

DRE-03

**Present and Projected Land Use Analysis
of the
Earman River Canal (C-17)**

May 1968

PRESENT AND PROJECTED LAND USE ANALYSIS

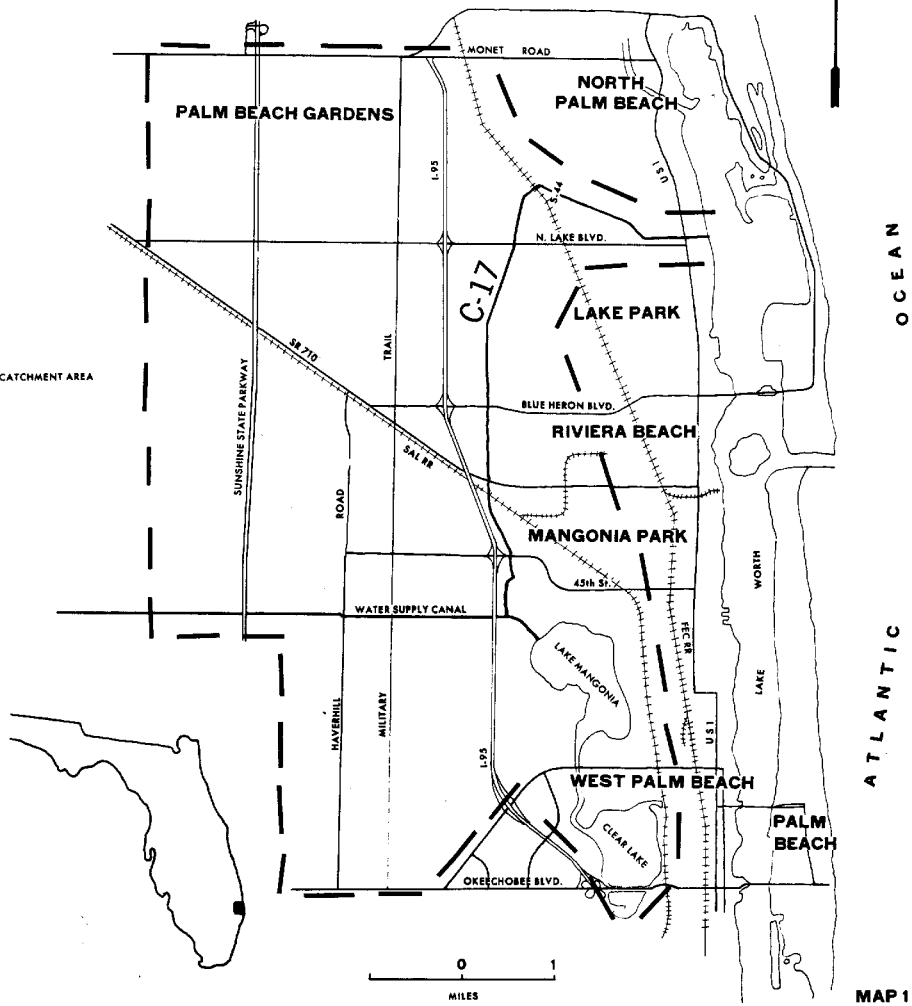
of the

EARMAN RIVER CANAL (C-17)

CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT

May 1968

C-17 DRAINAGE AREA



MAP 1

C-17 DRAINAGE AREA GENERAL TOPOGRAPHY



WATER CATCHMENT AREA

ELEVATIONS ABOVE MEAN SEA LEVEL

WATER CATCHMENT AREA BOUNDARY

0 1
MILES



OCEAN

ATLANTIC

MAP 2

C-17 DRAINAGE AREA GENERAL SOILS MAP



OCEAN

ATLANTIC

MAP 3

SOIL ASSOCIATIONS

- 1 ST. LUCIE
- 23 POMFANO-DELRAY-FELDA
- 18a BRADENTON-WABASSO-FELDA
- 13b MYAKKA-POMPANO
- 21 BROWARD-KERI-FELDA

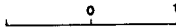
WATER TABLE THAT NORMALLY IS WITHIN 15 INCHES
OF SURFACE AND FREQUENTLY RISES ABOVE THE SURFACE



