh separates the distinct headlands on this spit of land. The northern part of this land is exposed bedrock, surrounded on three sides by marsh, and on the fourth by water. In studying the aerial maps, it seems likely that this high point was once an island, with no upland connection to the mainland. Historically, a salt marsh system would likely have covered the entire hind-shore.

The cove then narrows to its articulation with the Tokeneke Brook system. Portions of the eastern shore of this cove have been modified quite heavily, and are among the most heavily impacted shorelines in Darien.

The lower half of the eastern shore is dominated by grey birch. This is the largest stand of birch found along the coastline of Darien. Comparisons of field observations against various base maps suggest that this shoreline was straightened and backfilled. The stand of birch is divided by a tidal inlet, with a small patch of patens and a bank of phragmites at its head.

The upper half of the eastern shore is a mixture of cordgrass, phragmites, dock structures, seawalls, and some eroding banks. At the head of the cove, a dam maintains the water level of the pond upstream. The water of this pond is saline by virtue of the fact that marine water does flow into the pond at high tide. The pond is a popular place for fishing and crabbing.

The western shore of this cove is largely comprised of alterniflora fringe, with wooded upland behind. Two docks are constructed within this zone. At the point where the cove doglegs, the shore is walled, and a sizable dock is maintained. The cove then continues to widen into Scott's Cove. Most of the coast in this area is uniform habitat with a cordgrass band stretching to the high tide mark, and upland vegetation continuing inland. Two small pocket marshes can be found along the lower edge which were likely to have once been directly linked to the Tokeneke Trail marsh. Development upland of these two marshes has obstructed the freshwater inflow, but the tidal marshes continue to exist. In addition, a major mudflat extends seaward of this area by some 270 yards.

Off this point to the west, a bar connects a small island. The presence of peat suggests that this once supported alterniflora, but none is currently visible.

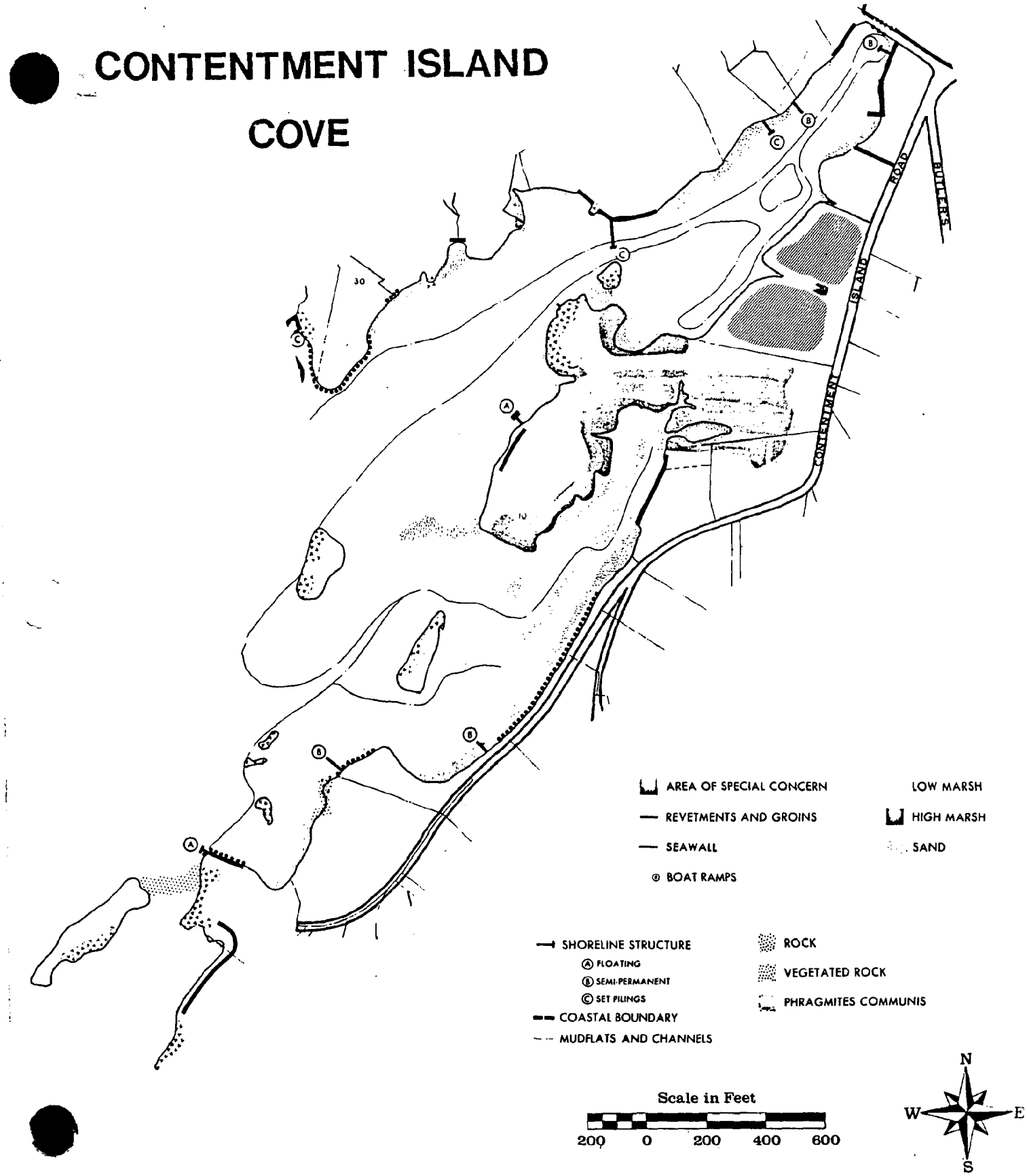

CONTENTMENT ISLAND
COVE
CONTENTMENT ISLAND ROAD
BUTLER'S
AREA OF SPECIAL CONCERN
REVETMENTS AND GROINS
SEAWALL
BOAT RAMPS
LOW MARSH
HIGH MARSH
SAND
SHORELINE STRUCTURE
FLOATING
SEMI-PERMANENT
SET PILINGS
COASTAL BOUNDARY
MUDFLATS AND CHANNELS
ROCK
VEGETATED ROCK
PHRAGMITES COMMUNIS
Scale in Feet
200 0 200 400 600
N
W
E
S

FIGURE 12

Summary & Conclusions - Contentment Island Cove

1. This area supports the largest patens marsh in Scott's Cove. Extensive areas of mudflat and alterniflora hummocks are situated to the south of this marsh. On-site inspection and comparison with a 1953 topographic map of the area suggest that the entire area once supported a much greater area of alterniflora. Reasons for the loss of cordgrass standing stock are not obvious, because existing uses present no obvious conflict.

2. An area in the upper portion of the cove shows signs of fill and shoreline straightening. The filled area is low and any development would require flood hazard protection, as well as other extensive measures.

3. The predominant shorefront use of this area is for docking and access to small power and sail vessels. Eight dock structures exist in the area, with much of the shoreline stabilized by revetment or seawall.

4. Three sizable islands are located in this cove. They are largely utilized for roosting and feeding by shorebirds.

5. The cove receives freshwater via a series of ponds and the Tokeneke Brook. The watercourse's water quality is an important contributor to the cove's health.

4.4 (b) Tokeneke Brook

Tokeneke Brook is a fresh water tributary to Contentment Island cove and Long Island Sound. Smaller than the Noroton, Goodwives, and Five Mile Rivers, the Brook is nonetheless an important coastal and inland feature for the Town of Darien.

Tokeneke Brook consists of a series of ponds connected by a small brook running north-south. While the watershed of Tokeneke Brook covers a sizable portion of eastern Darien, the major portion of the system can be seen south of the Conrail railroad tracks from which it flows through 8-10 different ponds before ending up in Contentment Island cove and Long Island Sound. From a Coastal Boundary perspective, the portion of Tokeneke Brook lying within the primary coastal boundary is that section south of Tokeneke Road. However, the portion of the Brook considered in this report is that section felt to be somewhat influenced by tidal cycles: Tokeneke Brook just north of Old Farm Road south to Contentment Island cove.

Lying just north of the point where Old Farm Road bisects Tokeneke Brook is a dam that impounds a small pond upstream. Upstream of this dam, the vegetation shows no relationship to coastal and marine habitat.

Moving south from the dam, the brook makes a short dogleg, and passes under Old Farm Road where it opens up into an irregularly shaped pond that stretches north-south with a short branch extending to the east, and another extending west. For the sake of description, this pond is called "Cross Road pond". The pond measures 430 yards north-south overall, with the two branches extending 70 yards east-west from the main axis.

The character of the pond's shoreline is largely lawn extending down to the shore with little or no shoreline protection evident. The areas immediately south of Old Farm Road bridge and a residence on the western shore are the only areas where seawall or revetment is present. In several areas along the pond's border, stands of phragmites are found. A few isolated areas of erosion were evident. This erosion was most likely caused by the feeding of waterfowl, and use of haul out areas. According to the National Flood Insurance maps, this pond is not in a high flood hazard area, though some flooding would occur along the pond's border. Tidal flux and estuarine mixing in this pond appear to be minimal.

At the bottom of the Cross Road pond, as the Tokeneke Brook passes under Cross Road, there is a causeway and culvert system. South of the causeway, the brook again opens up into a pond system.

The pond is apparently nameless, but as a result of the number of children who crab there, the pond was termed "Crab Pond." Crab pond is narrowest at its northern apex from which it widens into a boot-like southern portion. It extends 300 yards in a north-south direction and expands from 9 to 130 yards at its southern end.

Unlike Cross Road pond, the entire margin of Crab pond is seawalled. At high tide, Crab pond and Contentment Island cove are linked with the pond receiving a regular flushing of marine waters. The dike at the tail of the pond does maintain the water level, however, and while the tidal flux in the Contentment Island cove will measure an average of 7.2 feet, the Crab pond will rise and fall inches instead of feet. The salinity of the pond is also lower than that found in the cove. The pond is surrounded by private residential homes on all sides except on the southeast corner, where a causeway for Contentment Island Road crosses between Crab pond and another pond. There is no obvious link between the two ponds, and the smaller pond has a lower salinity. As indicated in Crab pond's name, the pond is inhabited by a population of blue crab. These crabs are not abundant in the western Long Island Sound areas, and are largely restricted to ponds such as this because of the crab's ability to survive cold winters in the fresher waters. In addition to the blue crab, the pond has a number of small fish like the chub. A filamentous algae abounds, especially towards the end of summer.

TOKENEKE BROOK

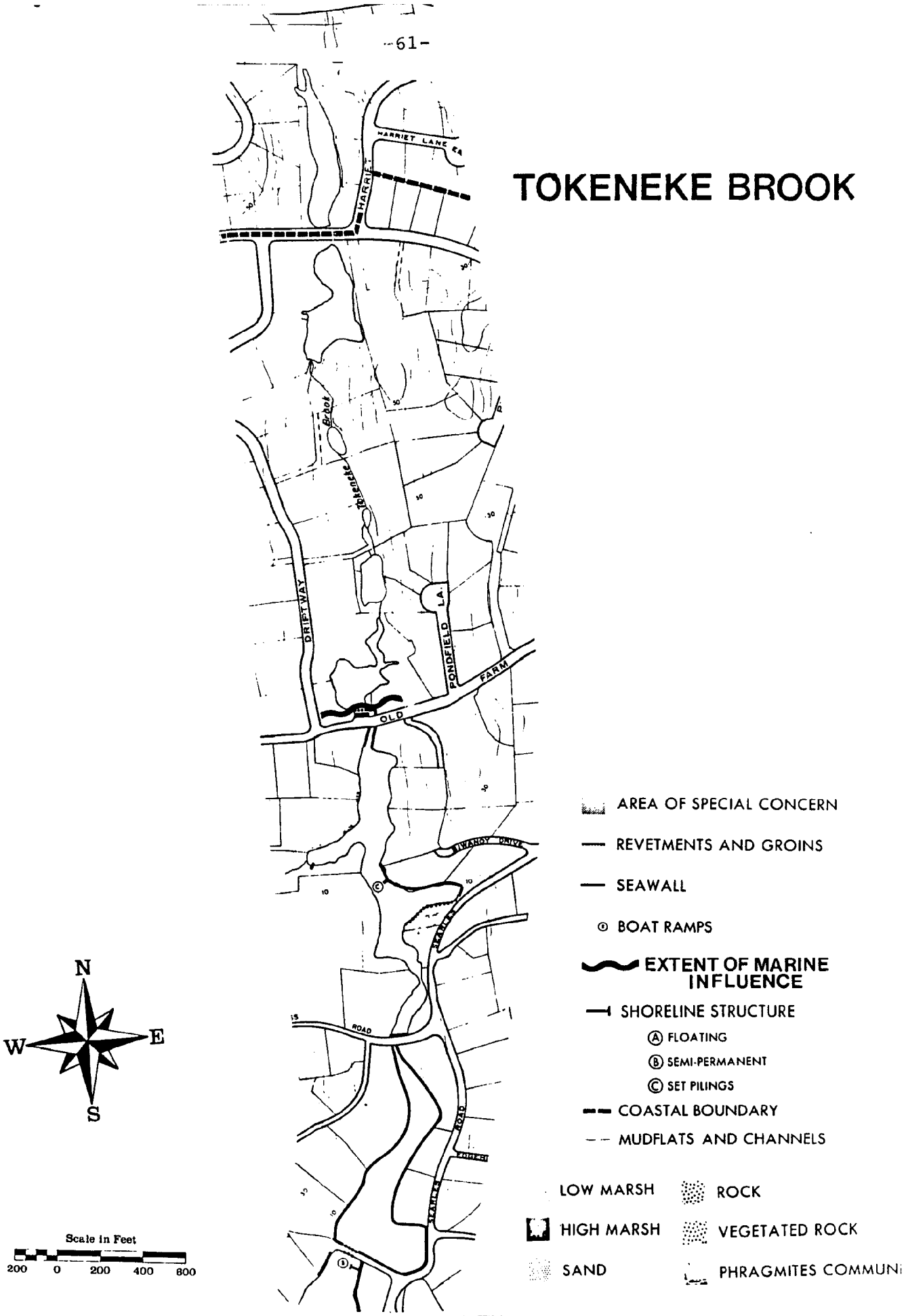


FIGURE 13

South of Cross Road, the flood hazard area increases with a 100 year flood hazard extending through the area between Five Mile River and Tokeneke Brook, except for the highest elevations.

4.4 (c) Tokeneke Trail cove

The Tokeneke Trail cove covers an area from the point of land south of Tokeneke Trail, moving west to the southwest tip of Delafield Island. This area includes one small inlet, Tokeneke Trail cove itself, and a phragmites marsh which lies north of the cove.

Tokeneke Trail point is actually two separate points, split by an inlet which once served as a drainage outlet for the Tokeneke Trail marsh. The eastern point of land is protected by a revetment. This shoreline protection extends into the inlet which serves as a mooring place for a private residence. At the head of the inlet, the land elevation rises to about 25 feet on the eastern shore. The western point is exposed rock with sand beach behind. A seawall is maintained landward of the beach, and a mudflat extends south. From this point, the shoreline extends north into the cove. The eastern head of the cove is bedrock, while the remainder of the 334 yard shoreline is seawall. A small patch of cordgrass grows seaward of a portion of seawall, and two docks provide water access for residences. At the head of the cove is the Tokeneke Trail causeway and its restricted flow sea gates. A floating dock is also tethered to the causeway.

Behind this causeway is a phragmites marsh of some 7.3 acres. Displaying vegetation typical of tidal marsh with restricted tidal range, this marsh has a center of open water, a fringe of cordgrass, and a dominant stand of phragmites. In scattered areas throughout the phragmites, remnant areas of patens can be found. The reed, however, has displaced the patens, associated marsh flora, and cattail, on the freshwater fringe.

The tidal range within the marsh is approximately 3.5 feet, while the Cove experiences a tidal range of 7.2 feet. The restriction of tidal flow has not affected the cordgrass (though its position has moved down towards the mouth of the marsh), but it has altered the vegetation type in the upper tidal range. The phragmites growth has several problems associated with it: (1) in late summer and fall it stands 8 to 10 feet tall, blocking visual access to the open marsh and Scott's Cove; (2) when mature and dry, reed grass is flammable and will burn readily; and, (3) phragmites does not offer the quality nesting and feeding habitat for the variety of wildlife that a natural salt marsh does.

Investigation into the possibility of increasing tidal flow and restoring this marsh has been initiated. Conversations with Mr. Thomas Steinke, Conservation Director of the Town of Fairfield, reveal that measures can be taken (and have been taken in Fairfield) which will rehabilitate the marsh into its natural

state, and still afford a similar degree of storm surge protection as is offered now.

This marsh drains two watersheds; one which runs roughly parallel to Arrowhead Way for approximately a mile upstream, and another small creek which drains a small pond some 250 yards upstream. Major drainage to the east of the marsh is achieved through the sea gates under the causeway, but another small creek drains the high tide water off to the southeast, and into Contentment Island cove.

An osprey nesting platform is located in the eastern portion of this marsh. Given the extent of phragmites invasion, and the lack of visual access to major feeding grounds, it is unlikely that a pair of fish hawks would nest on the platform. Currently, no ospreys are known to nest in Fairfield County. However, increased nesting success in the Connecticut River area, and numerous local sightings of pairs in the spring and fall, make future nesting in the area highly possible.

Moving back into Tokeneke Trail cove, the western border is largely in a natural state, although two docking platforms are maintained for private access. A fringe of cordgrass runs nearly continuously along the coast, and two patens marshes lie behind the cordgrass fringe. One is a small pocket marsh approximately 70 yards downstream from the causeway, while the other is larger high marsh occupying some two-thirds of an acre in the center of the cove. A boat launching ramp was once built through the middle of this marsh, and the remnants of gravel roadtop and wooden bulkhead are still visible. No recent use of the ramp was obvious, and access to the road has become overgrown. South of the ramp, a rock upland interrupts the marsh, which curves around it, to rejoin the cove some 100 feet downstream. At the mouth, the marsh is again lost as the topography rises. Rock outcroppings and upland vegetation dominate the southeastern portion of Delafield Island.

At low tide, the cove is exposed mudflat, except for a small serpentine channel that drains the Tokeneke Trail marsh. The mudflats off the Delafield Island patens marsh show signs of marsh peat, suggesting that the growth of cordgrass was once more extensive. Existing marsh appears to be healthy and productive.

Exposed to Scott's Cove, the southern edge of Delafield Island runs some 300 yards in an east-west orientation. This portion of the coast is predominantly comprised of bedrock outcropping, seawalls and broken fringe cordgrass. Seawalls run the entire length of the Island, and three docks are maintained. Centered along this exposure is a small sand beach. At the tip of Delafield Island, a small island lies 80 yards to the south. At low tide, a subsurface stonewall connecting the Island to the mainland becomes apparent. The purpose of this wall is not clear, but it is a hazard to boaters not familiar with the area.

TOKENEKE TRAIL COVE

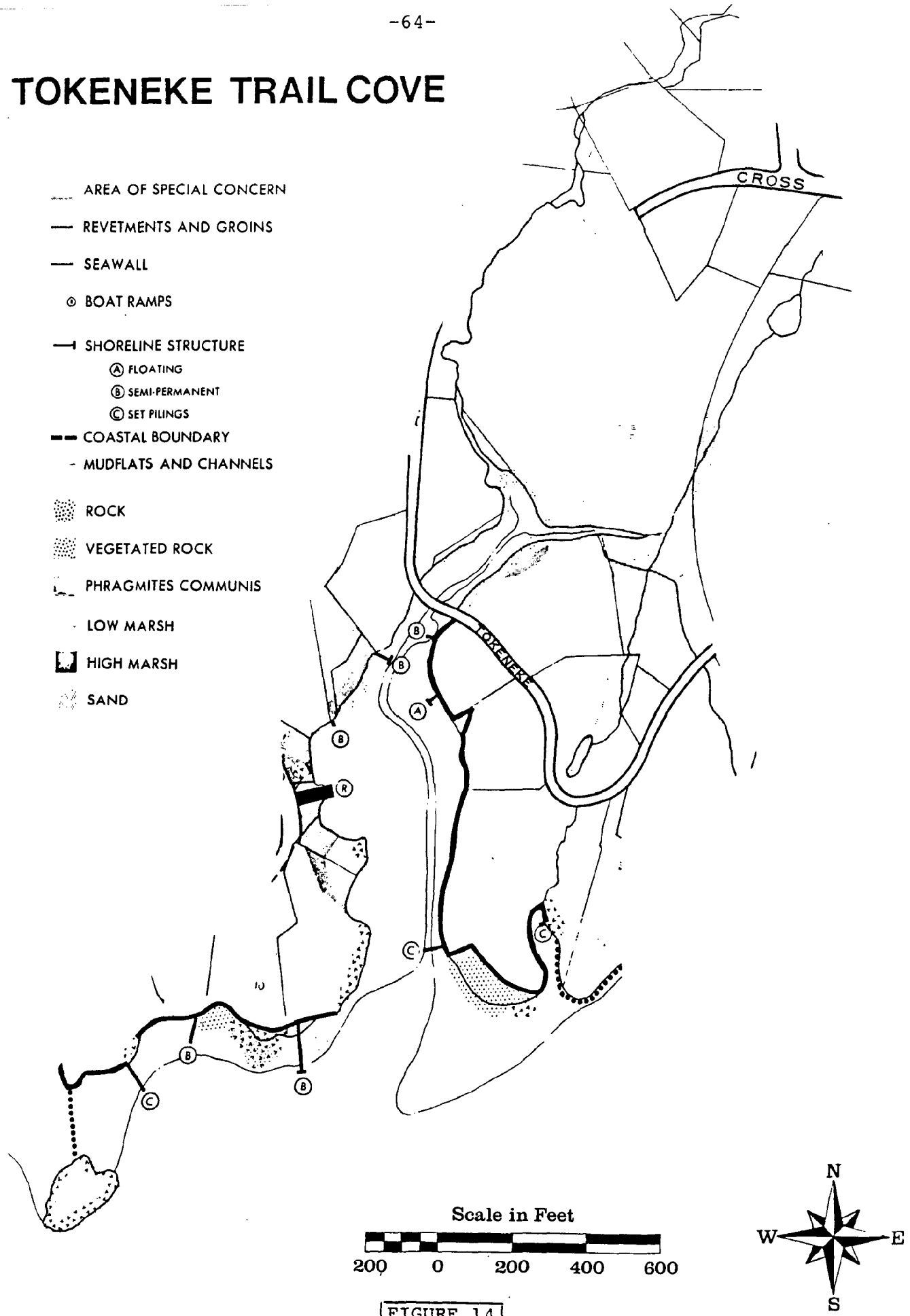


FIGURE 14

Summary & Conclusions - Tokeneke Trail cove

1. The feasibility of restoring the Tokeneke Trail marsh should be studied further. The dominance of phragmites obstructs visibility, presents a fire hazard, and degrades the quality of wildlife habitat.

2. The marsh is being used occasionally for educational purposes by invitation. Restoration would significantly improve its educational value.

3. Restoration of marsh through increased tidal flow may cause the loss of some "usable" property. Such loss will have to be mitigated.

4.4 (d) Delafield Island cove

Delafield Island cove is roughly semi-circular, with approximately 0.75 miles of shoreline, 16.2 acres of mudflat and alterniflora marsh, multiple pocket patens marshes, and one sizable island. The defined boundaries of the cove begin at the end of Delafield Island, and move in a half circle to a spit of land jutting out towards an island.

The dominant characteristic of this cove is the cordgrass marsh. An estimated 70-80% of the cove's area is alterniflora, while the remainder is mudflat and tidal creek. The transformation of this cove from low tide to high tide is striking. At low tide, it is exposed mudflat and cordgrass with most of the creeks clear of water. However, at high tide, the cove is transformed into open water with just the tops of the cordgrass breaking the surface. This low marsh is the largest in volume and standing stock of any alterniflora marsh to be found in Darien.

The shoreline is quite varied. Behind the foot of Delafield Island, the cordgrass marsh grows to the edge, and seawalls protect the upland. Approximately 270 yards from the point, a pocket patens marsh claims a small point of land. Some 33 yards east, the access road to Delafield Island is located adjacent to the cove. Riprap has been placed on the edge of the road, and runs 280 yards in an arch to the north. In between the riprap, where available soil and correct tidal elevation are found, small patches of marsh glasswort and sea lavender are found growing.

At the point where the road leaves the coast, another patens marsh is found. Stretching some 100 yards, this high marsh is the largest inside Delafield Island cove. This stretch of patens is broken twice by small tidal inlets. Behind the patens, several stands of phragmites mark the higher ground. A large rock rises 35 feet above the cove. Here, the patens narrows into a thin, at times broken, border. On the northern side of the rock outcrop, the cove drops into another small inlet. The band of high marsh widens at the apex and again narrows at the next point. Situated just behind the point, what is apparently a wooden sun deck has been placed in amongst the alterniflora.

