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COMPREHENSIVE
PLAN
SUMMARY



dukes county, massachusetts

METCALF & EDDY, INC. 1969 • 1971

Dukes County Planning and Economic Development Commission

December 2, 1971

The Metcalf and Eddy prepared "Comprehensive Plan Summary" to which this letter is affixed has been the subject of much public speculation since the Commission voted not to accept the original draft at its July 7, 1971 meeting. Many discussions with, and revisions by, the consultant over the subsequent four month period has not however resulted in what in all honesty can be termed a compromise. Philosophical differences, as well as differences of opinion related to interpretation and emphasis were not, nor could not, be resolved. Consequently this document does not represent the position of a majority of the Commission.

This unfortunate circumstance does not however render the Summary and the six preliminary reports useless. Much basic information has been collected and analyzed and many important questions have been posed. By receiving the Summary for circulation among interested groups and individuals the Commission hopes to preclude any further speculation as to its contents and to generate interest in the review and discussion sessions which will commence at the next regular Commission meeting in January. The review sessions will ultimately result in the preparation and adoption of a policy oriented Comprehensive Plan for the County.

In reviewing this document, the following errors were found to exist.

1. The strategy alluded to on page 3, bottom left hand paragraph, was not within the "scope of services" in the contractual agreement and was consequently prepared by and included in the draft by the consultant on his own volition. Item 7 under the heading "Purpose and Scope" on page 5 is consequently not applicable.
2. The word "recommended" should be substituted for the word "complete" in line one, paragraph two, right hand column of page 5.
3. The next to last phrase in the left hand column on page 26 should read: The number of day-trippers brought to the Vineyard by air is estimated to be 7,500 persons.
4. The captions under the two photographs on page 42 should be transposed.
5. As mentioned above the strategy alluded to on page 55 and other places was never intended to be included as a part of this study, nor was it included in any contractual agreements between Metcalf and Eddy and the Commission.

Dean R. Swift
Chairman

SUMMARY
of the
COMPREHENSIVE PLAN
for
DUKES COUNTY, MASSACHUSETTS

October 1971

This report was prepared for the Dukes County Planning and Economic Development Commission and the Massachusetts Department of Community Affairs, and was financially aided through a Federal grant from the Department of Housing and Urban Development under the Urban Planning Assistance Program authorized by Section 701 of the Housing Act of 1954, as amended.



METCALF & EDDY, INC.

ENGINEERS & PLANNERS

ABSTRACT

TITLE: Summary of the Comprehensive Plan for Dukes County, Massachusetts

AUTHOR: Metcalf & Eddy, Inc.

SUBJECT: Summary of a strategy and plan for protecting the County's rural environment and creating a viable year-round economy

DATE: October 1971

PLANNING AGENCIES: Dukes County Planning and Economic Development Commission and its Citizens' Advisory Committee, and the Massachusetts Department of Community Affairs (Office of Regional Affairs)

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ABSTRACT:

Dukes County, Massachusetts (Martha's Vineyard and the Elizabeth Islands) is one of the two remaining bastions of hope for preserving the rural environment of a large warm water island lying off the Eastern Coastline of the United States. At the same time, with each passing year, the economy of the County is becoming more dependent for its viability upon the tourist-oriented summer season.

This report determines the present situation and trends in the County's rural environment and economy; and, based upon a continuance of these trends, forecasts the 1980 and 1990 situation and the potential impacts of these forecasts upon the County's rural environment and economy.

The recommended goal is to protect the County's rural environment and its existing open space and developed facilities from: (1) contamination and loss by overpopulation and overuse; (2) vehicular congestion and noise and air pollution; (3) indiscriminate misuse and overuse of land and buildings; and (4) loss and destruction of its animal, fish and bird life, and danger to human life by people, vehicles, water pollution, and salt water intrusion, while at the same time creating an economically and socially viable and balanced year-round society with an increased per capita income dependent for its livelihood upon the same environment and facilities it seeks to protect.

A future land use is recommended together with a strategy for both carrying out the plan and fulfilling the goal, which strategy was not agreed upon by Metcalf & Eddy and the Commission. At the request of the Commission, no recommended strategy is included.

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October 1971

Mr. Dean R. Swift, Chairman
Dukes County Planning and Economic
Development Commission
Court House
Edgartown, Massachusetts 02568

Dear Mr. Swift:

In accordance with the terms of our agreement dated October 20, 1969, we are pleased to submit this "Summary of the Comprehensive Plan for Dukes County, Massachusetts".

The preparation of this report represents the culmination of a 24-month's effort by the Commission, other interested persons, and Metcalf & Eddy, Inc.

The County, one of the few bastions of rural environmental splendor left along the eastern coastline of the United States, faces clear and present danger from despoilers. The following plan and program is designed to protect the environment for the enjoyment of future generations, as it has been so richly enjoyed by present and past generations.

This summary was prepared personally by the writer and, as revised, by representatives of the Commission and the Massachusetts Department of Community Affairs.

Very truly yours,

Approved

John Podger
Vice President

METCALF & EDDY, INC.

James R. Woglom, A.I.P.
Assistant Vice President

INVESTIGATIONS • REPORTS • DESIGNS • ADVICE DURING CONSTRUCTION • ADVICE ON OPERATION
PLANNING • VALUATIONS • LABORATORIES • RESEARCH

INTRODUCTION

Purpose and Scope

The purpose and scope of the report is to:

1. determine the existing situation and present trends in the various elements of the County's environment and economy;
2. present observable impacts of these trends upon the County's environment and discuss economic potentials;
3. forecast the 1980 and 1990 situation based upon a continuance of present trends;
4. determine the potential impact of these forecasts upon the future environment and economy of the County;
5. establish community goals;
6. recommend a future land use plan and;
7. recommend a strategy for both carrying out the plan and fulfilling the established goals.

This report is a summary of the complete Comprehensive Plan for Dukes County consisting of the following six preliminary studies:

1. *Generalized Existing Land Use*, January 1970, p. 14.
2. *Physical Features, Natural Resources and Open Space*, March 1970, p. 48.
3. *Year-Round Population and Economic Base*, May 1970, p. 33.
4. *Seasonal Population and Housing*, August 1970, p. 12
5. *Major Problems, Unique Characteristics, and Alternative Planning Policies*, October 1970, p. 22.
6. *Planning Proposals and Land Use Controls*, April 1971, p. 57.

Presentations

This report is divided into five major parts:

- I. Present Situation and Trends
- II. Present Impacts and Economic Potentials
- III. Forecasts and Their Potential Impacts
- IV. Goals
- V. Strategy and Future Land Use Plan

The arrangement of the summary differs from the six preliminary studies constituting the complete Comprehensive Plan, but is considered more effective in presenting the highlights of the plan. Greater emphasis has been placed in the summary than in the complete plan upon forecasts, their potential impacts upon the environment, goals, and a strategy for carrying out the plan. Where readily available, later statistical information than obtainable during the preliminary study phase has been employed in preparing the summary.

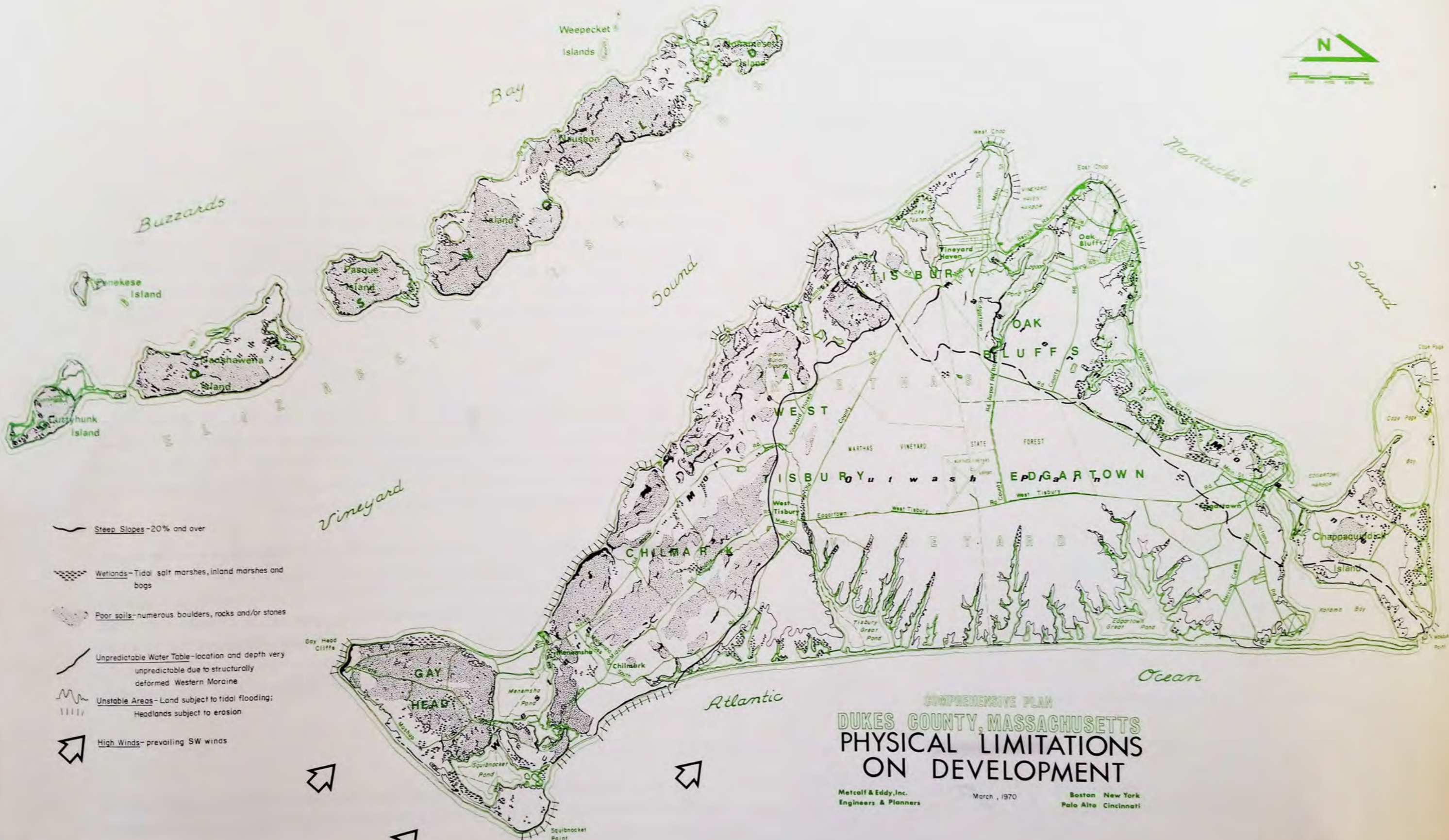
County Location







Dukes County, comprising some 106 square miles of area, consists of two island groups: Martha's Vineyard (93 square miles) and the Elizabeth Islands (13 square miles). Martha's Vineyard (the Vineyard) is comprised of the six towns of Edgartown, Oak Bluffs, Tisbury (Vineyard Haven), West Tisbury, Chilmark, and Gay Head. Gosnold is the only town on the Elizabeth Islands (the Elizabeths) (see Figure 1).

The Vineyard is located approximately seven miles south of the Town of Falmouth, located on Cape Cod (Barnstable County) on the southeastern coast of Massachusetts. The Elizabeths are located approximately one mile southwest of Falmouth and 14 miles southeast of the City of New Bedford, Massachusetts. Approximately 15 miles east of the Vineyard lies the Island of Nantucket. The only means of transportation to the Vineyard is by water (ferry or private boat) or air (commercial airlines or private plane). Similarly, to the Elizabeths, transportation is only by ferry, private boat or air taxi. New York City is 150 miles and Boston 80 miles from the County.

Terms

Martha's Vineyard, the Elizabeth Islands, and Nantucket are known collectively as "the Islands" and those who live there on a year-round basis as "the Islanders". Similarly, off-Island is called "the Mainland".



-  Steep Slopes - 20% and over
-  Wetlands - Tidal salt marshes, inland marshes and bogs
-  Poor soils - numerous boulders, rocks and/or stones
-  Unpredictable Water Table - location and depth very unpredictable due to structurally deformed Western Moraine
-  Unstable Areas - Land subject to tidal flooding; Headlands subject to erosion
-  High Winds - prevailing SW winds

COMPREHENSIVE PLAN
DUKES COUNTY, MASSACHUSETTS
PHYSICAL LIMITATIONS
ON DEVELOPMENT

Metcalf & Eddy, Inc.
 Engineers & Planners
 March, 1970
 Boston New York
 Palo Alto Cincinnati

PART I
PRESENT SITUATION AND TRENDS

Subjects analyzed include: (1) natural resources (weather and climate, physiography, steep slopes, minerals, soils, water coastal flooding, shore erosion, vegetation-habitat, fish and wildlife), (2) existing land use (pattern, amounts, types, location, land values, and environmental controls), (3) transportation (external and internal systems and modes), (4) community facilities (town and state buildings, county-wide buildings, and public utilities), (5) population (off-seasonal and seasonal), (6) housing (units and other sleeping accommodations), (7) economy (history, employment, and unemployment), (8) human values and income (environmental and social values and income), and (9) organization and financing (town, public county or regional, and semi-public or private).

NATURAL RESOURCES

A Priceless Asset

The varied and distinctive natural resources of the Vineyard and the Elizabeths are both paradoxically, its most priceless asset and its greatest attractive force to year-round and summer residents and visitors.

There is no other island left to visitors and tourists along the Eastern Coast of the United States, south of Duker County, as large in size as the Vineyard, whose natural resources have not been seriously altered by development and pollution.



The Vineyard as Seen From the Ferry

Climate and Weather

As with any insular location, the location of Duker County is moderated by the influence of the ocean; its summers are cooler and its winters warmer than the Mainland. Compared with the Mainland, warm weather comes later in the spring but lasts longer in the fall.

The mean annual amount of precipitation for the County is approximately six more inches than for Boston. This annual difference between the two places is offset by the two out of three years in which, during the summer months, rainfall in the County averages one inch less than for Boston. Also, the ocean water tends to be warmer than along most parts of the New England Coast.

Sustained winter winds from the southwest have a substantial cooling impact, particularly upon the Gay Head peninsula, and render the area relatively inhospitable for year-round habitation. Similarly, the location of the Vineyard is exposed to tropical hurricanes and northeasters. The sparsely settled southern and western shores receive the brunt of any later summer or early fall hurricanes, while the more populated eastern and northern coastline receive the late fall, winter, or early spring northeasters. In contrast, one of the popular attractions of the weather is the cool daily summer sea breeze. However, at the same time during all portions of the year, high humidity and early morning fog can be a deterrent.

In general, the tremendous variability of the weather has created an outlook of acceptability by the Islander on many facets of his life and his environment, not just the weather and the climate. At the same time, it has attracted the summer tourists and the year-round retiree.

Physiography

The landform of the County is directly attributable to the work of the glaciers. Three physiographic regions were formed on the Vineyard: the Western Moraine, the Eastern Moraine, and the Outwash Plain (see Figure 2). Glacial action from the northwest formed the Western Moraine, and from the northeast the Eastern Moraine, leaving in between them as a triangular-shaped region, the Outwash Plain.

From the cliffs at Gay Head to Makoniky Head (between Lake Tashmoo and James Pond) stretches the folded and deformed Western Moraine, which is characterized by long northeast-trending ridges separated by low valleys. While the ridges average between 200 and 300 feet above sea level, the valleys contain some of the few brooks and small ponds on the Vineyard. Impervious clay near the surface supports the flow of fresh water across the land and traps it in small depressions.

Irregularities in this moraine's marginal contours, along with the post-glacial deposition of sand forming beaches and dunes, created the large Menemsha and Squibnocket Ponds. At its western end, the moraine undulates more gently when it becomes the wide, windswept moors of Gay Head. Listed as a National Landmark, Gay Head Cliffs are the most famous physical feature of Dukes County. (See Figure 3).

"Sediment layers, streaked like bright finger-smear dyes, show red, green, tan, gray, yellow, brilliant white, and nearly coal black across the face of the cliffs and give this foreland its name.

"Some layers are primarily sand, others mainly gravel, others compact clay. Some are full of fossils; large glacial boulders protrude like boney knuckles from others. This colorful confusion of sediments, the creased and shuffled pages of an ancient manuscript, contains New England's most complete record of its past hundred million years."*

The Eastern Moraine is not nearly as folded nor faulted as its counterpart, and, therefore, presents a much more subdued character with gently rolling land averaging between 50 and 100 feet above sea level. Typical glacial sand, gravel, and boulders lie within the moraine, although surface boulders, rocks, and stones are much scarcer as compared to the Western Moraine. The paucity of clay here allows no streams and few fresh water ponds.



Gay Head Cliffs



National Landmark

As the last ice sheet began to melt and recede northward at the end of the Ice Age, deposits of sand and gravel were carried from the glacier and sorted by melted-water streams. The accumulated deposits combined to form an extensive outwash plain nearly 10 miles wide, known locally as the Great Plains, which is very flat and nearly featureless. Its most interesting geographical feature, is the system of large, branching ponds along the south shore and the "bottoms" or gentle valleys connecting the ponds with the interior. (See Figure 3). The "bottoms", a most unique land form feature, are the channels of former streams from the melting glacier. When conditions became drier and the sands soaked up the water, the streams vanished, leaving their beds in the plain. The two largest ponds, Edgartown Great Pond and Tisbury Great Pond, are actually composite ponds with their branches or coves fanning out northward.

In the coves today, the ponds lie at sea level in the wide mouths of the extinct glacial streams. As the ice vanished, sea water filled these stream mouths and turned them into little estuaries and bays. In the post-glacial period, the Atlantic Ocean built a 15-mile long barrier beach walling off the bays from the sea. Gradually, their waters freshened and they became ponds.

*Chamberlain, Barbara Blau, *These Fragile Outposts*, p. 9, American Museum National History, New York, 1964.



An Entrance to the "Bottoms"



Christiantown Indian Burial Mounds

The surfaces of the Elizabeths bear coarse glacial drift and large erratic boulders, not unlike that of the Western Moraine before the boulders there were used by the Indians for burial mounds and by the colonists for stone farm walls. The drift on the Elizabeths assumes the form of low ridges averaging 100 feet elevation. The whole morainal deposit forms a thin veneer over a thick layer of yellowish sand and blue clay, which makes up the great bulk of the deposits of the islands above sea level. Structurally, these islands take an intermediate position between the Western and Eastern Moraines.

Steep Slopes

Most of the steep slopes (20 percent and over) are associated with the glacial ridges and coastal cliffs of the Western Moraine and the Elizabeths. There is a concentration of slopes 20 percent and over along the north shore of the Vineyard stretching in a band between North Road in Chilmark and Vineyard Haven Road in West Tisbury and the Coast. (See Figure 2). Slopes of this degree of steepness are generally considered unsuitable for building development. Serious erosion problems result when vegetation is stripped off hillsides and development is attempted.