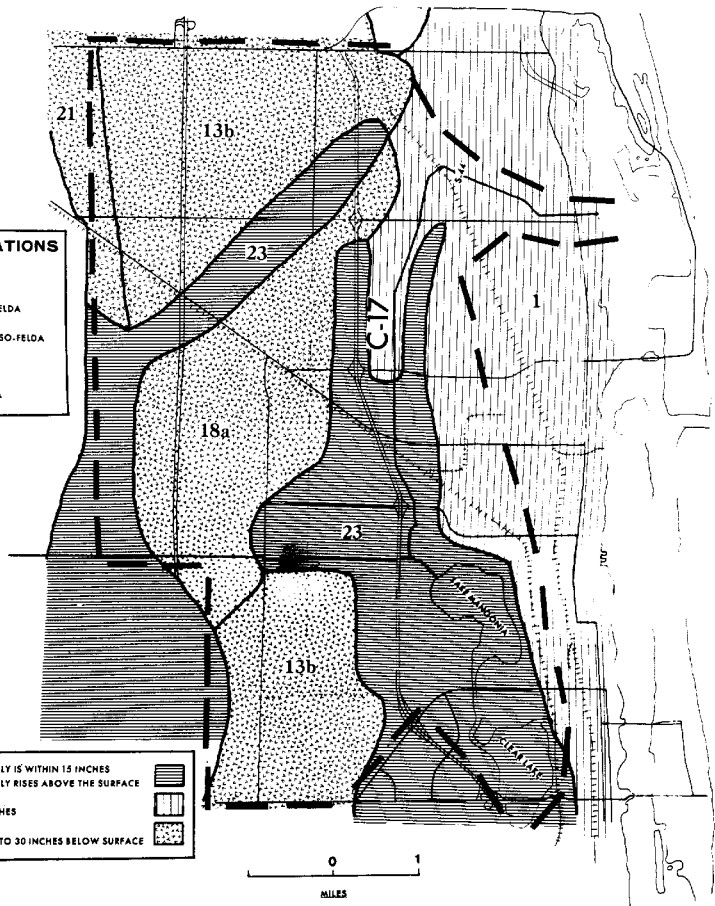
WATER TABLE BELOW 60 INCHES



WATER TABLE FLUCTUATES 0 TO 30 INCHES BELOW SURFACE



MILES



LOCATION

The area served directly by C-17 consists of about 41 square miles of flat, poorly drained lands, lying immediately west of the coastal ridge and north and west of the City of West Palm Beach. (See Map 1)

PURPOSE

The purpose of this report is to determine the amount and type of development which is occurring at present and that which is logical to expect in the C-17 drainage area within the next 50 years.

TOPOGRAPHY

Elevations in the drainage area are between 10 and 20 feet above mean sea level. The major portion of the area lies between 15 and 18 feet. The general topographic features can be seen on Map 2.

PRESENT PROJECT CONTROL FACILITIES

C-17 is nearly 7 miles long and includes a spillway and dam in North Palm Beach (Structure 44). The original design and construction of the present project facilities in the study area were considered adequate for a predominately agricultural use. There is one sub-drainage district in the C-17 drainage area. The North Palm Beach County Water Control District serves the unincorporated lands in the drainage basin.

SOILS

The soils of the study area are predominately poorly drained, sandy soils with loamy subsoils. Most of the soil mantle is sandy flatlands overlying the deposits of the Pleistocene marine terraces which include deposits of sand, marl, silt and shell.

The following are the five general soil associations found in the study area according to the U. S. Department of Agriculture, Soil Conservation Service:

1	St. Lucie Association
23	Pompano - Delray - Felda Association
13 b	Myakka - Pompano Association
18 a	Bradenton - Wabasso - Felda Association
21	Broward - Keri - Felda Association

Map 3, the General Soils Map of the drainage area, indicates the location of each soil type. With the exception of the St. Lucie Association, which is a sloping soil because of its location along the coastal ridge, the area is dominated by nearly level soils.

Map 3 also indicates the areas of water table fluctuations in the different soil associations.

Perhaps the most restrictive aspect of the soils in the drainage area concerns their suitability for on-site sewage disposal. Virtually all the soil associations are classified as having moderate to severe limitations for septic tank use.

POPULATION

The overall growth of Palm Beach County, and specifically the C-17 drainage area, is reflected in population growth. As Palm Beach County's economy has expanded, it has attracted people from other areas to supplement its population through natural increase.

The population of an area represents both a cause and an effect of economic development. Its levels reflect the basic support of the economy in terms of jobs, but population also represents a consumer market that produces other jobs and a potential source of labor for new enterprises. All signs point toward a continuation of the local trends of increased population, higher wages and incomes, and higher skills.