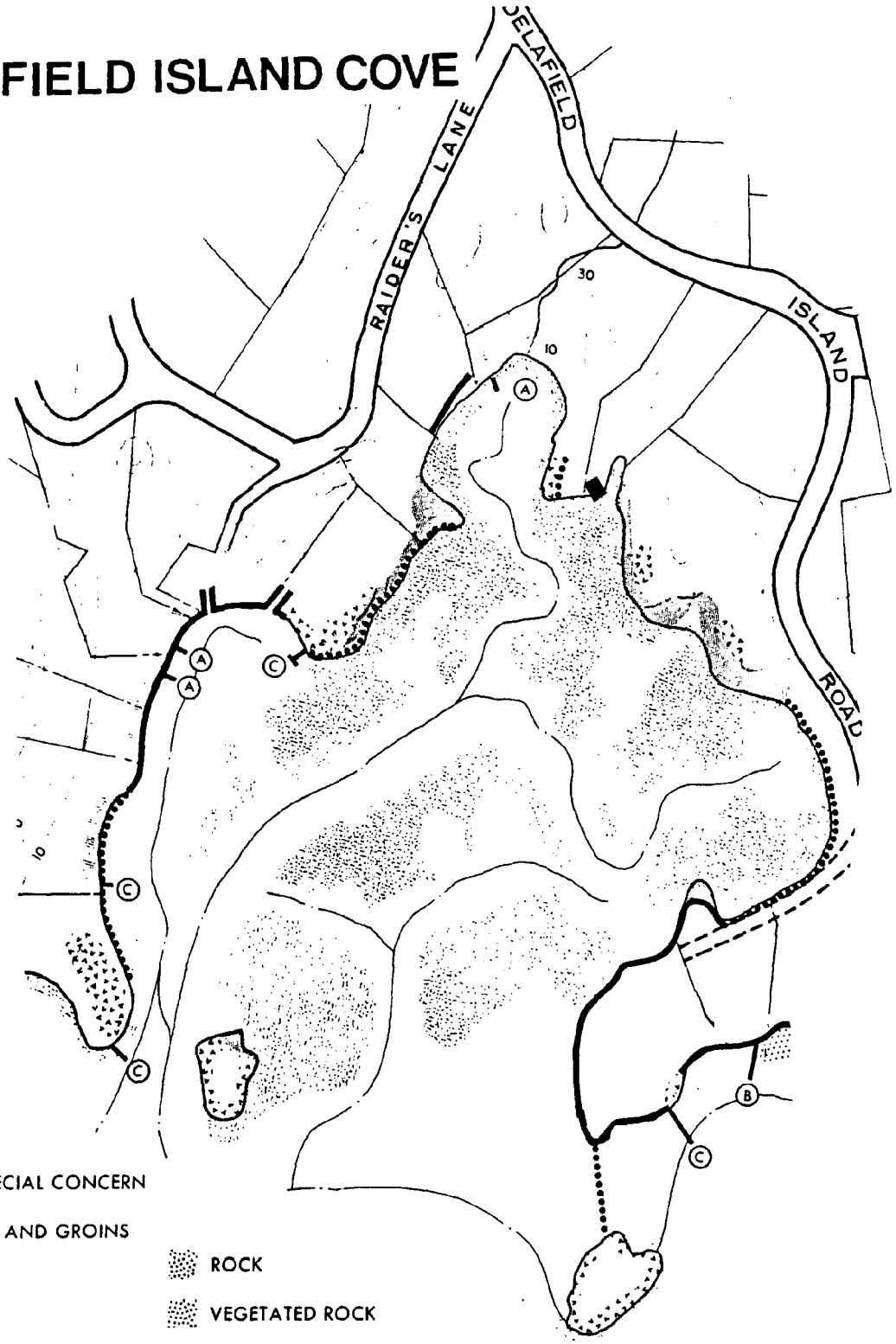
The rock point marks the start of another inlet at the head of the Delafield Island cove. The eastern shore of this inlet is marked by a cordgrass-upland interface. At the top of the inlet, a small dock is maintained. West of this dock, a high masonry stonewall rises to the elevation of a residence. In front of the home, small patches of phragmites are found. South of the wall, the slope lessens and another patens marsh occupies a small isthmus of land. Running the length of shore to the next promontory, a field stone wall is situated at the high tide line. Another very narrow band of high marsh exists precariously where elevation and suitable soil coincide. Typical of most points of land in this cove, the topography rises to 25 feet above mean sea level, as solid bedrock lies exposed. A residence has been constructed atop this rock and on the western shore of this headland, a dock serves the residence. Further along the property, a boat ramp bordered by seawall is also to be found.

From this point on the character of the shoreline changes. Running east-west, a seawall approximately 80 feet long has been subjected to erosion from behind, likely the result of storm waves breaching the wall and carrying off the smaller backfill. The stonewall terminates to allow a small stream to drain, and then continues to the south. A large stand of phragmites runs approximately 270 yards on a north-south axis behind the seawall. Inland of the reed-grass, the elevation rises to 50 feet above mean sea level. The area between the toe of the slope and the seawall has been filled and four dock structures are keyed off of it. Historically, the channel east of this wall has been maintained by dredging. Currently, this area is the deepest in the cove, but remains navigable by most vessels only at high tide. Approximately 200 yards down this segment of coastline, a major "landscaping" project has been undertaken on the slope. The natural groundcover has been stripped off, leaving the soil and rock fully exposed. No apparent attempt to stabilize the slope was made during the 1981 growing season. Aside from the erosion of the thin topsoil, and the striking contrast with the surrounding slope, the likely use of fertilizers to landscape this slope may adversely impact the marsh further. Denuding a slope of this type would not appear to give the landowner any clear benefit, since the face of the slope is not visible from the house, so the reason for doing this is unclear. However, the residents of the remainder of the cove do have a direct view of this slope, and a lot of money and effort will have to be spent before the slope is properly stabilized and "landscaped".

The western border of the cove is a narrow rocky isthmus which stretches toward an island. A dock is located on the tip of the point. The island has upland vegetation, and a small pocket of patens marsh is located on its northern exposure. Cordgrass marsh extends west and north from the island.

Delafield Island cove is heavily used by waterfowl as a feeding station and roosting area. Large numbers of black ducks rely on the cove for food and open water protection. Canada geese and mallards move into the marsh in large numbers for the night.

DELAFIELD ISLAND COVE



AREA OF SPECIAL CONCERN
REVETMENTS AND GROINS
SEAWALL
BOAT RAMPS
SHORELINE STRUCTURE
Ⓐ FLOATING
Ⓑ SEMI-PERMANENT
Ⓒ SET PILINGS
COASTAL BOUNDARY
MUDFLATS AND CHANNELS

ROCK
VEGETATED ROCK
PHRAGMITES COMMUNIS
LOW MARSH
HIGH MARSH
SAND

Scale in Feet
200 0 200 400 600

N
W E
S

FIGURE 15

During the winter, waterfowl numbers increase, with the above species being joined by buffleheads, American widgeon, and other winter migrants. The island and much of the cordgrass marsh are under the protection of the Nature Conservancy. Their protection and limited access restrict hunting pressure to the open water fringe.

Potentials for increasing boating access were discussed with area experts. It was generally felt that providing deep water (for sailboats) access for private docking facilities would be extremely expensive, impact a large area of marsh and mudflat, and provide limited benefit (i.e hundreds of cubic yards of dredging for a few riparian landowners' boats).

Summary & Conclusions - Delafield Island cove

1. This area supports the largest cordgrass marsh in Darien, and every attempt should be made to preserve the integrity of the marsh system.

2. The cove represents important waterfowl habitat.

3. Private landowner practices, such as installing sun decks in the intertidal zone and denuding upland areas for no apparent reason, should be controlled through regulation, enforcement and public education.

4. Several proposals have been advanced for dredging this area to permit improved navigation, and to help control "silting of the marsh." However, dredging would bring limited benefits; it would in fact have adverse effects on the marsh--such as erosion--and would increase boat traffic within the area.

4.4 (e) Salem Straits cove

The Salem Straits cove is located in the western quarter of Scott's Cove. Its 1.9 mile long coastline incorporates one major tidal inlet, and a tidal pond. The southern boundary of this cove is the northern shore of Great Island.

As found in the rest of Scott's Cove, the dominant shoreline characteristic of Salem Straits cove is a cordgrass fringe with upland vegetation behind. Interspersed along this shoreline are seven distinct patens marshes. In addition, several islands, rock bluff, and an artificial dike are found within this area.

The first 300 yards of Salem Straits cove are composed primarily of cordgrass fringe, backed by upland vegetation. At the notch of this circular portion of shoreline is a stand of phragmites. Several rock outcroppings occur and one small sand beach is found. Two docks serve private residences.

From this point, the coast has been modified to form a tidal pond regulated by a concrete weir structure. While the structure is not well maintained, it does serve to restrict the tidal range inside the pond. The extent of the range rise and fall was not ascertained, nor is the date of construction and prior use of this site known. The perimeter of the pond is cordgrass. No docking structures were observed during the field examination, but the aerial photographs show some form of float structure existed as of April 1980, when the flight was made. One small patens pocket does exist near the northern apex of the pond, and the rear backs two stretches of patens marsh to the west, connected with the Salem Straits elbow marsh system. During the field examinations, numbers of kingfishers and snowy egrets were observed diving and stalking the edges of the pond, suggesting that it is inhabited by small fry, minnows, and chubs.

From the tidal pond's entrance to the south, the coast turns rocky, and at the point rises to rocky bluff. From here, the cove turns west to form a tidal inlet which reaches some 575 yards to the west, where it angles to the north another 265 yards.

The first 170 yards of this "elbow" marsh's northern coast is rocky shorefront. Two docks are maintained from this shore. A narrow, broken fringe of cordgrass inhabits the toe of this rock slope.

The next 350 yards of shore are patens marsh, broken by rocky vegetated points. Along the entire coast, cordgrass lines the intertidal zone. Three separate patens marshes are found, each occupying the head of three distinct coves found in this section of the inlet. The majority of this coast is not bordered by development. This undisturbed nature might well account for the frequent sightings of ospreys roosting in a patch of dead trees on one of the rocky vegetated points. This area has good potential for siting of a platform to induce osprey nesting. A dock/boardwalk structure has been constructed over the largest high marsh. The patens on either side of the boardwalk appears to be healthy and stable.

The final 300 yards of the northern shore of this coast, leading to the "elbow", is predominately cordgrass fringe, with the adjacent upland consisting of a small embankment vegetated by planted grasses and/or hardwoods. Two docks provide access to the water. As the point is rounded to the north the shoreline remains similar for the first 100 yards.

From this point north to the apex of the elbow marsh, and south along the first 150 yards of opposite shoreline, the major coastal habitat is cordgrass fringe, backed by a strip of patens marsh. At the head of the marsh inlet, the patens is further backed by a stand of phragmites. Other small stands of phragmites are also scattered along the remainder of this coastal section. Three docks obtain access across the line of marsh.

Midway down the western shore, a large area of marsh has been denuded by frequent feeding of waterfowl. This practice has completely exposed the sediment, and has caused concern among neighboring residents. Attempts have been made to get the landowners to restrict or cease feeding, but the activity continues.

Below the patens marsh, the shoreline returns to cordgrass fringe backed by vegetated upland, until the watercourse angles east back towards Scott's Cove. At this point, the coastal character changes.

Running some 450 yards along the shore of the elbow marsh inlet is an artificial dike berm some 5 feet above mean high tide. This berm is broken in two places by culverts. Erosion has occurred around these pipes, and water floods behind the berm at mean high tide or higher. Covering several acres behind this berm is a patens marsh, fringed by meadow grasses typical of a freshwater or brackish water wetland; phragmites are also found. Preliminary studies would suggest that the patens' existence is borderline due to low salinity. Numerous signs of muskrat feeding in this area suggest a sizable population of the rodents. In the eastern portion of this meadow, a platform has been erected apparently for ospreys, but the platform has become overgrown, and is now useless for nesting fish hawks.

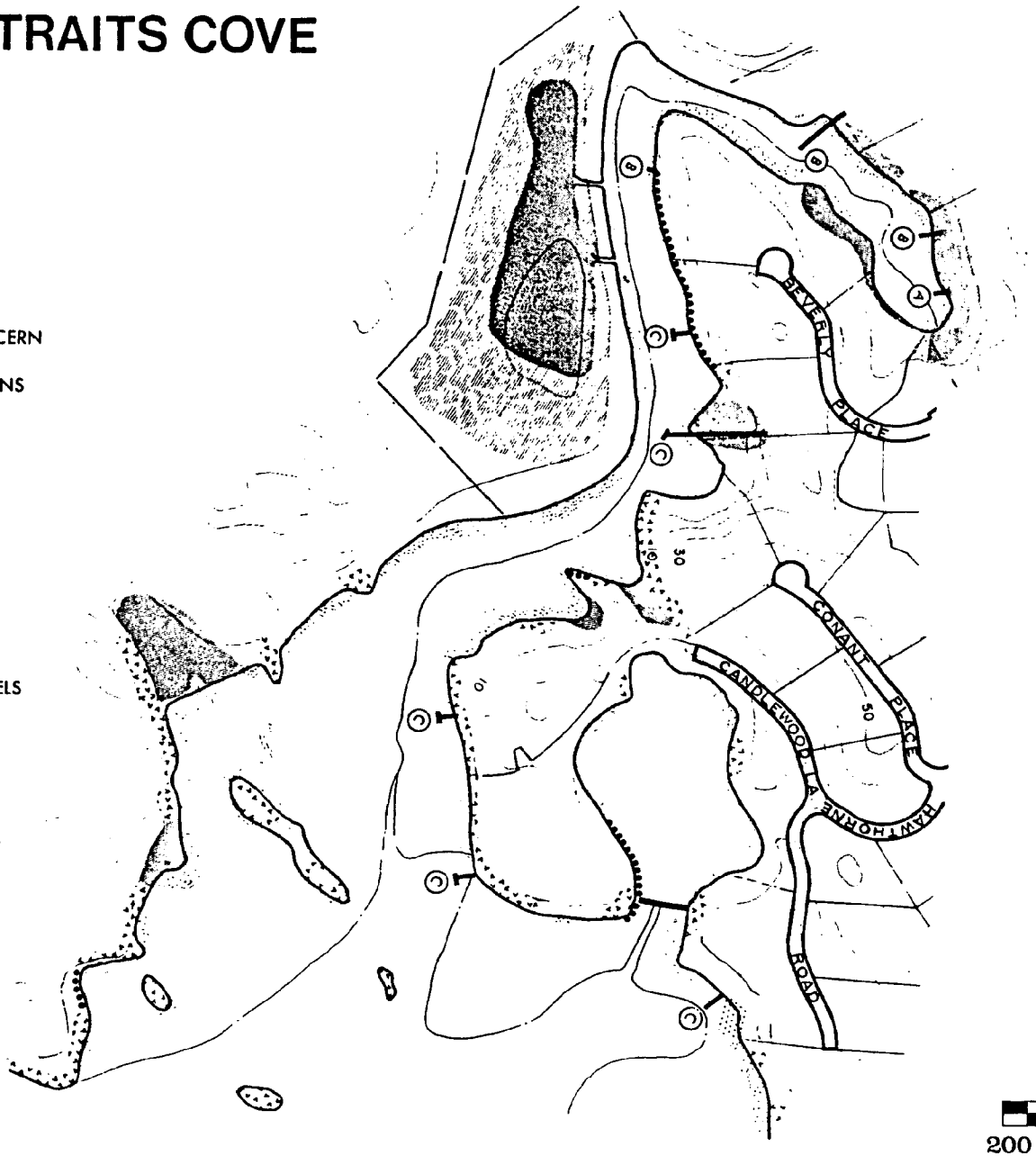
At the eastern border of this meadow, the coastline becomes rocky, consistent with the opposite shoreline. Here are numerous rock outcroppings, cordgrass fringe, rocky islands, and two patens marshes. This section of coast is not developed for water access or residential purposes. It stretches roughly 460 yards east-west, and the eastern edge marks the northeastern corner of Great Island. In the middle of this segment, an island lies north-south and is some 100 yards long. Adjacent to this is a large mudflat system, curving away to each side toward the hind shore. Behind this island, on the mainland, are two marsh systems. Both are protected by the island and shallow mudflats. Several other small rock islands lie off the northern shore of Great Island. This northern portion of the Island is heavily used by several species of water birds including the snowy egret, common egret, and great blue heron. They roost in trees along the coast during the hightide periods, when feeding activity is low.

Summary & Conclusions - Salem Straits cove

1. Because of the low density of development along a large portion of this shore, numerous patens marshes are found, along with a diversity of other habitat.

2. The area forms important roosting and feeding habitat for water-dependent birds, including herons and egrets. The frequent sightings of ospreys in this area suggest that the area is attractive to their needs as well. The potential for erecting a nesting platform should be considered.

SALEM STRAITS COVE



- AREA OF SPECIAL CONCERN
- REVETMENTS AND GROINS
- SEAWALL
- BOAT RAMPS
- SHORELINE STRUCTURE
  - (A) FLOATING
  - (B) SEMI-PERMANENT
  - (C) SET PILINGS
- COASTAL BOUNDARY
- MUDFLATS AND CHANNELS
- ROCK
- VEGETATED ROCK
- PHRAGMITES COMMUNIS
- LOW MARSH
- HIGH MARSH
- SAND

FIGURE 16

3. Erosion, due to feeding activities of waterfowl, should be examined, and the effects on the adjacent marsh mitigated.

4. Marsh area on the northern edge of Great Island should be stabilized, with marine water inflow maximized, and the inlet points stabilized against erosion.

4.5 Sargent's Cove

This section of the Darien coastline runs from the northeastern tip of Great Island to the southwestern edge of Hay Island. Viewed from the east, Sargent's Cove extends only 0.8 linear miles on a north-south axis, but the actual coastline covers a distance of approximately 2.7 miles. This portion includes a deepwater harbor, a large mudflat/cordgrass marsh, one brackish pond, and a large section of rocky shorefront.

The eastern end of Great Island runs 360 yards in a north-south direction. The majority of it is rocky shorefront, with small pockets of cordgrass found where protection from direct easterly exposure is offered by offshore rocks. The rocky shorefront rises some 5-10 feet above mean high tide and is topped by hardwoods.

The exception to this rocky nature occurs approximately one-third down along this coast. Here, an offshore island gives protection from the east and a small cove is situated behind with a cordgrass fringe backed by a horseshoe patch of patens. In addition to the patens, salt marsh bulrush was found growing in the Cove. While this bulrush likely grows elsewhere in the Darien coastal zone, this was the only location discovered during the survey.

From the southeastern tip of Great Island, the shore opens up into Sargent's Cove. Directly inside the northern shore, a small cove occurs which has been utilized as a salt water swimming pool and bathing beach. A rock dike has been constructed in the intertidal zone. This maintains the water level behind, with the basin being inundated at high tide. Behind the pool is a sand beach. At the eastern end of the dike, concrete steps and a "sunning area" have been constructed. When this area was surveyed, the pool held a small school of menhaden, several windowpane flounder, oysters, red-beard sponge and several other species of marine life. It could not be determined whether this life occurred naturally, or was placed in this "aquarium".

The southern flank of Great Island is predominantly rock bluff, ranging from 10-25 feet in height above mean sea level. At one point, a masonry wall has been placed atop the rock bluff just south of the main house, otherwise the bluff and other shorefront are unbroken. Small patches of cordgrass exist in areas where some protection is offered.

Toward the back of the Cove, the coastline has been modified into a major docking area, together with associated off-loading area

and access causeway. Riprap has been placed at the toe of the causeway, and continues along the facing shore of the docking cove, terminating as a groin on the opposite point. On the far side of this point, a marine railway is in place.

Upland of the railway is a storage building for boats. A small patch of cordgrass occupies the intertidal. This leads into another small cove which terminates at a dike. Behind the dike, a pond is maintained. The waters of this pond are brackish, suggesting that some limited tidal flow exists between the pond and the Cove. No obvious tidal line was observed. A look at the 1835 topographic charts for this area suggests that Great Island was once a true island, connected to the mainland via a marsh system. On-site observations indicate that this portion of the island was likely once connected with the wetland system to the north (Salem Straits cove).

The southwestern shore of this small cove is riprapped at the high tide line, and a small patens marsh with cordgrass fringe can be found. The riprapped shoreline continues for another 100 yards. South of this shore, a slight depression has allowed a sand beach to form at the back of Sargent's Cove. The remaining 130 yards to the entrance to Coon's Point marsh is cordgrass fringe with cobble and numerous rock outcroppings.

Between Long Neck Point and Hay Island is another marsh/mudflat system. At the center of this marsh is an island with access provided by a wooden causeway. The northern shore of the marsh is cordgrass fringe, with upland vegetation immediately inland. The western shore of the marsh is divided at regular intervals by seven docks, four of which are quite long (about 200 feet) in attempting to reach the main channel of the marsh. While the docks are generally well-maintained, they provide access only to small shallow-draft vessels as the majority of the marsh is exposed mudflat during the ebb tide.

The southern edge of the marsh, running along the northern shore of Hay Island, is characterized by cordgrass fringe. The southwestern portion of this fringe fronts on artificial fill, an access causeway, and phragmites, while the northeastern fringe is backed by hardwood vegetation.

The majority of the marsh is mudflat. The standing stock of alterniflora is restricted to shoreline fringe and the coast of the center island. The island also has a patens which runs along the eastern edge. While no obvious explanation was apparent, the low ratio of standing cordgrass to mudflat suggested that some form of impact such as ice action, poor flushing, or boating and related activities may have been responsible for reduced productivity of the marsh.

The southern shore of Sargent's Cove proper is dominated by cordgrass fringe, accompanied by rock outcroppings and upland vegetation.

Hay Island is occupied by a single residence. As a result, the northern shoreline is relatively undisturbed. However, there is one major stand of phragmites some 30 yards east of the Coon Point marsh entrance. In addition, the cordgrass fringe and rock outcrop character is broken by one cove, where a small beach exists. Directly offshore, a small vegetated island offers protection to the cove.

Sargent's Cove, also known as Ziegler's Cove, and marked as such on nautical charts, is a popular mooring and rafting-up area for boats, especially on the weekends. This results in several impacts: overcrowding of boats with the resultant litter and lowered water quality; disturbance of riparian owners in the area; and, as a general result, adverse impact on the marine life. Preliminary results from ongoing Coastal Energy Impact Studies being conducted by the Oceanic Society suggest that some form of stress exists during the summer period. Samples taken during this period exhibit pioneering organisms, while samples taken during the fall and early winter show a more stable marine community. While boating cannot be directly indicted for this impact, it is likely to be at least partially responsible. Sargent's Cove is one of the few natural deep water harbors in the area, and as the popularity of sailing increases, pressure on this Cove will also be likely to increase.

The eastern edge of Hay Island is largely rocky shorefront, with small coves formed behind the protection of bare rock outcroppings. Unlike Great Island, Hay Island lacks the high rock bluffs. Instead, the island is an average of 10 feet above mean sea level with the highest elevation found along the southwestern shore.

A sand beach occurs on the lower third of the eastern shore. As is typical, an offshore island guards its entrance. Directly south of the beach, a large rock outcropping juts into the Sound. To the southwest of this point, another cove forms. A patens marsh has developed with cordgrass seaward, and with an inland border formed by riprap. The cove is approximately 75 yards across, and the shore reaches out to another rocky point. Again, the coast falls away from this point, and another small patens marsh is found. Cordgrass seaward and riprap landward mark its boundaries.

Some 150 yards in from the southeastern tip of Hay Island, a seawall has been constructed to protect an access road. From this point, the next 230 yards of coastline is rocky shorefront. The southwestern extent of this shorefront is marked by a patch of cordgrass.

At this location, the natural features of Hay Island cease and man-made features dominate. A breakwater 130 yards long has been constructed to protect the causeway leading to the Island. An irregular system of open water, cordgrass, patens, and phragmites has formed between the breakwater and the stone causeway.