Minerals

Silica sand used for making glass, particularly on the Elizabeths, is known to exist. The only mineral used commercially has been a limited mining of clay for making pottery.

Soils

The surficial soils of the Outwash Plain and the Eastern Moraine are made up generally of sands and gravels having excellent drainage characteristics. However, the Western Moraine, in many places, contains exposed impermeable cretaceous clays, boulders, rocks, and stones, which create moderate to severe limitations for drainage (including on-lot sewerage systems), home sites, and land cultivation. (See Figure 2). Generally, the Elizabeths, particularly Cuttyhunk, contain soils similar to those of the Western Moraine.



Stones and Sands

Water

Water resources of an area generally consist of both groundwater and surface supplies. The well-drained soils and moderate or relatively flat slopes of the Eastern Moraine and the Outwash Plain create large recharge areas. In contrast the poorly drained soils and steep or relatively steep slopes of the Western Moraine and the Elizabeths allowed the overland flow of water into valleys creating the formation of small streams and ponds. As a result, while groundwater supplies (wells) are relatively both predictable as to location and depth and relatively good producers in the Eastern Moraine and the Outwash Plain, the opposite is true in the Western Moraine and in the Elizabeths. (See Figure 2). In many of the latter cases, individual wells provide insufficient water for domestic purposes, let alone for fire-fighting purposes. On the other hand the development of small surface water supplies (reservoirs) is potentially possible in the Western Moraine and the Elizabeths.



Up-Island Pond



A Typical Inland View

Coastal Flooding

Flooding, caused by tropical hurricanes and severe Northeasters, is limited to coastal areas and inland areas penetrated by marine waters.

Table 1. Hurricane Tide Levels
(in Feet above Sea Level)

Location	Normal high tide (ft)	Hurricane September 1938	Hurricane September 1944	Hurricane August 1954
Martha's Vineyard	1.0	6.9	7.3	7.6

Source: *Hurricane Survey - Massachusetts Coastal and Tidal Areas*, U. S. Army Corps of Engineers, Waltham (1964).

Areas subject to coastal or tidal flooding, in some places up to 500 feet from the shore line, extend all along the southern and eastern shores and even in some places to the northern and western shores of the Vineyard. (See Figure 2).

Shore Erosion

According to Chamberlain, all of the Vineyard and the Elizabeths could be nearly eroded away by the year 4000, and entirely gone 2,000 years later.* Waves direct their strongest attack upon capes and headlands which project into the sea, whereas their attack is at the same time greatly weakened upon the shores of bays and coves. The result

*Op. Cit., Chamberlain, p. 268.

is that the headlands are cut back rapidly while the bays are little affected. If the process continues long enough, a smooth shoreline will result.

The southern shore of the Vineyard is a classic example of this erosive process. Formerly reaching southward an extra mile or two, the entire frayed edge of the Outwash Plain has been hemmed with a long barrier beach in the ten thousand years since the retreat of the glaciers. (See Figure 2).

Personnel from the Coastal Development Section of the U. S. Army Corps of Engineers estimate that the rate of erosion increases along the southwestern shore from one to two feet of land lost in a normal year at Gay Head Cliffs to three to five feet lost at Squibnocket Point. The material of the cliffs, the exposure of each to the elements and the release of the groundwater causes these differing rates.

A U. S. Army Corps of Engineers study of the northeastern shore of the Vineyard from East Chop to Edgartown Harbor found erosion of bluffs and beaches and storm damages to shore roads and coastal property from wave attack. The Corps has initially recommended a terminal groin at the Oak Bluffs Town Beach, and the widening of the now nearly nonexistent beach by the direct placement of sand fill.* Preliminary work is currently under way.

Besides the current dredging projects for navigation carried out by the Corps in Vineyard Haven, Edgartown, Menemsha, and Cuttyhunk Harbors, the Corps is currently studying both Gay Head Cliffs and Katama Bay.



Katama Bay and Edgartown Harbor

Vegetation Habitat

Vegetation is directly related to climate, soils, topography, and the succession of plant life, which in turn establishes the habitat for both wildlife and humans. Changes in wildlife are usually directly related to changes in vegetation.

*"Beach Erosion Control Report on Cooperative Study of Martha's Vineyard, Massachusetts", U. S. Army Corps of Engineers, Waltham, Massachusetts, 1965.

One determining factor in the type and species of vegetation is the amount of exposure to wind and salt spray. Therefore, generally speaking, woodland is found in central locations, next followed by scrubland, and then heathland along the shore. (See Figure 3). A second determining factor is the history of land use and plant succession. Except for the lone fragment of New England's virgin hardwood forests, which survives on Naushon in the Elizabeths, land cultivation, sheep grazing, and forest fires have destroyed all the original cover in the County.*

The best remaining second-growth, hardwood woodland is found in the Western Moraine in Chilmark and West Tisbury. White and black oak are the dominant species with stands of swamp maple in the wetter areas; and beech, sassafras, and tupelo scattered throughout the rest of the area. The only softwood woodland of any size, consisting of red and white pine and white and Norway spruce, is located in the Martha's Vineyard State Forest. According to the resident state forester, the County does not contain enough commercially good lumber to operate a lumber mill.

Scrubland planted with cedar, pitch pine, oak or various berry bushes is a transitional stage between a field, now abandoned for cultivation, and more substantial woodland. Where the effects of the prevailing southwest wind and salt spray are most severely felt particularly along the southern shore, this type of vegetation is considered to be relatively stable.



Typical Scrubland

*In 1807 it is reported there were 15,600 sheep and 2,800 cattle on the Vineyard. Mayhew, Eleanor, *Martha's Vineyard A Short History and Guide*, Dukes County Historical Society, 1956, p. 54.

The low, heath community, typified by poverty grass (beach heath), lichen, bearberry, and other low berry bushes is located on Gay Head, especially between the high sand dunes and the more inland scrubland, on Chappaquiddick Island, especially at Wasque Point, and on areas behind the South Beach dunes. Heathland is easily susceptible to destruction by human activity, especially when it involves trampling it over and cutting it up into smaller pieces.

For dunes to develop and become stabilized from the effect of winds and sea, they must be protected from all forms of human activity. Vehicular traffic (dune buggies, etc.) and even people, if allowed to roam freely over the dunes, will destroy one of the most unique of nature's habitats.



Sand Dune

Wetlands function as giant natural sponges that protect the surrounding upland from flooding and create groundwater recharge areas. Acre for acre certain kinds of wetlands are among the most biologically productive areas on earth. Most of the tidal salt marshes are protected from storm waves by barrier beaches. Coastal wetlands are most prevalent in the tidal ponds and bays. In the brackish ponds in back of South Beach wetlands also occur, although they are not as tidal as they once were before the development of the beach. Inland wetlands occur mainly in the Western Moraine where drainage has been interrupted by glacial action. The formation of sand dunes on Gay Head has also cut off drainage and resulted in freshwater swamps and bogs inland. (See Figure 3).

Salt marshes are factories of basic animal and plant nutrient contributing organic wealth to coastal waters that support shellfish and finfish resources. Decomposing plants and minute animals that thrive there wash out of the marshes on the tide to feed these important marine resources.



Salt Marsh

Brackish marshes and ponds, such as those along the south shore of the Vineyard, support vegetation not unlike that of freshwater habitats. However, certain kinds of pond weeds do better with a certain amount of salinity in the water, and for this reason, Chilmark and Oyster Ponds, as well as Tisbury and Edgartown Great Ponds, are especially good feeding areas for waterfowl and migratory shorebirds.

Freshwater ponds support aquatic plants and are considered to be distinct and valuable wetland habitat. They, like all other wetlands, should not be filled in for development.*

On the basis of research and extensive field investigation conducted by Frank C. MacKeever of the New York Botanical Gardens,** three main areas containing rare wild flowers have been delineated in the County. All three are located on the Vineyard in the: (1) area in Gay Head from Squibnocket Beach to Gay Head village, including the sand dunes and heathland along the Atlantic, and the scrubland and wetland margins of Squibnocket Pond; (2) area in Chilmark from Bliss Pond to the Tiasquam River, including the morainal ridge and Peaked Hill, and (3) a smaller area in Chilmark just to the southeast of the intersection of North Road and Tea Lane.

Fish

Among the County's important natural resources are shellfish, particularly the bay scallop, hard clam or quahaug, soft shell clam, and American oyster.

*Massachusetts State Legislation places restrictions on the filling and dredging of wetlands, as well as on the uses to which both coastal and inland wetlands may be put; these wetland laws are discussed in a section of this chapter titled, "Existing Land Use", (P.21).

**This work was done for the Vineyard Garden Club and is now located in the Vineyard Haven Library.



- Ponds and Bays**
- Tidal
 - Brackish
 - Fresh
- Sand Dunes and Beaches**
-
- Unique Geological Features**
- Gay Head Cliffs
 -
- Vegetation**
- Representative types and species indicated
- Wildlife, Waterfowl and Shorebirds**
- Representative species illustrated
- Shellfish and Finfish**
- | | |
|----------------------|--------------------|
| 1 Oysters | 10 White Perch |
| 2 Clams | 11 Alewives |
| 3 Quahogs | 12 Eels |
| 4 Scallops | 13 Trout |
| 5 Blue-shelled Drabs | 14 Pickeral |
| 6 Lobsters | 15 Yellow Perch |
| 7 Striped Bass | 16 Swordfish |
| 8 Blue Fish | 17 Summer Flounder |
| 9 Winter Flounder | 18 Scup |
| | 19 Cod |

COMPREHENSIVE PLAN
DUKES COUNTY, MASSACHUSETTS
IMPORTANT
NATURAL RESOURCES

Marcell & Eddy, Inc.
 Engineers & Planners
 March, 1970
 Boston New York
 Palo Alto Cincinnati

Scallops, the only free-swimming species, need a salt water habitat, including a solid bottom and relatively warm water. Scallops cannot tolerate the colder waters north of Cape Cod – its northern geographic limit. Quahaugs tolerate salt water, but need mucks in the holes of otherwise solid bottoms, such as the bottom of ponds. Clams need fresh water and sandy or permeable clay bottoms, such as those of tidal flats and shore edges. The American oyster exists in nearly fresh water, and needs both a solid face of stones or old shells and more of a closed pond environment than the other three species, where the tidal currents and wave action are not so strong.

All four species of shellfish are highly intolerant of polluted water. Shellfish taken from polluted waters for human consumption constitute a serious health hazard.

The shellfish producing areas of the Vineyard and the Elizabeths fall into two categories: tidal ponds of generally high salinity, and enclosed brackish water ponds that are only occasionally open to tidal flow. Figure 3 shows the various kinds of bays and ponds in the County with the species of shellfish found in each.

Other fish found are striped bass, bluefish, winter flounder, lobsters, swordfish, summer flounder, and scup. The first two sport fish are the object of the annual Vineyard striped bass and bluefish derby, held for the last quarter century from September 15 to October 15. Swordfish were once very important commercial fish in Vineyard waters but due to overfishing, are now considered to be mainly a sport fish.

In the brackish ponds along the southern shore of the Vineyard, white perch and eels are taken; in small tidal Farm Pond and in large fresh Squibnocket Pond, white perch and alewives are important resources. The important freshwater species are trout, pickerel, and yellow perch.

Wildlife

Waterfowl, which includes ducks, geese, and swans and shorebirds nest on the Vineyard, but the Island serves mainly as a migration and wintering area. The whole southern shore between Squibnocket Pond and Katama Bay, including all the brackish and fresh ponds behind South Beach, is considered valuable waterfowl and shorebird habitat. The Cape Poge Bay area on Chappaquiddick Island from Wasque Point to Cape Poge, as well as the Sengekontacket Pond area, is also a good feeding and nesting ground, although the latter area is becoming more developed with houses built around the pond shores. (See Figure 3 for general locations of waterfowl and shorebirds.)

In general, the best habitat for waterfowl is a combination marsh-and-shallow water area that supports beds of pondweeds. Evidently an ideal salinity level for the growth of pondweeds was maintained in the ponds behind South Beach when storms breeched the barrier beach and salt water found its way into the ponds. With the recent promotion of



A Family of Ducks

shellfish production and the more regular opening of the barrier beach for increased tidal flow, there is some question among wildlife specialists as to whether the pondweeds now receive too much salt water. In any event, there is general agreement that there has been a decline in the number of migratory waterfowl in the last few decades.

In the 1930's there was serious consideration given to making the whole South Beach area of the Vineyard from Squibnocket Pond to Edgartown Great Pond into a National Wildlife Refuge under the U. S. Department of the Interior; however, lack of federal funds killed the proposal. The ecological value of this southern shore area is still as important as, or more important than, any comparable natural resource area on the Vineyard. Here is a combination of waterfowl, shellfish, shorebirds, and other forms of wildlife (otter for instance), as well as a variety of vegetation and landforms. This wild beach area maintained by the forces of nature is not a good place for development. Lands subject to tidal flooding and headlands subject to erosion make this shore area very unstable; in addition, valuable coastal wetlands are located here. Most of the migratory waterfowl and shorebirds spend the summer months in the maritime provinces of Canada and further north. This means any increased recreational use of South Beach in the summer does not have to conflict with these forms of wildlife.

Two other small but valuable conservation areas should be mentioned. Both specialize as summer breeding colonies of the snowy egret, of which there are only four such areas in New England. One is located on the Little Neck area of Cape Poge of the Vineyard, and the other is the area in Gay Head known as West Basin Beach or the Lobsterville Dunes. The latter of the two egret-nesting areas is also considered to hold one of the largest remaining black-crowned night heron colonies in Massachusetts.

The most important upland game found in the County are the Eastern cottontail, white-tailed deer, and bobwhite quail. Not as plentiful, but nevertheless important, are the following species: otter, muskrat, seal, mink, pheasant, ruffed grouse, gray squirrel, raccoon, skunk, snowshoe hare, and fallow deer. Wild turkey is found on Naushon Island in the Elizabeths, and woodcock can be found in the spring up-Island, but only as a migrant. In addition to this wide variety of upland game, population on the Vineyard; among the most common of these are the meadow vole and the Vineyard white-footed mouse. Moles, shrews, bats, and wild house cats round out the list of fauna presently found in the County. (See Figure 3 for areas of habitat for these animals.)

EXISTING LAND USE

Danger and Opportunity

The Vineyard and the Elizabeths are the only group of islands along the Eastern Coast of the United States, south of the New Hampshire-Massachusetts state line, which have over 80 square miles of undeveloped land. As a result, there exists both a danger of overdevelopment and misuse and an opportunity to protect and preserve the environment.

Pattern and Amounts

The overall settlement pattern consists of small urbanized towns and villages separated by relatively large areas of rural land containing low-density rural residences, major public and semipublic facilities and transportation, major recreation and conservation areas, and vacant land. The pattern has been termed "a series of small urbanized pockets in a rural landscape." Traditionally, it still follows the settlement pattern of the Colonial United States.

The existing generalized land use pattern of Dukes County is shown on Figure 4.

Table 2. Amount and Intensities of Existing Land Use

<i>Use</i>	<i>Acres</i>	<i>Percent of developed land</i>	<i>Percent of total land</i>
DEVELOPED	5,850		9
Residential Areas			
Town and village higher density ⁽¹⁾	1,500	26	2
Outlying medium density ⁽²⁾	1,550	27	3
Rural low density ⁽³⁾	2,000	34	3
Major Commercial	80	2	1
Major Industrial	20	1	1
Major Public and Semi-public Facilities and Transportation	700	10	1

OPEN SPACE	7,150	100	11
Major Public and Semi-public Conservation Areas	6,600		10
Major Recreation Areas	550		1
VACANT	<u>54,700</u>		<u>80</u>
TOTAL LAND AREA	<u>67,700</u>		<u>100</u>

1. Four to eight housing units per gross acre and includes minor scattered and largely individual commercial, industrial, public and semipublic facilities, transportation, recreation and open space uses.
2. Minimum of 10 housing units grouped together at a density of one-to-one and one-half units per gross acre.
3. From two to ten gross acres or more per housing unit.

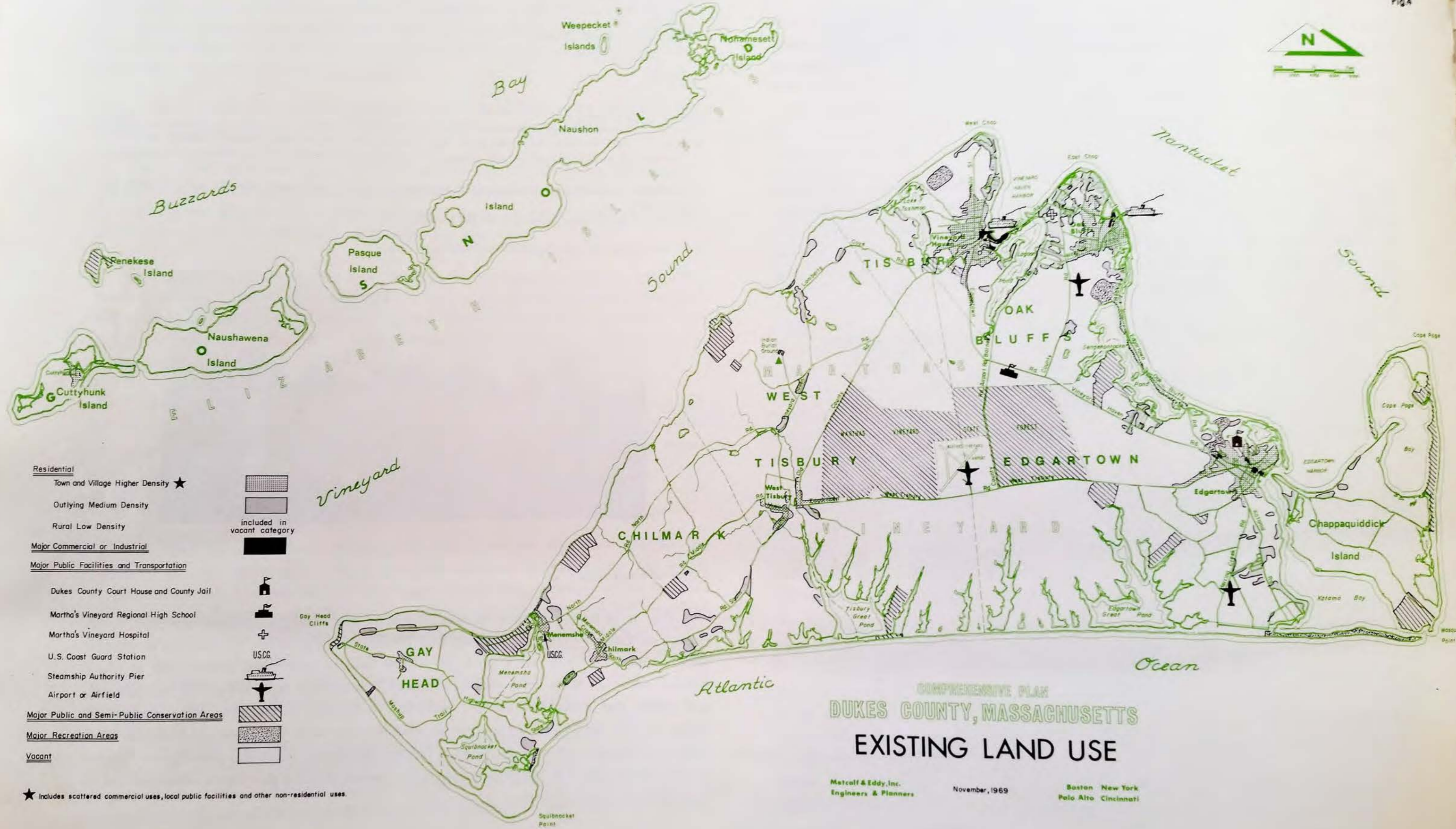
Note: See Figure 4 for generalized location of land uses.