Population growth trends and projections for Palm Beach County, and the C-17 drainage area are summarized in Table 1.

TABLE 1 - POPULATION GROWTH TRENDS AND PROJECTIONS

<u>Year</u>	(East Coast) <u>Palm Beach County</u>	<u>Study Area</u>
1950	114,688	4,000
1955	152,229	5,200
1960	228,106	10,000
1965	280,000	54,000
1975	510,000	85,000
1985	608,000	120,500
1995	1,000,000	140,000
2005	1,400,000	165,000
2020	1,600,000	190,000

The further we get into the future, the more likely it is that we will experience some deviations from the projected patterns. Population growth trends and projections for Florida, Palm Beach County and the C-17 drainage area are shown on Graph 1.

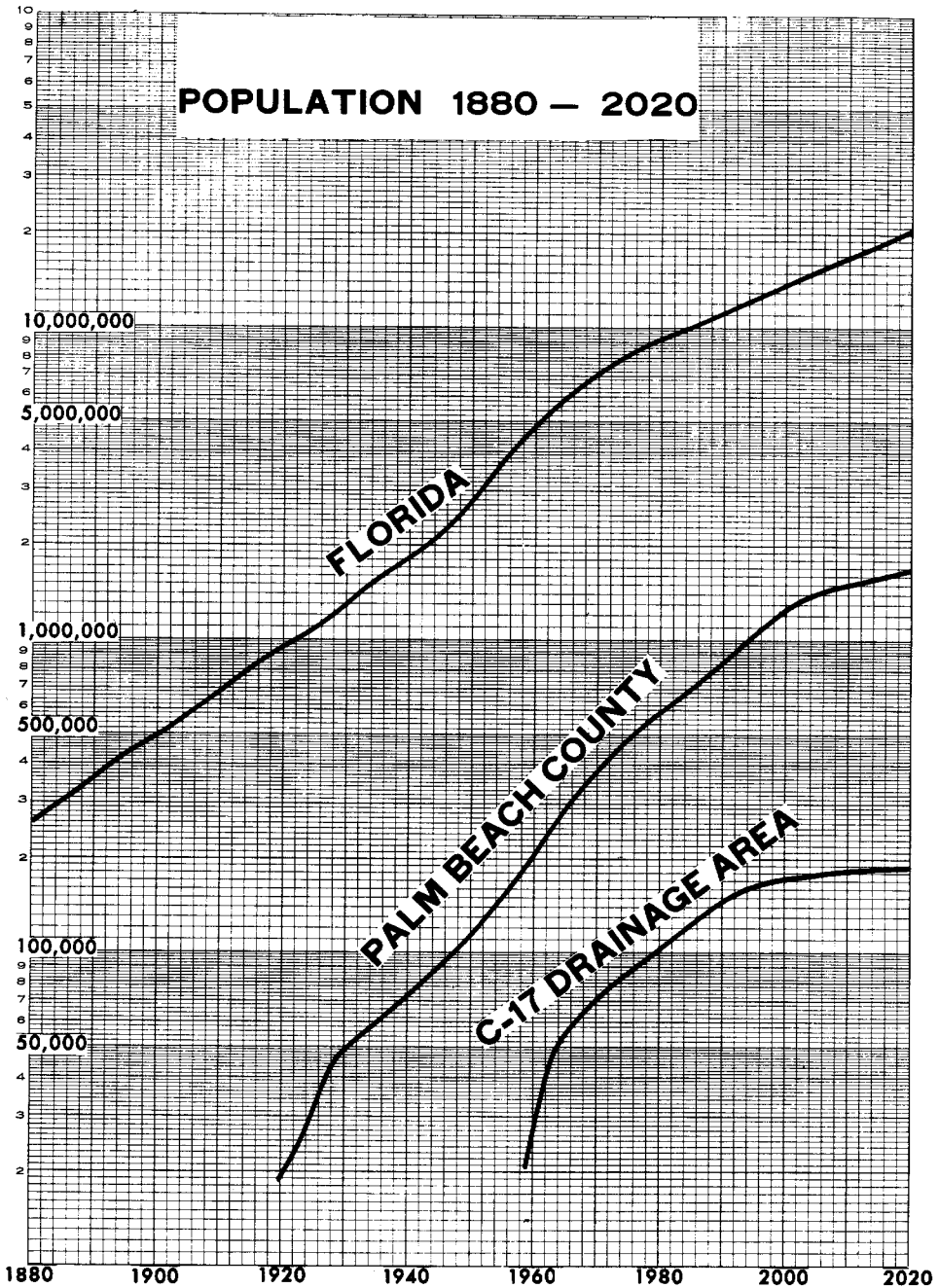
PRESENT LAND USE

The present land use was determined from aerial photographs plus field and aerial surveys.