SARGENT'S COVE

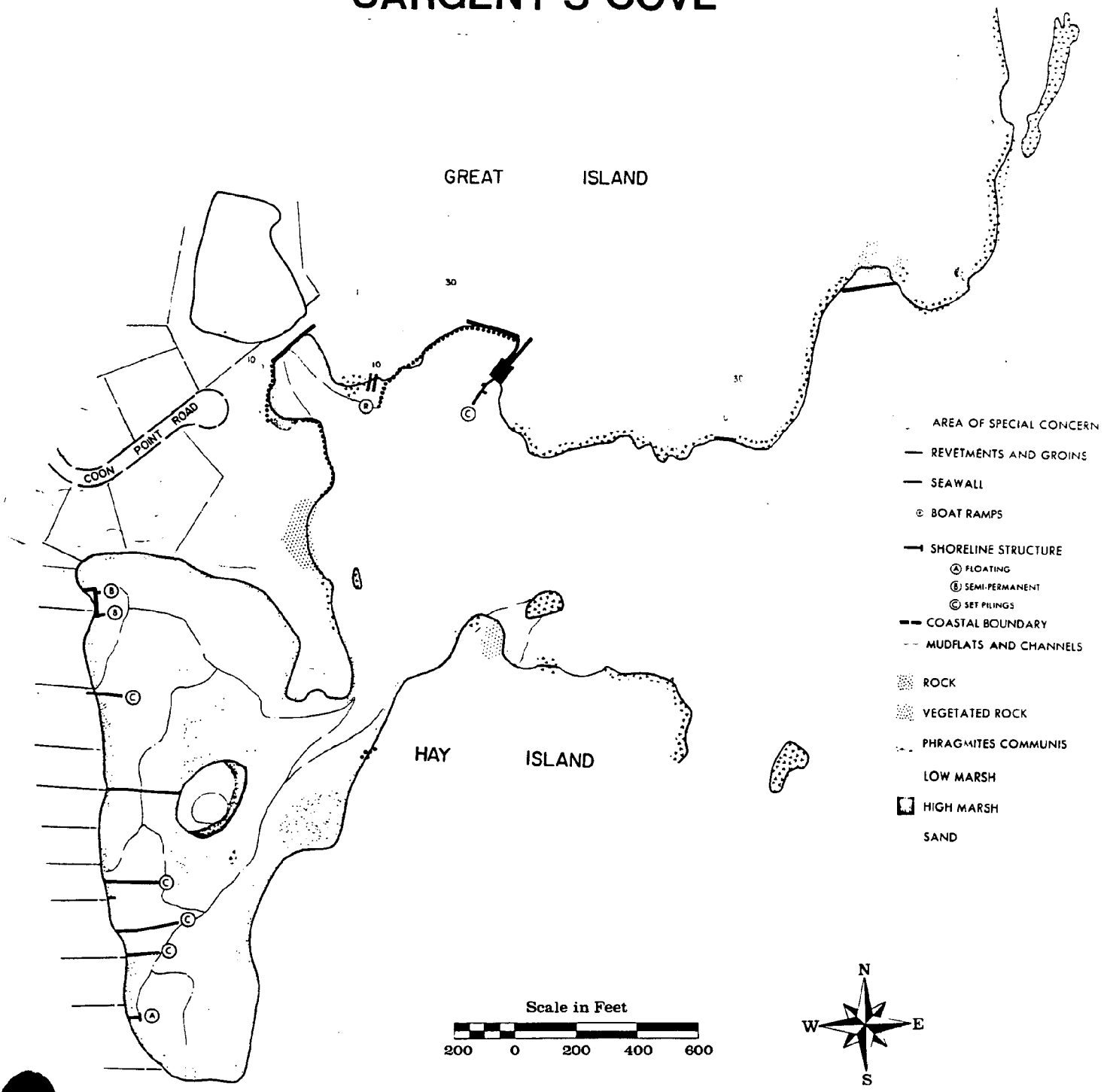


FIGURE 17

An additional 100 yards of rip rap has been placed at the toe of the causeway, south of the breakwater. The narrow gap between the riprap and the masonry work of the causeway is occupied by gravel and some high marsh vegetation. A cordgrass fringe exists seaward of the riprap. At the point where the causeway turns west, the shoreline drops to the south, and the coastline of Long Neck Point begins. At the articulation of the two, a sand beach has been formed with a stand of phragmites landward.

Summary & Conclusions - Sargent's Cove

1. Impact of boating on the natural systems of the Cove, and the adjacent landowners, should be investigated further. Possible mitigation measures to be pursued include designation of the area as a special anchorage, with enforcement by the Town Harbor Master.

2. Coon Point marsh shows a low ratio of standing growth to mudflat. Further study should be made into the historical density and distribution, along with identification of possible causes.

4.6 Long Neck Point

This point of land represents the Town of Darien's deepest penetration into Long Island Sound. From its junction with Hay Island along its eastern shore to the point itself, it stretches north-south for 900 yards. Long Neck Point's western shore covers a slightly longer distance to the mouth of the Darien River. As Darien's southernmost portion of land, it is also the most exposed to the wind and wave action of the Sound. Unlike the bedrock fortification protecting Great Island, Butler's Island and Contentment Island, Long Neck Point is largely made up of glacial till; a non-stratified mixture of boulders, gravel, sand and clay. As a result of this geological composition, seawalls, riprap and other shoreline protection structures are obvious coastal features along the Point. The elevation of Long Neck Point is variable, ranging from approximately 10 feet above mean sea level at the tip to about 50 feet at the north-central portion. The Point's shoreline totals some 1.4 miles.

Beginning at the juncture where the Hay Island causeway passes inland, the coast swings into the south. The entire eastern exposure is bordered by some form of seawall or revetment. The upland portion is cultivated lawn and landscaping.

The coast redirects slightly to the west and is straight for the next 400 yards. Here, a seawall marks the approximate high tide mark and a sand beach forms an intertidal margin some 25 yards wide. Two docks are found in this area. One of them, approximately 20 feet long, is marked on nautical charts as maintaining a private navigation marker. The final 300 yards to the point is again a combination revetment and seawall. A narrow cordgrass fringe lies seaward of the riprap. Approximately three-quarters

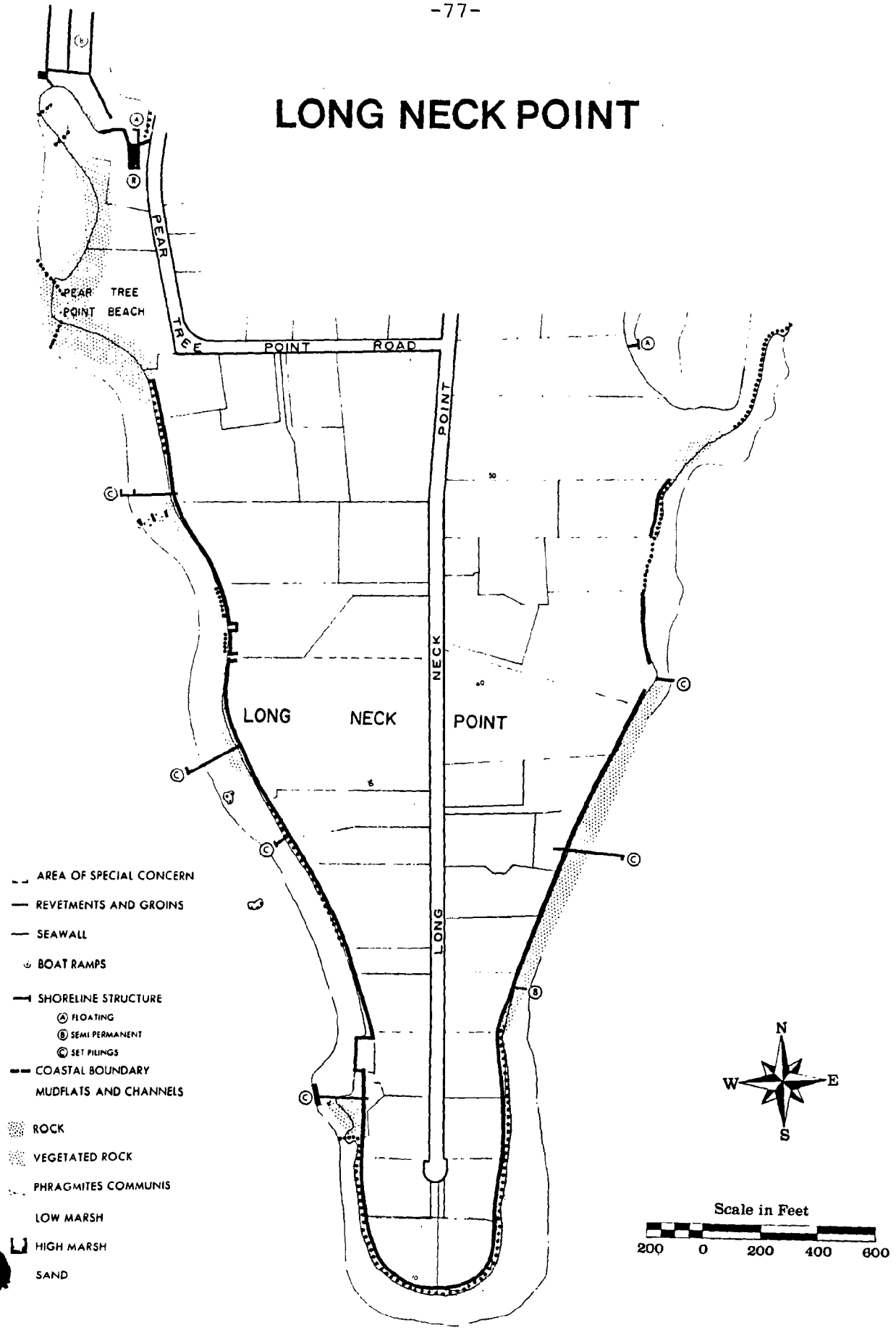

LONG NECK POINT
PEAR TREE POINT BEACH
PEAR TREE POINT ROAD
LONG NECK POINT
LONG NECK POINT
AREA OF SPECIAL CONCERN
REVETMENTS AND GROINS
SEAWALL
BOAT RAMPS
SHORELINE STRUCTURE
FLOATING
SEMI PERMANENT
SET PILINGS
COASTAL BOUNDARY
MUDFLATS AND CHANNELS
ROCK
VEGETATED ROCK
PHRAGMITES COMMUNIS
LOW MARSH
HIGH MARSH
SAND
N
W
E
S
Scale in Feet
200 0 200 400 600

FIGURE 18

of the way down the eastern shore of Long Neck Point, the coastal features turn from gentle slope to modified escarpment, and then moderate to flat ground at the end of the Point.

The combination of revetment and seawall continues around the Point onto the western exposure. Some 170 yards north, a short breakwater interrupts the revetment, and a small beach has formed behind the breakwater. Landward, a seawall marks the beach's upland boundary, and to the north a massive dock has been constructed. The dock consists of a breakwater, topped by an accessway, and at the end is a concrete docking leg. North of the dock a seawall continues and a large building has been built out over the water. Continuing up the western shore, the seawall is reinforced by revetment for approximately 220 yards. Offshore, a rock pile island exists which was likely formed by the dumping of extra rubble or similar action. One dock is maintained from this coastal portion. The type of seawall used changes at this point to concrete blocks. Cordgrass fringe grows in the intertidal area at the lower portion of this property, and a sand beach forms around the base of another substantial docking structure. Some erosion is evident in the block wall. The cordgrass fringe continues northward in front of the concrete block wall. The northern end of this wall has collapsed and rock rubble has been placed in the breech. A small drainage gully divides the property here. The lot to the north utilizes the riprap/seawall combination and maintains a stairway for access to the narrow band of beach that fronts the property.

Above this beach, a cordgrass fringe can be found. The small beach band becomes wider behind the protection of cordgrass, and widens around the base of two docks. The dock to the south has been removed recently, and only the rock stanchions are in evidence. The dock directly to the north has been maintained.

Summary & Conclusions - Long Neck Point

Because of Long Neck Point's exposure to Long Island Sound, the maintenance of revetments and seawalls, along with the control of erosion, are major concerns. The shoreline survey revealed that shoreline protection structures were mostly in good condition; however, certain segments were in need of maintenance. Failure to do so promptly, and properly, will likely lead to continued loss of seawall with erosion, and damage to inland areas likely.

4.7 Pear Tree Point

The beach at Pear Tree Point is one of two public beaches within the Town of Darien. The associated Darien Boat Club is the only "Town" boating facility. It is a quasi-public organization and offers the largest number of slips of any boating facility within the community.

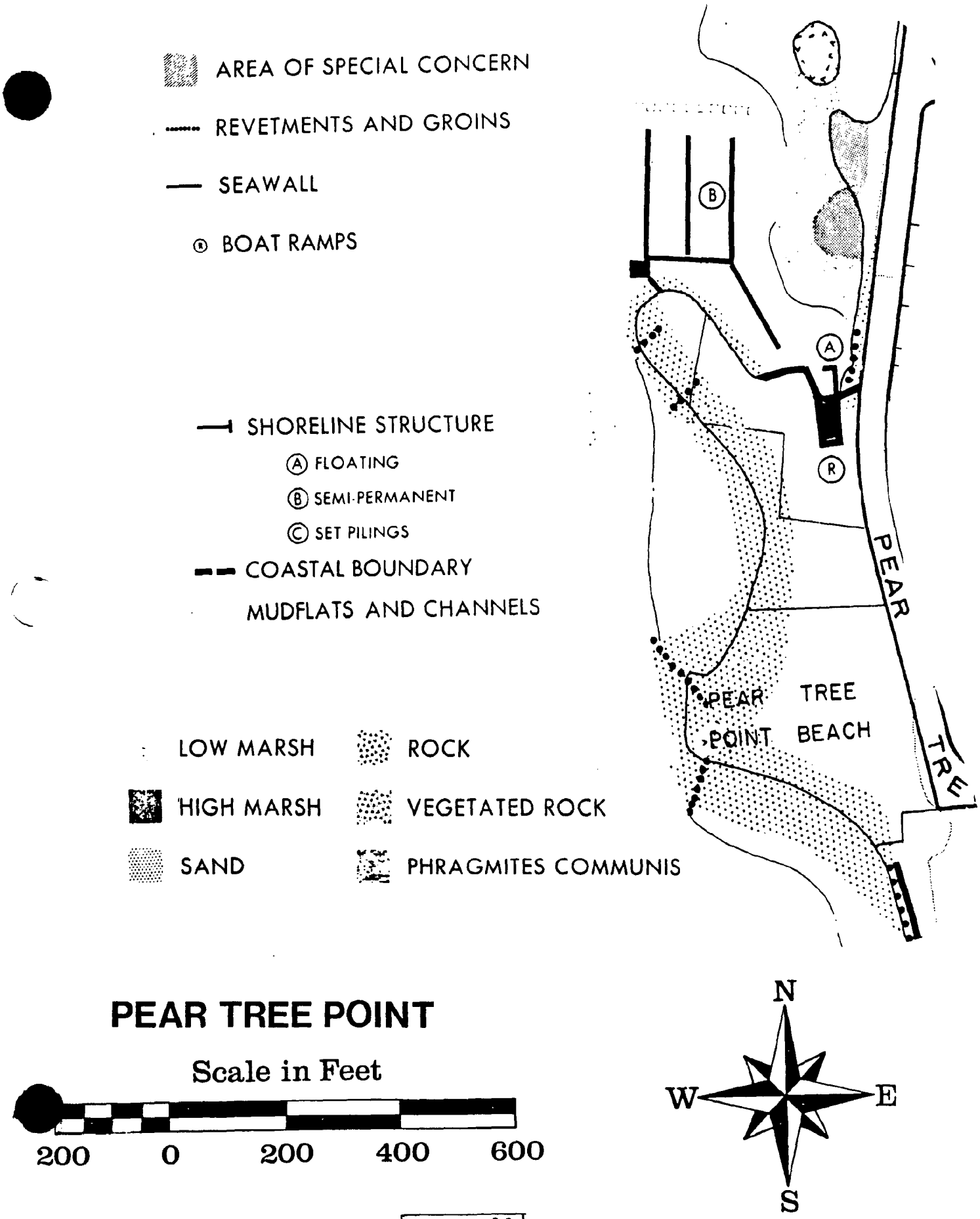

AREA OF SPECIAL CONCERN
REVETMENTS AND GROINS
SEAWALL
BOAT RAMPS
SHORELINE STRUCTURE
A FLOATING
B SEMI-PERMANENT
C SET PILINGS
COASTAL BOUNDARY
MUDFLATS AND CHANNELS
LOW MARSH
HIGH MARSH
SAND
ROCK
VEGETATED ROCK
PHRAGMITES COMMUNIS
B
A
R
PEAR
PEAR TREE POINT
TREE BEACH
TRE
PEAR TREE POINT
Scale in Feet
200
0
200
400
600
N
W
E
S

FIGURE 19

Pear Tree Point Beach consists of two stretches of sand, one that runs east-west some 100 yards, and the second that reaches north-south approximately 150 yards, representing a beach area of 2.75 acres. Between the beach fronts, two breakwaters have been constructed to stabilize the sand. A building providing restrooms and changing rooms is also located between the sand faces. Landward of these beaches is a parking lot with a capacity of 240 spaces. This parking lot is also used by the Darien Boat Club and the public boat launching ramp. At the height of the summer season, this beach is heavily used by townspeople, and is also open to the general public for a fee. Residents displaying a beach sticker are allowed unlimited use of the park.

The beach itself needs to be replenished on a regular basis. The last nourishment project was carried out in 1980 and entailed the placement of 900 yards of sand.

Directly to the north of the beach area is the Darien Boat Club facility. This marina accommodates 244 boats, most of them power boats, with an average length of 20 feet. The demand for boat space at the Club far outstrips current supply, and expansion of these facilities ranks among the most important coastal concerns in Darien.

A 1967 plan for expansion was designed to increase boat dockage by approximately one-third. If such expansion were to be undertaken, it would likely involve the dredging of the marsh system directly to the northeast of the Boat Club. This system currently shows signs of stress as a result of its proximity to the adjacent marina. Litter and other debris, along with signs of reduced productivity (possibly from oil contamination) were visible during the shoreline inventory. In addition to the required dredging, the shoreline along Pear Tree Point Road would have to be stabilized against erosion from increased wake wash and other wind/water action. Other concerns from expansion of this facility would include greater pressures on existing parking facilities; disposal of dredged material from the improvement project; future maintenance dredging; and control of sedimentation from upstream and from Darien Harbor. This sedimentation occurs at two major areas; the docking basin, and the "gut" between the Darien Boat Club and the western shore of the Darien River. Preliminary investigations would suggest that the major source of sediment for the docking basin is upstream from the Darien River and Gorham's Pond, while the "gut" is likely to receive sediment largely from the along-shore movement of sand from the Pear Tree Point Beach and other areas within the Darien Harbor area. A recent February 1982 permit request to the Corps of Engineers and the State DEP calls for the maintenance dredging of the berthing basin, approximately 65 yards by 315 yards, to the depth of minus six feet mean low water. The permit request calls for the removal by clamshell dredge of approximately 8,000 cubic yards of sand and silt for disposal at an open water site in Long Island Sound.

In addition to the docking facilities of the Boat Club, there is also a Town-owned boat ramp located directly to the east of the Club. While exact figures on the number of boats using the ramp are not available, it receives heavy use during the boating season and is the only public boat ramp in Town. The parking of vehicles, along with their boat trailers, places an increased burden on the available parking at Pear Tree Point.

Summary & Conclusions - Pear Tree Point

1. Parking facilities for the Beach and Boat Club are the single major factor restricting increased use of the area.

2. As a result of the boat ramp, trailers are left in the parking lot. The combined length of tow vehicle and trailer causes additional strain on those already overused facilities.

3. As Darien's public beach facilities are placed under increased demand, it is imperative that the Town continue to assess this demand and take all feasible measures to meet the requirements.

4. Expansion of the Darien Boat Club docking facilities should be considered.

5. Further study should be undertaken of the hydrological regime and sedimentation patterns in order to determine appropriate actions for managing Pear Tree Beach, Darien Boat Club's "gut", and the mooring basin directly inside the Point.

4.8 Darien River

The Darien River is a portion of the watercourse between Gorham's Pond to the north, and Darien Harbor to the south. Extending north-south some 1,140 yards, the Darien River drains into Gorham's Pond, along with the Goodwives River and Stony Brook, which also drain into Gorham's Pond. The Darien River has three major marsh systems along its banks. It is navigable by shallow draft vessel to Ring's End Landing at its northern extreme, and exhibits a wide range of habitats and uses.

Beginning at the southeastern shore of the River, just north of the Darien Boat Club, the eastern bank is dominated by a cordgrass patens marsh which extends 230 yards to the north. The lower portion of this marsh is a cordgrass intertidal portion, connected to a patens marsh on the higher ground. As mentioned in the previous section, this marsh shows some signs of stress from its proximity to the Darien Boat Club. The upper portion is a cordgrass fringe and shoal which form a small haven. Shoreward of this system, the land rises to Pear Tree Point Road.

North of the marsh, the coast narrows to a cordgrass fringe which borders a high stonewall that rises to the road. A landing juts

out into the River, protected by a seawall and riprap. From this point, the shore jogs to the east. The coast comprises largely vegetated slope, broken in places by rock outcroppings and some riprap.

The vegetated character of the slope is altered after some 150 yards by a house that has been constructed within the intertidal zone. The remainder of the property is protected by revetment to the north. Cordgrass fringe continues for 50 yards to the peak of a small cove. The coast swings to the west, as the land forms a peninsula. The southern edge of this peninsula is cordgrass fringe, with a stonewall behind it. A single dock is constructed on the shore. The western end of the peninsula is bulkheaded with a dock maintained in the middle of the seawall, and the northern shore returns to the cordgrass fringe backed by a short section of riprap in the middle. At the northeastern edge, a small seawall has been constructed.

The final 300 yards of the Darien River's eastern shore is cordgrass, backed by a short bank of upland bordering Pear Tree Point Road. At a point approximately two-thirds of the way north, a small parking area has been provided off the road. A scenic view of the River is offered, but some erosion does exist along the shoreline.

The head of the River, known as Ring's End Landing, consists of a concrete and stone causeway/tidal gate and residential buildings which lie between the River and Ring's End Road. The tidal gates regulate the waters of Gorham's Pond, and water from the Darien River goes into the Pond only at high tide. The buildings located at Ring's End Landing are situated behind a stone seawall.

There is a great deal of concern over the silting of Gorham's Pond, especially at the articulation of the Pond with Stony Brook. As a management measure, the tidal gates at Ring's End Landing are opened on occasion to aid tidal flush, and to help relieve silting. However, this action raises concern downstream, especially at the Darien Boat Club, over increased sedimentation from the flushing actions upstream. The extent of sedimentation and siltation in the River is estimated by a former harbor master to be occurring at the rate of approximately 2 1/2 inches per year.

The western shore of the Darien River features a more diversified range of habitat and shoreline features. South from Ring's End Landing, the first 250 yards of shore is predominately cordgrass fringe, backed by vegetated slope and cultivated lawn. A derelict dock, float, and maintained dock are located within this zone. In several locations, the slope leading down to the River has been used for dumping of toppings and other rubbish.

Directly downstream, a shoreline extension project has been constructed. This project consists of a seawall projecting out into

the River, with a floating dock attached. The area behind the seawall has been backfilled, brought up to grade, and made into lawn. The shoreline directly downstream of this site resumes the more natural vegetated slope character of the shore upstream. A single dock is found in the downstream area.

Approximately 75 yards south of the extension, the shore is interrupted by a large stand of phragmites. A dock is maintained amongst the reed grass.

From this point, south to the mouth of the Darien River marsh, the shoreline is cordgrass fringe with riprap directly behind. A short breakwater of sorts is constructed out into the cordgrass. Here, the shoreline opens out into a major marsh system.

The Darien River marsh covers approximately 7.1 acres. At the mouth, it is some 280 yards wide, and stretches approximately the same distance back into the marsh. Three distinct branches occur off the main marsh. The main marsh is predominantly mudflat, with the cordgrass largely restricted to the edges, and one berm which protects the marsh entrance.

The northern shoreline is cordgrass fringe, with a band of high marsh behind it. The width of this patens marsh varies. At a point directly behind the protecting arm of cordgrass, a dock has been constructed across the patens and low marsh. The materials appeared to be quite new at the time of the survey, and it is probable that the work was performed without proper permits. An area of marsh immediately to the west has also been disturbed, but the cause was not identified.

The shore gently curves toward a minor inlet. A small dock is located at the entrance, and an upland meadow is directly behind the coast. The inlet contains cordgrass, patens band, and two small docks. Several stands of phragmites are scattered here; a stonewall lies on a northern shore; and a tidal inlet also can be found. The entrance is quite narrow, spanning only a few yards.

The western shore of the marsh continues to be occupied by cordgrass fringe and a narrow band of high marsh. A dock has been constructed, along with a low stone wall. The shoreline then curves into a second inlet. The mouth to the inlet is cordgrass up to a stone dike. Behind this dike, patens marsh has developed over 0.68 acres. Inland from the marsh, a stand of phragmites is evident. East of the entrance to the patens marsh is a low stonewall and an old dock.

A third marsh is found on the southern shore of the Darien River marsh. The marsh occupies one-half of the lower shoreline. It is likely that this marsh once totally bisected the wooded peninsula to its east. However, a causeway to provide access to the wooded point now cuts the marsh in two. This third marsh is approximately 1.36 acres in size and drains into the Darien River marsh through one tidal inlet vegetated by cordgrass.