A Rural Residence

Types and Location

The down-Island or more urbanized end of the Vineyard contains the three town centers of Tisbury (Vineyard Haven), Oak Bluffs, and Edgartown. These three developed areas contain the Vineyard's principal higher density residential areas (four to eight housing units per gross acre) and their related commercial, light industrial, recreational, and public and semipublic services necessary to support them. The major medium to higher density residential areas, (one to four housing units per gross acre) such as West Chop in Vineyard Haven; East Chop, Vineyard Highlands, Eastville, and Lagoon Heights in Oak Bluffs; and Katama in Edgartown are located in these developed areas adjacent to or outside the town centers.



- Residential**
- Town and Village Higher Density ★
- Outlying Medium Density
- Rural Low Density
- Major Commercial or Industrial**
- Major Public Facilities and Transportation**
- Dukes County Court House and County Jail
- Martha's Vineyard Regional High School
- Martha's Vineyard Hospital
- U.S. Coast Guard Station
- Steamship Authority Pier
- Airport or Airfield
- Major Public and Semi-Public Conservation Areas**
- Major Recreation Areas**
- Vacant**

★ Includes scattered commercial uses, local public facilities and other non-residential uses.

COMPREHENSIVE PLAN DUKES COUNTY, MASSACHUSETTS EXISTING LAND USE

Metcalf & Eddy, Inc.
Engineers & Planners
November, 1969
Boston New York
Palo Alto Cincinnati

The up-Island or more rural end of the Vineyard contains the small villages of West Tisbury, Chilmark, Menemsha (also in Chilmark) and Gay Head. Cuttyhunk lies in the Town of Gosnold.

The village centers are much smaller than the town centers and contain only a few commercial uses and public and semipublic facilities, in addition to clustered groups of residential buildings.



Town Center of Oak Bluffs

The town centers of Vineyard Haven, Oak Bluffs, and Edgartown contain the only commercial areas of any size, and these consist principally of service and retail uses, and are relatively small.

The only major industrial area in the county, consisting of boat-building and storage yards, oil storage, truck storage, and building supply and construction yards, is located in Vineyard Haven along Beach Road.

Major public facilities or those having island or county significance are: (1) the Martha's Vineyard Regional High School located in the rural portion of Oak Bluffs on the Edgartown-Vineyard Haven Road; (2) the Dukes County Courthouse and Dukes County Jail both in the center of Edgartown; (3) the Martha's Vineyard Hospital off Beach Road lying between Vineyard Haven and Oak Bluffs; (4) the U. S. Coast Guard Stations in Menemsha and Cuttyhunk; (5) the Woods Hole, Martha's Vineyard, and Nantucket Steamship Authority Ferry Terminals at Vineyard Haven and Oak Bluffs; (6) the Martha's Vineyard Airport, owned and maintained by the Dukes County Commissioners, and

centrally located on the Vineyard, and (7) two small private airfields in Edgartown and Oak Bluffs.



Vineyard Haven Industrial Area

Major public and semipublic conservation areas and major recreational areas (principally public beaches, golf courses, harbors, and special areas) are shown in further detail on Figure 5.

Table 3. Type and Ownership of Existing Open Space

<i>Conservation areas⁽¹⁾</i>	<i>Owner</i>	<i>Acres (approx.)</i>
State Forest	State	4,000-4,500
Penikese Island	State	85
Felix Neck Wildlife Sanctuary	Massachusetts Audubon Society (Felix Neck Wildlife Trust)	200

			<i>Public beaches</i>	<i>Owner</i>	<i>Length</i>
Wasque	Trustees of Reservations	200			
			Edgartown-Oak Bluffs State Beach	State	2 mi
Cape Poge Wildlife Refuge	Trustees of Reservations	300	Norton Point Beach	County	3 mi
Tisbury Pond Club at Long Cove	Trustees of Reservations – Tisbury Pond Club	200–300	Oak Bluffs Beach	Town of Oak Bluffs	1 mi ⁽²⁾
			Edgartown Beach	Town of Edgartown	500 ft
Menemsha Hills	Trustees of Reservations	200	West Tisbury Beach	Private area leased by Town (restricted to Town residents)	500 ft
Cedar Tree Neck	Sheriff's Meadow Foundation	300			
Chilmark Reservation	Sheriff's Meadow Foundation	65			
Sheriff's Meadow	Sheriff's Meadow Foundation	20			
Sengekontacket Pond	Rod and Gun Club	20			
Wintucket Cove, Etc.	Edgartown Water Company	175			
Lake Tashmoo, Etc.	Tisbury Water Department	60			
Mashacket Neck	Town of Edgartown	75			
Town Forest	Town of Chilmark	37	Chilmark Beach	Private area leased by Town (restricted to Town residents)	500 ft
Lobsterville Dunes & Cranberry Bogs	Town of Gay Head (Indian Common Land)	250	Menemsha Beach	Town of Chilmark	750 ft
East Chop (scattered)	East Chop Association	40	Gay Head Beach	Town of Gay Head (restricted to Town residents)	500-600 ft



Oak Bluffs Town Beach During the Off-Season

Golf courses⁽³⁾

	<i>Location</i>	<i>Size</i>	<i>Trends</i>
Island County Club (public)	Oak Bluffs	18-hole	
Edgartown Golf Club (private)	Edgartown	9-hole	
Mink Meadows Golf Course (private)	Tisbury (West Chop)	9-hole	



Golf Course

Harbors

	<i>Boating Facilities (max)</i>
Edgartown Harbor	500 boats
Vineyard Haven Harbor	250 boats ⁽⁴⁾
Oak Bluffs Harbor	200 boats
Menemsha Basin	125 boats ⁽⁵⁾
Cuttyhunk Pond	200 boats

Special Areas

	<i>Comments</i>
Gay Head Cliffs	Geological phenomenon a National Landmark, visited by estimated 100-200,000 people annually
Christiantown	Indian burial ground and chapel; visited by tourists

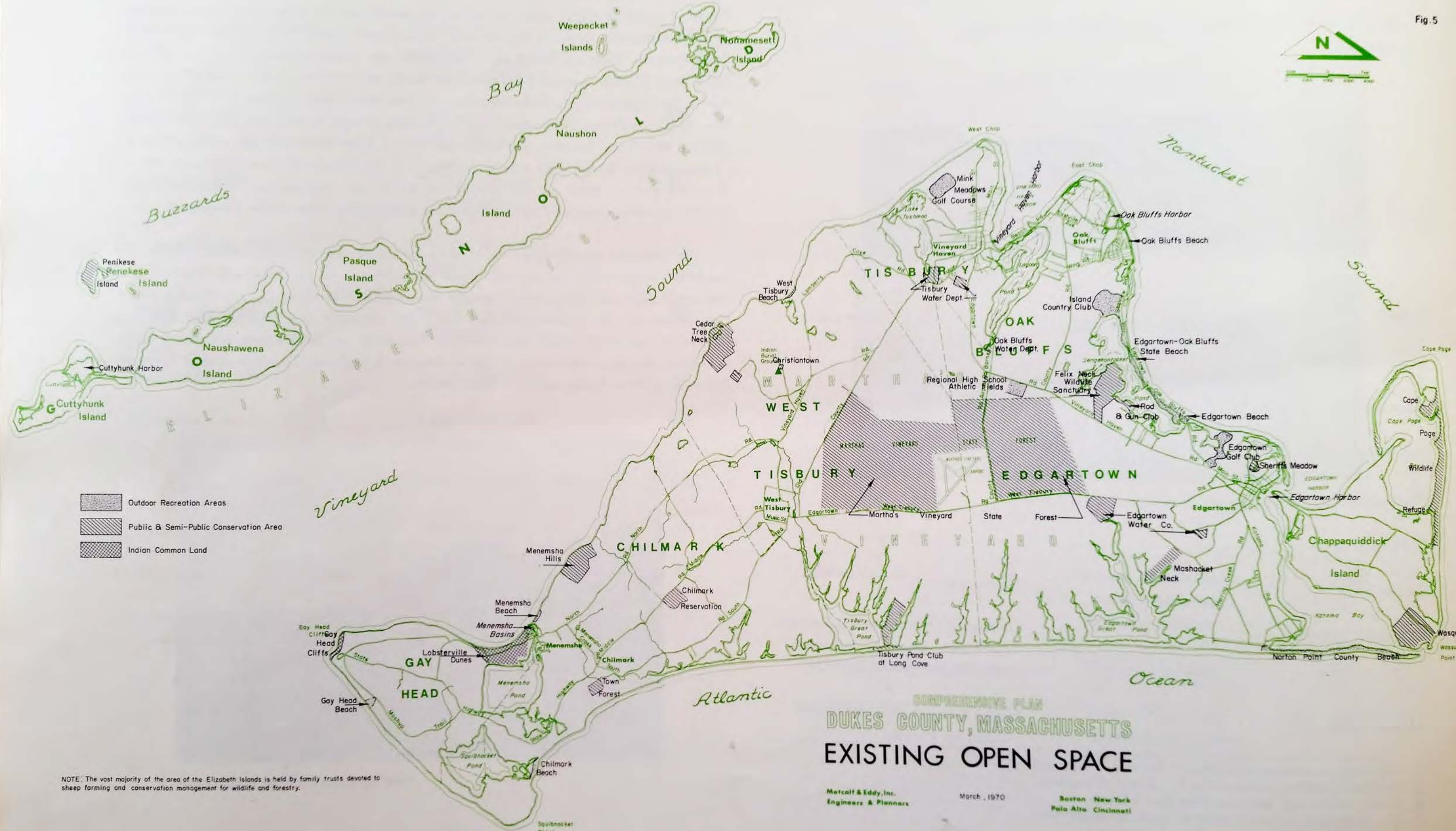
1. Only those conservation areas 20 acres and over are included.
 2. Oak Bluffs Beach to be restored by U. S. Corps of Engineers.
 3. Private yacht beach, and tennis clubs are not listed.
 4. Does not include Lagoon Pond, or nonrecreational facilities.
 5. Includes 25 to 50 fishing boats.




Over the years the principal cause of the difference between rural development up-Island and urban development down-Island on the Vineyard was undoubtedly the location of public transportation access points. However, the large size of the State Forest – 4,000 to 4,500 acres laying in the middle of the Vineyard caused a definite physical separation between the up- and down-Island towns. In the same way Lagoon Pond between Vineyard Haven and Oak Bluffs, and Sengekontacket Pond and the new Felix Neck Wildlife Sanctuary between Oak Bluffs and Edgartown, have placed a physical role in the separation and differentiation of these three town centers. Similarly, Katama Bay, which could not be crossed from Edgartown except by ferry or boat, has caused a distinct difference between the urban pattern of Edgartown and the rural pattern of Chappaquiddick Island. The relative isolation of the Elizabeths from the Vineyard by Vineyard Sound, which are not interconnected by any regularly-scheduled year-round ferry or air service, has resulted in no land use relationship between the two islands.

Nevertheless, the filling-in process or coalescing of areas of development between the respective town areas has already begun down-Island on the Vineyard. This trend is noticeable along the Edgartown-Vineyard Haven Road and along County Road between Oak Bluffs and the above-mentioned road. The relatively new regional high school is located on the former road, while the new Waterview and Sengekontacket cluster home developments are on the latter. A similar situation is beginning to occur west of Vineyard Haven along West Spring and West Main Streets.



New Apartments Near Katama Bay



-  Outdoor Recreation Areas
-  Public & Semi-Public Conservation Area
-  Indian Common Land

COMPREHENSIVE PLAN
DUKES COUNTY, MASSACHUSETTS
EXISTING OPEN SPACE

Metcalf & Eddy, Inc.
 Engineers & Planners
 March, 1970
 Boston New York
 Palo Alto Cincinnati

NOTE: The vast majority of the area of the Elizabeth Islands is held by family trusts devoted to sheep farming and conservation management for wildlife and forestry.

Environmental Controls

Of the seven towns in the county, only Edgartown, Tisbury, and Oak Bluffs have enacted any type of zoning. The existing by-law in Edgartown requires minimum lot sizes of one acre on Chappaquiddick Island and one-half acre in the rest of the town, except in and around the business district. Oak Bluffs requires no minimum lot sizes in its two residential and one commercial districts. Tisbury's by-law pertains only to West Chop where 25,000 square feet minimum lots are required for dwellings. No town has adopted land subdivision regulations and only Oak Bluffs has a building code. A recent attempt by all towns to adopt a by-law requiring permission by the owner to sleep on private property was turned down in all towns, but Edgartown, where only portions were adopted. In general, environmental controls are looked upon with suspicion by the citizens attending town meetings.

The state-administered Hatch Act, which controls filling or excavating inland wetlands or flood plains has been employed only three times in the County since its enactment in 1965. The state-administered Coastal Dredge and Fill Law of 1963 (Jones Law), which is similar to the Hatch Act, but applies to coastal wetlands has been employed about 25 times. Both of these acts are regulatory measures used on an individual project basis to protect natural resources against misuse. In contrast, the also state-administered Coastal Wetlands Act of 1965 and the Inland Wetlands Act of 1968, which are forms of natural resources zoning for delineation in advance of the areas which are to be regulated, have not been applied in the County.



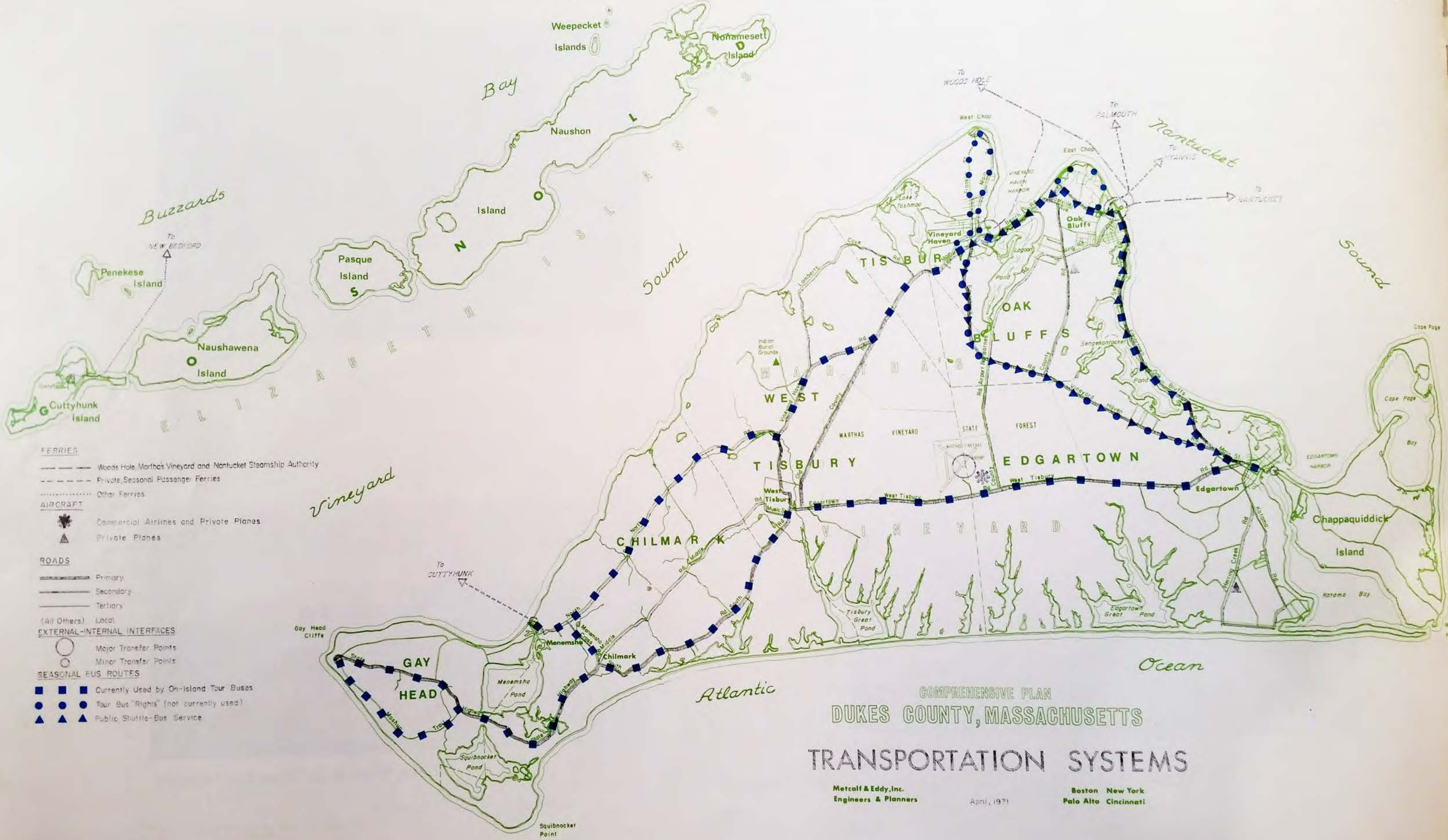
West Chop



Landscape



Two Boats of the Steamship Authority



- FERRIES**
- Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
 - Private, Seasonal Passenger Ferries
 - Other Ferries
- AIRCRAFT**
- Commercial Airlines and Private Planes
 - Private Planes
- ROADS**
- Primary
 - Secondary
 - Tertiary
 - (All Others) Local
- EXTERNAL-INTERNAL INTERFACES**
- Major Transfer Points
 - Minor Transfer Points
- SEASONAL BUS ROUTES**
- Currently Used by On-Island Tour Buses
 - Tour Bus "Rights" (not currently used)
 - Public Shuttle-Bus Service

COMPREHENSIVE PLAN
 DUKES COUNTY, MASSACHUSETTS
 TRANSPORTATION SYSTEMS

Metcalf & Eddy, Inc.
 Engineers & Planners
 Boston New York
 Palo Alto Cincinnati

April, 1971

TRANSPORTATION

Pressures and Demands

Islands are unique places in their own right, with peculiar social and economic problems associated with their insularity. Dukes County natives as other island people traditionally have been very independent on one hand, and dependent on the other. In the recent past, they could afford to be independent because of the relatively high time-space relationship to the large urban centers of New York City, Boston, and other major metropolitan areas. On the other hand, they were dependent because they had to rely generally upon these same areas for the manufactured convenience and necessities of life. The reduction in the time-space relationship of the County to these large metropolitan areas, the expansion of the eastern seaboard, better known as Megalopolis, towards the County, the national trend towards leisure life and the relative despoiling of other rural island environments along the eastern seaboard, have placed tremendous pressures and demands upon the transportation systems serving the County.