The following categories and their definitions are used on the three land use maps presented in this study.

1. Urban -- Any residential, commercial, or industrial agglomeration of 40 acres or more in extent and having at least one building or 1,000 square feet of floor space per acre.
2. Semi-urban -- A transitional category developed to distinguish land use with urban characteristics but without the intensity of development to warrant inclusion in the urban category. Included

POPULATION 1880 — 2020



are airports, parks, cemeteries, golf courses and residential, commercial, or industrial locations of 160 acres or more with a density of at least one building or 1,000 square feet of floor space for each five acres.

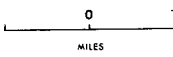
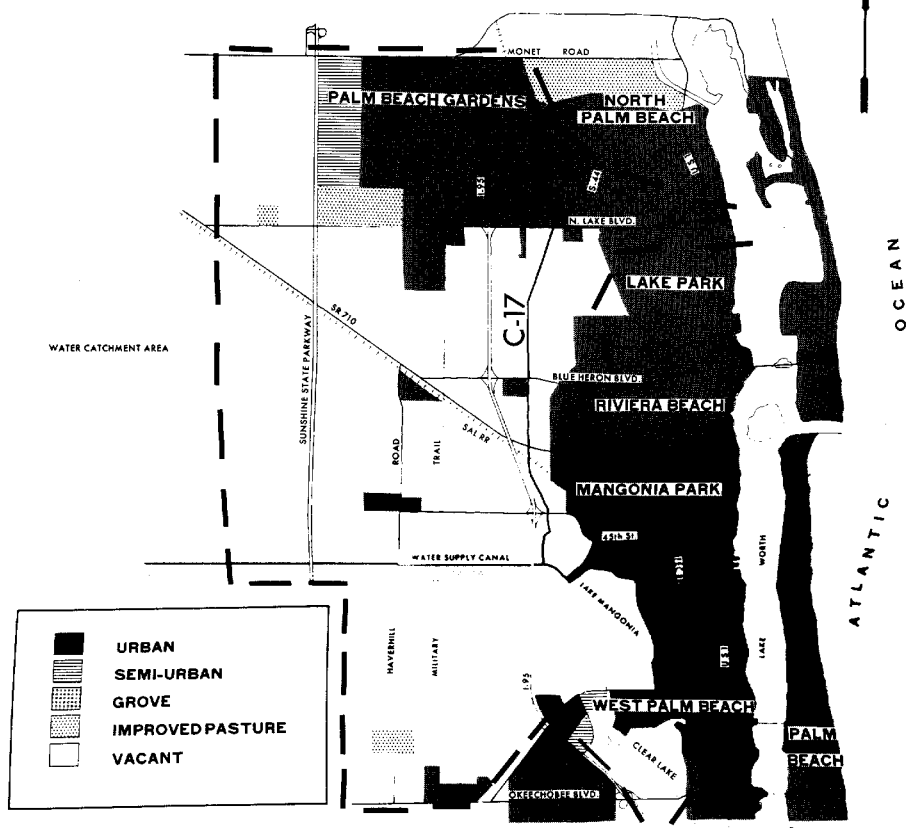
3. Grove -- Includes all perennial tree fruit crops such as citrus, mangos and avocados.
4. Improved pasture -- All pasture land which has been planted to improved grasses, and cleared, drained, fertilized regularly or irrigated.
5. Vacant -- Includes all land not in the previous categories whether it be used as native range, forest land or completely unused.

The present land use of the drainage area is shown on Map 4. The following observations were made after study of this map and comparing it to land use maps of the area completed in April, 1955, for the original studies of the C-17 drainage area. A study of aerial photographs taken in December, 1954, supplemented the comparison of the maps.

It is apparent that an almost complete reversal of land use has occurred in the study area. In 1955, about 16% of the total area was occupied or being utilized by man with about 14% of this total for agricultural endeavours, principally pasture land, and the remaining 2% for urban purposes.