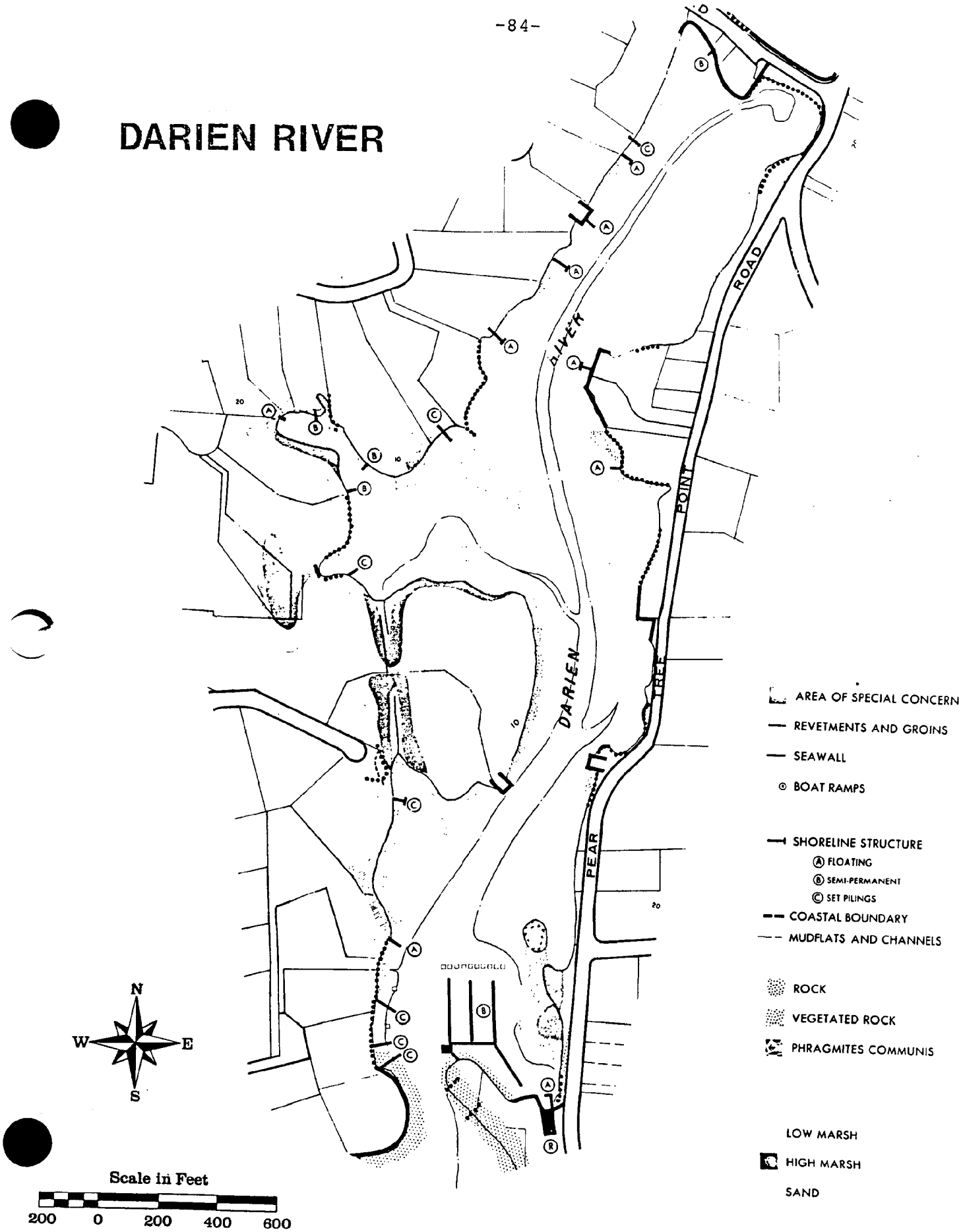

DARIEN RIVER
DARIEN RIVER
PEAR TREE POINT ROAD
AREA OF SPECIAL CONCERN
REVETMENTS AND GROINS
SEAWALL
BOAT RAMPS
SHORELINE STRUCTURE
(A) FLOATING
(B) SEMI-PERMANENT
(C) SET PILINGS
COASTAL BOUNDARY
MUDFLATS AND CHANNELS
ROCK
VEGETATED ROCK
PHRAGMITES COMMUNIS
LOW MARSH
HIGH MARSH
SAND
N
W
E
S
Scale in Feet
200 0 200 400 600

FIGURE 20

The remainder of the southern shoreline is characterized by cordgrass fringe and a band of high marsh backed by hardwood forest which continues out to a point which marks the southeastern boundary to the Darien River marsh.

The next 250 yards of shoreline of the western coast of the Darien River is uniform, with a narrow cordgrass band backed by hardwood forest. This forest serves as an important roosting area for wading birds, in particular, the black-crowned night heron. Dozens of these birds were sighted in the hardwoods during the high tide. In addition, a pair of ospreys were seen utilizing a standing dead tree on several occasions during the shoreline survey. At the lower end of this wooded shoreline, a landing has been constructed of stone and fill. It does not appear to be used, as it is overgrown with weeds and other vegetation.

From the landing, the shoreline opens up to form another major marsh system. The cordgrass fringe widens and funnels into an inlet backed by patens. The tidal inlet reaches north to the causeway that serves the wooded peninsula. This marsh system backs directly on the marsh described on the southern shore of the Darien River marsh. The patens marsh runs approximately 75 yards south from the causeway, and is approximately 100 feet at its widest point.

The cordgrass and adjacent mudflats reach from the tidal inlet, which bisects the patens marsh southeast some 110 yards, and widens to 180 yards at the mouth of the marsh. A single dock is found in this marsh inlet. The western shore of the lower marsh is marked by a narrow band of high marsh consisting largely of alder, and the southern entrance to the marsh is dominated by a large growth of phragmites.

The remaining 220 yards to the mouth of the Darien River is predominantly cordgrass fringe, broken by four dock structures and backed by stands of phragmites, stone riprap,and open land. On the point, a sand beach is backed by seawall. At this location, the River is barely 25 yards across at mean low tide and directly faces the Darien Boat Club.

Summary & Conclusions - Darien River

1. Siltation of the "gut" and the Boat Club mooring basin is a major issue. It is thought that the opening of the tidal gates at Ring's End Landing to alleviate sedimentation in Gorham's Pond leads to increased silting of the lower River. Sources of siltation and sedimentation rates for the River and Gorham's Pond will require further study.

2. The Darien River poses several examples of what shouldn't be done within the coastal zone, such as: building directly in the intertidal zone; allowing the collapse of seawalls through lack of maintenance; construction of non-permitted

work in tidal marsh; and so forth. While these have not overwhelmed the natural character of the River, they are nonetheless illustrative of mistakes that mustn't be repeated in the future.

3. The tidal marshes located mid-way along the western shoreline of the Darien River are significant natural systems. Signs of impact, disturbed patens areas, and new docking structures are present. Any further infringements should be properly controlled.

4.9 Gorham's Pond

From the Ring's End Road causeway and tidal gates to the dam just north of Goodwives River Road, Gorham's Pond extends north-south approximately 0.8 miles. Gorham's Pond is the second largest tidal pond in the Town of Darien, behind Holly Pond.

Gorham's is fed by the Goodwives River to the north and Stony Brook midway along its western shore. The southern border of the Pond is formed by a stone causeway and tidal gate which restricts the outflow and inflow. This, in turn, restricts both the tidal range and the circulation.

All of Gorham's Pond, a portion of the Goodwives River, and the lower segment of Stony Brook lie within the primary Coastal Boundary. However, the "coastal" character of the area is further restricted. For the purposes of this report, the coastal segment of the Goodwives River is a short section from the top of Gorham's Pond north 100 feet above the bridge on Goodwives River Road where the placement of a riprap dam prevents any tidal action or saline water intrusion upstream. On Stony Brook, the "coastal" character extends westward from its confluence with Gorham's Pond to a point 50 feet upstream of the bridge on Old King's Highway South, where a small rock dam marks the termination of coastal influence. It should be noted that the true coastal character from a sense of marine vegetation, marine fauna, and other factors is even more restricted to the lower portion of Gorham's Pond.

Beginning at Ring's End Landing, on the southern border of Gorham's Pond, a stone causeway extends 100 yards roughly east-west. On the causeway's eastern end, a tidal gate and spillway control the water flow. These gates are still operative, and are occasionally opened to reduce sedimentation in the Pond.

The timing and extent of these openings are a disputed issue because residents along the Pond would like to see the tidal gates opened more often, while interests along the Darien River, including the Darien Boat Club, feel that opening the gates causes increased sedimentation downstream of the Pond. When the gates are not open, the water flow is regulated with marine waters entering the Pond only at high tide.

Moving north along Gorham's western shore, the land/water interface is characterized by private residences with lawns extending to the shore and some shoreline protection in place. These open lawn areas are separated by wooded areas with no man-made shoreline protection.

The shoreline between Ring's End and the mouth of Stony Brook is primarily forested upland with small areas of marine vegetation found along the shore. Only at the southern edge of this segment, between the Ring's End causeway and the home located immediately north of Ring's End Road, does any substantial shoreline protection exist. The overall character of this part of Gorham's Pond is upland vegetation broken in two places by lawns of private homes. Approximately 600 yards upstream of Ring's End is the mouth of Stony Brook. Offshore of this area lies major shoaling caused by sediments from Stony Brook settling in the quieter waters of Gorham's Pond. In some places the shoal is exposed, while in others, the water is only inches deep. Miscellaneous debris is trapped there, including tree limbs and metal objects of all sorts. The area is unsightly, but used by a variety of wading birds as a roosting area with some feeding likely.

Moving westward into Stony Brook, the shore is bordered with large rocks along the bank. The bottom of Stony Brook here is sandy. Some 65 yards upstream of the confluence, Stony Brook opens up into a meadow. The flora present here is largely freshwater in nature, with cattail and purple loosestrife among the dominant vegetation. Shortly after the meadow opens up, Stony Brook splits into two branches which merge again some 50 yards upstream. Just north of this merging point, Stony Brook passes under Old King's Highway South. A short distance upstream of the bridge, Stony Brook passes through a series of riffles which mark the study's inland boundary.

From the mouth of Stony Brook, Gorham's Pond narrows northward towards its confluence with Goodwives River. Immediately north of the entrance to Stony Brook is a rocky point followed by a seawall, extending 120 yards, backed by lawn. North of the seawall, the shoreline returns to upland vegetation on a small point, followed by another home with a lawn and no seawall in front. A fringe of patens and bulrush is found along the shoreline border. Upstream of this area, a stretch of upland habitat reaches some 125 yards before being broken by another small lawn area. At this point, the Pond narrows to a narrow neck of water measuring approximately 75 feet across. Along the western shore, upland forest dominates the shoreline for 275 yards. In a few small areas some wetland vegetation is present, but the shore is primarily broken by rocks with vegetated slope. After this wooded segment, the western bank opens up to another lawn. Here the shoreline jogs and narrows, forming the mouth of the Goodwives River. A stand of phragmites is located on the western corner. From this point, the Goodwives River Road bridge is only 100 yards northeast.

The extent of the coastal influence ends 100 feet further upstream, as a result of a masonry stone dam. The banks on both sides of the River between the dam and bridge are primarily upland vegetation.

Extending south from the Goodwives River Road bridge, the eastern bank of Gorham's Pond resembles the western bank with two major differences: 1) the upper portion of the eastern shore is steeper in slope and 2) the Goodwives River Road extends in close proximity along the entire length of the Pond's eastern bank. Subsequently, the character, along a major portion of the eastern bank, is dominated by the road. Moving south from the bridge along the eastern bank, the shore consists of wooded bank for 350 yards. At regular intervals, private homes are located at the top of the bank. As a result of the steep embankment and narrowness of Gorham's Pond at this point, little visual access is maintained, and formal physical access is provided at only one point along the southern portion of this stretch. At this point, a set of stairs leads down to the water. Some 350 yards south of the Goodwives River Road Bridge, the Pond opens up, and the slope of the eastern bank moderates. Here a house is located close to the shoreline and a large stand of phragmites extends along the southern edge of the property.

For the next 170 yards of Gorham's Pond's eastern shore, the Goodwives River Road parallels the shore with the band of vegetation averaging 40-90 feet between the road and the pond. One residence is squeezed between the shore and the road. The banks are relatively steep vegetated slopes. South of this section, a peninsula juts out opposite the mouth of Stony Brook. A seawall rings most of the peninsula, while a patens salt marsh dominates the southern edge. Three homes occupy this peninsula.

The shore then returns to border the Goodwives River Road, and continues in this fashion to the Ring's End causeway. The shoreline is vegetated slope gradually moderating to the south. Some 65 yards upstream of the causeway and tidal gates, a stone seawall begins which forms part of the causeway structure.

The vegetated slopes which dominate the majority of the eastern shoreline are extremely prone to erosion as a result of their grade and proximity to Goodwives River Road. In several places, the slopes have been used for disposal of tree and other organic debris. While existing erosion is light, care should be taken to avoid stressing the slopes.

Conclusions - Gorham's Pond

1. Because of the tidal gates, Gorham's Pond has little tidal flux, resulting in relatively few shoreline protection structures, restricted circulation, and reduced coastal habitats such as intertidal flats.

GORHAM'S POND

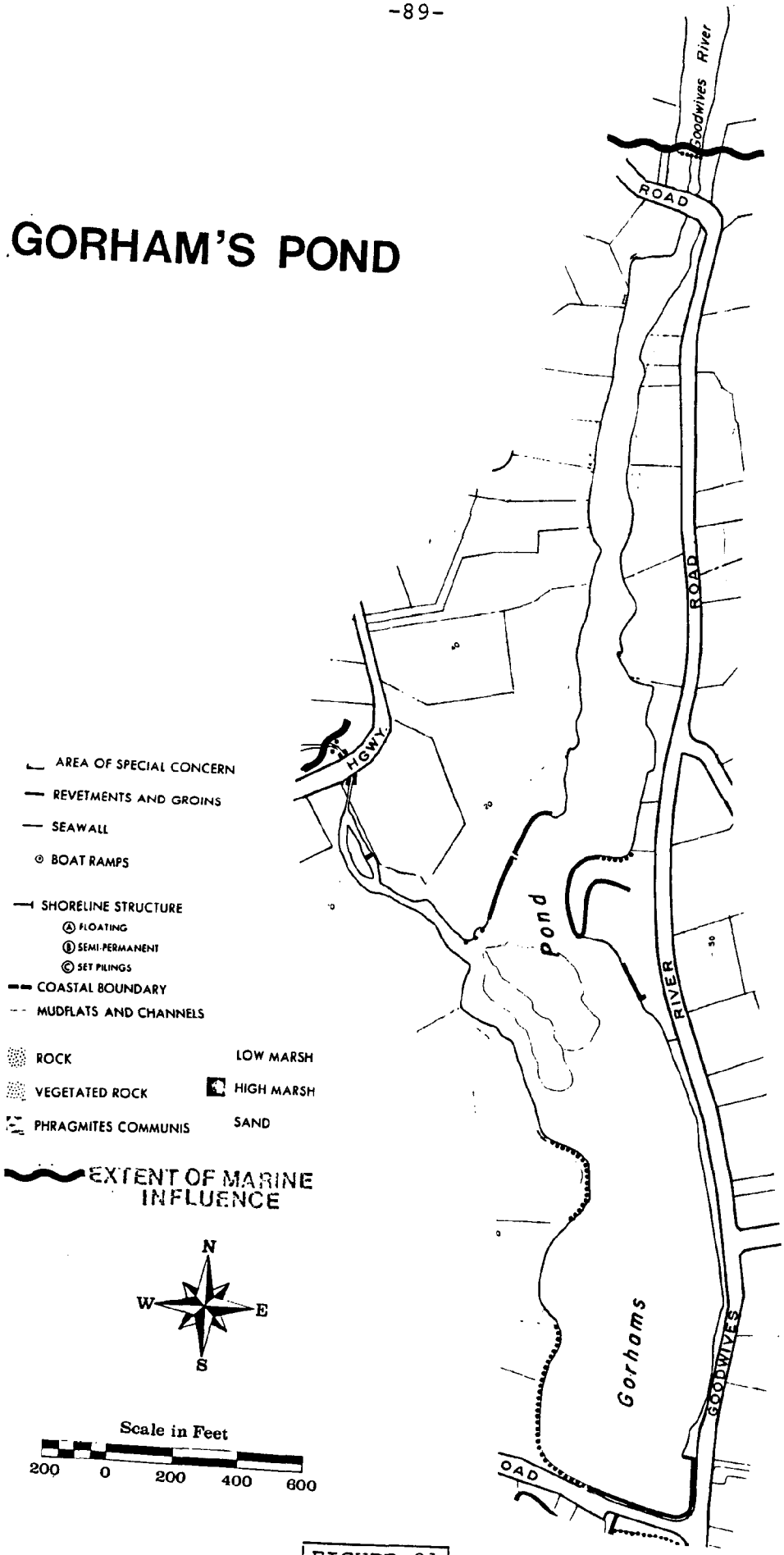


FIGURE 21

2. Sedimentation within the Pond, especially at the mouth of Stony Brook, is extensive, causing many residents concern. Means of correcting this situation should be studied, keeping in mind possible adverse consequences in the Darien River.

4.10 Noroton Bay - Weed Beach

Noroton Bay stretches generally from the mouth of the Darien River south to include Nash Island and Pratt Island. The western end of Noroton Bay extends to the entrance of Holly Pond. The coastline is largely characterized by fortified shoreline, backed by private residences. A private yacht club and private residential beach/recreation facility are found in this area. While the straightline distance barely measures one-half mile east to west, the actual shoreline twists and turns to cover more than 1.8 statute miles.

To the west of the Darien River "gut", a sand beach has formed. This beach, 150 yards east-west, is a continuation of the beach formed in the "gut", and is stabilized by three wooden groins which cut the beach at right angles. These, in turn, are anchored to a seawall that runs the length of the beach. At the western end the shore swings south, and at the angle the seawall ends, leaving sand beach backed by slightly higher ground inland. South of this angle, the sandy character of the intertidal zone continues for the next 250 yards, but the coast is a myriad of seawall, boat railway, bulkheaded boat launch areas, and mooring areas. The first part of this shore is seawall, with two groins placed in the intertidal. South of this area is the Noroton Yacht Club complex. Beginning at a groin, this area has a boat railway, boat ramp, small beach, revetment which turns into bulkhead, six finger docks (during the boating season), a larger sand beach (used for bathing), and a long pier (100+ yards). The Club is private, with 200 member-families. They maintain a fleet of 200+ boats averaging 22 feet in length, consisting largely of sailboats. The demand for dry storage area and mooring space out in the Harbor outstrips current supply.

From the Yacht Club pier, the shoreline opens into a cove. The northern shore of this cove is dominated by five docks, and two wooden groins. A small privately-owned sand beach exists to the west of the Noroton Yacht Club. The next property is seawall fronted by riprap, and followed by a section of seawall and three permanent docks. Towards the head of the cove, the intertidal area becomes a sand beach which continues into the northeast corner of the cove. A small stand of phragmites occupies the corner. Two docks are constructed in this section.

The inner, or western, shore of the cove is riprapped with three dock structures extending from the shore. The lower third of this shore, and most of the southern section, is a cordgrass marsh. This marsh is backed by an access road to Nash Island on the western shore, and upland vegetation on the southern shore.

In addition to the marsh which extends approximately two-thirds of the way along the shoreline, a large dock has been built, and to the east cordgrass fringe is found. The point is marked by two groins at right angles to each other. The remainder of Nash Island faces Noroton Bay and Long Island Sound.

The eastern face of Nash Island is seawall fronted by sand beach, cordgrass fringe, and rock outcroppings from north to south respectively. A house has been built out over the intertidal zone in this section.

The southeastern corner of the Island is marked by a stonewall that extends into the intertidal zone and is topped by a wooden gazebo.

The general nature of Nash Island, and its southern shore in particular, is rocky. Because of its exposure to the Sound, the southern shore is heavily fortified, utilizing natural bedrock features and masonry. The entire shore is backed by a seawall. The foreshore character begins as cordgrass fringe, while the western end is fortified by both revetment and seawall. Several rocky points have been incorporated into the defenses. Offshore, numerous rock outcroppings and small islands exist.

The western face of Nash Island is also seawalled, but the intertidal area is sandy. In the middle of this shore, a rocky spit reaches into the Sound, terminating as an island. The residence on the southwestern tip maintains a stairway to the water. The western shore continues around into a small cove.This cove and the cove behind the Noroton Yacht Club are separated only by the construction of a causeway. The southern shore of this cove is marked by revetment and seawall, and at the head of the cove a sand beach has formed. Landward of the beach, riprap has been placed. The northern shore of the cove is seawall, fronted by a narrow strip of fine sediment beach and a cordgrass fringe. This shore is tipped by a large section of exposed bedrock which forms the southeastern tip of Pratt Island.

The northwestern shore of Pratt Island is seawall, fronted by a rocky intertidal zone and cordgrass fringe. This continues to the point where the coast meets Nearwater Lane. Here, the shore has been riprapped for approximately 80 yards to protect the roadway. A long pier (120 +/- yards) is located here as part of the Noroton Bay Association beach facility.

The shore between the Noroton Bay pier and the entrance to Holly Pond (1000 yards +/-) is sand beach. A privately-owned stretch 100 yards long occurs directly north of the pier. A rock and wooden bulkhead breaks the continuity of the beach. Behind this structure, a ramp has been constructed and two small patches of cordgrass grow seaward of this section.

The beach, now Weed Beach, then continues uninterrupted for another 250 yards to where it is broken by a rocky point with upland vegetation. A short breakwater has been constructed to its

NOROTON BAY

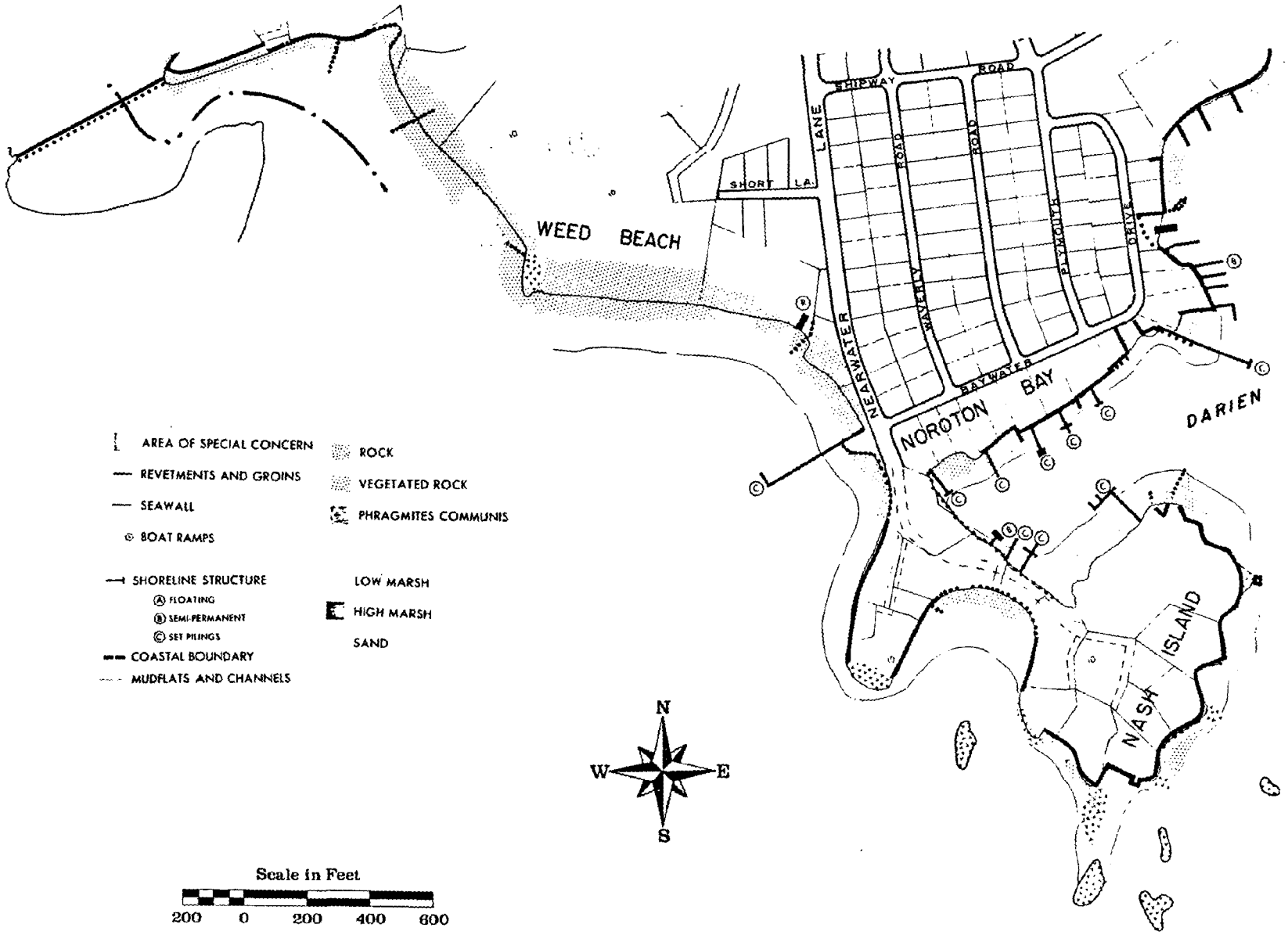


FIGURE 22

north and a cordgrass marsh lies in a low area off its end. The sand beach continues from this point and runs north. A rock jetty is the only major obstruction breaking the next 70 yards. In addition to the recreational usage of this area, Weed Beach is used for field trips by the Darien Nature Center to teach Darien school students about coastal ecology and intertidal marine life.