Systems and Modes

There are two types of transportation systems serving the County: external and internal. The only external modes of travel from and to the County and the Mainland are by water (public or private ferry and private boat) and by air (commercial airline, air taxi or private airplane). The internal modes are by street (automobiles, trucks, buses, bicycles, and walking).

External System and Mode-Water

The Woods Hole, Martha's Vineyard and Nantucket Steamship Authority, a public agency created by the state legislature, provides year-round ferry service between Woods Hole (located in the Town of Falmouth on Cape Cod) and Edgartown (Vineyard Haven). During the summer season, service is also provided between Woods Hole and Oak Bluffs. During the summer of 1972 (restricted by state law to summer use only), the Authority plans to also operate from Hyannis, located in the Town of Barnstable on Cape Cod.

Since the Authority provides the only year-round ferry service to the Vineyard, the Islanders must rely upon the boats of the Steamship Authority for almost all of their food and other basic necessities. However, the maintenance of year-round service creates the threat of a deficit each year; it is unprofitable to operate during the off-season.

By state law, any annual deficit must be defrayed by Dukes County, Nantucket County, and the Town of Falmouth. From 1949 to 1962 the total deficit amounted to



Oak Bluffs Steamship Authority Terminal

the above two counties and one separate town. Since 1963, the Steamship Authority has operated at a profit. The profit made each year, along with new bonds issued, are used to improve general service, floating equipment, and terminal facilities.

Both Vineyard terminals of the Steamship Authority are located down-Island at Vineyard Haven and Oak Bluffs. The former is the main terminal, being located behind the protective breakwater in Vineyard Haven Harbor. Because of the northeast orientation of the harbor, northeasters can still be a problem. The wharf at Oak Bluffs is more exposed to bad weather, being located along the northeast shorefront on Beach Road. Therefore, the Authority operates at Oak Bluffs from early June until late September. Oak Bluffs now handles about 20 percent of the yearly total number of passengers carried in and out of the Vineyard by the Steamship Authority. This operation has assisted in relieving some of the access and parking facility problems at Vineyard Haven. However, during peak periods in the summer serious traffic and parking congestion exists at both terminals. The Authority does not enjoy the power of eminent domain and therefore must rely on the cooperation of the Town of Tisbury and private property owners to both provide necessary parking and traffic control and to meet the possible future need for additional land.

The Steamship Authority currently operates three boats in and out of Martha's Vineyard. The "Islander" built in 1950 has a maximum capacity of approximately 770 passengers (240 passengers during the off-season), 55 automobiles, and up to 160 tons of freight, which if carried in large trailer trucks or smaller vehicles, supplants some of the



The Islander and the Uncatena

seasonal and off-seasonal and 20 to 25 automobiles. The "Nobska" built in 1925 has a maximum capacity of 988 passengers (192 during the off-season) and 20 to 25 automobiles. It is understood the Authority has authorized the preparation of plans for the delivery during 1972 of a new and larger boat (maximum of 1,280 passengers and 64 automobiles).

By state law only the Authority has the right to operate boats 100 tons or over between the Mainland and the Island, which, if not legally, does practically prohibit the carrying of automobiles and trucks by other than the Authority.

In addition, the following three private ferry companies provide service to the Vineyard during the four summer months and in some cases, the late part of May and early part of October:

- (1) The Island Commuter Corporation, which operates on a daily basis between Falmouth and Oak Bluffs, employing the pier facilities of the Town. The corporation is presently constructing its own pier just inside the entrance to Oak Bluffs Harbor.
- (2) The Nantucket Boat Company, which operates on a daily basis between Hyannis and the Town's pier at Oak Bluffs.
- (3) The Vacationer, which operates on a weekly basis between Onset at the head of Buzzard's Bay on Cape Cod and Oak Bluffs.



Oak Bluffs Harbor

The Nantucket Express Lines used to operate between Hyannis and the Island, but went out of business after the 1969 season.

The only regular seasonal transportation link between the Vineyard and the Elizabeths is a small private tourist boat, which during the summer runs twice a day on Wednesdays and Sundays between Menemsha and Cuttyhunk. Cuttyhunk's principal ties are to New Bedford by way of the "Alert", operated by the New Bedford Tug Boat Company. From mid-June until mid-September daily service is provided. During the remainder of the year, one roundtrip is made on Tuesdays and Fridays only. A total of only 5,400 passengers were carried from July 1, 1968 to June 30, 1969, of which 4,200 were carried during the 13-week summer season.

The other external mode of water-borne travel is by private boat. The estimated present capacity of all public harbors and docking facilities on the Vineyard is 1,250 boats. Another estimated 100 to 250 spaces, principally for small boats, are available in private harbors.

External System and Mode-Air

There are three airfields on the Vineyard, the publicly-owned Martha's Vineyard Airport on the Tisbury-Edgartown town line and two private airfields, one in Edgartown and the other in Oak Bluffs (see Figure 6). The only landing area in the Elizabeths is a U. S. Coast Guard seaplane base for use by a private air taxi service from and to New Bedford and in emergencies.



Cuttyhunk Seaplane

The Martha's Vineyard airport originally built during World War II as a U. S. Navy field, was taken over by the Dukes County Commissioners after the end of the war. Since that time commercial aircraft as well as private planes have used the field. In 1969, the Commissioners proposed a 1,300-foot extension to the existing 5,000-foot northeast-southwest paved runway. Following an intensive controversy generated by a citizen group on the Vineyard, the State of Massachusetts permitted a 500-foot extension to the southwest but turned down the 800-foot extension to the northeast. The controversy centered around possible future use of the airport by jet aircraft and the potential impact of such aircraft upon the environment of the Vineyard. Owing to the lack of state and federal funds, two other proposals, one for the installation of an instrument landing system and a federally-installed and operated tower, were not implemented.

The two privately-owned landing fields are grass strips for use by small propeller-driven aircraft.



Martha's Vineyard Airport Terminal



Edgartown Airfield

Executive Airlines, which in 1970 used de Havilland Twin Otter and Beechcraft Model 99 aircraft, both small (18-passenger) turbo-prop jet, is the only commercial trunk airlines which operates regularly-scheduled year-round into and out of the Vineyard. Daily flights connect with New York City, Boston, Nantucket, and Hyannis. In April, 1971, Executive Airlines announced approval by the Federal Civil Aeronautics Board to use larger aircraft flying into and out of the Vineyard. During the summer, only Northeast Airlines, presently (1971) operates Douglas DC-9 (115 passenger) pure jets into and out of the Island on a daily basis connecting with New York City, Boston, Nantucket, Hyannis, and New Bedford.

Beginning in May, 1971, Air New England, which took over from Air Spur of New York, began operating Douglas DC-3 (26 to 28 passenger) propeller-driven aircraft on a daily basis during the summer into and out of the Vineyard, connecting with New York City and Boston.

In addition, Mass Air, a small air taxi service based in New Bedford, provides year-round daily flights into and out of the Vineyard, from New Bedford, principally for newspaper deliveries, but also on occasion for passengers.

Table 4. Past Changes Passengers by All External Transportation Modes⁽¹⁾

	Off-Seasonal		Seasonal	
	Water	Air	Water	Air
1950	30,000	500	110,000	2,000
1960	40,000	2,000	120,000	7,500
1970	100,000	3,500	425,000	35,000

1. Passengers are approximately one-half of the number of passenger trips to and from the Vineyard.

External Modes-Passengers

Since 1950, the number of off-seasonal passengers carried by water to the Vineyard has tripled and the number of such seasonal passengers has quadrupled. Similarly, since 1950, off-seasonal passengers by air have increased tenfold and such seasonal passengers have increased twentyfold.

Of the seasonal passengers by water to the Vineyard approximately 250,000 are carried by the Steamship Authority, another 100,000 by the private ferries and the remaining 50,000-75,000 by private boats. Similarly, of the 30,000-35,000 seasonal passengers by air to the Vineyard, approximately one-half are carried by commercial airlines. Since they were instituted in 1963, the private ferries each year have increased their percentage of total passengers carried by all ferries to and from the Vineyard.

The largest increase in any category of seasonal passenger has been in the day-tripper (person who does not stay overnight on the Vineyard). In 1970, approximately one-half of all seasonal passengers to and from the Vineyard were day-trippers. Such passengers have increased by over fourfold during the last 10 years or from approximately 50,000 in 1960 to almost 210,000 in 1970. In 1970, approximately 80,000 of such passengers were carried by the Steamship Authority, another 105,000 by private ferries and the remaining 25,000 by private boats and airplanes. The number of day-trippers brought to the Vineyard by air (an estimated 7,500). Many of them land at Edgartown Airport and use the state beach.



Private Boats

External Modes-Vehicles

Table 5. Past Changes in Vehicles by All External Transportation Modes⁽¹⁾

	Off-Seasonal		Seasonal	
	Automobiles	Trucks	Automobiles	Trucks
1950	5,400	700	11,600	700
1960	7,000	1,300	14,000	1,200
1970	21,000	3,000	40,000	3,500

	Boats		Airplanes	
	Boats	Airplanes	Boats	Airplanes
1950	1,500-2,000	800-1,000	2,000-2,500	800-1,000
1960	1,500-2,000	1,000-1,100	3,000-3,500	1,500-2,000
1970	2,000-3,000	1,500-2,000	15,000-17,000	5,000-6,000

1. Vehicles are approximately one-half the number of trips to and from the Island only. In the case of airplanes and boats because of internal use there is no direct correlation between for instance landings, take-offs and dockings.

Internal System - Roads and Parking

An existing road classification system is shown on Figure 6. Similarly, to the findings of the existing land use study, there is definite contrast between the street

patterns of the three Vineyard urban down-Island towns of Vineyard Haven, Oak Bluffs, and Edgartown and the rural up-Island settlements. The down-Island towns contain a closely-spaced (200 to 500 feet apart) grid street system discontinuous in many places and made up of narrow (20 to 22 feet) roadways with in many cases four to five-foot sidewalks on each side. The up-Island settlements are connected by a widely-spaced pattern (4,000 to 6,000 feet or more apart) made up of narrow (20 to 22-foot roadways) country lanes with stone walls in most cases within five to six feet of the edge of the roadway. Such streets and roads have a traffic capacity of approximately 400 vehicles per hour in both directions and are dangerous for use by trucks and large buses or a heavy mixture of vehicles, bicycles, and pedestrians. The only principal exception to narrow roadways on the Vineyard is the recently constructed Edgartown-Vineyard Road consisting of a 24-foot roadway with two 10-foot grass shoulders.



Rent a Car or Bike, Anyone?

Off-street parking facilities on the Vineyard are limited in both number and size. Small lots (generally less than 50 spaces per lot) exist at the Steamship Authority Terminals at Vineyard Haven and Oak Bluffs, one at the Edgartown Harbor, one in the center of Edgartown, one each at supermarkets in Vineyard Haven and Edgartown, at various drive-in eating establishments and at certain county facilities on the Vineyard. Probably of the entire 93 square miles of the Vineyard there are not more than 1,000 off-street public parking spaces. In many cases in Edgartown, Oak Bluffs, and Vineyard Haven, building coverage prohibits the creation of both public and private off-street facilities. As a result, the narrow streets in the three Vineyard down-Island towns are also used for parking, which further reduces the traffic capacity of such narrow roadway to approximately 200 vehicles per hour in both directions. The existing road system of the Vineyard was never built to serve the automobile. Street widening, which would be virtually impossible in the three Vineyard down-Island towns, would similarly destroy the rural environment of the Vineyard up-Island towns.

Table 6. Past Changes in Vehicles and Vehicular Trips for Internal Automotive Modes⁽¹⁾

	Off-Seasonal		Seasonal	
	Vehicles	Average daily vehicular trips	Vehicles	Average daily vehicular trips
1950	1,500-2,000	3,000-3,500	2,000-2,500	10,000-15,000
1960	1,500-2,000	3,000-3,500	2,500-3,000	20,000-25,000
1970	2,000-2,500	4,000-5,000	9,000-10,000	75,000-100,000

1. Vehicles and vehicular trips include private automobiles, trucks, taxicabs, and buses.

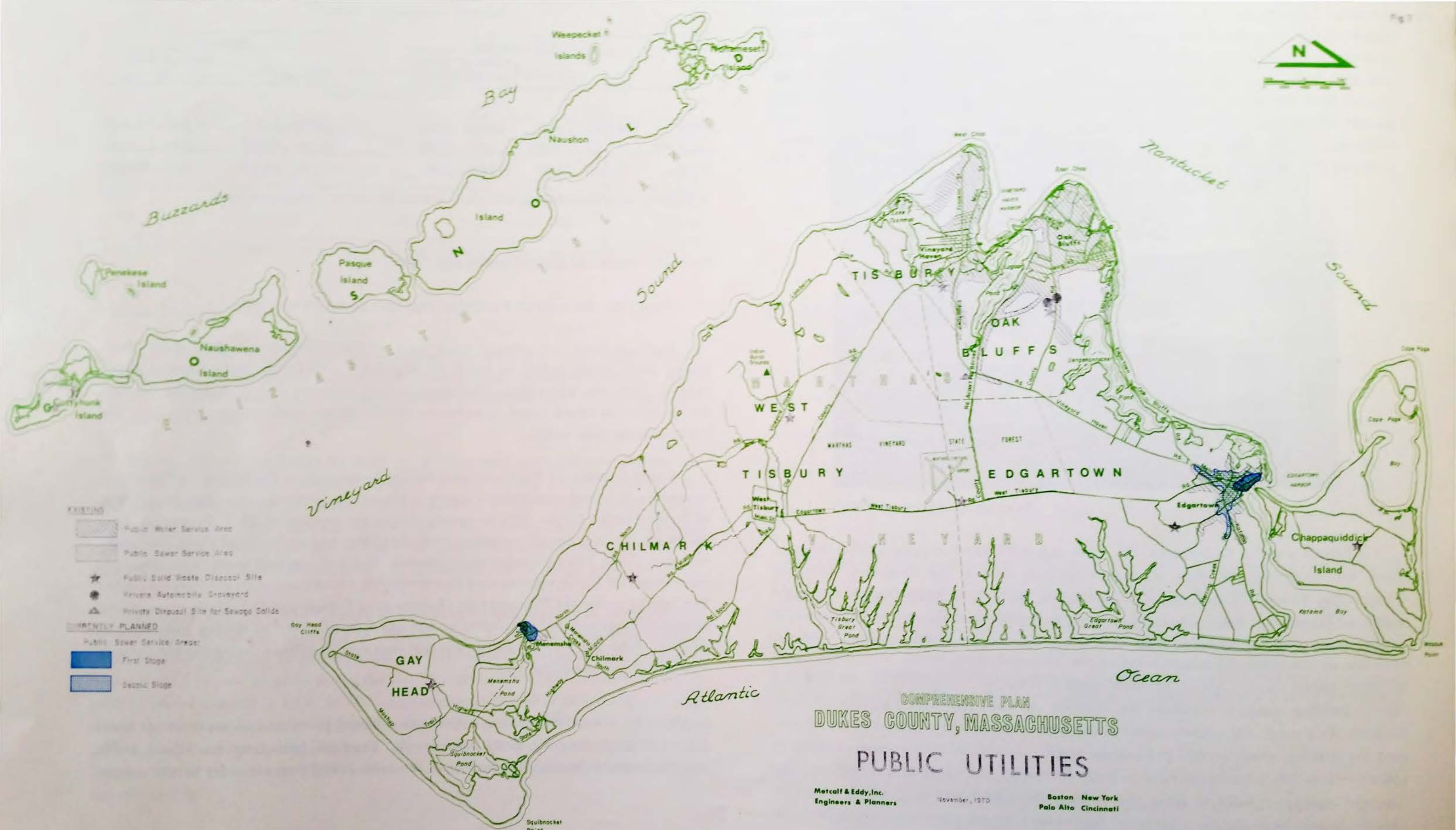
Internal Systems and Modes-Vehicles and Traffic

Since 1960, the estimated vehicular trips have increased fourfold.

Traffic volumes on primary roads have probably increased tenfold since 1960. During peak periods traffic on Beach Road and Edgartown-Oak Bluffs Road probably exceeds 1,000 vehicles per hour. The largest increase in recent years probably has been on the primary up-Island roads, particularly Middle Road, which probably carries 250 vehicles during peak hours.

Figure 6 shows the bus routes used during the summer by the three Island based bus companies. It is understood that a fourth company has petitioned the State Department of Public Utilities for the right to operate during the summer of 1971. In general, these routes are the same for all companies with the major stop at Gay Head Cliffs. The whole trip around the Vineyard takes approximately two and one-half hours, with departure times from Oak Bluffs and Vineyard Haven scheduled to dovetail with the ferry schedules. The "rights" to use the West and East Chop loops in Tisbury and Oak Bluffs, respectively, because of neighborhood complaints are not currently exercised by the bus companies. In addition, there is a seasonal shuttle bus that runs every half-hour during the day between Vineyard Haven and Edgartown.

In 1970, the all-Island Selectmen's Association agreed to try and persuade the off-Island bus to stop operating big diesel buses on the Vineyard. Such buses are definite traffic hazards requiring the use of sidewalks in the down-Island towns in order to turn corners.



- EXISTING**
- Public Water Service Area
 - Public Sewer Service Area
 - Public Solid Waste Disposal Site
 - Rivers, Automobile Graveyard
 - Rivers Disposal Site for Sewage Solids
- WHITELY PLANNED**
- Public Sewer Service Area
 - First Stage
 - Second Stage

COMPREHENSIVE PLAN
 DUKES COUNTY, MASSACHUSETTS
 PUBLIC UTILITIES

Metcalf & Eddy, Inc.
 Engineers & Planners
 November, 1970
 Boston New York
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COMMUNITY FACILITIES

Town and State Buildings

Each town has its own town offices, fire and police facilities, town equipment garage or shed, and grammar school. In addition, each town through its town government or a private trust operates a public library. Similarly, in each town, except Chilmark, there is some form of religious institution. Other types of semipublic and institutional facilities such as clubs, etc., are found throughout the County.