Today, the total amount of land being utilized has more than doubled since 1955. From 16% to approximately 40% in 1967. Only 2% is now devoted to agriculture and is still primarily improved pasture. An estimated 38% is now utilized for urban and semi-urban living. This includes water bodies within the area such as man made lakes and secondary drainage canals.

C-17 DRAINAGE AREA PRESENT LAND USE



MAP 4

The remaining 60% has been placed in the category of vacant land for the purpose of this report.

The distribution of the existing land uses in the C-17 drainage area is illustrated in Table 2.

TABLE 2 - ESTIMATED LAND UTILIZATION
C-17 DRAINAGE AREA, 1967

<u>Land Use Classification</u>	<u>Acres</u>	<u>% Total Land</u>	<u>% Occupied Land</u>
Residential	4,000	15	38
Commercial	500	2	4
Industrial	296	1	3
Non-Residential*	1,200	5	12
Transportation	2,300	9	22
Water	1,650	6	16
Agriculture	550	2	5
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Total Occupied Area	10,496	40	100
Vacant	<u>15,744</u>	<u>60</u>	---
Total Area	26,240	100	---

*Recreation areas, institutions such as schools, nursing homes, hospitals, golf courses.

As the table indicates, the largest single use of urbanized lands is for residential purposes. Transportation is the second largest consumer of occupied acreage in the drainage area. Interstate 95 and the Sunshine State Parkway alone are estimated to occupy nearly 50% of the transportation acreage.

AGRICULTURE

The most important agricultural enterprise in the study area is a

dairy located on Military Trail and south of the water supply canal. The herd consists of about 200 cows with an estimated value of \$150,000 to \$200,000. There is an estimated 100 acres of widely scattered cropland within the study area. The total value of agricultural products in the drainage area was estimated to be about \$250,000 in 1967.

DISCUSSION

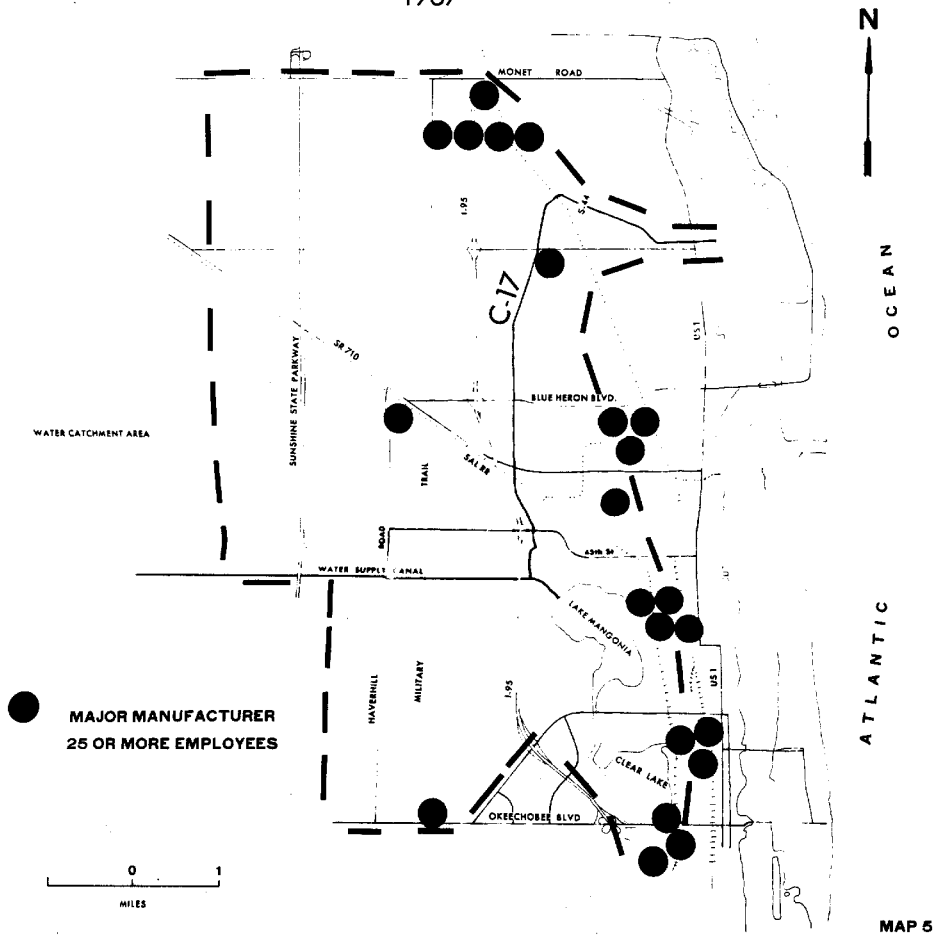
Referring to the present land use map, it must be noted that in some areas indicated as vacant land, major developments are already underway. Century Village, a 50 million dollar development, is located at Okeechobee Boulevard and Haverhill Road. Its areal extent is about 800 acres and present plans call for over 3,000 manufactured homes. The second area, where major developments are expected to begin sometime in 1968, is the land immediately west of Clear Lake. This 131 acre site is part of the Perini Corporation Development of the Westward Expansion area of the City of West Palm Beach. The project will have rental apartments, condominium, recreation areas, and a small shopping plaza. The estimated cost of this project is 2.5 million dollars.