A final stretch of beach is located in the inlet to Holly Pond. Here, a sand shoal has built up on the Stamford shoreline (this area is part of Stamford's Cove Beach, and it is also used for recreational purposes). The Darien side is characterized by seawall fronted by sand beach, and further fronted by stands of cordgrass. A short rock jetty angles out from the eastern third of this shoreline. This shore runs 250 yards to the east to the entrance of Holly Pond which is marked by a long tidal gate which regulates the water level in the Pond.

Returning to the easterly end of this coastal section, the Darien Harbor lies south of the Darien River. It is bordered by Long Neck Point on the east and Noroton Bay and Nash Island on the west. Though the Harbor is considered a rough water harbor because of its exposure, more than 140 boats are moored within this special anchorage. Currently, the harbor can be considered full because any expansion would have to occur to the south, exposing the moored vessels to even greater wave and wind disturbances. Since more than 75% of Darien's boats are located in Darien Harbor, including the Darien Boat Club, there is a great deal of interest in exploring various means of expanding the mooring/slip capacity. One such means, presented in the 1966 Town Harbor Advisory report, proposed the construction of a breakwater off the tip of Long Neck Point to provide protection from the southeast.

The area of Westcott Cove, off the western shore of Noroton Bay and Weed Beach, is utilized to a limited extent as a mooring area. Because of its exposure and multiple rocks and shoals which are situated in the area, it is doubtful that this location could ever serve as a major boat basin. However, consultation with area boating experts has disclosed that the construction of a boat ramp in the Weed Beach area would greatly assist the parking problem at Pear Tree Point. Aides to navigation would have to be placed and maintained to guide boaters in and out of the offshore area opposite Weed Beach.

Summary & Conclusions - Noroton Bay

1. Darien Harbor is extensively used as a special anchorage for boats from the Town. Means to expand the harbor should be investigated further, including potential expansion of offshore mooring capacity and increased docking facilities.

2. The feasibility of constructing a boat ramp in the Weed Beach area should be studied.

3. The Weed Beach area is important not only for public recreational purposes but also to the Darien school system for educational purposes. Easy access combined with conditions of this intertidal area, make it the best location in Darien for this purpose.

4.11 Holly Pond

Holly Pond is a large body of water whose tidal fluctuation is controlled by a set of tidal gates at its southern boundary. The gates have not been properly maintained, and have fallen into disrepair. Freshwater flow into Holly Pond is derived from the Noroton River at the Pond's northern limit. The Noroton River drains a watershed approximately 7360 acres in size, beginning in New Canaan and flowing south 4.7 miles into Holly Pond.

Holly Pond assumed its current character in 1960, following the construction of the tidal gates. As a result of the gates, water level has been stabilized with the tidal range, reduced to 2.5 feet. The reduced circulation in the Pond, and the pollution loading via the Noroton River, often result in algae blooms in late summer. According to local residents, the smell and poor appearance can become "unbearable" during these periods. Currently, the Pond is used for limited fishing, gathering of shellfish for bait only, and small boat recreation.

Access into the Pond from Westcott Cove is limited to shallow draft vessels during extreme high tide. Waterskiing is a popular sport in Holly Pond, though restricted to the southern end due to shallow conditions.

In addition to the recreational use of the Pond, it is heavily used by waterfowl, domestic and wild, and especially mute swans whose numbers often reach several dozens during the winter. Mallard and black ducks inhabit the area during the summer, while shovelers, hooded mergansers, buffleheads, pintail, American widgeon and several other species of waterfowl can be seen during the migratory periods and winter. Holly Pond forms the southern border between Darien and Stamford. On the Stamford side, the southern edge is largely recreational (Cove Park) along with private residences located on the water. The majority of the mid and northern coastline is modified and bordered by a roadway with some private access to a few small docks. A scenic overlook located halfway along the Pond's western border is extensively used by local residents to enjoy the view, and feed the pigeons and waterfowl.

Beginning at the dam at the southern end of Holly Pond, the Darien coastline runs northeast for some 850 yards. The shoreline is characterized by a narrow sand beach backed by a seawall or revetment for the first 260 yards. The latter section is backed by vegetated slope. The shoreline shifts to the east for 170 yards and opens up to form a series of small coves. The edges of the southernmost cove are cordgrass fringe with vegetated upland. A sizable and highly productive patens marsh is

found at the head of this cove. It covers 1.77 acres, and is bordered to the south by Brush Island Road. The eastern and northern edges of the marsh are marked by broken stands of phragmites. The eastern shore of the cove reverts to broken cordgrass fringe, with several stands of phragmites in evidence.

Midway along the eastern shoreline between coves, a revetment is maintained with a small dock immediately to the north. North of the dock, another small cove is found. Here, the dominant coastal feature is high marsh. Larger than the marsh system to the south, this one also appears to be healthy and highly productive. Bounded on the east by Nearwater Lane, this marsh is under the protection of the Land Trust of Darien. It consists of two "horns"; the eastern horn is capped by a growth of phragmites, and is bisected by a tidal creek with cordgrass, while the western horn is shorter and served by a single narrow tidal ditch. The spit of land that forms the western border of the cove is marked by cordgrass band, patens strip, and upland vegetated by bentgrass and sumac. The western shore of the spit is characterized by bayberry and alder, fronted by cordgrass.

From the spit, the shoreline runs north marked by cordgrass bounded by upland. On the next point of land, the cordgrass fringe is backed by seawall which continues around the point into another series of coves. To the east of the seawall, a dock is constructed, and approximately 100 feet further on, the cordgrass fringe fronts a patens marsh. This marsh is approximately 75 feet at its widest point, and it extends in an arch some 85 yards. The marsh is backed by phragmites, shrubs, and lawn. To the north of the marsh system, the cove is fed by a stream system under Nickerson Lane. From the mouth of the stream the western shore is cordgrass fringe. As the shoreline curves to form another cove, the point is fortified by revetment, and a dock is located off the point.

The revetment continues around the point and, as has been found at the head of the previous three coves, there is a high marsh system located on the northeastern corner. This system is the smallest of the four marshes, covering barely 150 feet of shore, with a maximum width of about 60 feet. The northwestern corner of the cove is protected by a revetment, and the western shore is characterized by a cordgrass fringe and secondary growth upland. At the tip of Beach Drive, a sand beach has formed between the seawall and low water. From this point, the shoreline runs approximately 250 yards north-northwest and is dominated by seawall with a single lot protected by riprap. From the riprap to the apex of the inlet, a cordgrass fringe is found. The opposite shore is fortified by revetment and lacks cordgrass. A gazebo has been constructed on the point off Lighthouse Way.

Proceeding up the shoreline from the point, a small beach and dock lie immediately to the west, while the next two properties have a narrow beach in front of a revetment. To the northwest, the shoreline is also protected by a revetment, and within

approximately 70 yards a small cove is formed. The southwestern portion is protected by revetment, while the northwestern is wooden bulkhead. Three docks are located here. The wooden bulkhead continues around the Seagate Road point some 150 yards, and a dock is found just before the end. Scattered patches of cordgrass lie directly seaward of the bulkhead. Another inlet is found in this general location. The southeast shore of the inlet is marked by the wooden bulkhead, with a connected dock; the interior portion lacks shoreline protection and a large stand of phragmites is located there. The area in front of the phragmites is used to haul out small boats, and thus is devoid of vegetation. The head of the cove has a storm drain with associated seawall, and the opposite shore is marked by scattered cordgrass with phragmites lying directly inland.

From this point, the next 300 yards is marked by riprap that has been placed along the shore. The area in front of the Darien YMCA property has a narrow gravel beach seaward of minor riprap. A dock and concrete boat ramp are maintained in this section. Northwest of the YMCA, the Weed's Landing coastline is vegetated slope with remnants of a stonewall in front. Since the conclusion of the shoreline survey in October 1981, the southeast exposure of this point has been regraded with the construction of a seawall and outfall. Moving northwest off the point, the first 100 yards is predominantly vegetated slope, with a narrow sandy intertidal area. A small creek drains into Holly Pond, and the grade modifies to become a narrow intertidal beach which is backed by lawn for the next 100 yards, and an outfall is located in this section. To the northwest, a seawall and dock have been constructed. A small pocket of patens marsh measuring some 75 square feet is located between the seawall and water.

Holly Pond narrows in this location to approximately 150 yards between the Stamford shore and Darien. The Pond continues to narrow gradually to the mouth of the Noroton River, some 550 yards upstream, where the Boston Post Road crosses the waterway. Holly Pond is extremely shallow within this area and even shallow draft vessels have problems navigating it.

Moving west from the patens marsh, the shore consists of cordgrass fringe with some riprap in place, protecting the toe of vegetated slope for 70 yards. Further on, a seawall with a dock is in place. The wall extends some 85 yards, except where it is broken by Catalpa Street, and a short revetment guards the end of the street. The northern end of the seawall turns inland, and the next property is sandy beach with a dock constructed in the middle. Patches of cordgrass grow scattered through this area. The next property is protected by a long seawall (extending approximately 190 yards) which moves gradually inland, and the northern portion is fronted by a large stand of phragmites. The shoreline jogs here, and is dominated by a large parking lot and restaurant building which lie directly alongside the watercourse. The final yards to the Boston Post Road bridge are concrete seawall.

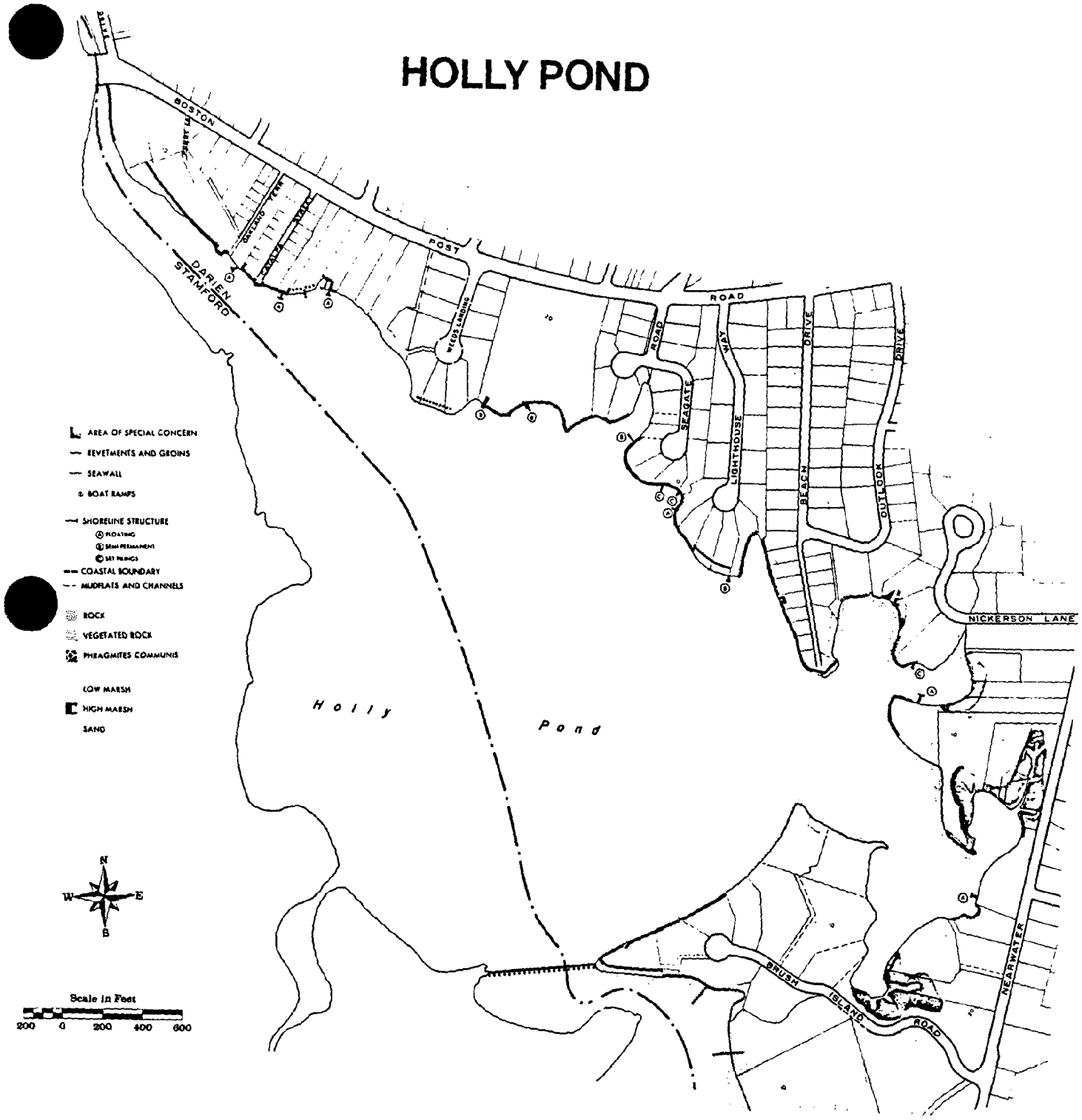

HOLLY POND
BOSTON
POST
ROAD
DARIEN
STAMFORD
WEEDS LANDING
SEAGATE
ROAD
LIGHTHOUSE
WAY
BEACH
DRIVE
OUTLOOK
DRIVE
NICKERSON LANE
NEARWATER
BRUSH
ISLAND
ROAD
Holly
Pond
AREA OF SPECIAL CONCERN
REVETMENTS AND GROINS
SEAWALL
BOAT RAMPS
SHORELINE STRUCTURE
COASTAL BOUNDARY
MUDFLATS AND CHANNELS
ROCK
VEGETATED ROCK
PHRAGMITES COMMUNIS
LOW MARSH
HIGH MARSH
SAND
N
W
E
S
Scale in Feet
200 0 200 400 600

FIGURE 23

Midstream in the upper stretch of Holly Pond is a mudflat which is exposed by the change of tide. It is one of the few areas so exposed in Holly Pond, due to the small tidal fluctuations.

Summary & Conclusions - Holly Pond

1. Holly Pond suffers significant sedimentation, and the Pond's circulation is extremely limited by the inoperative tidal gates. In addition, the water quality of the Noroton River, along with the warm water temperatures due to the shallow and sluggish nature of the Pond cause algae blooms in the summer. The Pond's productivity, along with the development of future use scenarios, will be a primary focus of this Coastal Area Management Program.

2. Due to the Pond's nature, boating is restricted to shallow draft boats, and even these are largely limited to the southern end of the pond.

3. Holly Pond does have the potential for increased use as a small boating area involving canoes and small sailboats. In fact, a sailing school on the Pond has opened recently on the Stamford side, and the Darien YMCA operates a similar program. Serious consideration should be given to restrict such use to sail and low-power boats only.

4. Holly Pond serves as a major resting area for migrating and resident waterfowl. The large number of mute swans presents a problem as a result of their aggressive behavior towards other waterfowl and their sizable contribution to the organic loading present in the Pond.

5. The four tidal wetland systems found in the southeastern portion of Holly Pond are highly productive, scenic, and should be considered important parts of the natural resources in Darien.

6. Darien should initiate planning with Stamford on the future of Holly Pond. The direction taken by Stamford in establishing its Coastal Area Management Plan is particularly important within this area.

4.12 Noroton River

As mentioned under the Holly Pond section, the Noroton River is a relatively small river running south from New Canaan 4.7 miles to drain into Holly Pond and Long Island Sound. The River drains a watershed of approximately 7,360 acres. Recent flow data are lacking since the United States Geological Survey ceased its monitoring efforts. Data collected by the U.S.G.S. for the period 1964-65 gave a peak flow of 160 cubic feet per second and a mean flow of 6.38-7.71 cubic feet per second. Water quality for the Noroton River varies according to season and flow.

NOROTON RIVER

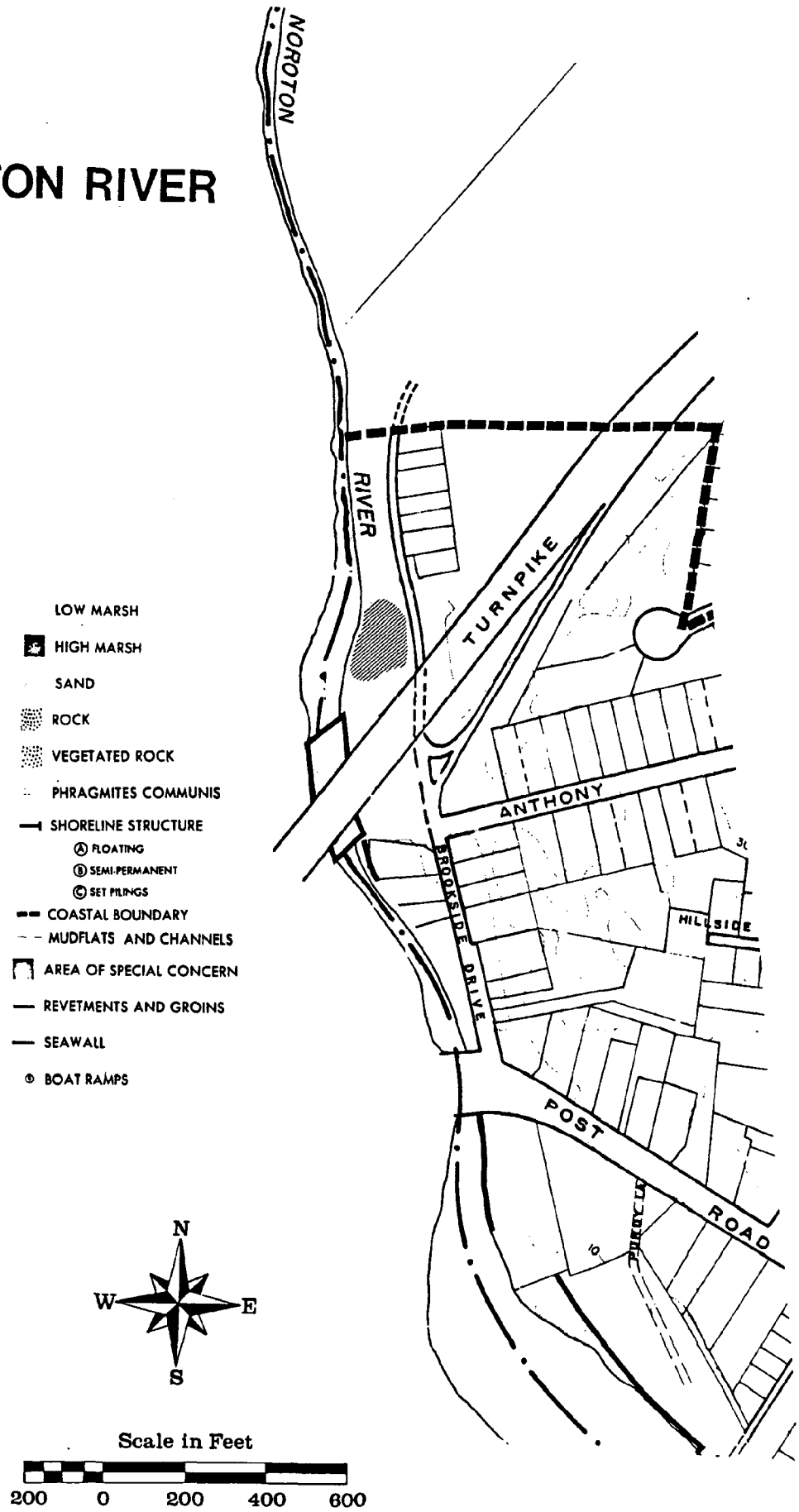


FIGURE 24

A study done for Holly Pond in 1973 stated that the two largest sources of pollution for the River were industrial discharges from companies bordering the Stamford shoreline, and seepage from septic fields and tanks on the Darien side. Moves toward control of industrial discharges along with proper sewering and maintenance of septic fields has improved the water quality, though problems still exist.

The Noroton River forms the border between Stamford and Darien. The Coastal Boundary in Darien encompasses the lower 570 yards of the River. Coastal character is lacking chiefly due to small tidal influence and the principally freshwater outflow. Coastal influence is further restricted to the portion of the Noroton River between Holly Pond and the southern entrance to the bridge under Interstate 95 where the concrete foundation forms a low dam.

Moving upstream under the Post Road bridge, the Darien side (eastern bank) is characterized primarily by rocky shore backed by wooded fringe. The river bottom is sandy with numerous rocks. Some tidal rise and flow is evident. Residential development is present, but for the first 180 yards it does not extend to the river bank. Brookside Drive borders the lower 80 yards of the eastern shore of the Noroton River, followed by a number of private homes. Some 25 yards before the tunnel under Interstate 95, a lawn extends to the shoreline, and a stonewall is maintained.

At the southern entrance of the I-95 tunnel, concrete and steel debris is found in the river bed. The tunnel itself consists of three massive concrete culverts extending the width of the highway (some 100 yards). At the northern entrance to the culverts, a variety of litter and debris is present, including tree limbs and bed mattresses.

Between the I-95 culverts and the Coastal Boundary (approximately 275 yards), the Noroton River is somewhat deeper and slower moving, due in part to the damming action of the I-95 culverts. The banks consist primarily of shrubs, trees, and some vacant lot vegetation. No residential development exists along this segment of the Darien shore and a narrow shrub-covered band is backed by Brookside Drive. One area of fill is located just north of I-95, and erosion from this site is evident.

Conclusions - Noroton River

1. The water quality of the Noroton River plays a critical role in the environmental health of Holly Pond. Attempts to improve Holly Pond must focus on maintenance and improvement of this quality.

2. The Noroton River poses some flood hazard to the surrounding area, especially as a result of rainfall and freshwater runoff. The culvert under I-95 forms a potential bottleneck

greater amounts of water behind the northern side of the Interstate with subsequent flood damage.

3. The area of fill located north of I-95 should be stabilized to prevent further erosion and sedimentation of the Norton River, and the area along the River in this section should be restored. Additional concerns such as protection of existing aquifers, oil spill from parking areas, and related matters also need to be addressed fully.

IDENTIFICATION OF COASTAL ISSUES

5.0 Identification of Coastal Issues

The following discussion attempts to focus potential policy actions on specific problems and issues deemed to be of greatest importance by the coastal management study team.

The issues outlined in this chapter cover a broad range of coastal resource and land use conflicts. Many of the individual issues identified will need additional study to be properly addressed. Some require administrative change alone, while others will require capital expenditures, stronger enforcement actions and other financial considerations.

The listing outlined here is not complete. It is understood that there are numerous other conflicts, potential problems, and parochial concerns that may be of interest to a single user group or coastal land owner.

5.1 Improvement of Boating Opportunities

That part of the CAM Program which explored options for expanding and improving boating opportunities within the Town of Darien, identified the following specific proposals as deserving of addition planning and engineering study. These proposals include:

- Providing an additional boat launching ramp to expand boating access and opportunity for the townspeople. It is essential that the provision of such a ramp be pursued, especially since alternative opportunities are so limited.

- Establishing a launching ramp for boats of 17 feet or less at Weed Beach. Trailer parking facilities could be provided in the vacinity of the paddle courts or on a longer range basis near the sewage treatment plant. In combination with the existing ramp at Pear Tree Point, this second facility should satify even the long range need for launching ramps.

That part of the CAM Program which explored options for expanding and improving boating opportunities within the Town of Darien identified the following specific proposals as deserving of additional planning and engineering study. These proposals include:

- Exploring further all proposals for expanding facilities at the Darien Boat Club including the Club's recommendation for increasing docking facilities from 244 to approximately 325 spaces.

- Pursuing the following long range objectives and needs with appropriate State and Federal agencies. These include:

  . Improving the capacity and safety of the Harbor.

- Establishing a special anchorage control system for the section of shoreline within, and in proximity to, Sargent's (Ziegler's) Cove to eliminate or at best minimize overuse and abuse resulting from transient mooring activities.

- Improving the regulatory process governing the construction of individual docks to assure that coastal resources are being protected as fully as is practical.

These conclusions and recommendations were based, in part, on of the following findings:

Five Mile River Area

- Approximately 500 boats are currently docked or moored within the area.

- The existing channel is 100 feet wide, and is under Federal maintenance.

- This anchorage is already severely congested, particularly with regard to access in and out of the channel at the mouth of the River.

- It would not be desirable to dredge the Darien side of the River due to both the existing boating congestion, and the fact that the existing marshes are more valuable as wildlife habitat and flood protection.

- Use and development of both sides of the River should be better regulated to achieve the respective objectives of each community, and the purposes of CAM.

Tokeneke Club Shoreline Area

- Potential anchorage to the south of the Tokeneke Beach Club is too exposed to offer any real value for safe boat mooring facilities.