County-Wide or Regional Buildings

The only county-wide or Martha's Vineyard regional facilities of prominence are: the Dukes County Court House, Dukes County Jail, Martha's Vineyard Regional High School, Martha's Vineyard Hospital, Martha's Vineyard Airport, and Woods Hole, Martha's Vineyard, and Nantucket Steamship Authority Terminals at Vineyard Haven and Oak Bluffs (for the latter two, see the previous chapter titled "Transportation.") (For location of these county-wide buildings, see Figure 4).

The Dukes County Court House, located on Main Street in Edgartown, was built originally in 1858 and remodeled in the 1950's. It combines both court facilities and administrative offices of the county. While in good structural condition, it is inadequate in size for both present and future needs. The lack of parking facilities is an ever-present problem.



Dukes County Court House

The Dukes County Jail, also located on Main Street in Edgartown, is housed in a granite building erected in the 1800's. The building does not lend itself to modernization with the present dependence upon the Barnstable County Jail and Cape Cod House of Correction for long-term facilities. There is no longer any need for Dukes County Jail facilities, except for overnight lockup and persons awaiting trial.

Both the court house and jail are poorly located in respect to a central location on the Island. A long-range solution to the needs for both a county court house and jail would be the construction of a new combined facility on a large site located in the south side of the Edgartown-Vineyard Haven Road at its intersection with Airport Road or just west of the Regional High School.

The Martha's Vineyard Regional High School, built in 1958 and located on the Edgartown-Vineyard Haven Road, is operated as a four-year high school by the Martha's Vineyard Regional High School Committee. The present facility is operating near its design capacity of 450 students. Recommended improvement for greater emphasis upon vocational and technical training as well as additional space for college preparatory facilities requires an addition within the next five years. Students from the Elizabeths attend public schools in the City of New Bedford. Similarly, New Bedford hospitals also serve the residents of the Elizabeths.



Martha's Vineyard Regional High School

The Martha's Vineyard Hospital, located in Oak Bluffs at the intersection of Beach Road and containing 40 beds, was built in the 1920's. The hospital trustees have had plans prepared for a new 80-bed hospital for construction adjacent to the present building. From a long-range standpoint this is an unfortunate selection of site. Accessibility from the entire Vineyard dictates a preferable site owned by the County and located on the Edgartown-Vineyard Haven Road across from the Martha's Vineyard Regional High School. The drawbridge on Beach Road, when raised, creates a time obstacle for emergency access to the present hospital from Vineyard Haven. As required by the Demonstration Cities and Metropolitan Development Act of 1966, it is recommended that the proposed site for the new hospital adjacent to Beach Road be disapproved by the Dukes County Planning and Economic Development Commission. The location of the new hospital on the Edgartown-Vineyard Haven Road, in conjunction with the existing regional high school and the recommended new county court house, would create a county civic center.



Martha's Vineyard Hospital

Public Utilities

Three public utility systems are particularly important to the maintenance of the environment and life in the County: water, liquid wastes, and solid wastes.

Table 7. Existing Public Water Systems

<i>Town</i>	<i>Ownership</i>	<i>Source</i>	<i>Maximum safe yield mgd⁽¹⁾</i>
Edgartown	Investor	3 wells	4.30
Gosnold (Cuttyhunk)	Town	5 wells	0.14
Oak Bluffs	Town	5 wells	1.00
Tisbury (Vineyard Haven)	Town	2 wells	4.00
Chilmark (Menemsha) ⁽²⁾	Investor	2 wells	0.10

1. Million gallons per day.
2. Operates only in the summer.



Oak Bluffs Standpipe

The service areas of the existing public water systems are shown on Figure 7.

Metcalf & Eddy, Inc., was recently engaged by the County Commissioners of Duke's County to both undertake a groundwater study, including the potentiality for salt water intrusion, and to prepare a long-range water plan for the County. This study and plan are scheduled for completion by January 1972.

Based upon the above-cited study, it was found that average daily water use during the summer season is approximately two and one-half to three and one-half times average daily water use during the off-season. Water use during the peak day is approximately four to eight times use during the average off-season day. Despite a recent return to the "wet weather cycle," public water use during the last ten years has shown an approximate



Tisbury Well

20 to 25 percent increase. Only the Oak Bluffs system has exceeded an 80 percent use on peak day of its maximum safe yield. Therefore, Oak Bluffs should locate an additional source for development during the next five to ten years.

There is only one public sewer system in the county, serving a portion of Cuttyhunk (Gosnold), consisting of pipes which discharge untreated sewage into Vineyard Sound. At the present time, only Edgartown is on the official implementation schedule of the State Water Pollution Control Commission, which calls for initiating construction of a collection system and water pollution control plant by September 1972. The currently-planned first and second stages of this system are shown on Figure 7. A preliminary engineering report also has been prepared for the Menemsha portion of Chilmark. To date no formal action has been taken by the state or town in implementing this plan.



Untreated Sewage Discharge

The location of the existing public solid waste disposal facilities are shown on Figure 7. Municipal collection service is provided by the Towns of Tisbury, Oak Bluffs, and Cuttyhunk, while residents in the remaining towns either must rely upon private contractors for collection service or must themselves transport their solid wastes to their respective town disposal areas.

Table 8. Existing Public Solid Waste Disposal Facilities

Town	Type of facility	Size in acres	
		Total area	Used area
Chilmark	Open dump	29	1
Edgartown	Open dump	11	9
Chappaquiddick	Open dump	11	1
Gay Head	Open dump	6	1
Gosnold (Cuttyhunk)	Open dump	0.5	0.2
Oak Bluffs	Open dump	25	5
Tisbury	Partial sanitary landfill	50	15
West Tisbury	Open dump	10	5
Martha's Vineyard Airport	Open dump	2	0.5



Open Face Dump



Open Face Dump

It is estimated that approximately 500 tons of refuse (not including junked automobiles, brush, septic tank pumpings, and bulky wastes) are produced each week in the County during the three summer months but only 75 tons per week during the other months of the year.

Eight of the nine disposal facilities are operated presently as open face dumps, an unacceptable means of disposal, and illegal open burning occurs at all facilities. None of the disposal areas is fenced nor is the entrance gated, thereby permitting uncontrolled access to the site. Furthermore, only in the Edgartown, Oak Bluffs, and Tisbury facilities are custodians on duty on a full time basis (40 hours per week), and only in the latter facility is equipment available for daily use.

There are two basic alternative plans for the future operation of solid waste disposal facilities in the County: one, the continuation of individual municipal facilities and, the other, the creation of intermunicipal facilities. In the short range future the most economical means of disposal will be sanitary landfill (disposition and compaction of raw solid wastes, both combustible and noncombustible, in layers, and a daily covering of these wastes with a compacted layer of earth).

It is recommended that all open burning be ceased immediately at all solid waste disposal facilities and also an engineering study be undertaken immediately to determine which of the two basic plans or a combination of them is the most feasible for the County. At the same time, the most feasible means of collection, whether municipal, intermunicipal, or private, or a combination of them should be investigated.

POPULATION

Dualism

The tremendous variation between the off-season (year-round) and summer seasonal population of the county creates a dualism in community social and economic life. On one hand, the local environment, tranquility, and relaxed way of off-season life is definitely disturbed by the summer resident and visitor. On the other hand, the summer resident and visitor bring dollars to the County.

Two Distinct Groups

Population is measured at two different times: one, on April 1st and, the other, on the Fourth of July or Labor Day weekend.

Those residing in Dukes County on April 1 are reported as legal county residents by the U. S. Bureau of the Census. The number of year-round residents, except for a small number of daily, weekend, and weekly visitors to the county and those year-round residents who go to Florida and the Caribbean during the winter, is essentially the same during the fall, winter, and spring months.



Menemsha Basin

During the Fourth of July and Labor Day weekends, in addition to the year-round residents and their guests, the population consists of: (1) those who own or rent houses or other sleeping accommodations for the entire summer and summer seasonal residents, including their guests occupying the same dwelling, (2) weekly, overnight, and weekend visitors who rent accommodations for a period less than the entire summer, and (3) day trippers.

Generally, between June 15 and the day after Labor Day (the general period of public school vacation), the population approaches that of the seasonal peak population.

Year-Round

In 1970, the year-round population was 6,117, up from 5,829 in 1960 and 5,633 in 1950, respectively.

Table 9. Past Changes in Year-Round Population

<i>Town</i>	<i>1950</i>	<i>1960</i>	<i>1970</i>
Chilmark	183	238	340
Edgartown	1,508	1,474	1,481
Gay Head	88	103	118
Gosnold	56	66	83
Oak Bluffs	1,521	1,419	1,385
Tisbury	1,930	2,169	2,257
West Tisbury	<u>347</u>	<u>360</u>	<u>453</u>
Total	5,633	5,829	6,117 ⁽¹⁾

1. The 1969 Metcalf & Eddy estimate for the 1970 population was 6,250.

Between 1950 and 1970 the population of the four small rural towns and the principal urbanized town, Tisbury, increased, while the populations of the other two urbanized towns, Edgartown and Oak Bluffs decreased. This further substantiates the noted land use trend of down-Island growth on the Vineyard.

Table 10. Past Changes in Year-Round Age Groups

Age group	1950	1960	1970
Under 5 years (pre-schoolers) Percent of total population	543 9.7	505 8.7	395 6.5
5 through 14 years (elementary schoolers) Percent of total population	889 15.8	1,013 17.4	1,046 17.1
15 through 19 years (high schoolers) Percent of total population	377 6.7	394 6.8	484 7.9
20 through 34 years (younger labor force) Percent of total population	1,021 18.2	793 13.6	925 15.1
35 through 59 years (older labor force) Percent of total population	1,769 31.2	1,790 30.7	1,752 28.6
60 years and over (retired persons) Percent of total population	1,034 18.4	1,331 22.8	1,515 24.8
Totals	5,633	5,829	6,117

The most significant trends in the County's age groups are: (1) both numerical and percentage decreases since 1950 in the pre-schoolers, (2) both numerical and percentage increases since 1950 in the high schoolers, (3) similar increases since 1960 in the younger labor force, which is a reversal of the 1950-60 trend, and (4) a continuing increase both numerically and percentage-wise in the retired age group.*

Despite the comparative increase in the younger labor force, it is estimated that less than one-half of those who graduate from the Martha's Vineyard High School stay on the Vineyard through their twenty-first birthday. However, many return in later years to spend the rest of their life on the Vineyard. Those who leave for the Mainland are for the purposes of attending college, serving in the armed forces, or seeking greater job opportunities. The percentage of the total county population aged 35 years and over, which was 49.6 percent in 1950, stayed relatively the same for both 1960 and 1970, 53.5 and 53.4 percent, respectively. The significant reduction in pre-schoolers, particularly since 1960, if the trend continue, will have a long-range impact upon aging the population composition of the County.



Lure of the Landscape

*This trend is even more marked if the 1940 population is also considered.

As typical of rural areas, the County has more females than males (113 females for every 100 males). In 1960 there were 795 females aged 60 years and over, who represented 13.6 percent of the population, but by 1970 the figures for this group had risen to 917 and 15.0, respectively. As a result of the number of one-person families, such women represent the most rapidly increasing population group in the County. If this trend continues, its long-range impact upon the County, while profound, is extremely difficult to assess. To say the least, it will increase dramatically the demand for services to be performed by younger persons. This trend already appears to be taking place as demonstrated by the in-migration of younger persons unrelated to families in the County.

Seasonal

Table 11. Past Changes in Population on Peak Day

	Residents and their guests		Seasonal visitors		Total
	Year-round	Summer seasonal	Weekly, overnight, and weekends	Day trippers	
1950	5,500-6,000	8,000-10,000	1,000-1,500	500-1,000	15,000-18,500
1960	6,000-6,500	12,000-15,000	2,000-2,500	1,500-2,000	21,500-26,000
1970	7,000-7,500	19,000-21,000	6,500-7,500	6,500-7,500	39,000-43,500

The peak day is on the Fourth of July and Labor Day weekends. Over the years during the remaining summer period, the estimated population has ranged between 50 to 85 percent of peak day with the high points being on weekends during late July and early August and the low points being before the Fourth of July and after Labor Day. During the last ten years, the summer season both has been extended back to May 30 and forward to the end of September and the percentage of persons on an average day to a peak day during the summer has increased.

An estimated total of approximately 250,000 different persons either lived on or visited the County during the summer of 1970. Therefore, during the summer months in 1970's, the County population swelled to five to seven times its normal winter, fall, and spring populations. It appears that the age composition of the seasonal population is far more oriented to the younger age groups than the year-round population.



Vineyard Haven Harbor in the Early Morning During the Off-Season



Vineyard Haven Passenger Loading Area During the Off-Season

HOUSING

Attractive Force

The ecological and aesthetic variety in the natural environment of the County is matched by the cultural and historical diversity of its varied man-made settlements. The varied architecture of the Vineyard's housing has been one of its most attractive forces. Oak Bluffs, originally known as Cottage City because of the predominance of summer cottages built in the latter part of the nineteenth century, still retains a distinct Victorian flavor through its gingerbread architecture. Both the West Chop (Vineyard Haven) and East Chop (Oak Bluffs) areas display the now little found forms of untampered late nineteenth and early twentieth century forms of seasonal home architecture. Edgartown,

which was founded as a colonial whaling port, still retains an affluent flavor in terms of the architecture of its large captains' homes. Up-Island on the Vineyard many examples still exist of typical early New England farmhouses. The fishing villages of Menemsha and Cuttyhunk are reminiscent of the ancient call of the sea.



Edgartown Captain's Home

Housing Units

A housing unit includes expected year-round and seasonal homes and apartment houses not under construction or unfit for occupancy, but only separate living quarters in hotels, motels, inns, guest houses or trailers, if they are the usual place of residence of the occupant.



Oak Bluffs Cottages

Table 12. Past Changes in Housing Units

Year	Total number of units	Year-round units		Seasonal units	
		Number	Percent	Number	Percent
1950	3,987	2,068	52	1,919	48
1960	5,340	2,224	40	3,116	60
1970	6,010	2,492	41	3,518 ⁽¹⁾	59

1. U. S. Census count increased by 500 units based upon local records and discussion with 1960 and 1970 census taker.

Between 1960 and 1970, only one-half of the number of housing units were built or created, as for the 1950-59 decade. The 1960-70 trend indicates a slight emphasis upon seasonal units but not to the degree of 1950-60 trend. Many former seasonal units are now used for year-round purposes. Since the rate of increase in year-round housing units was higher than the rate of increase in population, the median number of persons per year-round occupied unit dropped from 2.4 in 1960 to 2.2 in 1970, the lowest for any county in the state. Again, as found in the population chapter, was a reverification of the trend towards both smaller family size and more one person occupied housing units.

At the same time, only about five percent of the County's housing structures consist of more than one unit, a very low percentage.

Most of the year-round units are located down-Island on the Vineyard in the three larger towns of Tisbury, Oak Bluffs, and Edgartown. In the past, this also has been true for the location of seasonal units. However, in recent years, there appears to be an emphasis in both year-round and seasonal housing units in the up-Island towns.

Other Sleeping Accommodations

In addition to housing units, there are many other sleeping accommodations on the Vineyard.

Table 13. Past Changes in Other Sleeping Accommodations in Persons on Peak Day

	1950	1960	1970
Motels, hotels, inns, etc., for tourists	2,000	3,000	4,000
Boarding and lodging houses for seasonal employees	250	500	1,000
Private boats	500	1,000	3,000
Campers, trailers, tent sites, etc.	0	25	100
Totals	2,750	4,525	8,100



An Older Hotel and New Motel

The principal increases have been in accommodations in private boats visiting the Vineyard and the Elizabeths and a continuing increase in motel, hotel, and similar accommodations. To date, there has been little emphasis upon campers, trailers, tent sites, etc.

Although no similar survey was done as part of the 1970 U. S. Census, the 1960 U. S. Census of Housing found that 11.2 percent of the County's housing units were physically deteriorating and another 2.9 percent were physically dilapidated. A 1971 exterior field survey done by Metcalf & Eddy revealed that while there exist both scattered individual and small groups of housing, principally in the northeastern portion of the Vineyard and also the fishermen shacks in Menemsha that are not keeping with the present building standards, the only large area of inadequate housing is the "Camp Meeting Grounds" area. Because of both the high potential incendiary nature of the old frame construction and the high percentage of building coverage in this area, there exists an inadequate amount of light and air and a potential fire conflagration hazard.



Camp Meeting Grounds Area

At the same time, by comparing the 1970 and 1960 censuses of plumbing facilities, it appears that a marked improvement was found in the only units surveyed-year-round.

However, the more important and principal housing problem on the Vineyard revolves around the extreme difference between average rents during the summer months (\$400 to \$600 per month) and the rest of the year (\$75 to \$100 per month). As a result, essentially the same amount of rent can be obtained from a summer rental only as from a

year-round rental. This creates a tight-housing market, which makes it difficult for both low-income families and single persons such as school teachers to rent adequate year-round housing. Similarly, in the summer, college students who work at summer resort areas, have difficulty in finding adequate but reasonably low cost living quarters. The recent increase in transients, many of whom are on public welfare has complicated the entire housing situation.

Because of the need to import from the Mainland almost all construction materials, and the relative shortage of skilled workmen, both new construction and sales housing is relatively expensive.

However, in comparison for the same period, the amount of both seasonal and year-round housing increased more in Nantucket County, where construction costs are even higher than in Dukes County.

There are no reported minority housing problems in the County. The so-called Portuguese from Cape Verde Islands have intermixed amicably with the other residents of the County.

Based on discussions with County social service and welfare agencies, there exists an estimated need for 100 to 150 units of adequate housing for low-income families and elderly persons in the County. There is also a need for some means of requiring that adequate building and housing standards be originally met and continuously maintained.

There also appears to be a market for year-round and seasonal rental and sales apartments for high income families. Condominiums appear to be a distinct possibility for meeting this need, provided the extremely high initial investment can be protected over the long range.

ECONOMY

History

An examination of the early economic history of the county reveals urbanized settlements at Edgartown, Oak Bluffs, Vineyard Haven, and Cuttyhunk dependent upon the sea (fishing and whaling) for their livelihood. Similarly, the western portions of the Vineyard and the remaining portions of the Elizabeths were dependent upon the land (agriculture, sheep-raising, and some small water-powered industry) for their economic livelihood. In the late 1800's the summer seasonal resident began to come to the Vineyard. However, it was not until after World War II and, particularly after 1950, that the Vineyard economy became tourist-oriented.