Immediately north of this area is the new Civic Auditorium and West Palm Beach Stadium. Other major developments within this area are the Palm Beach Mall shopping center and the Palm Beach Lakes housing development and golf course.

It is interesting to note that the 1955 land use projections of this area west of Lakes Mangonia and Clear, indicated that these lands might never be used for agricultural or urban purposes.

The present degree of urbanization in the drainage area has occurred rapidly but in an orderly fashion when compared to other areas. The communities of Mangonia Park, Riviera Beach, and Lake Park have expanded

LOCATION OF MAJOR MANUFACTURERS 1967



westward into the drainage area as anticipated. The main, unexpected thrust of urbanization westward has occurred in the extreme northern area in the community of Palm Beach Gardens.

The Perini Development of Palm Beach Lakes, the community of Palm Beach Gardens and more recently, the Century Village development are indicative of the complete and irreversible change occurring in the C-17 drainage area at present.

A key factor in the urbanization of the drainage area is clearly the changing nature of the local economy. The industrial growth of Palm Beach County, and specifically the C-17 drainage area, where at least 20 major manufacturers have located, has enhanced the areas reputation as one of the most dynamic business and industrial centers in the southeastern sector of the United States. Map 5 indicates the present location of the major manufactureres in the drainage area.

In the last 20 years, the lower east coast of Florida, particularly Dade and Broward Counties, has moved through a period of what might be termed economic revolution. A broad spectrum of new industrial activities has appeared and urban areas have grown at an unprecedented pace.

Within the past 10 years, this spectrum of new industrial activity has appeared and grown rapidly in Palm Beach County. The county is in the fortunate position of being able to build solidly upon the old while capitalizing upon the new.

The economy of eastern Palm Beach County now rests chiefly upon three solid foundations: (1) a strong, traditional industry, tourism; (2) a growing group of new-line industries and; (3) expanding service facilities.

Trends in manufacturing employment are perhaps the most important point about recent economic trends in Palm Beach County. It indicates

the introduction of new industries into the local economy, industries which indeed were not previously represented on a substantial scale in the county a decade ago.

Table 3 indicates the growing civilian labor force, their general distribution in non-agricultural enterprises and more specifically, those engaged in manufacturing.