Scott's Cove

- Providing boating facilities within Scott's Cove should be prevented in order to protect and preserve this important environmental area. The risks involved in developing boating facilities are far too great relative to possible ecological damage.

- Public education, zoning enforcement, and necessary regulations must be strengthened in order to prevent construction of improper docks or other shore structures that would damage the natural shoreline.

Ziegler's Cove

- The Cove is considered to be an exceptionally good harbor but limitations are imposed by restricted or nonexistent access to its shoreline. No practical action is apparent for modifying this situation in the near future.

- It may be desirable to establish a special anchorage area within the Cove, under the jurisdiction of the Town Harbor Master to control visiting boats. Heavy use by transient vessels during the boating season creates severe pollution, noise, and other problems.

Noroton Bay/Weed Beach

- The Noroton Bay area has critical problems relative to exposure, and poor protection of boat mooring or dockage areas. This area has limited potential for improved mooring facilities due to the extreme risk involved in keeping a boat along the westerly shoreline of the Bay.

- As stated, a launching ramp could be provided at Weed Beach to relieve some of the pressure for the launching of boats of 17 feet or less. The parking facilities are larger than at Pear Tree Point Beach, and the access to the shoreline is workable. Some expansion of parking facilities, particularly for the storage of boat trailers, could be provided at this facility. In addition, navigation channels ensuring safe water access to and from Weed Beach need to be provided.

Darien Harbor

- More than 75% of Darien's boats are moored within the Darien Harbor and Boat Club areas.

- The Darien Harbor currently has 140 boats moored offshore, starting in the "gut area" north of the Boat Club.

- The Harbor is considered to be full in terms of its current mooring capacity. The only additional mooring areas that are available would be further offshore in the rougher waters, which are subject to storms with three-to-five-foot waves.

- The Darien Harbor is considered to be an exposed rough water harbor.

- The Town has not experienced a serious hurricane in many years (since 1955), so the potential damage from having additional boats moored further offshore cannot be readily assessed.

- A February 1966 report, prepared by the Town Harbor Advisory Commission, indicated that it would be desirable in the future to create a barrier offshore to protect Darien Harbor.

- The Town should consider seeking the assistance of the Corps of Engineers in doing a feasibility study on providing such a barrier.

Darien River

- The Darien Boat Club currently accommodates 244 boats at its docks. The average length of a member's boat is 20 feet.

- The Club's 1967 expansion plan sought to increase the boat boat dockage capacity by approximately one-third.

- A possibility would be to dredge the marsh northeast of the Boat Club in order to increase the capacity of the docks, and to improve access from the Town boat launching ramp. The following problems would have to be solved before any action could be taken:

    . Adverse effects from the loss of tidal marsh.

    . Stabilization of the Pear Tree Point Road shoreline.

    . Provision of permanent sedimentation and erosion controls for protecting this area.

    . Severely restricted off-street parking and vehicular access conditions.

    . Funding of dredging and spoil disposal, particularly in view of the large amount involved.

- A study of the effects of sedimentation transport and the continual filling in of the "gut area" below the Darien Boat Club is needed.

- Siltation and sedimentation within the River is a severe problem. This has been estimated by a former harbor master to occur at the rate of approximately 2 1/2 inches per year.

Miscellaneous

- A complete public education program, necessary regulations, and other needed actions should be instituted in an attempt to limit the number and type of scattered, individual docks. Concurrently, it will be essential to improve other boating facilities needed to serve the townspeople.

- There is a strong need to publiicize and enforce zoning requirements and other local regulations governing the storage of boats on individual residential properties during the off season.

5.2 Coastal Hazard/ Flood Damage

The storms of Autumn 1955 dramatically emphasized the need for requirements to protect Darien's flood prone properties from the effects of periodic inundation. Subsequent to that event, incremental improvements were made to the Town's planning and regulatory programs, relative to flood hazard considerations. Data and specific conditions determined from the major storm of October 1955 served as the basis of these measures. While these actions certainly improved flood protection, they could not adequately resolve the many problems centering on flooding potentials and flood damage prevention. The data were still incomplete and quite often decisions had to be determined by local experience or on assumptions. Darien's situation in this regard was not unique, but rather common to the experience of most communities.

In recognition of the harmful effects of flooding in terms of loss of life and property, health and safety hazards, and many other results, the Federal Government through the Department of Housing and Urban Development (HUD) and later, the Federal Emergency Management Agency (FEMA), developed and implemented a comprehensive program to address these needs. This effort to establish workable data and carry out comprehensive regulatory programs was directly part of the Federal Flood Insurance Program.

On December 28, 1980, the Town of Darien adopted its first set of formal regulations governing land use and development in flood prone areas. This action was taken by the Planning and Zoning Commission in direct response to the federal initiative, pursuant to Title 44, Chapter 1, sections 59-75 of the Federal Register. Essentially, the program designates regulated areas within Darien and specifies requirements for any activities to be undertaken within those areas. Such regulated areas are set forth on the official Flood Insurance Rate Map and on the Flood Boundary and Floodway Map, both of which are on file with the Planning and Zoning Department.

The cited maps also provide data on floodways, 100-year storm floodprone districts, 500-year storm floodprone districts, and other related factors including specific flood level elevations in critical areas. This information is applied in the administration of the regulatory program. The application of particular standards is based on the relationship of proposed activity to the specific location and may include: required elevations to be adhered to; needs for precise engineering design; the incorporation of special site development features; or other such measures.

FLOOD MAP
(EXAMPLE)

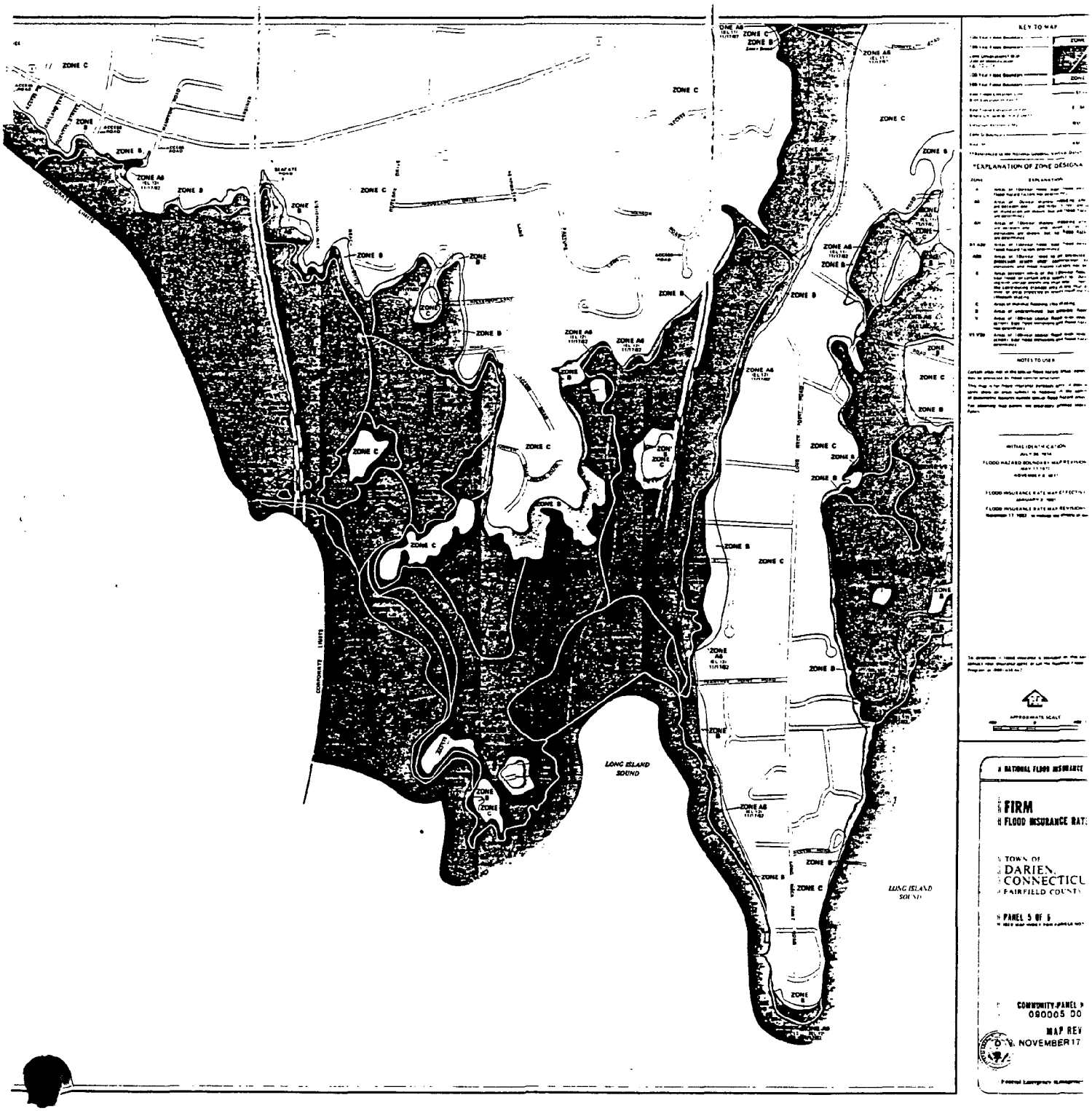


FIGURE 25

Of direct relevance to Coastal Area Management is that aspect of the FEMA program covering the Long Island Sound shoreline and related areas within the Coastal Boundary. Specific zones have been determined as "coastal high hazard areas" and criteria have been developed in full recognition of a flood prone area's exposure to high velocity waters, including but not limited to, hurricane wave wash. Within Darien, the minimum base flood elevation along the shoreline is 12 feet above mean sea level. Incorporating wave velocity factors, this minimum elevation exceeds 17 feet above mean sea level in certain areas. Significant segments of the shoreline are subject to heavy flooding.

Consideration of coastal hazards, as outlined on the Flood Insurance Rate Map, is pertinent not only to regulatory purposes but may also be applied directly to project and program planning. Examples would include proposals to expand boating opportunities; design and construction of shoreline structures; establishment of permanently protected areas under Conservation Easements; or the reclamation of a tidal marsh.

Darien's flood damage prevention program is continually being improved and refined as flood prone areas are being reinventoried. Reinforced by other programs, such as Coastal Area Management, necessary land use controls are being strengthened, planning objectives clarified, and public education activities expanded.

The policy set forth by CAM states that the planning process must consider the potential impact of coastal flooding and erosion patterns on coastal development in order to minimize damage to, and the destruction of, life and property and reduce the necessity of public expenditure to protect future development from such hazards.

The regulations promulgated under Section 489. of the Darien's Zoning Regulations largely address these concerns of CAM.

5.3 Preservation and Enhancement of Tidal Wetlands

The Town of Darien has a richness of tidal wetlands, varying from narrow banks of alterniflora (cordgrass) lying between low tide and upland areas, to alterniflora/patens marshes covering several acres of shorefront. More than 76 acres of tidal wetlands exist within the Coastal Boundary of Darien. This estimate does not include the cordgrass bands which are among the most common features of the coastline. While the Town has been able to preserve a greater portion of its tidal wetlands than other towns in Fairfield County, fill operations and other developments have claimed a sizable share over the past 150 years. While accurate measurement is impossible, it seems likely that only 30% of the historical wetlands exists today.

Recommendations to preserve and enhance Darien's tidal wetlands include the establishment of a firm policy to prevent any further loss. This can be implemented as follows:

Education

- Educate coastal property owners on the intrinsic value of wetlands, the legal framework protecting wetlands, and the regulatory process with which people must comply in order to alter or develop wetlands.

- It is contended that the majority of coastal property owners do not fully understand the importance of wetlands resulting in development without permits, and the allowance of other changes which adversely impact wetlands. Landowners must understand the regulatory system and its benefits in order to comply properly.

Regulation

Included in the recommendations for preservation and enhancement of Darien's tidal wetlands are the enforcement of existing regulations, in cooperation with the State Department of Environmental Protection and the Corps of Engineers. Work performed without a permit, or work completed beyond permit specifications, should be required to be removed entirely and its impacts mitigated. Althouth it is believed that existing regulations are sufficient to provide the needed protection, efforts should continue at the municipal level so that Town officials will fully understand the existing regulatory framework, and can respond in an appropriate manner to landowners' inquiries and permit applications.

When work is permitted on, above, or adjacent to regulated wetlands, the design and placement of the work should reflect a state-of-the-art understanding of construction within such areas. For example, the proper placement of deck slats can permit sufficient light to reach wetlands vegetation, thus preventing loss of plantlife beneath docks and piers.

Restoration

The feasibility of restoring wetlands areas such as the Tokeneke Trail marsh must be determined. Improving tidal range and natural flushing action will result in the destruction of phragmites grasses, and the gradual return of patens grasses to the marsh. This restoration or rehabilitation would lead to a more valuable scenic and wildlife habitat; a decreased fire hazard and mosquito breeding environment; increased educational value; and ultimately, to higher land values for adjacent properties.

In the future, as historical wetlands areas are being considered for redevelopment, their restoration to truly functioning tidal wetlands should be considered.

Identification and Preservation of Significant Tidal Wetlands

While the value and benefit of tidal wetlands cannot be given a minimum size, several relatively large tracts of wetlands still exist within Darien. These must be carefully and specifically defined, and precise procedures for their protection must be set forth in cooperation with the State Department of Environmental Protection. Available opportunities to permanently protect such areas under open space declarations, conservation easements, or similar means should be pursued in all cases.

Wetlands systems considered suitable for special effort and permanent protection include:

A. Five Mile River marsh
B. Tokeneke Beach Club marsh
C. Tokeneke Trail marsh
D. Contentment Island marsh
E. Delafield Island marsh
F. Darien River marsh
G. Holly Pond marsh

The interrelated nature of coastal resources must be recognized, and wetlands policies and actions must be coordinated with policies on dredging, erosion control, water quality, and shellfish resources.

5.4 Maintenance of Recreational Shellfish Opportunities and Establishment of Commercial Oystering Policy

The Town of Darien currently permits recreational harvesting of shellfish in only one area: Scott's Cove. Management of this resource, by the Town, is limited to the issuance of shellfish permits. The permits are available to residents of the Town of Darien and by special agreement to residents of Stamford. This agreement, which is not widely recognized, limits the number of permits issued to Stamford residents to one-half of those issued in Darien.

The nearshore waters of Darien are also utilized for commercial oyster growing. The jurisdiction line for Darien extends in a straight line from Bell Island Point in Norwalk, west to Contentment Island's extreme southern point, west to Long Neck Point, and then due west to Shippan Point in Stamford. All shellfish found inshore (north) of this line are under the jurisdiction of the Town of Darien; those found offshore to the State line are under management of the Connecticut Department of Agriculture, Aquaculture Division.

Concern has recently surfaced on the use of Town waters by commercial oyster companies. Excessive noise and exhaust pollution have been cited specifically as problems. These complaints led to a search of records to determine the extent of all leased or franchised grounds within the Town's waters, but failed to turn up any information.

A meeting with Tallmadge Brothers of Norwalk, the leading oyster growing company in the area, clarified many of the questions concerning the commercial grounds. The majority of Tallmadge's ground is franchised and maps are historically recorded with the Town. Tallmadge stated its willingness to work with the Town in establishing the locations of existing grounds; working with a local shellfish commission, if organized; and preventing further coastal landowner conflict by keeping vessels well-muffled and out of inshore embayments in the early morning hours.

Actions required by the Town to enhance shellfish resources include the following:

- investigate potentials for expanding the number of areas available for recreational shellfishing. Since Scott's Cove has extremely limited access, locations such as Weed Beach should be considered as possible alternative sites. For example, the City of Stamford permits shellfishing off Cove Beach on a conditional basis and something comparable may be allowed in Darien.

- establish a management plan in consultation with the Connnecticut Department of Agriculture's Aquaculture Division. This would include an assessment of the current resource, evaluation of proposed management techniques to enhance and expand the resource, and determination of regulatory measures required to ensure continued protection.

5.5 Local Policies on Dredging of New and Existing Navigation Channels

It is the declared policy of the Connecticut Coastal Area Management Act to: encourage the maintenance of existing federal navigation projects; discourage new federal improvement dredging projects; and disallow new dredging within tidal wetlands areas, except where no alternative exists.

The Town of Darien must formulate a set of policies on dredging which clarify how and where existing channels will be maintained; which areas could be subjected to future improvement dredging, such as an expansion of the Darien Boat Club; and which areas should not be dredged, either publicly or privately, such as Scott's Cove.

The Town of Darien plays only a marginal role in the actual issuance or denial of a dredging permit. It is the Corps of Engineers, New England Division, and the Connecticut Department of Environmental Protection who issue or deny a permit to dredge and dispose of the material. However, the Town does have a large stake in the outcome of dredging projects, especially when new work involves tidal wetlands, wildlife habitat, shellfish concentrations or other valuable resource areas. The Town should endorse the State CAM policies on dredging, and determine a

suitable balance between these policies and the need to provide for water dependent uses and recreational boating interests.

Darien shares one federal maintenance project with the City of Norwalk, and that is the Five Mile River channel. No improvement of this channel is planned, and no other federal improvement/ maintenance project is likely within the Town. Much of this is attributed to the fact that, in the past, federal maintenance work was 100% federally funded. Now new legislation is being advanced which would require state and local cost-sharing, and this will obviously alter the viability of any new improvement project.

Five Mile River is a small recreational harbor. The impact of cost-sharing on the harbor is not fully understood at this time, but there will most likely be an increased hardship on the users. The Five Mile River Commission and the two involved communities should begin to examine alternatives to 100% federal funding for continued maintenance of the harbor channel. Because of the nature of the River, and the existing federal project, there is little need for additional dredging of private channels linking the federal channel with private docks and businesses.

The other major area of dredging activity involves the lower portion of the Darien River. Sedimentation from Gorham's Pond and upstream, together with littoral drift along Noroton Bay, cause the cut at Pear Tree Point to shoal regularly. The largest concentration of boats in the area lies directly behind the Point, at the Darien Boat Club. This area is the second largest maintenance project in Town, being the major facility for small boats of 20 feet in length or less.

Other dredging activity relates to private permits. Many riparian owners seek to dredge areas like the Tokeneke Cove marsh and Scott's Cove to enable them to bring larger craft into private docks.

By way of illustration, an expansion of the Darien Boat Club may call for removal of some 45,000 cubic yards of material, with a loss of one to two acres of adjacent wetlands. As a result, the Club would then be able to accommodate an additional 60 to 80 vessels. In contrast, a Scott's Cove project of similar size could impact 5 to 10 acres of marsh through removal and/or erosion, while the benefit from the dredging project may be restricted to one or a few dock owners served by the channel. Another contrast is that, in the case of the Boat Club, the improvement project expands an existing marine use. In Scott's Cove, the dredging project would create a new usage, since only shallow draft vessels can navigate it currently, and even then only at high tide.

Economic disposal of dredge material is critical to dredging operations. In the Darien area, two methods are used; open water disposal and upland disposal. If the material is

relatively clean, and suitable as fill or beach nourishment, upland disposal at an appropriate site should be endorsed. For other material, especially sediment which has been enriched organically, open water disposal should be followed. A recent designation of a western Long Island Sound disposal site gives Darien a reasonable choice on the latter option.

5.6 Protection and Enhancement of Wildlife Habitats

Other recommended policies set forth in this section call for the protection and enhancement of tidal wetlands, shellfish beds, and mudflats. If these policies are implemented properly, they will also serve to protect wildlife habitat. For example, mudflats managed as recreational shellfish-beds also serve to provide valuable feeding grounds for shorebirds and wading birds. Preserving tidal wetlands for flood control values also assures habitat for a wide variety of marine life.

In addition to these general areas, several locations within Darien's Coastal Boundary also serve as valuable wildlife habitat, especially for birds. The areas cited in this report represent sites specifically noted during the survey as being important habitats for specific species. These are:

The Fish Islands, other offshore islands and exposed rocks

- feeding and nesting areas for large numbers of shorebirds and other coastal species

- valuable to migratory species during the spring and fall migrations. Species include: ruddy turnstone, double-crested cormorant, black-bellied plover, common tern, snowy egret, great blue heron and green heron.

Great Island, north shore

- roosting area for snowy egret, great blue heron, great egret, and other species of wading birds.

Juniper Road peninsula, Darien River

- roosting area for black-crowned night heron.

Salem Straits inlet

- excellent potential for osprey nesting area. A pair of fish hawks were seen frequently in the area during the fall migration.

Holly Pond

- valuable nesting area for large numbers of waterfowl, especially during migration. Species which have been sighted include: shoveler, American widgeon, hooded

merganser, pintail, and green-winged teal. The large number of mute swans on the Pond poses problems because of their aggressiveness against other waterfowl, and because they degrade water quality. Some form of control should be considered, but it may be met by a strong, negative reaction from the public.

Currently, the feeding of waterfowl poses a problem in at least one area. Such feeding establishes an artificial relationship which should be discouraged.

5.7 Project Analyses and Proposals for Specific Coastal Areas

Certain potential projects have been identified and analyzed as being desirable for the improvement of Darien's coastal resource base.

A specific program should be undertaken to reclaim the Tokeneke Trail marsh as a viable marshland area. It would become more suitable as habitat, and consequently, more valuable for conservation and educational purposes. Steps required in achieving this would include:

- determining the precise extent and amount of tidal flushing action needed to enable the re-establishment of the patens marsh in lieu of the extensive phragmites growth currently within the project area.

- conducting necessary engineering analyses of the factors applying to the control gates at the Tokenene Trail causeway, specifically with regard to allowing the requisite flushing action to occur within the marsh.

- establishing the most suitable means of eradicating the existing phragmites growth within the marsh.

- developing preliminary cost estimates of necessary actions.

5.8 Protection and Preservation of the Shoreline, Particularly Lands within 100 Feet of Mean High Tide, and Areas of Special Concern.

The Town of Darien has been establishing and implementing measures to protect and preserve critical shoreline areas since 1973. Lands of special concern include marshes, beaches, wildlife habitats, and similar important resource areas. These programs have now been reinforced and expanded by the enactment of the State's Coastal Area Management Act.

Basic policies being pursued center on permanently protecting as much of the Town's coastal resources as possible. Methods used in the past, and required for future success in carrying out these policies, include:

Public Ownership

Public ownership of Darien's shoreline consists of two beach areas, and the strip of shoreline south of Ring's End Landing. The Town should be prepared to acquire important coastal resource areas through outright purchase whenever possible and appropriate. In turn, it is incumbent upon the community to practice conservation and protection in a manner consistent with the declared policies of the Coastal Area Management Program.

Ownership by Non-Profit Organizations

At the present time, two important marsh areas are owned by the Nature Conservancy. Both of these properties were donated by private landowners, and such an arrangement provides a fully acceptable alternative to public ownership, particularly with regard to the permanent protection of vital resource areas. The Land Trust of Darien is also involved directly in ownership or control of coastal resource areas, offering yet another alternative.

Open Space Declarations

Permanent protection of resource areas is also achieved through formal open space declarations. These offer a sound and workable alternative to public or quasi-public ownership since protection and preservation can be achieved while enabling actual ownership to be retained by private property owners. Specific arrangements are flexible, and may, for example, involve an abutting lot owner, or a neighborhood association. Very often, this system is more acceptable to private parties. Such declarations are routinely required as part of subdivision approvals.

Conservation Easements or Restrictions

Conservation easements offer yet another approach to permanently protecting valuable shoreline resources. These essentially involve a deed, covenant or restriction covering a specific area of land, and can provide several advantages. They can:

- be used in conjunction with a particular ownership arrangement or open space declaration to better assure that resource conservation and protection needs will be met. Basically, this is achieved by virtue of the grantee having a third party interest in the future of the area. For example, the Town Conservation Commission, which is the recipient of a large number of these easements, could file a civil action if the terms of the easement were not complied with. This offers an effective enforcement tool.

- offer increased flexibility, since no conveyance of land, or establishment of a separate parcel need be accomplished. Accordingly, the entire lot or parcel can be used, subject to the terms of the easement, e.g. the

easement area may apply to the satisfaction of a rear yard setback.

- involve easements designed and implemented to achieve specific needs, or to allow certain exclusions. Such easements are oftentimes easier to negotiate with an individual property owner.

Further comments on this issue are as follows:

- Over the past decade, about two and one-half miles of Darien's shoreline have been placed under the protection of conservation easements, accounting for approximately 15% of the total shoreline. These easements were accomplished through individual efforts, as well as through formal actions on subdivisions, special permits, and related types of matters.

- As opportunities become available, the resource analyses conducted as part of the Municipal Coastal Program will be used to specifically identify and prioritize resource areas which should be placed under permanent protection.

- With the identification of specific data and needs and a program laid out in advance, it is anticipated that comparable success can be achieved over the next decade relative to improving the protection and preservation of coastal resources.

5.9 Improvement and Expansion of Physical and Visual Public Access

Physical Access

- In accordance with the adopted Plan of Development, the former "Ross property", adjacent to Weed Beach, was acquired by the Town in 1975.