Employment and Unemployment

Table 14. Past Changes in Reported Employment and Unemployment

Year	Estimated employment		Estimated unemployment			
	February	July	February Number	February Percent	July Number	July Percent
1962	1,820	3,270	420	18.8	100	3.0
1966	1,810	3,390	280	13.4	80	2.3
1968	1,860	3,330	300	13.9	70	2.1
1969	1,930	3,760	230	10.6	60	1.6
1970	1,950	3,820	320	14.0	110	2.8

Table 15. Comparison of Total Off-Seasonal and Seasonal Employment

Category	1966	
	February	July
Agriculture	100	100
Construction	240	320
Manufacturing	40	50
Transportation, Communications and Public Utility	100	170 ⁽¹⁾
Wholesale and Retail Trade	300	930
Finance, Insurance, and Real Estate	90	110
Services	200	600
Government and Public Education	330	330
Unclassified ⁽²⁾	410	780
Totals	1,810	3,390

1. Principal increase in transportation.

2. Includes jobs not normally covered by Employment Security such as religion, self-employed individuals, fishermen, and domestics.

It is estimated that the peak summer employment in 1970 was over 4,000. Therefore, the peak summer employment is probably over twice the average winter-time employment. While there has been a slight increase in reported total winter employment, the percentage of winter-time employment also has increased during the last six years. Thus about 300 persons were collecting unemployment checks during the winter of 1969-70, these individuals being defined as those who work 13 weeks or more during the year.

Again, a paradox is found between the County's off-seasonal and seasonal economic life. The summer unemployment rate is approximately one-half the national average and the winter rate is over three times the national average.

Dukes County has been classified by the U. S. Department of Labor as "an economically depressed area" — an area with an average unemployment rate of over six percent.



Shells

Table 16. Past Changes in Off-Seasonal Industrial and Commercial Employment and Units⁽¹⁾

Industrial or commercial unit	Employees in		Reporting Units	
	1964	1969	1964	1969
Agriculture, forestry and fisheries	19	(2)	6	(2)
Construction	232	319	51	72
Manufacturing	67	62	11	7
Transportation and other public utilities	111	93	14	11
Wholesale trade	17	22	5	6
Retail trade	304	385	70	71
Finance, insurance and real estate	86	116	15	20
Services	177	223	53	47
Unclassified	(2)	(2)	1	(2)
Totals	1,014	1,241	226	239

1. Not including nonprofit employment principally government, education, religious and self-employed.
2. Withheld by U. S. Department of Commerce to avoid disclosure; usually means a substantial decline for a classified industry.

The principal increases in employment categories between the winter and the summer are in wholesale and retail trade, transportation, and services. These three combined categories increased from approximately 600 in the winter to 1,700 in the summer. Many of these summer jobs are taken by off-Islanders.

All categories have increased with the exceptions undoubtedly of agriculture and also transportation and public utilities.

In 1930, 45 percent of the County's employment was involved in agriculture, fishing, manufacturing, or construction. By 1970, such employment had fallen to an estimated 23 percent of the County's employment.

In terms of the typical year-round Islander's family income, in 1930, probably 75 percent of its annual income came from year-round activities. By 1970, such year-round activities probably provided less than 33 percent of such family's annual income.*

Tax Rates and Land Values

Table 17. Past Changes in Town Valuations and Tax Rates

Town	Equalized valuations (\$100,000)		Equalized valuation per year-round resident (\$1000)		Equalized tax rate per \$1,000 valuation	
	1961	1970	1961	1970	1961	1970
Chilmark	5.9	12.0	24.8	35.3	9.60	12.10
Edgartown	23.0	49.6	15.6	33.5	21.50	19.70
Gay Head	20.6	30.2	200.0	255.9	12.40	21.30
Gosnold	14.0	23.2	212.1	279.5	17.40	15.70
Oak Bluffs	15.5	32.0	10.9	23.1	26.50	22.50
Tisbury	18.4	32.0	8.5	14.2	24.70	33.00
West Tisbury	4.5	11.4	12.5	25.2	15.00	9.70
Total	101.9	190.4	-	-	-	-

During the past 10 years, the County's equalized valuation has almost doubled. The tax rates in four towns — Edgartown, Gosnold, Oak Bluffs, and West Tisbury have dropped. A large increase in valuation from largely seasonal building, without a significant resultant increase in year-round population or in demand for new or unproved town services, has either held down tax rate increases or reduced them.

During the same period of time vacant land values have increased approximately tenfold from \$150 to \$250 per acre in 1960 to \$1,500 to \$2,500 per acre in 1970.

*Also see a section of the chapter titled "Human Values and Income." (P. 42).



Vacant Land

HUMAN VALUES AND INCOMES

Human Ingredients

The human ingredients of the natural processes of life and motivations for their continuance in Dukes County are basically not different from any other place of habitation in the world. These ingredients consist of the interplay and balance between environmental and social values and personal or family income. To some persons the environment is the principal value regardless of its impact upon income. To others the reverse is true. However, to most there is a hope that the environment can be protected without having a detrimental impact upon income.

Environmental and Social Values

Life styles of the native Islanders, who have by heritage been dependent largely upon the sea and land (rural environment) for their livelihood instead of other people (urban environment), are quite different from those of off-Islanders. Native Islanders tend, on the whole, to be more conservative, independent, and family-oriented and more apt to take for granted their natural environment than native off-Islanders. Thus, the year-round pace of life and work is more relaxed, less competitive, and less subject to change than off-Island life.

The present trend in the County appears to be one of polarization between two year-round social groups. One group consists of the Islander, who has spent most of his life in the County, and who as a result may not have enjoyed as high an income as those who have lived on the Mainland, and who now looks upon the recent upsurge in tourism or summer visitors to the County as an economic advantage to himself. He believes this advantage may be in increased business or in increased potential sales price for his land or other property.

The other group is the Islander, who presently lives in the County, and who has economically achieved the financial independence to spend the rest of his or her life in the County.



A Scene on Tashmoo Pond

The interests of the first group tend to be shared by the off-Island tourist interests, while the interests of the second group tend to be shared by the seasonal residents. The first group also tends to maintain and control the public political process, while the second group has chosen the route of private control of land use by means of real estate trusts, foundations, etc. In both groups, of course, are those to whom protection of the environment is the almost total goal.

Those who are caught principally in the middle of the contending forces are the married children of the Islanders who wish to buy property and remain year-round in the County, low-income families who depend upon the economic upsurge during the summer to get by financially during the winter, and retired persons living on a fixed income which is becoming more marginal each year as the cost of living continues to increase. At the same time, transients, many of whom under the new Massachusetts State-takeover of welfare have been able to place themselves on the Vineyard's public welfare rolls, and have created a potentially explosive social and economic situation. As a result, such transients have made the Vineyard more dependent upon the State and Federal governments and less able, as the Islanders desire, upon themselves in determining their own destinies.



An Up-Island Country Home

Income

In the past the sea in terms of fishing and the land in terms of agriculture provided the principal income for the year-round Islanders. Retired Islanders living year-round in the County were few in number. Now, for the non-retired Islander, income is derived principally from two other sources, year-round sales and rentals of property to off-Islanders and sales services to off-Islanders during the summer months. For the retired Islander his principal, if not only, income is from pensions, annuities, social security, etc. Therefore, both groups are more and more dependent upon capital invested outside the County and, therefore, are becoming more and more dependent upon changes in the national economy and the dictates of outside economic forces.

"Sales Management Survey of Buying Power," a private marketing publication, reports that the increase between 1961 and 1969 in effective buying power per household or the money remaining after payment of all income taxes was only \$2,764 (i.e. an increase from \$5,263 to \$8,027.) The statewide increase for this period was \$3,547 from \$7,595 to \$11,142. In both 1961 and 1969 Dukes County had the lowest effective buying power per household of any County in the state. During the same period, despite tourist-oriented economic development, Barnstable County remained fifth lowest from the bottom. In contrast, the ranking of Nantucket County increased from fourth lowest to sixth lowest. Also, during both of these years, Dukes County had the highest percentage of its households classified as low income families of any county in the state.



The Center of ~~Edgartown~~
Vineyard Haven

This situation is further reflected by the \$198,668 increase in welfare payments for the Vineyard between 1968 and 1970 (\$332,412 to \$531,080). Interestingly, welfare payments for Gosnold during the same period are reported to be zero.

In 1965, the Martha's Vineyard Chamber of Commerce estimated the gross dollars generated by the County resort industry at \$35 to \$37 million. Undoubtedly, by 1969 this figure had risen to over \$50 million. It is, therefore, surprising to find that U. S. Census reported receipts for Dukes County by year-round (County-based) retail and service establishments represented only a small portion of these gross dollars and have not, it appeared, participated in the rapid increases generated by the County resort industry. Since the total annual income of all year-round County residents as reported by Sales Management equals only one-half of the estimated \$50 million reported for the County by the Chamber of Commerce, the tourists dollars are apparently being drained off by non year-round County residents, probably the off-Islander entrepreneurs and developers.



The Center of ~~Vineyard Haven~~
Edgartown

ORGANIZATION AND FINANCING

Next Target

Dukes County, particularly the Vineyard, is in the path of development. Many of the development opportunities have now been exploited on the south side of Cape Cod, and Martha's Vineyard is closer to the Mainland than Nantucket. The Elizabeths are too small and not readily accessible. The only present obstacle appears to be the softness of

the national economy and the relatively high interest rates on borrowed money. As soon as these ease, the increased pressure of the developers will be recognized in the County.

Basic Essentials

Two basic essentials to carrying out any successful program for protecting the natural assets of the County, whether publicly or privately-sponsored, are an organization with: (1) sufficient jurisdiction, powers, and competent professional staff to cope with the problem and (2) adequate financing to initiate and sustain the effort.

Town

Each town in the County is controlled by the open town meeting form of government. None of these town meetings has extra-jurisdictional powers outside the political limits of the town.



Tisbury Tercentenary

Each town has the power through its town meeting to adopt environmental controls such as a zoning by-law, building code, housing code, and sanitary code and, through the creation of a planning board, the adoption of land subdivision regulations. Only Edgartown, Oak Bluffs, and Tisbury have adopted any kind of zoning and no town has adopted any of the other types of environmental controls. Only Tisbury and Edgartown have created planning boards. Of the other environmental controls, the only adopted regulation is a building code by Oak Bluffs.

Also, while a Massachusetts town may exercise eminent domain powers for the acquisition of open space, it is a rare occasion when a New England town selects this procedure. No such actions are known of to have been taken by a town in Dukes County.

While Edgartown, Tisbury, West Tisbury, and Chilmark have set up conservation commissions, only Edgartown has drawn up an open space plan, and applied for state and federal funds to acquire conservation and open space land.

Similarly, no town has created a town industrial financing authority for purposes of acquiring land, erecting buildings, and leasing them for purposes of economic development. No town has established a public housing authority for acquiring land, erecting buildings, and renting them for housing or taken any action towards sponsoring the creation of a separate "new community or planned unit development subdivision." Also, no towns have entered into inter-municipal or regional compacts or arrangements for such activities as purchasing, constructing housing, operating water or other utility systems, etc.

Public County or Regional

There are four public organizations in Dukes County which have a broader jurisdiction than a single town. These with their general responsibilities are:

1. County Commissioners for the County of Dukes County – administer court-related offices, operate county communication center, maintain Indian Burial Ground and County beaches, control rodents in town dumps, participate in the construction and maintenance of roads, advertise and promote the County, and operate the Martha's Vineyard Airport.
2. Dukes County Planning and Economic Development Commission – prepare comprehensive plans for the physical, social, and economic development of the County, which shall be advisory only.
3. Martha's Vineyard Regional High School Committee – construct and operate a four-year high school for Martha's Vineyard.
4. Woods Hole, Martha's Vineyard, and Nantucket Steamship Authority – operate steamship lines with vessels of 100 tons and over year-round between Martha's Vineyard, Nantucket, and Falmouth.

Semipublic and Private

There are several semipublic and private organizations concerned with a particular aspect of life or nature on the Vineyard such as the All-Island Selectmen's Association, Martha's Vineyard Hospital Trustees, Martha's Vineyard Chamber of Commerce, Martha's Vineyard Community Services, Inc., Trustees of Reservations, Martha's Vineyard Conservation Society, Felix Neck Wildlife Trust, Sheriff's Meadow Foundation, Vineyard Open Land Foundation, Concerned Citizens of Martha's Vineyard, Martha's Vineyard Garden Club, etc.



Typical Open Space

Powers

In summary, none of these public, semipublic, or private organizations presently has the following powers to:

1. Adopt, administer, and enforce environmental controls such as a zoning bylaw, land subdivision regulations, building code, housing code, sanitary code, and similar environmental regulations and standards throughout the entire County.
2. Acquire conservation and open space through exercise of eminent domain powers across town lines.
3. Acquire land, erect buildings, and lease them for purposes of constructing a new community.
4. Acquire land, erect buildings, and lease them for purposes of economic development.
5. Acquire land and erect buildings and rent them for housing.

6. Control the timing and numbers of persons and vehicles entering and leaving the County.
7. Employ a means of public financing adequate to deal with the financial needs of the County in carrying out all or most of the above powers.

Main Concern

A main concern for the future of the County is the absence of a publicly created organization with both county-wide jurisdiction and adequate powers and financing to effectively deal with the problems facing the County.



A Priceless Landscape

In contrast to small islands such as Nantucket, the large land size of the Vineyard makes it virtually impossible for one or even a group of private financiers to acquire land holdings of such size that they can effectively protect the environment of the Island. As a result, to be successful they must work through the process of government. Under the normal course of events by the time strong county-wide or regional government with sufficient powers to deal effectively with the developer is created, "Martha probably will have been raped."* This was certainly the case in Long Island, Staten Island, along the New Jersey coast, and Cape Cod, where attempts to protect the environment and improve the year-round economy were found to be largely ineffectual on a town by town basis. By the time county or regional government was created with sufficient powers, jurisdiction, and financing to cope with the problem, the environment had been severely damaged.

*See article in *Progressive Architecture*, June 1966, p. 170 titled "A Rural Problem: Will Martha Get Raped?"

PART II
PRESENT IMPACTS AND ECONOMIC POTENTIALS

Observable present impacts upon the rural environment of the County are listed. Potentials for improving the year-round economy of the County are discussed.

PRESENT IMPACTS

Observable Impacts

Various deleterious impacts upon the rural environment of the County are already observable, some of which are listed below.

Natural Resources

1. The dunes and heathland in the vicinity of Gay Head are beginning to show evidence of damage caused by the presence of too many people tramping indiscriminately over them.
2. New development too close to the shoreline is subject to coastal flooding and, in some cases, on steep slopes has already caused erosion.



Erosion

3. Salt water intrusion was reportedly found recently in a well drilled near Katama Bay.

4. According to the Town Boards of Health there are reported septic tank and cesspool failures in various portions of the Vineyard.

5. A recent testing in 20 locations of waters surrounding the Vineyard found two coliform counts that exceeded the prescribed state limit (70 per 100 milliliters). One in Edgartown showed a coliform count of 1,200 and, the other, in Menemsha Basin a coliform count of 50,000. In addition, it is reported that in Cuttyhunk, raw sewage is being dumped untreated into Vineyard Sound from the County's only sewer system.

6. An unfortunate oil spill in February 1970 in the South Beach area near Tisbury Great Pond resulted in the deaths of hundreds of seabirds.

7. The increased level of noise and air pollution encountered from commercial jet aircraft using the Martha's Vineyard Airport, which began in 1970, is a deterrent to the rural environment.

8. Burning at the nine open face dumps in the County has increased the level of air pollution.

9. Increased use of automobiles, trucks and buses, particularly large diesel buses, has undoubtedly increased both the noise level and the level of air pollution in the Vineyard.

Land Use

1. New land uses, particularly commercial uses, adjacent to urbanized portions of the down-Island towns in the Vineyard are indiscriminately intermixed in small parcels with residential uses. Additional amusement establishments, night clubs, and other elements of an active night life, disturb the heretofore quiet summer nights of the three down-Island towns.



An Outlying Shopping Center

2. With the increased use of the automobile, down-Island is beginning to attract more of the summer tourist activity for the Vineyard. Menemsha, with its improved harbor and fishermen shacks, and Gay Head, with its famous cliffs, are rapidly becoming recreation and tourist-oriented areas.

3. Perhaps a subtle, but nevertheless rapid and indiscriminate breakdown is occurring in a heretofore stable and reasonably balanced land use pattern. The best evidence of the reactionary pressures to this breakdown are the "flood" of new and old fences and gates, particularly down-Island, covered with no trespassing placards and private land and roadway markings.

Roads, Parking Facilities, and Harbors

1. During the summer peaks overpopulation and congestion are the bywords. Primary roads at peak traffic periods, particularly Beach Road, Middle Road, and the Edgartown-Oak Bluffs Road on the Vineyard are jammed with cars, trucks, buses, bicycles, and pedestrians. All three down-Island towns, particularly in their business centers, at the two Steamship Authority Terminals, at the Chappaquiddick Ferry, at the State Beach, in the harbors, etc. are congested. Even the up-Island roads of the Vineyard and Cuttyhunk are crowded. Gay Head Cliffs and Menemsha Basin are overfilled.



Site for Grand Illumination Night

2. Because of too many people, last year's renowned and long-standing annual celebration of the Grand Illumination Night at the Camp Meeting Grounds in Oak Bluffs was almost a fiasco.

3. Another problem has been persons who roam the streets, ostensibly without jobs, who sleep indiscriminately on the beaches, clog the roads, walk all over private property, steal from stores, stop traffic, and generally establish themselves as undesirables.

4. In addition day-trippers, particularly because of their limited time on the Vineyard, have a tremendous impact on the environment of the Island. They clog the streets in the vicinity of Vineyard Haven, Oak Bluffs, and Edgartown Harbor; they congest the same area and outlying streets with bicycles; they create a demand for restaurants, amusement establishments, gift shops, bicycle and car rental agencies, bus terminals, and rest rooms adjacent to Vineyard Haven and Oak Bluffs Harbors; they clog the Edgartown Beaches, etc.

Congestion, of course, is a state of mind or determination of level of tolerability. Therefore, it must be a shock to many of those who now visit the Vineyard in the summer seeking the peace and quiet of a rural environment to find the same overpopulation and congestion they supposedly left behind in their urban environment. Many year-round Islanders have the same reactions to summertime overpopulation and congestion.



No Congestion Here

A resultant trend is beginning in which many heretofore year-round residents, particularly retired people, spend only the off-season on the Vineyard.

ECONOMIC POTENTIALS

Solution

A long-range solution to the County's economic problems, which also will benefit the majority of the year-round residents, is an improvement in the year-round economy of the County. This probably means a stronger emphasis on a return to the County's original economic role, dependency upon the sea and the earth for its livelihood, instead of upon "imported money" generated by the tourist industry and retirement incomes. A few such economic potentials are listed below.