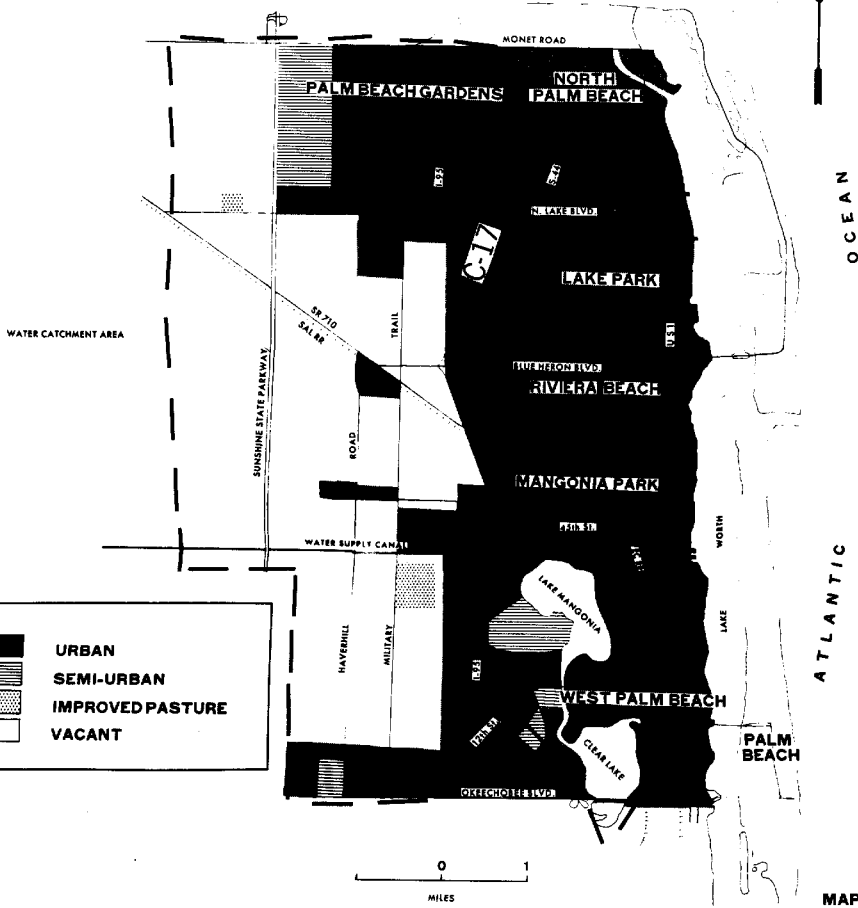
TABLE 3 - TRENDS IN NON-AGRICULTURAL AND
MANUFACTURING EMPLOYMENT 1957-1967
PALM BEACH COUNTY

<u>Year</u>	<u>Civilian Labor Force</u>	<u>Non- Agriculture</u>	<u>Manufacturing</u>
1957	75,400	45,600	3,600
1958	82,300	49,000	5,400
1959	87,600	52,100	6,700
1960	92,100	54,200	8,000
1961	97,600	57,400	10,000
1962	102,800	62,900	11,600
1963	106,300	66,100	12,100
1964	110,700	69,700	12,500
1965	117,000	75,000	13,800
1966	126,300	82,600	15,300
1967	130,900	86,900	15,700

Of the total manufacturing employment in 1967, it is estimated that 60 to 70% were employed in manufacturing plants which have located in the C-17 drainage basin during this time period.

The location of the Pratt-Whitney plant in Palm Beach County and the development of Palm Beach Gardens and the community of North Palm Beach were primary factors in the rapid urban growth in the northern

C-17 DRAINAGE AREA 1985 LAND USE



	URBAN
	SEMI-URBAN
	IMPROVED PASTURE
	VACANT

portion of the C-17 drainage area. The subsequent location of at least 5 major manufacturers in Palm Beach Gardens added increased impetus to the process of urbanization, mainly in the demand for residential sites.

FUTURE LAND USE

Future projections are usually based on carefully formulated assumptions. Those used in this report are:

1. Such an event as a major change in our form of government or economy, a large scale disaster, or all-out war, would have unpredictable effects. Therefore, it is assumed that such catastrophic changes will not occur.
2. The present population trends for Florida and Palm Beach County will continue for the life of the project.

Table 4 and Map 6 indicate anticipated land use without project incentive, in the drainage basin by 1985. Residential acreage is expected to be more than double that of 1967. The majority of this additional acreage is expected to occur in Palm Beach Gardens and the Westward Expansion area.