- Also, in direct response to the recommendations set forth within the Plan, the Town acquired the strip of land between Pear Tree Point Road and the Darien River, immediately south the Ring's End Bridge. Whereas the Ross property was purchased, this strip was conveyed as part of a subdivision approval process. It provides limited access for fishing and passive recreation, such as painting or photography.

- A continuing policy should be maintained that, as sound opportunities for expanding public ownership through purchase or charitable donations occur, the Town should be prepared to take positive action.

Visual Access

- Visual access to Long Island Sound is an important amenity which contributes strongly to the quality of life in Darien.

- Visual access across key segments of the shoreline, available from public streets or public lands, is restricted to seven locations, six of which are under some form of permanent protection. These include:

  . terminus of the public portion of Five Mile River Road (public street)
  . Long Neck Point Road across Sargent's Cove (existing visual easement).
  . Pear Tree Point Beach (public land).
  . Pear tree Point Road at Ring's End Landing (public land)
  . Goodwives River Road at Gorham's Pond (unprotected)
  . Weed Beach (public land)
  . Nearwater Lane across Holly Pond (conservation area).

- A 700 foot plus strip of shoreline was conveyed to the Town in 1981 as part of a subdivision approval, in accordance with the recommendations of the Town Plan. This assures permanent protection of the views over the upper reaches of the Darien River, together with the limited public access to the shoreline area mentioned above.

- The Town's first visual easement was secured in 1980, as part of a subdivision review. It permanently protects a favorite view from Long Neck Point Road over Sargent's Cove, and across the Sound.

- As workable opportunities become available, the Town establish permanent protection of the three public visual access locations:

  . Goodwives River Road overlooking Gorham's Pond and the Ring's End Bridge
  . Pear Tree Point Road overlooking the central portion of the Darien River, generally opposite Juniper Road
  . Five Mile River Road

5.10 Identification and Control of Erosion and Sedimentation

The shoreline between Greenwich and Norwalk, including the coastline of Darien, is considered to be the most irregular segment of Connecticut's coastline. A good indication of this irregularity is given by a comparison of the shoreline length measured linearly between the Byram River and the Norwalk Harbor. While the area stretches only 15 linear miles, there is a total of 68.9 miles of shoreline. This is also seen in Darien with approximately 2 linear miles compared to 16 miles of actual coastline.

The nature of the coastline, sediment sources, littoral transport, and wave energy dissipation are all significant factors in determining the amount of erosion and sedimentation likely to occur. Erosion and sedimentation are important for several reasons. Highly erodible areas are not only prone to loss of property and potential loss of life, but they also act as sediment sources for the coastal area which in turn may fill in wetlands, alter littoral transport, and generally degrade the coastal appearance of the area. Sedimentation can have a direct impact on coastal bodies of water. In the Town, both Holly Pond and Gorham's Pond suffer serious sedimentation problems in certain areas.

As mentioned in another section of this report, the geology of Darien is extremely varied. Viewed from offshore, the linear two miles of shoreline consist mainly of rocky shorefront and escarpment, with one major drumloid feature found in the form of Long Neck Point. Behind rock "shields", such as Butler's Island, Contentment Island, Great Island, and the Pratt Island area are resources which are more sensitive to erosion such as beaches, salt marshes, and mudflats.

The rocky headlands suffer the least pronounced erosion of any portion of the coastline of Connecticut. While the bluffs on the north shore of eastern Long Island may suffer losses of up to four feet per year, the majority of shoreline along the Darien coast suffers little or no noticeable erosion on an annual basis. Hence, significant shoreline alteration within a short period of time is rare for this area. On the other hand, extensive changes arising from artificial filling of tidal areas are common. In addition, the development of sensitive bluff and modified escarpment areas with poor shoreline protection and/or land development practices will account for isolated areas of erosion.

The coastal resources in Darien most prone to erosion are the beach areas. This erosion is chiefly a response to longshore currents, and exposure to wind and wave action. A good example of this erosion can be seen at Pear Tree Point Beach which is continually being reduced in size because its sand is transported into the "gut" near the Darien Boat Club, or lost to the outer Noroton Bay area. This necessitates regular nourishment of this beach. Conversely, the western side of the "gut" undergoes continuing maintenance necessitating physical removal of the sand to facilitate navigation.

Historically, as areas along the Darien coastline have been developed, a large number of shoreline structures have accompanied that development. As a result, structural stabilization plays a major role in the erosion and sedimentation process. Very often, the structures are beneficial, well designed, and facilitate shoreline usage. However, in many cases, these same structures can be poorly designed, detrimental to existing natural processes, and very often become a public safety hazard.

Many of the structures that were built years ago failed to utilize good design and proper materials and, with the high cost of maintenance, have fallen into disrepair. These structures are no longer affording shoreline protection, but instead are both eyesores and safety hazards.

There are two basic techniques for controlling erosion. They may be separated into "structural" alternatives and "nonstructural" alternatives. Structural alternatives are often costly to build, expensive to maintain, and afford little long-term protection against shoreline processes. Nonstructual alternatives avoid the use of structures by looking toward placement of sand fill, control of land use in the adjacent upland area, and the restoration of historical natural areas.

The most important erosion and sedimentation control for the Town of Darien will likely come down to one item - education. Many of the erosion problems witnessed in Darien are small in scale and are the result of landowners practicing unwise disposal practices, such as tossing topping and other yard debris over the head of a cliff or denuding an entire steep slope in order to landscape; and even feeding waterfowl extensively on sensitive wetland areas. These practices are not done with the intent of creating erosion but rather, they are undertaken as a timesaving or "out of sight, out of mind" philosophy. An educational program directed at the coastal landowner which emphasizes the importance of controlling sedimentation and erosion by wise use of construction and maintenance of shoreline structures will be the most important method of preserving Darien's coastline, and will avoid the piecemeal destruction of the shore.

5.11 Establishment of a Policy for Coastal Structures and Filling

Under the Coastal Area Management Act, the policy for coastal structures and filling obliges municipal, state, and federal agencies to require that structures within tidal wetlands and coastal waters be designed, constructed, and maintained to minimize adverse impacts on coastal resources, circulation and sedimentation patterns, water quality, and flooding and erosion. It also requires the reduction of the use of fill to the maximum extent practicable, and the reduction of conflicts with the rights of adjacent landowners.

This policy is of major concern to the Town of Darien because of the large number of private structures and fill activities that exist. There are numerous examples throughout the Town where private landowners have constructed or maintained poorly designed structures, or have carried out fill operations that have adversely impacted the marine environment, while imposing a safety hazard to Town residents.

There is a general misconception among private landowners that if the applicant were to go through the proper permitting processes,

their dock or other coastal structure application would be denied. This perception is erroneous because, ideally, the coastal permitting process is designed to take into account good design, and proper material use, maximum coastal resources protection, and public safety. Under optimum conditions, the above scenario would read that the landowner interested in building a structure should go to the local town hall to receive guidance on what permits and design were necessary. After receiving necessary federal, state or local permits, he would then employ a marine contractor to do the design work and construction. The facility would be built, taking into account such things as light penetration to the underlying vegetation, thereby causing minimal impact on the adjacent wetlands. The structure would also withstand coastal storms and winter ice, therefore greatly reducing its maintenance schedule. Darien's policy on coastal structures should emphasize that coastal construction embody the best available design and material use, rather than emphasizing the rejection of the right to Darien's landowners to have access to the waterfront.

The actual permitting process in the State of Connecticut is complex, and poorly understood by most coastal landowners. In most cases, the Corps of Engineers is responsible for regulating structures in the navigable waters of the United States. In addition to the Corps of Engineers, the Connecticut Department of Environmental Protection has control over Connecticut's water quality certification and tidal wetlands. The Town plays a local role through its planning and zoning regulations and Coastal Site Plan Review. Although moves are being taken to streamline the permitting process, a potential applicant is often confused, and believes that even if the permit is accepted, it would take years for the request to receive approval.

The Town of Darien, in an effort to simultaneouly alleviate this confusion and protect its coastal resources, should consider a two-stage program. The first part would entail the education of coastal landowners on the specifications of Federal, State, and local regulations: What activities do and do not require permits; what is the definition of maintenance versus new construction and expansion; and finally, enable the landowners to recognize that it is in their best interest that this permit system be applied.

The second stage of this program would be directed toward those individuals who, when given the above information, would rather work outside the permit process than be faced with the bureaucracy and possible denial of their project. This second program would call for the identification of all existing structures as of a certain time frame. Much of this work has already been completed under this program. Once existing structures are identified, riparian owners would be made aware that, on an annual basis, an inspection would be conducted of the coastline. Where structures were identified, and found to have been constructed without a permit, action would be taken against the owner.

Again, it should be emphasized that this action would not be undertaken for legal or regulatory satisfaction as much as for protection of the sizeable investment of riparian owners in their coastline. Said annual inspections would involve a minimal expense since the ground work has already been laid, and would obly necessitate a single man-day or two to carry out. Only when those interested in breaking the law are fearful of enforcement of those same laws will coastal structures and filling be controlled and regulated in the Town of Darien. Failure to control this aspect of the program would render ineffective the entire Municipal Coastal Program. Lack of enforcement will manifest itself in the "nickel and diming" of Darien's valuable coastal resources, such as tidal wetlands, mudflats, and sand beach.

The term "fill" is also important in the coastal zone. It encompasses a range of activities from beach nourishment to "shoreline extension projects". Generally, beach nourishment is low in impact and high in public benefit. Shoreline extension is often done for a single owner's benefit and the general public's loss. Much of Darien's historic wetlands have already been subject to fill. A recent survey of the shoreline showed several cases of improper or illegal fill operations which resulted in erosion and sedimentation impacts; loss of wetland vegetation and its associated benefits; loss of mudflats and their associated benefits; and even obstruction of navigation. Aspects such as coastal hazard zones, sedimentation and erosion impacts, impact to adjacent wetlands and mudflats, and direct impact to water quality will all have to be considered in granting either the exemption or passage of a Coastal Site Plan Review.

In addition to increasing the awareness of the riparian land owner of his or her rights and obligations in carrying out the construction of coastal structures and fill operations, it is paramount that Town officials charged with enforcing and managing these structures, along with the persons who will make up the coastal site plan review process, be fully aware of the regulations for determining which coastal structures and filling operations are permissible, and which should be denied.

5.12 Mitigation of Coastal Development Impacts

The impacts associated with coastal development in the Town of Darien are difficult to clarify and quantify. Under CAM, the policy is to insure that the development, preservation, or use of the land and water resources of the coastal area proceed in a manner consistent with the capacity of the land and water resources, without significantly disrupting either the natural environment or sound economic growth. Obviously, one person's view of what is a manner "consistent with the capacity of the land" may be very different from another's. In fact, the terms "development" and "preservation" can be totally contradictory. The goal of Darien's coastal plan will be to resolve conflicts between opposing uses of the shoreline adjacent to marine and tidal waters. This will be done by giving preference to those

uses that minimize adverse impacts to natural coastal resources, while providing long term, stable economic benefits.

Currently, the shoreline of Darien is typified by one acre residential zoning with single-family homes, sizeable lawns, tracts of woodland and generally, a spacious uncluttered coastal shoreline appearance.

In a few areas, however, buildings have been built out into the intertidal zone; areas have been sealed off from their neighbors; refuse has been tossed over cliffs; and seawalls have been allowed to collapse. These are all forms of unwise coastal development, though they are quite different from coastal development impacts found in cities such as Norwalk and Stamford.

Coastal appearance is perhaps the most difficult coastal parameter to determine. Typically, most people will agree that the type of building permitted on the coastline makes a definitive impact on the character of that coastline. However, the problem begins when one tries to qualify exactly what is a good coastal appearance, and what is a bad one.

For the Darien coastline, a two-story wood-frame building set back from the head of a bluff, with a mixture of native and ornamental vegetation, might well be deemed attractive coastal appearance. Conversely, a building made of steel and glass rising three stories above that same bluff, with all the large trees removed to afford a 180-degree view, would likely be deemed detrimental to that same coastal appearance. The individual landowner, however, may well prefer a glass and steel structure over a two story wooden frame home. The paradox of this argument is that few of the coastal landowners would argue that one of the most attractive features of the Darien coastline is a relatively sparsely developed shorefront which is elegantly maintained with residential homes blending with natural surroundings.

In determining the general coastal development of the Town of Darien, and minimizing coastal development impacts, the decisions of the Planning and Zoning Commission, along with the findings of the municipal Coastal Site Plan Reviews, will be the most important aspects of controlling and regulating coastal development in the future. To do their job effectively, the applicable Coastal Site Plan Review agency must be fully aware of its responsibilies, and have a solid comprehensive knowledge of the coastline in their town. A familiarity with the coastal zone management statutes (what they say, and just as importantly, what they don't say) is equally important. A full history of past decisions will also be requisite in adding consistency to Darien's coastal land use decisions.

5.13 Management Of Tidal Ponds

Tidal ponds are a common feature along the glaciated Northeast coastline. They are typified by an open or regulated inlet to

seaward, and a freshwater inflow from the upland area. In general, they are shallow embayments with relatively undisturbed circulation, allowing sunlight to penetrate the water to the bottom which supports dense beds of filamentous algae. Left in their natural state, tidal ponds are extremely productive areas for shellfish, algae, and a variety of wildlife that feeds directly on various food sources. However, in southwestern Connecticut, an undisturbed salt pond virtually no longer exists. Instead we find salt ponds that are fortified by seawalls, and controlled by a series of dams and tidal gates. Darien has three salt pond systems: the small Crab pond/Cross Road pond system, Gorham's Pond, and the largest, Holly Pond.

The most stable of these salt ponds, and therefore, relative to the others the one of least concern is the smallest, "Crab pond/ Cross Road pond." These ponds form a brackish water system with a resident population of blue crab, chub, filamentous algae, and so forth. Sedimentation is not the major problem that it is in the other ponds. This is largely due to stable shoreline, low stream flow, and a series of pond/dams that divide the sediment basins. It should be noted, however, that the tidal connection with Contentment Island cove is by a dam, and circulation is restricted to surface water exchange. In addition, the culvert connecting Crab pond with Cross Road pond greatly restricts circulation. Ideally, a system of tidal gates and wider culverts should be designed to increase circulation, control sedimentation, and reduce eutrophication or filling in of this system.

Gorham's Pond, as already mentioned in Section 4.9, shows advanced signs of sedimentation and shoaling at the confluence with Stony Brook. Gorham's Pond is an artificially impounded pond. U.S. Geological Survey maps of 1836 show the Darien River extending past Ring's End Landing into the Gorham's Pond area. Since its impoundment, and the subsequent development of Darien's downtown section, the rate of sedimentation into the upper region of Gorham's Pond has accelerated, leading to the advanced stage of sedimentation that now has occurred. Because of the controversy over the opening of the Ring's End Landing tidal gate, along with the advanced stage of sedimentation, it is unlikely that the shoaling condition in Gorham's Pond can be alleviated without drastic measures such as dredging. Other measures of mitigation, such as increasing the schedule of tidal gate openings, would help to prevent further shoaling, but would also likely lead to direct conflict with the downstream users of the Darien River and the Darien Boat Club. Dredging of the Gorham's Pond area would be expensive, and appropriate disposal of the dredged spoil material difficult.

The largest of the tidal ponds, and a perfect case history of an urbanized salt pond, is Holly Pond. This Pond, originally a free flowing estuary of the Noroton River, was originally dammed in 1796. A mill was sited nearby which used a paddle wheel to draw energy from the waters. This dam operated for 142 years before it was destroyed by the hurricane of 1938. The original dam was

felt to have been too restrictive to tidal circulation and water-flow in the Pond. It is estimated that, prior to the installation of flap gates, sedimentation was advancing at an average rate of 1 inch per year over the entire surface of the pond. To reduce this rate of sedimentation, the flap gates were installed. Unfortunately, these gates were cemented shut by the accumulation of debris, and before long they were washed out to sea. In their place, guillotine type gates were designed which had to be operated manually. These were installed in 1966, and it is uncertain whether these gates have ever been operated since their installation.

An engineering study undertaken in 1973 by Frederick B. Harris, Inc. gave the following recommendations for the Holly Pond site. First and foremost was the elimination, to the greatest extent possible, of all pollution sources from the Pond, the Noroton River, and its drainage basin. It specifically listed the elimination of leaking septic tanks from the Darien shore, as well as the elimination of the industrial discharges located primarily on the Stamford shore. Secondly, the report recommended increasing the flushing capacity of the Pond. This would necessitate making the tidal gates operational. Once the gates were operational, a monitoring system should be installed in order to evaluate flow rates and water quality levels. The study further recommended the lowering of the water level (i.e., increasing tidal range) by one foot below the level of the dam in order to guarantee sufficient water circulation. This action would expose a larger area of mudflats, but the Harris engineers felt that increased water quality would more than compensate for the greater exposure of mudflats. The study also stated that an increase in tidal flushing of the system would not halt overall sedimentation of the Pond. Evidence of this shoaling can readily be seen at the upper reaches of Holly Pond just south of the Post Road bridge. The upper third of Holly Pond is very shallow throughout its entire extent.

In order for the sedimentation and erosion of Holly Pond to be managed and controlled, a joint effort of the City of Stamford and the Town of Darien will be necessary. The first goal for Holly Pond's management should be the repair of the tidal gates at the Pond's dam. The second should be the undertaking of tidal studies, current measurements, temperature profiling, adjacent land use, and recreation opportunities on Holly Pond. Studies recently undertaken by Oly-Pavia, Inc. for the Sherwood Island Pond in Westport, Connecticut have recommended extensive dredging of Sherwood Pond in order to restore the Pond's bottom to a gravel sand surface, and to remove much of the biological enrichment that exists in the muddy sediment. Sherwood Pond exhibits many of the same conditions as Holly Pond, therefore similar action on this Pond may be necessary if it is to be returned to a more natural condition. Holly Pond is no longer exposed to extensive industrial facilities, nor is it used as a commercial waterway. It does, however, receive waters from the Noroton River which did receive wastes from industrial facilities in the past.

Recent studies instituted under the Coastal Energy Impact Program (conducted by the Oceanic Society in cooperation with the University of Connecticut's Marine Sciences Institution) found the petroleum hydrocarbon distribution observed in August, 1982 sediment samples to reflect a general absence of foreign sources and pollution sources in the Pond proper. It went further to suggest that the sediments at the head of the Pond were heavily contaminated by commercial and industrial activity along the Noroton River. In other words, there were hydrocarbon concentrations equaling 520 parts per million in sediments that were visibly oily and smelly. Largely found in 1983 samples was decaying vegetation which was also relatively contaminated with hydrocarbon concentrations of 140 parts per million. These relatively high concentrations are the results of the historical industrial activity along the Noroton River, which passed the contaminated sediments into Holly Pond proper, which then acted as a sink for these substances. In addition, present commercial activities, and improper disposal of oil, could also be posing additional impacts to the Noroton River and Holly Pond. Because of its protected waters, relatively large water mass, and shallow water environment, Holly Pond offers recreational opportunities including, but not limited to, learning to sail, canoeing, fishing opportunities for youth, board sailing, and if the water quality improved, swimming. In addition to its use for active recreation, opportunities for passive recreation such as bird watching, and simply enjoying the aesthetic views are important aspects of the public enjoyment afforded by Holly Pond.

Currently, as a result of budget restraints, and lack of coordination between Stamford and Darien, a likely route will be the "no action" scenario. This would likely lead to increased sedimentation along the entire Holly Pond area, algae blooms that are both unsightly and odoriferous, and additional maintenance needs that would only increase the amount of capital necessary to renovate Holly Pond. It is therefore recommended that the City of Stamford and the Town of Darien meet to coordinate and discuss their approach to Holly Pond.

5.14 Preservation and Enhancement of Cultural Resources

Due to the nature of development along the Darien shoreline, man-made cultural elements are relatively limited. Dominant features are single family dwellings of varied architectural styles. A significant portion of these are situated on lots of one acre or more, enabling much of the natural shoreline to be maintained. This circumstance offers perhaps the greatest cultural opportunity for this segment of the coast.

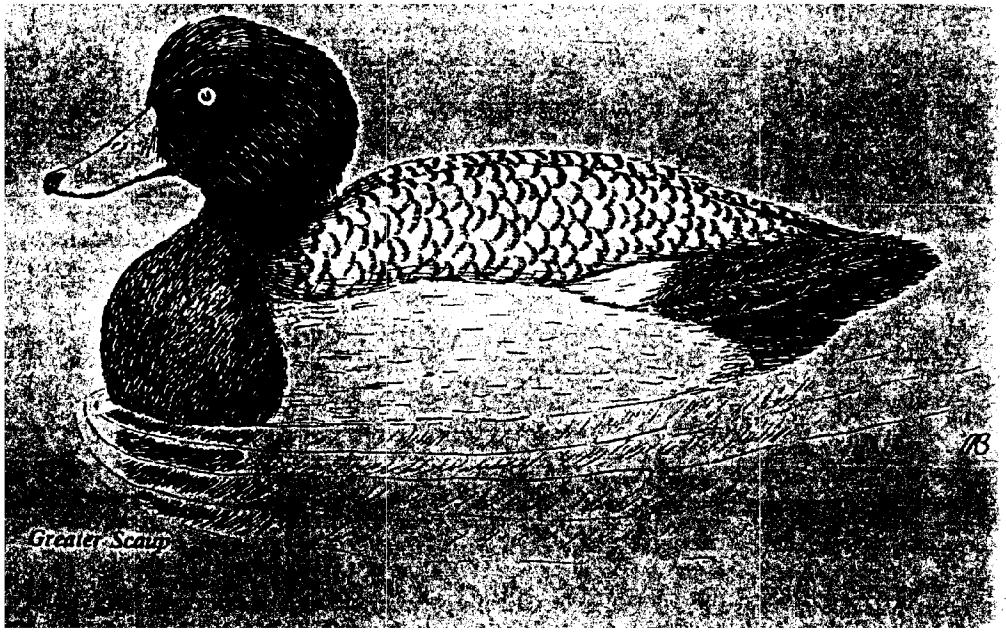
Historically, the most dominant feature on Darien's shore was the former Convent of the Sacred Heart building, located at the terminus of Long Neck Point. This structure was constructed originally as a private mansion in 1901, and then was converted into a religious school in 1924. It served as a well known landmark for boatsmen on the Sound. In 1972 its use as a religious school was

discontinued, and the property was subsequently subdivided for single family detached housing on one acre parcels. An attempt was made to preserve the main building, but due to a combination of factors, the efforts were not successful, and the cultural value of this once prominent landmark has been lost.

Another key landmark within the coastal area is the Ring's End Landing site, located at the point where the Darien River meets Gorham's Pond. This landing area was once the center of commerce in Darien. Its original character has been lost over the years, but it continues to serve as a reminder of the community's past. Additionally, this former landing site, together with the adjacent bridge, continues to be picturesque, and is frequently photographed or painted. Efforts should be pursued in the future to retain as much of the existing character as possible, and thus assure that future generations of residents can enjoy this link with Darien's past.

As alluded to earlier, the significant cultural value of Darien's shoreline may be the result of the restricted nature of it development. Other sections of this report have described how major blocks of the coast continue to be relatively undisturbed, and consequently much of the natural state remains intact, thus affording considerable opportunity to study and appreciate the flora, fauna, and natural processes of these various habitats.

Much of the work done as part of the Municipal Coastal Program can be applied to expand informational and educational opportunities on Darien's shoreline. More specifically, the resource mapping, analyses, and photographic inventory can be used directly to enable Darien's residents to become more familiar with the full values of the areas within the Coastal Boundary. It is an objective of this program to work toward this end.



6.0

PROPOSED AMENDMENTS TO PLAN OF DEVELOPMENT

The Coastal Area Management Program shall be consistent with the Town-wide planning program. Objectives considered under CAM will be included in the Town Plan of Development as it may be revised and offered for approval in the Spring of 1984. These objectives would include the following:

6.1 - Improve Physical Access to Long Island Sound.

6.2 - Preserve Visual Access to the Sound and its Related Coastal Resources.

6.3 - Expand Recreational Boating Opportunities.

6.4 - Improve Recreational Shellfishing Opportunities.

6.5 - Preserve and Protect Key Shoreline Resource Areas.

6.6 - Restore Degraded Natural Systems.

6.7 - Improve Educational Opportunities to Further the Understanding of the Importance of the Coastal Area.

6.1 Seek Improved Access to Long Island Sound and Associated Embayments

Inasmuch as the major segment of the shoreline lies within areas owned and controlled by private associations, whose roads are privately maintained and thus not available to other residents of Darien, it is obvious that any additional access to the Sound must be from Town roads through properties that may be purchased or received by the Town, or deeded to such non-profit organizations as the Nature Conservatory or the Darien Land Trust.

- It should be the policy of the Town of Darien to encourage access for its residents to the waters of Long Island Sound. This may be accomplished by expansion, development and effective utilization of Town-owned recreational facilities or through facilities which may be granted by gift, easement or otherwise within the coastal areas. Any such acquisitions shall be consistent with sound resource conservation procedures and constitutionally protected rights of private property owners. Nothing in this program, nor in the Town of Darien planning and zoning regulations, which may be adopted pursuant thereto, shall be used to require the granting of any such facility by gift, easement or otherwise.