Shellfish Industry Potential

The waters in and around the County are one of the best natural shellfish areas in the world. The County's annual harvest of bay scallops, quahaugs, clams, and oysters results in earnings of about \$200,000 to \$300,000, of which the bay scallop accounts for about 70 percent, and the other three species account for the remaining 30 percent.

To find ways for expanding the shellfish industry of the Vineyard, in 1966, two marine biologists did research and published their findings and recommendations.* Unfortunately, their recommended means for establishing a permanent shellfish research facility, with emphasis on artificial reproduction of all shellfish, were turned down. Their proposals were based upon the following considerations: (1) Dukes County has nearly 10,000 acres of bays and ponds ecologically suitable for shellfish culture or reproduction and (2) development of the shellfish industry would contribute substantially to off-seasonal employment (fall, winter, and spring).

The proposed shellfish hatchery would be analogous to the State Lobster Hatchery in Oak Bluffs, but the oysters produced would be planted only in the waters of the County. Matthiessen and Toner believed that such facility could be operated on a financially self-supporting basis, if the seed oysters produced were sold at cost to private individuals and to the towns. The shellfish hatchery could be operated and maintained as a public facility by the county and towns, or it could be privately owned and financed. Matthiessen and Toner estimated the annual returns from an oyster hatchery alone, would represent a 65 percent increase in the total value received from all shellfish. As shellfish production increased, there would be a commensurate increase in employment, as well as in income to buyers and distributors.

*Matthiessen and Toner, *Possible Methods of Improving the Shellfish Industry of Martha's Vineyard*, Marine Research Foundation, Edgartown, 1966.



State Lobster Hatchery

Oceanography Potential

The economic future of the oceans of the world is principally unknown. Sea farming is no longer a dream but a foreseeable reality. Undoubtedly, an increasing emphasis in the future will be placed upon oceanography by both public and private interests. If the Woods Hole Oceanographic Institute should ever decide to relocate, an attractive environment on the Vineyard could become the future site of this organization. Such an institution could bring with it related private research laboratories.

Agricultural Potential

It is doubtful if crop farming or dairying can return to prominence in the County. However, the long growing season and favorable climate could encourage the development of intensive nursery farming of shrubs, ornamental trees, vegetable plants, and flowers for sale on the Mainland.

PART III
FORECASTS AND THEIR POTENTIAL IMPACTS



Lagoon Pond

Higher Education Potential

The presence of the many professors, writers, and artists, indicates that this area is regarded favorably by those who follow academic pursuits. In the future it is expected one of the principal criteria for the location of a college or university will be the quality of natural amenities. This will be particularly true for those institutions specializing in researching and teaching about the environment, ecology and natural resources. Therefore, the greatest higher educational potential for the Vineyard should tie in with the shellfish industry and oceanography. Martha's Vineyard could become the oceanographic institute, university, and research center of the Eastern United States.

Manufacturing Potential

The Martha's Vineyard Airport area represents an opportunity for creating a light manufacturing-research oriented industrial air park. The manufacturing of research-oriented and tested special equipment and products related to oceanography and ecology which has low shipping weight and a high sales value to weight ratio, is a distinct possibility. The natural amenities of the rural environment of the Vineyard should attract scientists, researchers, engineers, etc. to the Island, but the need for skilled labor and technicians as supporting personnel could not be presently filled by year-round residents of the Vineyard. Therefore, one key to such economic development is improved vocational and technical training at Martha's Vineyard Regional High School.

Forecasts are made of off-seasonal and seasonal population, transportation aspects, housing and other sleeping accommodations, economic indicators, public utilities and land use. These forecasts are evaluated in terms of their potential impacts upon the County.

FORECASTS

Assumptions

Unless all of the following are carried out and in sufficient time, the forecasts prepared by Metcalf & Eddy and contained in the following sections could occur:

1. Present statistical trends will continue in the County, except as affected by predicted shifts in national trends and the previous experience of similar areas such as Cape Cod, the New Jersey Shore, etc.
2. Effective restrictions are placed upon accessibility and travel to and within the County by persons and vehicles, particularly through a franchise granted to the Steamship Authority.
3. Demands for increasing the number and size of facilities, the service areas of public utilities, the widening of streets and the enlargement of parking facilities are at least partially met.
4. Highly restrictive environmental controls involving zoning, land subdivision, building, housing, sanitation, air pollution, water pollution, etc., are placed upon and enforced in sufficient time to maintain the existing rural environment.
5. A public and/or private land acquisition program for creation of open space takes place in time, is of sufficient amount or is in the proper place to protect the existing rural environment of the County.
6. An economic development program takes place which will create a viable year-round shellfishing industry with related oceanography.
7. A housing program is carried out to meet the needs of the low-income and elderly families of the County.

8. A County or regional governmental organization with sufficient jurisdiction powers and competent professional staff to cope with the problem and adequate financing to initiate and sustain the required effort is created.

In the event that the following forecasts prove to be accurate, the following consequences also could occur:

Population

Table 18. Forecast of Population on Peak Day

	<i>Residents and their guests</i>		<i>Seasonal visitors</i>		
	<i>Year-round</i>	<i>Summer seasonal</i>	<i>Weekly, overnight and weekend</i>	<i>Day-trippers</i>	<i>Total</i>
1970	7,000–7,500	19,000–21,000	6,500–7,500	6,500–7,500	39,000–43,500
1980	8,000–9,000	25,000–28,000	20,000–25,000	15,000–18,000	68,000–80,000
1990	9,000–9,500	28,000–30,000	35,000–40,000	25,000–30,000	97,000–109,500



Vineyard Haven Center During a Spring Day

The population during the peak summer day in 1980 should be twice that of 1970 and in 1990 three times that of 1970. However, even more importantly, the population of the average summer day in 1980 should be three times that of 1970 and in 1990 four times that of 1970.

It is predicted that most of the increase in both year-round and seasonal resident population will take place up-Island on the Vineyard. Whereas, in 1970, on the seasonal peak day residents and their guests represented 67 percent of the total peak day population, these estimated percentages for 1980 and 1990, are only 47 and 36, respectively. The County during the summer will be “visitor or tourist-oriented.”

Between 1970 and 1980, the number of day-trippers on peak day should at least double.

Through 1980, persons 60 years and over, principally females will represent an increasing percentage of the population and then will decline in percentage through 1990.

Between 1980 and 1990, the rate of increase in the number of both year-round and seasonal residents will drop.

By 1980, almost all property owners of large tracts (100 acres or over) and the more valuable property will be out-of-county residents.

Transportation

Table 19. Forecast of Passengers by All External Transportation Modes

	<i>Off-seasonal</i>		<i>Seasonal</i>	
	<i>Water</i>	<i>Air</i>	<i>Water</i>	<i>Air</i>
1970	100,000–105,000	3,000–3,500	400,000–425,000	30,000–35,000
1980	200,000–225,000	6,000–7,000	750,000–800,000	50,000–60,000
1990	250,000–275,000	8,000–9,000	900,000–1,000,000	60,000–70,000

Table 20. Forecast of Vehicles by All External Transportation Modes

	<i>Off-seasonal</i>		<i>Seasonal</i>	
	<i>Automobiles</i>	<i>Trucks</i>	<i>Automobiles</i>	<i>Trucks</i>
1970	21,000	3,000	40,000	3,500
1980	40,000-45,000	5,000-5,500	75,000-40,000	8,000-9,500
1990	55,000-60,000	6,500-7,000	100,000-110,000	9,000-10,000
	<i>Airplanes</i>	<i>Boats</i>	<i>Airplanes</i>	<i>Boats</i>
1970	1,500-2,000	2,000-3,000	5,000-6,000	15,000-17,000
1980	1,500-2,000	3,000-4,000	8,000-9,000	22,000-25,000
1990	1,500-2,000	3,500-4,500	9,000-10,000	28,000-35,000

The number of passengers, automobiles, trucks, airplanes, and boats brought to the Vineyard during the summer season by 1980 will be twice those of 1970 and by 1990 two and one-half to three times those of 1970. During seasonal peak periods in 1980, traffic on primary roads on the Vineyard will be two and one-half to three times the 1970 traffic. During this same period, demand for parking in the congested urbanized areas of Edgartown Oak Bluffs, and Vineyard Haven probably will be two to three times the 1970 demand, and in the Menemsha Basin and at Gay Head Cliffs four to five times the 1970 demand. Similarly, the 1980 demand for boat mooring probably will be at least twice the 1970 demand. By 1980, during peak periods pedestrians on the streets of Vineyard Haven, Oak Bluffs, and Edgartown also will be twice to three times those in 1970.



A Private Dock

Housing

Table 21. Forecast of Housing Units

	<i>Total</i>	<i>Year-round</i>	<i>Seasonal</i>
1970	6,010	2,492	3,518
1980	6,700-7,400	2,800-3,000	3,900-4,400
1990	7,700-8,100	3,200-3,400	4,500-4,700

The increase in the number of all housing units built in the County between 1980 and 1990 will be nominal.



A New Up-Island House

In contrast to 1970, where less than five percent of the total housing was multiple-family, by 1980, approximately 10 percent of the total housing will consist of apartments including sales, rental, and condominium housing. Another 10 percent probably will be located in mobile homes. In the absence of public housing, the low-income family will be virtually unable to find adequate housing it can afford, other than possibly mobile homes.

A 50 percent increase in the number of motels, hotels, inns, etc. for tourists is forecast for the 1970-80 period.

By 1980, housing and other sleeping accommodations on the Vineyard will be principally tourist-oriented.

The demand and also facilities for camping accommodations such as by trailers, campers, and tent sites probably will increase tenfold between 1970 and 1980.



Campers Not Allowed

Table 22. Forecast of Other Sleeping Accommodations in Persons on Peak Day

	1970	1980	1990
Motels, hotels, inns, etc. for tourists	4,000	6,000	7,000
Boarding and lodging houses for seasonal employees	1,000	1,500	1,500
Private boats	3,000	5,000	5,500
Campers, trailers, tent sites, etc.	100	1,000	2,000
Totals	8,100	13,500	16,000

Economy

Table 23. Forecast of Economic Indicators

	1970		1980		1990	
	February	July	February	July	February	July
Employment	1,950	3,850	2,000	4,500	2,200	6,000
% Agriculture & Fishing	3.8	0.2	2.0	0.1	1.0	0.1
% Construction & Manufacturing	19.2	11.7	20.0	10.0	20.0	5.0
% Retail & all other services	77.0	88.1	78.0	89.9	79.0	94.9

It is expected that the principal economic growth sectors will be in motels and hotels, eating and drinking places, entertainment establishments, food stores, real estate, and health and medical services. *The County will become more and more tourist-oriented and dependent upon sources of capital from outside the County and, therefore, more and more influenced by the desires of large off-Island investors, and changes in the national economy. The amount of gross dollars generated by the tourist trade will continue rising, and the percentage retained by year-round residents of the County will continue dropping.*

The County will continue to have the highest percentage of low-income households of any county in the state and welfare costs will "skyrocket". *The reported median household income for the County will continue to be the lowest of any county in the state.*

Because of the increased demand and need for the construction of public improvements such as street widening, parking lots, harbors, bridges, sewers, and water mains, and improved police, fire and recreation services, the cost of which will be much greater than that derived from the increased tax base, by 1975 to 1980, the county and town tax rates will increase rapidly.

Public Utilities

The maximum peak day use of public water by the five existing piped systems should increase from approximately 4 million gallons per day in 1970 to 8 to 10 million gallons per day in 1980. By 1990, all towns except Gay Head probably will need public water systems. By 1980, public water pollution control plants probably will be needed in Edgartown, Oak Bluffs, and Tisbury. By 1990, such control plants also could be needed in Chilmark and West Tisbury.

Similarly, the present 500 and 75 tons of solid wastes produced per week during the summer and the other months, respectively, will increase by 1990 to 2,500 and 170 tons. By 1990, some means of county-wide solid waste disposal other than by sanitary landfill, probably an incinerator, will be needed.

Land Use

By 1980, the 5,850 acres of developed land (residential, commercial, industrial, and public and semi-public facilities) should increase to 7,000 acres and by 1990 to 8,500 acres. The expected principal growth areas will be adjacent to the present Vineyard down-Island urbanized centers and adjacent to up-Island improved roads. *In the absence of comprehensive, effective and enforced environmental controls urban sprawl or indiscriminate land use will be the order of the day.*

POTENTIAL IMPACTS

Evaluation of Impacts

Although the prediction of impacts upon the urban environment is an inexact art, it is far easier to define than the projection of impacts upon the rural environment. The urban environment is concerned with man and his products and improvements. The rural environment is also concerned with man in his relationship with nature including animal, bird, and fish life.

As an example, in an urban environment a water pipe can be defined in terms of cost and capacity. On the other hand in an undeveloped rural environment, it is more difficult to make finite measurements of the value of animal, bird, and fish life, heath grass, the natural habitat, the music generated by the relentless ebb and flow of the tide, the smell of clean air, and the quiet afforded by the absence of automobiles and other vehicles. It is on these latter values that the forecasts presented in the preceding discussion will have their greatest impact.

Potential Impacts

Unless the County carries out an effective and timely strategy and plan to offset them and these forecasts are not realized, the potential impacts upon the rural environment of the County of these forecasts could be:

Roads and Parking Facilities

Roads and parking facilities in the centers of Edgartown, Vineyard Haven, and Oak Bluffs by 1980 will be jammed and by 1990 will be beyond the level of tolerability. Widening of streets and development of new parking facilities will involve wholesale destruction of shade trees, boundary walls, and adjacent property. The only effective alternative measure would be a banning of all automobiles from the congested areas. The density of people at peak times will resemble those which occur in the core of a city. Crowds of this type in resort areas inevitably attract undesirables.

Even the up-Island roads will be beyond their operating traffic capacities at peak hours. Automobile and bus noise will be the rule. Bicyclists and pedestrians will take their lives into their hands attempting to ride or walk along the roadside. Signs, placards, gates, fences, and dogs will not keep out the interested or innocent intruders, photographers, sightseers, etc.



Anyone for a Bus or Car?

Gay Head Cliffs and Menemsha Basin may qualify as disaster areas.

By 1975 the Steamship Authority will have to build new piers in Vineyard Haven outside the urbanized area wherever they can buy the land. The same will be true in Oak Bluffs and even possibly in Edgartown. The cost of needed new pier facilities will be tremendous and also increase the operating costs of the Steamship Authority.



The Drawbridge in Lagoon Pond

Without enlargement harbor facilities at Edgartown, Vineyard Haven, and Oak Bluffs Harbors will be overloaded. In the absence of proper controls by 1980 oil and gasoline spills and the discharge of toilet wastes will pollute all three harbors.

The total inadequacy of public beaches will increase pressures for use of private property by the public. State Beach will look like Coney Island on Labor Day.

Land Use

By 1980 night clubs, drive-in movies, and other entertainment spots could change the four former quiet towns of Edgartown, Vineyard Haven, Oak Bluffs, and Gay Head into "swinging places." Commercial motels could dot the waterfronts completely changing the atmosphere of the three down-Island Vineyard towns. Because of downtown congestion, shopping centers owned by off-Islanders could slowly force out of business Island-owned businesses located in the center of the three towns.

The impact upon the land use of a former rural environment by too many people and cars is easily observable by examining what has occurred on Cape Cod during the past ten years. *The existing land use pattern of the Vineyard is now about where the land use*

pattern of Cape Cod was in 1960. The impact upon Cuttyhunk probably will lag about 10 years behind the similar impacts upon the Vineyard.



Can these be saved?

Natural Resources

In the absence of detailed ecological studies based on a predicted rate, location, and density of urbanized development and use of vehicles and numbers of people, it is virtually impossible to determine when physical features, natural resources, and animal, bird, and fish life will be destroyed. Based on the forecasts of population, vehicles, and land use development this destruction is predictable; it is only the timing that is uncertain. Based on past experiences throughout the United States in the transition of a rural environment into an urban environment, once physical resources, natural features, and animal, fish, and bird life are destroyed or leave, they rarely return. Also man is invariably slow in practicing preventive medicine in terms of air, water, land, noise, and thermal pollution.

The following undesirable events could occur:

1. In the absence of public sewerage systems, special boat toilets, and the elimination of oil and gas spills, increased development, more people, and more boats could increase the danger of pollution of groundwater and harbors. Eventually fish could die. Excessive withdrawal of groundwater used as a source of water supply could result in salt water intrusion.



Sailboats

2. A real opportunity for the development of the shellfish industry will be gone.
3. Intensive development of up-Island areas where the yield from groundwater sources is uncertain could require the construction of up-Island public water systems and eventually the piping of public water from down-Island systems followed by the construction of up-Island public sewerage systems.
4. The combination of low-lying morning fog and airplane and other vehicular exhaust fumes could create smog as well as increase the noise levels on the Vineyard.
5. Continued development in wrong places and too close to shorelines and in coastal flood areas, particularly along the southern and eastern shores of the Vineyard, could increase property damage and possibly cause loss of life at the time of the next hurricane.
6. Continued construction on unstable areas and steep slopes adjacent to the shorelines of the sea and ponds could increase erosion.
7. Loss of the grass lands on Katama Bay near Chilmark Pond could eliminate bird feeding areas and result in the eventual death of the birds.
8. Heathland on Gay Head especially between the high sand dunes and the more inland scrubland, on Chappaquiddick Island especially at Wasque Point, and on areas behind the South Beach Dunes could be destroyed.
9. Dune vegetation could be essentially destroyed.

10. The filling of wetlands and salt marshes could eventually eliminate feeding areas for fish and birds.



Can This Scene Be Saved?

11. Continued development of Gay Head and South Beach areas could virtually eliminate the rare plants in the areas.
12. Migratory waterfowl and shorebirds may no longer visit South Beach.
13. The egret nesting areas of the Little Neck portion of Cape Poge and West Basin Beach could be gone.
14. Fallow and white-tailed deer, bobwhite, quail, and other upland game could be gone.



South Beach

In summary, by 1990 the County, particularly the Vineyard, could have destroyed its rural environment at economic disadvantage to itself and the developers will move on to the next unspoiled area.

When the Island contracts environmental terminal cancer is unknown – it has not yet. However, the next five years are critical. If a definite and well-ordered program of preventive and prescriptive medicine is not undertaken almost immediately or within the next two years, by 1975 the Vineyard undoubtedly will have contracted environmental terminal cancer.

PART IV GOAL

The recommended overall goal for the future of the County is expressed in terms of rural environment and economic development.

RECOMMENDED GOAL

Goal

For the County, there can and should be a single overriding goal:

To protect the County's rural environment and its existing open space and developed facilities from: (1) contamination and loss by overpopulation and overuse; (2) vehicular congestion and noise and air pollution; (3) indiscriminate misuse and overuse of land and buildings; (4) loss and destruction of its animal, fish, and bird life; and (5) danger to human life by people, vehicles, water pollution, and salt water intrusion, while at the same time creating an economically and socially viable and balanced year-round society with an increased per capita income dependent for its livelihood upon the same environment and facilities it seeks to protect.