6.2 Protect, Preserve and Enhance Visual Access to Long Island Sound, its Embayments and Coastal Resources in General

Existing views of Long Island Sound and the Town's coastline which can be seen from Town roads and beaches ought to be preserved. This will require proper maintenance of these

properties including, but not limited to, planting and care of trees and other vegetation.

Land use regulations and Coastal Site Plan Review procedures shall be used in ways that preserve or improve existing views should opportunities arise. Such actions should:

- Protect existing property values in shoreline areas

- Resolve cooperation with private neighborhood associations, as appropriate, to assist in preserving key neighborhood views and vistas for the general benefit of affected private property owners.

6.3 Expand Recreational Boating Opportunities for the Residents of Darien

In the achievement of this objective a range of individual actions within the community should be considered. These may include:

- Improved protection of the Darien Harbor area, including the outer harbor, the Noroton Yacht Club area, and the Darien Boat Club.

- Expansion and improvement of the mooring and docking facilities within the area of the Darien Boat Club.

- Provision of a boat launching ramp at the westerly end of the Weed Beach public park area.

- Establishment of a special anchorage control system to more fully regulate temporary and seasonal moorings within Darien's waters.

- Assurance of the continuation of adequate boating facilities by the routine identification of areas which require maintenance dredging, and the provision of community assistance in securing necessary approvals to accomplish such work.

6.4 Improve Recreational Shellfishing Opportunities Without Causing Adverse Effects on Darien's Coastal Resources

The achievement of this objective will require numerous actions. Two key steps which must be taken by the Town of Darien are to:

- Establish a Town Shellfish Commission.

- Develop and implement a management program for the shellfish resources within the Town.

Following these actions, and based upon the experience gained, a more extensive program will have to be developed.

6.5 Preserve and Protect Key Shoreline Resource Areas Including:

- Five Mile River marsh
- Tokeneke Club marsh
- Fish Islands
- Scott's Cove/Delafield Island marsh
- Great Island shoreline
- Darien River marsh
- Holly Pond/Brushy Island wetlands
- Salt ponds: Gorham's and Holly

These areas have been preserved and protected to a large extent over the years by shoreline property owners, as well as by various actions of Town agencies and private organizations. It is anticipated that additional protection can be achieved by:

- More fully monitoring the activities undertaken by individual property owners within, or adjacent to, these designated areas.

- Applying existing land use regulations more effectively, and amending them as necessary to meet current or future requirements.

- Conducting educational programs to advise individuals of the importance to both the Town and the individual property owner of protecting these critical shoreline resource areas.

6.6 Attempt to Improve or Restore the Natural Systems within the Coastal Boundary through Improved Regulation, Public Education, and other Appropriate Efforts. Natural Systems which Might Merit such Consideration Include:

- Holly Pond
- Gorham's Pond
- Tokeneke Trail marsh
- Tokeneke Brook
- Cross Road/Crab pond

The enhancement of these systems might require one or more of several forms of action which could include: the elimination of of pollution; improved control of erosion and sedimentation; improved flushing actions by tidal waters; and improved water circulation patterns.

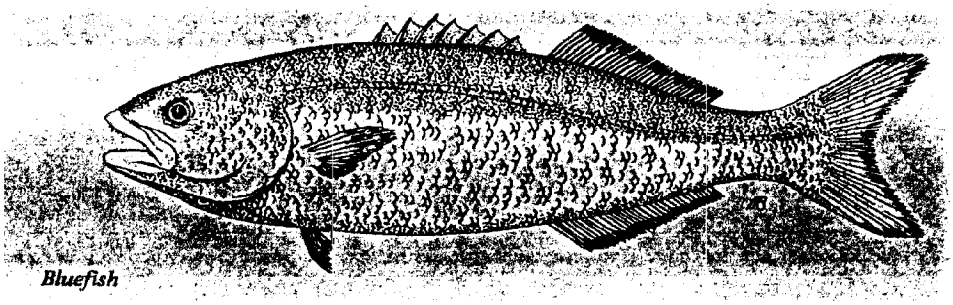
6.7 Improve Educational Opportunities to Further the Understanding of the Importance of the Coastal Area.

Recognizing that the unique natural features of the coastal area of Darien are an essential element in the quality of life in the Town, additional efforts should be made to inform the citizens of the Town by the following means:

- Prepare and disseminate information to the residents on all aspects of coastal area management

- Undertake specific projects in the future to inform coastal property owners, the general citizenry, and special interests of various aspects of the shoreline use and development. These would include dissemination of information on regulatory programs and their purposes; general advice on cause and effect of certain actions within coastal areas; and other related facts.

- Design a marine science curriculum for the Darien school system incorporating the history of the coastline, present geological makeup of Darien's coast, and the importance of wise management of coastal resources for future opportunities. This program could be formed in cooperation with local educational organizations, such as the Darien Nature Center.



7.0

PROPOSALS FOR REVISING LOCAL REGULATIONS

7.0 Proposals for Revising Local Regulations

Since the adoption of the Town's original Plan of Development in 1967, the Town of Darien has taken extensive actions to amend its zoning and subdivision regulations, and create new ordinances necessary to achieve the objectives set forth in that Plan. In addition, the Town has attempted to improve its regulatory processes, and to adopt necessary new measures as needs for additional programs became apparent, or as Federal and State legislation expands local authority.

An analysis of the Town's current land use regulations confirms that most of the necessary objectives for regulation have been achieved, and authority currently exists to carry out the purposes of the Coastal Area Management Program. Various sections of the Zoning Regulations are entirely consistent with the purposes of CAM and any needed amendments will be made in the future, should inconsistencies become apparent. Inasmuch as the Town's Zoning Regulations will be recodified during 1984, it is anticipated that any necessary modifications to specific language; correction of minor inconsistencies among specific sections of the regulations; and insertion of appropriate references to CAM, the Coastal Site Plan Review process, and other applicable programs will be accomplished. Because of this recodification, it is not deemed necessary or desirable to make minor modifications to the Regulations at this time.

The following regulations are in existence, and are directly related to coastal resources and CAM.

7.1 Zoning Regulations

Subsection 431.11 EXCEPTION FOR PRESERVATION OF SIGNIFICANT NATURAL, SPECIAL AND/OR MAN-MADE FEATURES AND RELATED OPEN SPACE AREAS, AND THE SUBDIVISION OR RESUBDIVISION OF LAND.

This subsection of the Zoning Regulations (effective as of June 5, 1977) enables the Planning and Zoning Commission to properly protect open space, cultural facilities, or related types of attributes from development under a cluster subdivision type of approach. The purpose, as stated in the Regulations, is as follows: "Where the Planning and Zoning Commission shall determine that significant natural, man-made, or special features exist on a site proposed for subdivision or resubdivision, the protection and preservation of which would promote the purposes of these regulations, the specific area, width, depth, frontage, yard and coverage requirements established by Sections 410 and 421 of the Zoning Regulations may be modified to achieve such protection or preservation. Such action may be taken provided that all plans, policies or other relevant regulations of the Town of Darien are adhered to and further, that the terms of this section are met in full. Applicable features shall include, but not be limited to, streams, water bodies, shorelands, wetlands, rock ledges, steep slopes, major trees, views, waterfalls, wildlife habitat, stonewalls, historic sites, landmarks, or unusual natural features."

As can be noted in this language, virtually any potential is covered under this subsection. Accordingly, the approach should be completely consistent with the purposes of CAM, and the protection of coastal resources should be achieved through the Commission's use of this subsection and the Coastal Site Plan Review process.

Additionally, the purpose of this whole approach is to provide reasonable flexibility in the division of land and its subsequent development when, in the judgement of the Commission, such flexibility will insure the conservation or preservation of features or areas which contribute to, or provide for, the health, safety and general welfare of the Town. Obviously, this would include the coastal resources of the community.

Section 482. SPECIAL REGULATIONS FOR PROTECTED TOWN LANDMARKS.

The purpose of this special section of the Regulations (effective April 6, 1975) is to allow flexibility to preserve Darien's cultural heritage. It is recognized that certain structures and land areas have value as Town landmarks. Their value transcends the ordinary standards incorporated in the Zoning Regulations, and it is therefore required that each individual site be considered a special case. Such Protected Town Landmarks could include any building, structure, group of structures or natural features, together with the parcel of land on which it is sited. In order to define such a landmark specifically, the Planning and Zoning Commission must determine, on the basis of factual data or expert opinion, that the landmark possesses a degree of historic significance, an architectural uniqueness, or cultural value which, if destroyed or altered, would represent a severe cultural loss to the community.

As can be noted by the general purposes of this section, a certain degree of flexibility is permitted to enable unique landmarks and/or structures to receive protection. Accordingly, it can be stated that this section of the regulations can be directly applied to achieving objectives set forth within the Coastal Area Management Program, e.g. enabling the preservation of Ring's End Landing.

Section 486. SPECIAL REGULATIONS FOR PROTECTION AND CONSERVATION OF LAND, WETLANDS, WATERCOURSES, TIDELANDS, FLOODPLAINS, AND OTHER NATURAL AREAS.

This Section of the Zoning Regulations (effective as of July 15, 1973) is also directly applicable to the coastal program. Though the section was adopted several years before CAM, its essential purpose is very similar to the key aspects of the CAM program. While there is some duplication, and a certain degree of overlap with the Coastal Site Plan Review process, Section 486 and CAM appear to be totally consistent, and any administrative difficulties will be resolved as part of the recodification of the Zoning Regulations in 1984.

The essential purpose of this section of the zoning regulations is to preserve and protect the natural resources of the Town including land, soil, water, wetlands, streams and watercourses, shorefront and coastal lands, tidal estuaries, trees and vegetation, aquifers and watertables, wildlife, areas of scenic beauty, and areas of ecological importance. This regulation was established in recognition of the important inter-relationship among these resources; the need for a suitable environment for human habitation; and their importance to the health, safety and general welfare of Darien and the larger environment.

Section 486. is a set of environmental protection regulations. The duplication between CAM and Section 486 pertains in particular to the 100-feet-wide strip along the landward side of the mean high tide line.

Subsection 486.2 specifically lists regulated activities within 100 feet of mean high tide including filling, excavation, regrading, and erection of any structures within this defined area. A Special Permit approval process is required, and, as part of the application review system, it is specified that necessary site development plans, environmental impact statements, specific analyses, and related materials be submitted as part of the application. It is required that the Commission ascertain that the proposed regulated activities will not adversely affect the natural resources of the Town, or the environmental character of the surroundings of the site. This negative declaration must be made before granting any Special Permit. It is also important to note that in granting a Special Permit, the Commission may attach any necessary conditions and limitations which it deems necessary to conserve the soil, water, air, vegetation and other natural attributes of the site and its environs.

The Section 486 regulations are Darien's "NEPA" (National Environmental Policy Act). They show considerable similarity to Section 404 of the Clean Water Act for watercourses and the marine environment. As such they predate CAM both in enactment and philosophy.

Section 488. COASTAL AREA MANAGEMENT

The specific purpose of this section of the Darien Zoning Regulations (effective March 10, 1980) is to achieve the goals, objectives and policies of the Connecticut Coastal Area Management Program as set forth in Section 22a-93-96 of the General Statutes as amended by Public Act No. 79-535, known as the Coastal Area Management Act. This section was established in direct response to the State's action to adopt a Coastal Area Management Program. It incorporates the necessary provisions relative to designating a Coastal Boundary; providing opportunities for administrative exemptions; the establishment of a filing fee for a Coastal Site Plan Review; and other related matters. This section is consistent with the purposes of CAM because it was specifically designed to respond to the enactment of Connecticut's program.

Section 489. FLOOD DAMAGE PREVENTION.

This section (effective as of December 28, 1980) was adopted by the Town's Planning and Zoning Commission in direct response to the federal initiative developed for the control of flood damage, and improvement of flood damage prevention.

The specific purpose of this regulation is stated as follows:

"It is the finding of the Planning and Zoning Commission and the Flood and Erosion Control Board of the Town of Darien that the flood hazard areas are subject to periodic inundation which may result, or might possibly result, in loss of life and property, health and safety hazards, destruction of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of tax base, all of which adversely affect the public health, safety, and general welfare."

Subsection 489.1 declares that the purpose of these regulations is to protect the citizens of Darien by making provisions for the preservation, protection, maintenance, or use of flood hazard and floodway areas.

It is this section of the Darien Zoning Regulations which pertains directly to the need to control use and activity within a flood prone area, including coastal hazard areas. Necessary data on flood prone areas, wave velocity factors, and other related elements have recently been assembled by the Federal Government. All such data are set forth on the official Flood Insurance Rate Map, and also on the Flood Boundary and Floodway Map on file in the Darien Planning and Zoning Office. As with the other sections of the Darien Zoning Regulations, this section will be amended and updated to meet future needs. In addition, flood prone areas will be reinventoried as necessary. The purposes and regulations of Section 489 are consistent with the purposes of CAM.

7.2 Subdivision Regulations

The general, declared policies and purposes of Darien's Subdivision Regulations are consistent with the purposes of CAM. For example, the declared policies are as follows:

1. Land to be subdivided shall be of such character that it can be used for building purposes without danger to health or public safety;

2. Proper provision shall be made for water supply, sewage disposal, storm drainage, and other required utilities;

3. In areas contiguous to brooks, rivers or other bodies of water subject to flooding, including tidal areas, proper provisions shall be made for flood protection,

including effects on neighboring properties and downstream areas or properties;

4. Proper measures shall be taken to prevent or minimize erosion, sedimentation, or other adverse effects on the natural environment;

5. Proposed streets must be in harmony with existing or proposed municipal thoroughfares shown on the Town's Plan of Development as adopted by the Commission;

6. Lots, streets, and related elements must be designed to protect and preserve natural features, and avoid unnecessary degradation of the natural environments;

7. In areas deemed proper or necessary by the Commission, permanent open space reserves shall be established;

8. Energy efficient patterns of development, including the use of solar or other renewable forms of energy and energy conservation, shall be encouraged.

In addition, the Subdivision Regulations also specify certain requirements for the submission of a formal application relative to environmental analysis, erosion and sedimentation control plans, provisions for permanently declared open space areas, provisions for the establishment of conservation easements over key natural resource areas; and related types of development regulations. As with the Zoning Regulations, the Subdivision Regulations have been continually amended and updated to reflect changing needs, new policies, and Federal and State initiatives.

7.3 Inland Wetlands Regulations

Since September 24, 1973, Darien has had in effect special regulations known as the "Inland Wetlands and Water Courses Regulations of the Town of Darien." These were prepared by the Darien Inland Wetlands Commission in accordance with the provisions of "An Act Concerning Inland Wetlands and Water Courses", Section 22A-36 to 45 inclusive of the General Statutes as amended, and pursuant to a Town ordinance passed by the Representative Town Meeting.

The administration of this program has been carried out quite successfully since that time and it is anticipated that requirements for full regulation of freshwater wetlands within the Coastal Boundary can continue to be met under the existing arrangement.

7.4 Coastal Site Plan Review

In response to the State initiative, Darien was among the first communities in Connecticut to adopt its own Coastal Boundary map, and incorporate necessary new language within the Town's zoning regulations (Section 488).

Since the adoption of the enabling legislation, the Planning and Zoning Commission has been improving its regulatory and administrative processes for Coastal Site Plan Reviews. It is anticipated that this learning process, together with the incorporation of coastal site plan review procedures and other aspects of the Commission's program, will continue in the foreseeable future. No particular difficulties have been encountered in the past, nor are any foreseeable in the near future.

If there is one major shortcoming in the regulatory process in Darien, relative to coastal area management, it is the degree of overlapping jurisdiction and administrative confusion resulting from the patchwork manner in which the various sections and subsections of regulations were established and set forth. As stated in the initial part of this discussion, however, it is anticipated that all or most of this duplication and related administrative difficulty will be resolved as part of the Town Plan of Development update, and the recodification of the Zoning Regulations. All of this work will be concluded by the Autumn of 1984. Accordingly, it would be a waste of effort and expense to attempt to address these concerns at this point in time.

A very important aspect of the Town of Darien's ability to better control the use and development of its shoreline areas is the work conducted as part of the Municipal Coastal Program. One of the major difficulties that the Planning and Zoning Commission encountered in attempting to enforce various regulations on coastal areas was the lack of any in-depth inventory and analysis of existing man-made and natural features and areas along the shoreline. Consequently, whenever an enforcement action was necessary, three key problems became apparent:

1. No specific inventory was available to prove beyond a reasonable doubt that a structure or man-made improvement did, in fact, exist prior to the time that the notice of violation was filed with the property owner.

2. Administrative and formal reviews were conducted without the benefit of having any advance analyses of coastal resources and values. Accordingly, most decisions were made on an ad hoc basis rather than being established in advance.

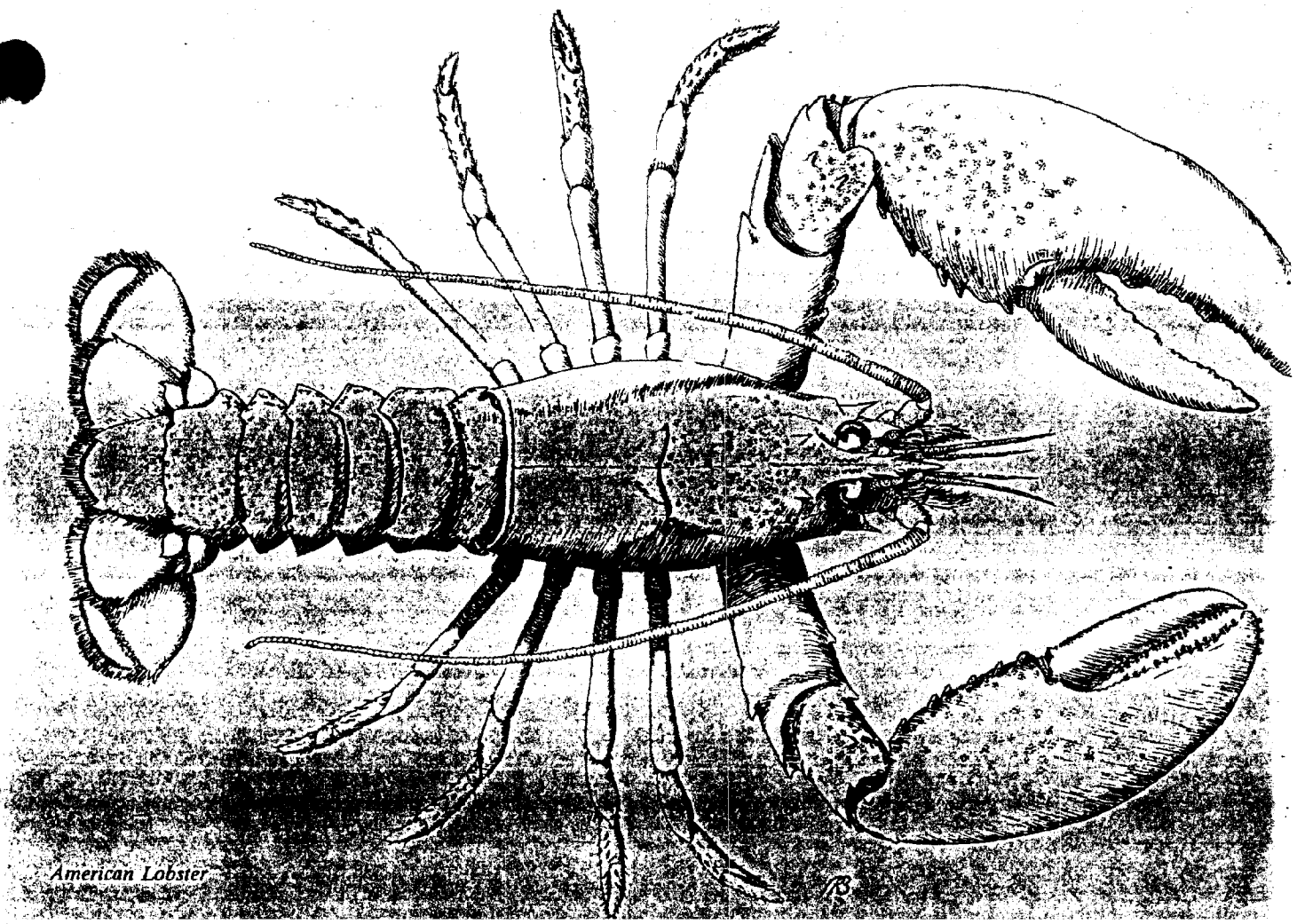
3. Extensive difficulties often developed between Commission representatives and individual property owners because of the lack of adequate data. The professional staff of the Commission was unable to advise an applicant in advance as to the key elements of the zoning or site plan reviews, and how the Commission would evaluate the proposal in relation to the coastal resources. The work completed under this Municipal Coastal Program will hopefully alleviate some of these problems.

Since the entire shoreline has been inventoried, and judgments have been made as to the value of these various resources, the

above administrative difficulties can be addressed directly. In addition, as noted in the issue statements and objective statements contained in this report, certain areas have been designated for particular concern; or for specific project activities.

Accordingly, it will now be possible to advise an applicant in advance of the concerns or objectives for a particular shoreline segment. This ability should significantly improve the regulatory process within the Town of Darien, as it pertains to coastal areas and coastal resources, in particular.

With regard to specific enforcement actions, the Coastal Resources Maps, in combination with the photographic inventory, should assist in pursuing any necessary legal action. Specifically, the coastal inventory will enable the Town to establish beyond a reasonable doubt that a certain situation did or did not exist at a given point in time (i.e. the Summer of 1982). The resource inventory should facilitate and improve this aspect of the regulatory process in many respects as well.



8.0

SUMMARY AND CONCLUSIONS

8.0 Summary and Conclusion

During the course of the establishment of the Municipal Coastal Program for the Town of Darien, one theme has been continually apparent: the coastline of Darien is of extremely high visual, aesthetic, and ecological value. When this shoreline is considered in relationship to the remainder of the Fairfield County coast, it is found to maintain a natural, relatively undisturbed appearance, while providing high quality residential opportunities. The residential zoning, past regulatory performance, and the concern of riparian landowners have combined to protect the 16-mile coastline of Darien as a shoreline that is a carefully balanced mix of residential development and coastal characteristics.

While the cities of Norwalk and Stamford face impacts from commercial and industrial redevelopment, the potential impact upon the coastline of Darien is much more subtle. Piecemeal destruction of natural habitats because of unwise shoreline structure placement; the placement of poorly designed coastal structures that do not fit into the nature of the shoreline, and new areas of erosion caused by poor management practices are among the greatest threats at this time to Darien's coastal heritage. As such, these impacts are not so obvious that they cry out to be addressed; rather, they are more subtle, and are therefore more difficult to identify and control.

The design and implementation of this Program should significantly assist in achieving these most fundamental objectives for the Town of Darien's coastal area, namely, the protection, preservation and wise management of the existing shoreline and coastal resources. The main application of this report, and the various materials prepared as part of this study, will be its use by the staffs of the Town of Darien and various State and Federal agencies. This Municipal Coastal Program will assist appropriate regulatory agencies in carrying out their respective programs.

It is anticipated that specific efforts will be required in the near future to disseminate more generalized information to coastal property owners and general residents of the Town. For example, the various permitting processes involved in shoreline activities need to be set forth clearly and succinctly so that individual persons can better understand who and what is involved, and why these controls are important.

While Darien is a coastal community and maintains a shoreline of high quality, the majority of the Town's residents have little or no direct access to or involvement with the shoreline. In order to achieve both a greater enjoyment of the shore, and allow its wise management and protection, a variety of educational programs need to be developed. These programs would be aimed at: increasing knowledge of the coastline and the importance of coastal resources; increasing potential recreational opportunities such as boating, shellfishing and swimming which are available within

the waters of Darien and Long Island Sound; and explaining the application and benefits of regulatory programs, wise shoreline development, and flood hazard prevention. As stated in previous chapters in this report, a vigorous pursuit of the expansion of visual and physical access to the shoreline for the residents of Darien is the paramount objective for increasing the enjoyment of the coastline, and the recreational opportunities which it affords.

In addition to this report and its value as a background and planning document for persons charged with coastal regulation, additional elements of the completed Municipal Coastal Program include:

- Base maps of the areas in the Town of Darien within the Coastal Boundary at a scale of 1" = 200'.

- Resource Inventory Maps (also at the scale of 1" = 200') detailing coastal resources such as tidal wetlands, mud-flats, coastal structures, and other significant natural and man-made features along Darien's shoreline.

- A slide presentation on the coastline of Darien to be used for educational purposes by the public school system and other interested groups and organizations. This slide program is intended to increase the townspeople's knowledge of Darien's shoreline and coastal resources.

- A set of index maps, keyed to the 35 MM slide inventory, to aid in identifying the precise shoreline location of individual slides.

- Photographic inventory of the entire shoreline of Darien using 35 mm color slides.

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