PART V STRATEGY AND FUTURE LAND USE PLAN

A future land use plan is recommended together with a strategy involving restrictions, environmental controls, organization, and financing for both carrying out the plan and fulfilling the established goal.

STRATEGY

(Note: Metcalf & Eddy, Inc. and the Dukes County Planning and Economic Development Commission were unable to mutually agree upon a recommended strategy. At the request of the Commission, no recommended strategy is included in this Summary of the Comprehensive Plan.)

FUTURE LAND USE PLAN

Key Design Elements

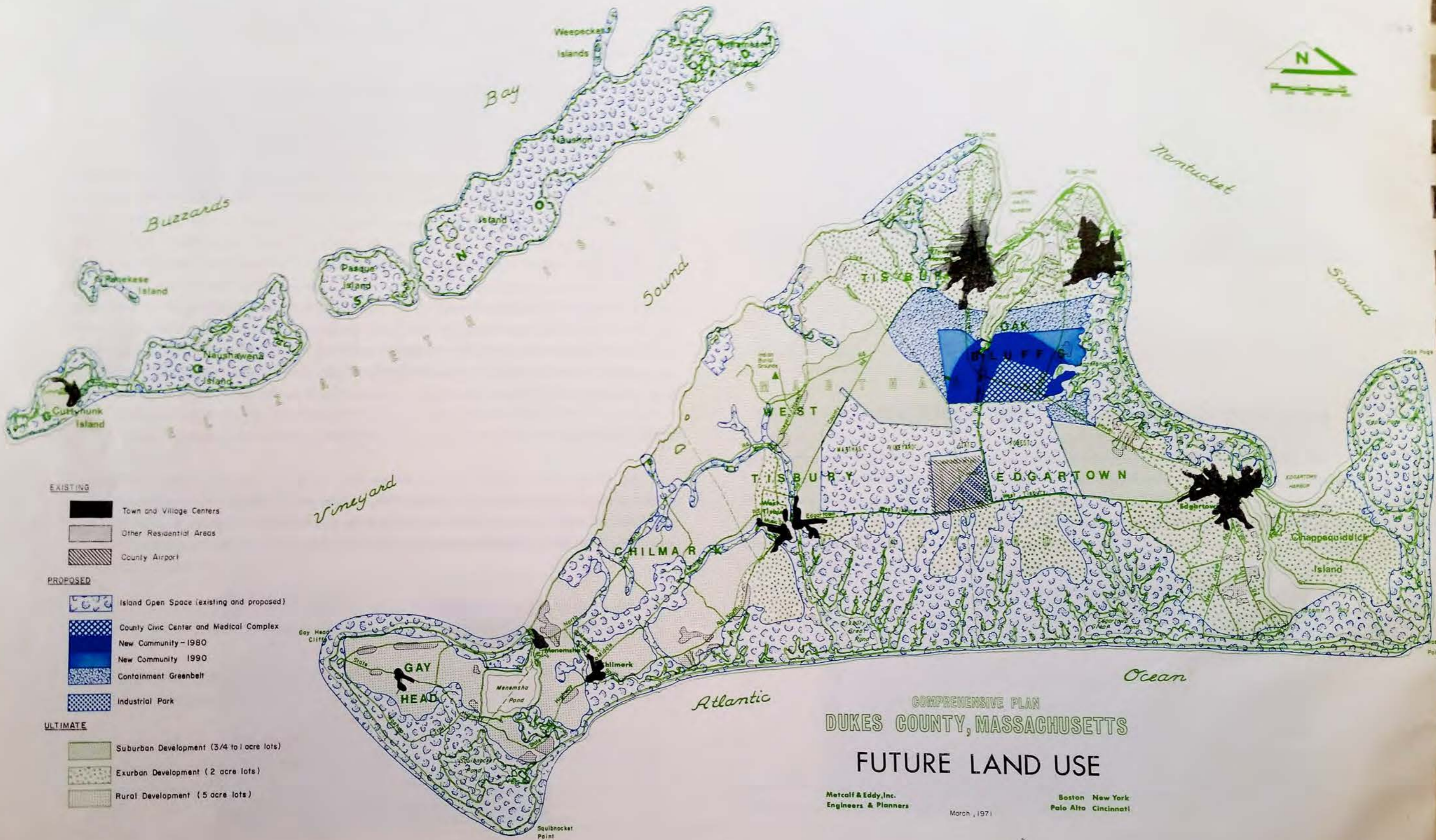
The Future Land Use Plan contains three key design elements. The first and most important is the proposed open space plan, which, if implemented, will protect the most fragile natural environments and conserve the most important natural resources of the Vineyard and the Elizabeths. The second, in terms of overall importance, but the first with respect to actual land acquisition and assembly, is the development of a new community within a containment greenbelt on the Vineyard. The third is the planning for ultimate residential densities which both respect the natural physiography and ecology, and allow for a livable and flexible man-made landscape. Separated for reasons of verbal and visual clarity, these three key elements are close related conceptually. Figure 8 is a cartographic representation of these design concepts. It should be referred to as each of these planning concepts and strategies is summarized in the next three sections.

Island Open Space

The Future Open Space Plan as shown on Figure 9 consists of both existing and proposed major conservation and outdoor recreation areas and the proposed containment greenbelt, the basic purpose of all of which is to protect and maintain a wide variety of land forms, vegetation, habitat, and wildlife on the Vineyard and the Elizabeths.



A Wildlife Habitat



- EXISTING**
-  Town and Village Centers
 -  Other Residential Areas
 -  County Airport
- PROPOSED**
-  Island Open Space (existing and proposed)
 -  County Civic Center and Medical Complex
 -  New Community - 1980
 -  New Community 1990
 -  Containment Greenbelt
 -  Industrial Park
- ULTIMATE**
-  Suburban Development (3/4 to 1 acre lots)
 -  Exurban Development (2 acre lots)
 -  Rural Development (5 acre lots)

COMPREHENSIVE PLAN
 DUKES COUNTY, MASSACHUSETTS
 FUTURE LAND USE

Metcalf & Eddy, Inc.
 Engineers & Planners

March, 1971

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The proposed open space included greenbelt system shown on Figure 9 is summarized in Table 24 with the approximate acreages listed in both the existing and proposed categories.

Table 24. Future Open Space

	<i>Approximate Acreage⁽¹⁾</i>		
	<u>Proposed</u>	<u>Existing</u>	<u>Total</u>
Shore and Pond Open Space	<u>13,900</u>	<u>2,050</u>	<u>18,450</u>
South Beach – Great Ponds ⁽²⁾	8,000	582	8,582
Gay Head – Squibnocket ⁽²⁾	4,000	285	4,285
Cape Poge – Wasque	1,000	500	1,500
Northeast Ponds	500	542	1,042
Lake Tashmoo	250	140	390
Lamberts Cove	150	1	151
Morainal Streambelts	<u>2,200</u>	<u>300</u>	<u>2,500</u>
New Town Greenbelt	<u>2,100</u>	<u>0</u>	<u>2,100</u>
Other Elements ⁽³⁾	<u>6,000</u>	<u>4,800</u>	<u>10,800</u>
Total	<u>24,200</u>	<u>7,150</u>	<u>31,350</u>

1. Excludes water bodies (ocean, bays, ponds, and streams).
2. Recommended for National Wildlife Refuge Area and National Park.
3. Includes the State Forest, Cedar Tree Neck, and "bottomlands".

New Community

Essentially, the idea of establishing a new community on the Vineyard is an old concept in modern idiom; it follows the historical New England settlement pattern within the context of contemporary growth pressures. The great desirability of the present Island landscape in which town and village centers are the major man-made elements in an otherwise richly diversified natural environment has already been discussed. Establishment of a new community of approximately the same size and density of the existing centers would be in keeping with this Island tradition. Usable open space would be preserved because development would be clustered at a higher density and in a smaller area than would be the case under current subdivision building trends.

There are three principal reasons for locating the proposed new community down-Island. First and most important is the intention to keep such large-scale development away from the more vulnerable ecology and physiography of up-Island. Secondly, it makes sense to take advantage of pressures for growth already being felt along the recently reconstructed Edgartown – Vineyard Haven Road, where the new regional high school has already been built. Thirdly, the proposed location with the Town of Oak Bluffs between Lagoon Pond and where the Barnes and County roads intersect with the above-mentioned road is strategically removed from the existing down-Island town centers. Secondary reasons for the selection of this particular site are the naturally deep basin at the head of Lagoon Pond and naturally deep channel to Vineyard Haven Harbor, thus providing ample opportunity for the development of new boating facilities and other water-oriented recreation. In addition, the State Forest acts as a natural buffer along the southern boundary of the site to prevent development from spreading.

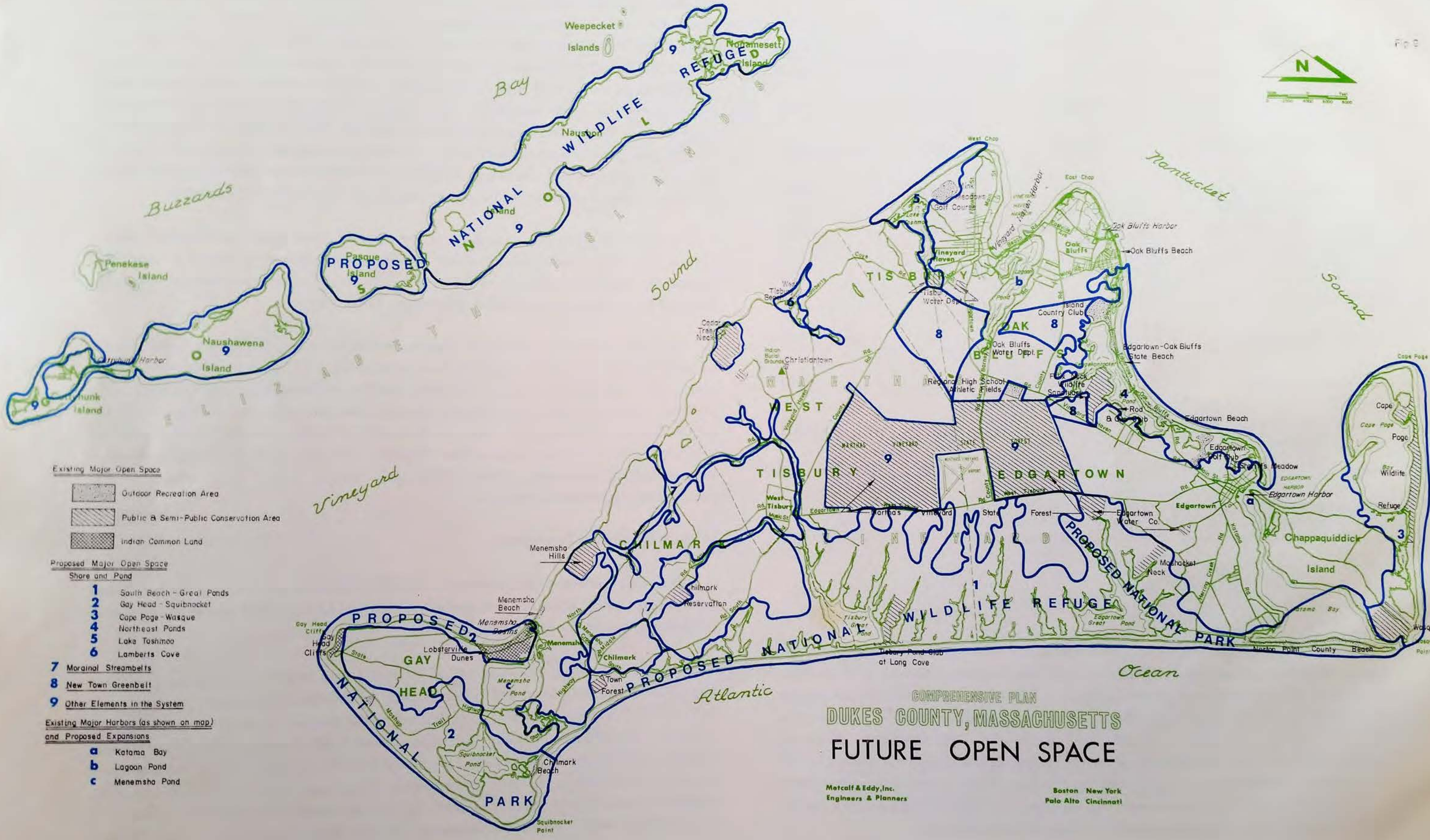
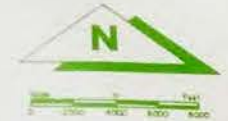
In order to protect the integrity of the existing down-Island town centers and to prevent the development of inevitable sprawl, a containment greenbelt is proposed around the northern perimeter of the new community. The new community should be designed for a maximum population of 5,000 to 7,500 persons.

General and special commercial services, including a planned shopping mall, should be developed to serve the expected new population. The recommended educational campus for some kind of higher education and the recommended new oceanographic institute, combined with environmental research labs and associated offices, would be highly desirable for location in this area. Recreational facilities should be developed for new boating activity along Lagoon Pond. Facilities for other kinds of outdoor recreation such as golfing, swimming, riding, hiking, and camping should be developed in the surrounding containment greenbelt.




Ultimate Residential Development

Ultimate residential development is classified according to average gross residential densities (including highways and streets), which can be expressed as average minimum lot sizes, such as are found in zoning bylaws.

"Town and village development" (1/8 to 1/4 acre lots or 4 to 8 housing units) is located in the existing town and village centers. "Suburban development" (3/4 to 1-acre lots or 1 to 2 housing units acre) is restricted to the interior of the Vineyard, where the possibility of salt water intrusion of the groundwater table is thought to be most remote. "Exurban development" (2-acre lots) is proposed for the remainder of the Outwash Plain not already included in the open space system; these larger lots are also proposed in the Eastern Moraine, where they can serve to restrain future development of the three down-Island towns. "Rural development" (5-acre lots) is reserved for the Western



Existing Major Open Space

-  Outdoor Recreation Area
-  Public & Semi-Public Conservation Area
-  Indian Common Land

Proposed Major Open Space

- Shore and Pond**
- 1** South Beach - Great Ponds
 - 2** Gay Head - Squibnocket
 - 3** Cape Poge - Wasque
 - 4** Northeast Ponds
 - 5** Lake Tashmoa
 - 6** Lamberts Cove
- Marginal Streambelts**
- 7** Marginal Streambelts
- New Town Greenbelt**
- 8** New Town Greenbelt
- Other Elements in the System**
- 9** Other Elements in the System

Existing Major Harbors (as shown on map) and Proposed Expansions

- a** Katama Bay
- b** Lagoon Pond
- c** Menemsha Pond

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 DUKES COUNTY, MASSACHUSETTS
 FUTURE OPEN SPACE

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Engineers & Planners

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Moraine and Cuttyhunk, where the underlying geological structure is very complex and the soils contain impermeable clays, thus making it quite difficult to site a septic tank and well on the same lot without assurance that the former will not contaminate the latter. Until an overall study of the groundwater supply and a detailed operational soils survey of the county are undertaken, these general land use proposals are considered reasonable and proper.



Rural Area



These should be Protected!

The amounts and intensities of future land use (ultimate) are shown in Table 25. These densities result in an estimated residential holding capacity or capacity on peak day of approximately 75,000 persons.

Table 25. Future Land Use

<i>Use⁽¹⁾</i>	<i>Existing 1970 acres</i>	<i>Ultimate acres</i>
	<u>5,850</u>	<u>36,350</u>
Developed		
Residential		
Town and Village ⁽²⁾	1,500	3,500 ⁽⁶⁾
Suburban ⁽³⁾	1,550	6,500 ⁽⁶⁾
Exurban ⁽⁴⁾	500	12,000 ⁽⁶⁾
Rural ⁽⁵⁾	1,500	13,000 ⁽⁶⁾
Major commercial	80	200 ⁽⁶⁾
Major industrial	20	150 ⁽⁶⁾
Major public and semi-public facilities and transportation	700	1,000
	<u>7,150</u>	<u>31,350</u>
Open Space		
Major recreational	550	1,500
Major public and semi-public conservational	6,600	29,850
Vacant	<u>54,700</u>	<u>0</u>
Total Land Area	<u>67,700</u>	<u>67,700</u>

1. Highways and streets are included within each use they serve. Water areas are excluded.
2. Average density of four to eight housing units per acre.
3. Average density of one to two housing units per acre.
4. Average density of one housing unit per two acres.
5. Average density of one housing unit per five acres.
6. Twenty-five percent included for undeveloped parcels within each category.

CHALLENGE

The following challenge is addressed to the Citizens of Dukes County.

Can you be the exception and protect the rural environment of your county from the ravages caused by unrestricted development or will your failure to act decisively and rapidly result in the indeterminate destruction of natural resources as has happened elsewhere? You and Nantucket are the last bastions of hope for warm water islands lying off the Eastern Coastline of the United States.



Seascape

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For Reference

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EDGARTOWN

Free Public Library

EXTRACT FROM THE LAWS OF MASSACHUSETTS—
Whoever willfully and maliciously or wantonly and
without cause writes upon, injures, defaces, tears or
destroys a book, plate, picture, engraving or statue,
belonging to a law, town, city or other public
library, shall be punished by a fine of not less than
five nor more than fifty dollars, or by imprisonment
in the jail, not exceeding six months,



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October 1971

Mr. Dean R. Swift, Chairman
Dukes County Planning and Economic
Development Commission
Court House
Edgartown, Massachusetts 02568

Dear Mr. Swift:

In accordance with the terms of our agreement dated October 20, 1969, we are pleased to submit this "Summary of the Comprehensive Plan for Dukes County, Massachusetts".

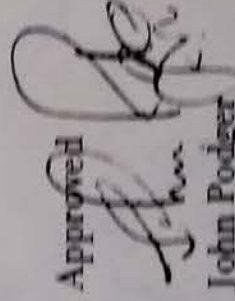
The preparation of this report represents the culmination of a 24-month's effort by the Commission, other interested persons, and Metcalf & Eddy, Inc.

The County, one of the few bastions of rural environmental splendor left along the eastern coastline of the United States, faces clear and present danger from despoilers. The following plan and program is designed to protect the environment for the enjoyment of future generations, as it has been so richly enjoyed by present and past generations.

This summary was prepared personally by the writer and, as revised, by representatives of the Commission and the Massachusetts Department of Community Affairs.

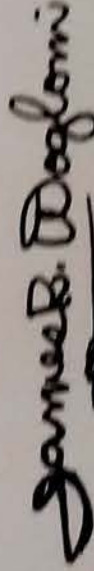
Very truly yours,

Approved



John Podger
Vice President

METCALF & EDDY, INC.



James R. Woglom, A.I.P.
Assistant Vice President