TABLE 4 - ESTIMATED LAND UTILIZATION
C-17 DRAINAGE AREA, 1985

<u>Land Use Classification</u>	<u>Acres</u>	<u>% Total Land</u>	<u>% Occupied Land</u>
Residential	9,000	34.3	50.0
Commercial	1,000	3.8	5.5
Industrial	900	3.5	5.0
Non-Residential	2,000	7.6	11.0
Transportation	3,000	11.5	16.5
Water	2,000	7.6	11.0
Agriculture	225	1.0	1.0
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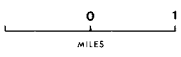
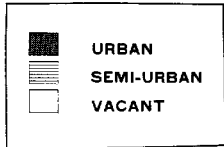
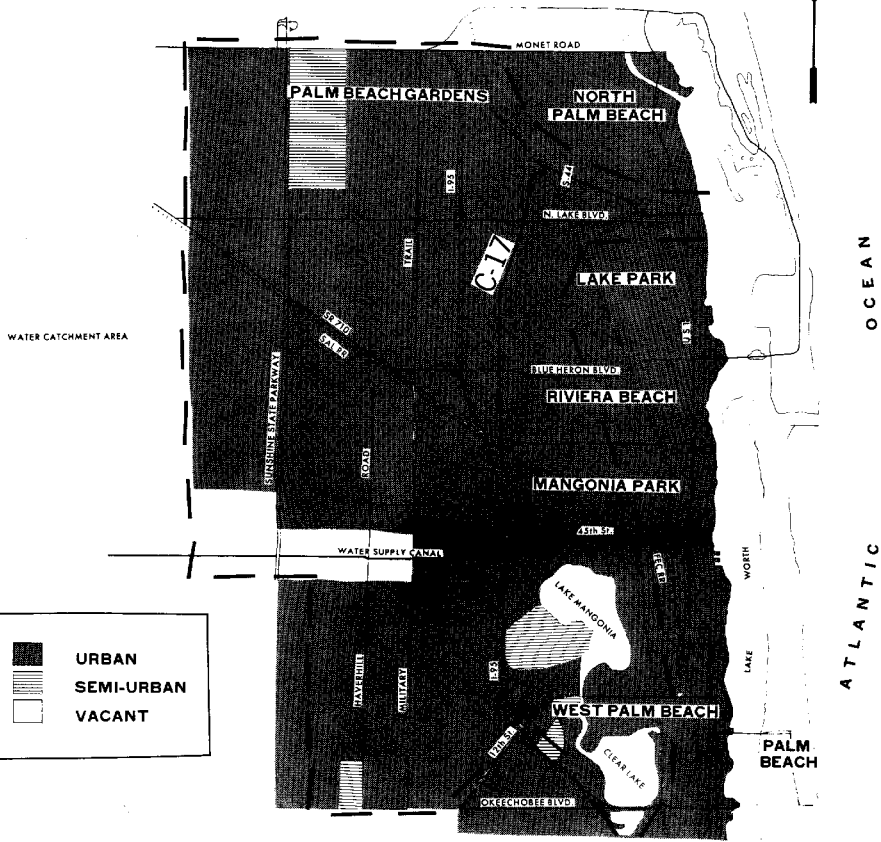
TABLE 4 - ESTIMATED LAND UTILIZATION (Continued)

<u>Land Use Classification</u>	<u>Acres</u>	<u>% Total Land</u>	<u>% Occupied Land</u>
Total Occupied Area	18,175	69.3	100.0
Vacant	<u>8,065</u>	<u>30.7</u>	---
Total Area	26,240	100.0	---

As indicated by Table 4, the total occupied area by 1985 is expected to be a minimum of 69% of the total area of the basin, an increase of 29% from 1967. The following factors will be the primary cause of the sustained population growth and urbanization of the study area.

1. Location of new industries and expansion of existing industries in the drainage area.
2. The proposed location of at least three higher educational facilities in the study area: (a) the proposed Florida Baptist College in Palm Beach Gardens; (b) a proposed northern campus of Palm Beach Junior College also in Palm Beach Gardens and; (c) the location of the Palm Beach Graduate Engineering Center in the Palm Beach Lakes development north of 45th Street and immediately east of C-17.
3. Construction of the proposed major road system for Palm Beach County to meet the anticipated road needs by 1985. The proposed road system includes construction of new arterial and collector roads plus construction of new major thoroughfares and other substantial improvements such as multi-laning of the existing major thoroughfares.
4. Adequate drainage and flood control facilities. Improvements to the primary and secondary water control facilities in the drainage

C-17 DRAINAGE AREA 2020 LAND USE



basin will undoubtedly lower initial development costs. The trends in future land development will be governed almost entirely by economics; not just to potential developers, but perhaps most importantly, the cost of providing required urban services at public expense. In the unincorporated areas of the drainage basin these urban services will be in the form of public amenities that are more and more in demand by the urban dweller such as adequate roads, schools, libraries and fire protection. Whether or not the C-17 drainage area attains its optimum level of development, its minimum level of growth will create new demands for public improvements.

Land is not an unlimited commodity, particularly when that land comprises an area subject to rapid urban growth. This applies to the C-17 drainage area. Approximately one mile west of the Sunshine State Parkway is the 12,160 acre water catchment area of the City of West Palm Beach. Because of recent legislation, this area will probably remain in its natural state and be used solely for the purposes of public water supply. The law does permit use of the catchment area for purposes not inconsistent with water supply such as recreation. The valuable water catchment area will of course present a barrier to urban growth westward in the C-17 basin. This reason alone will make the vacant lands to the east prime land for future development.

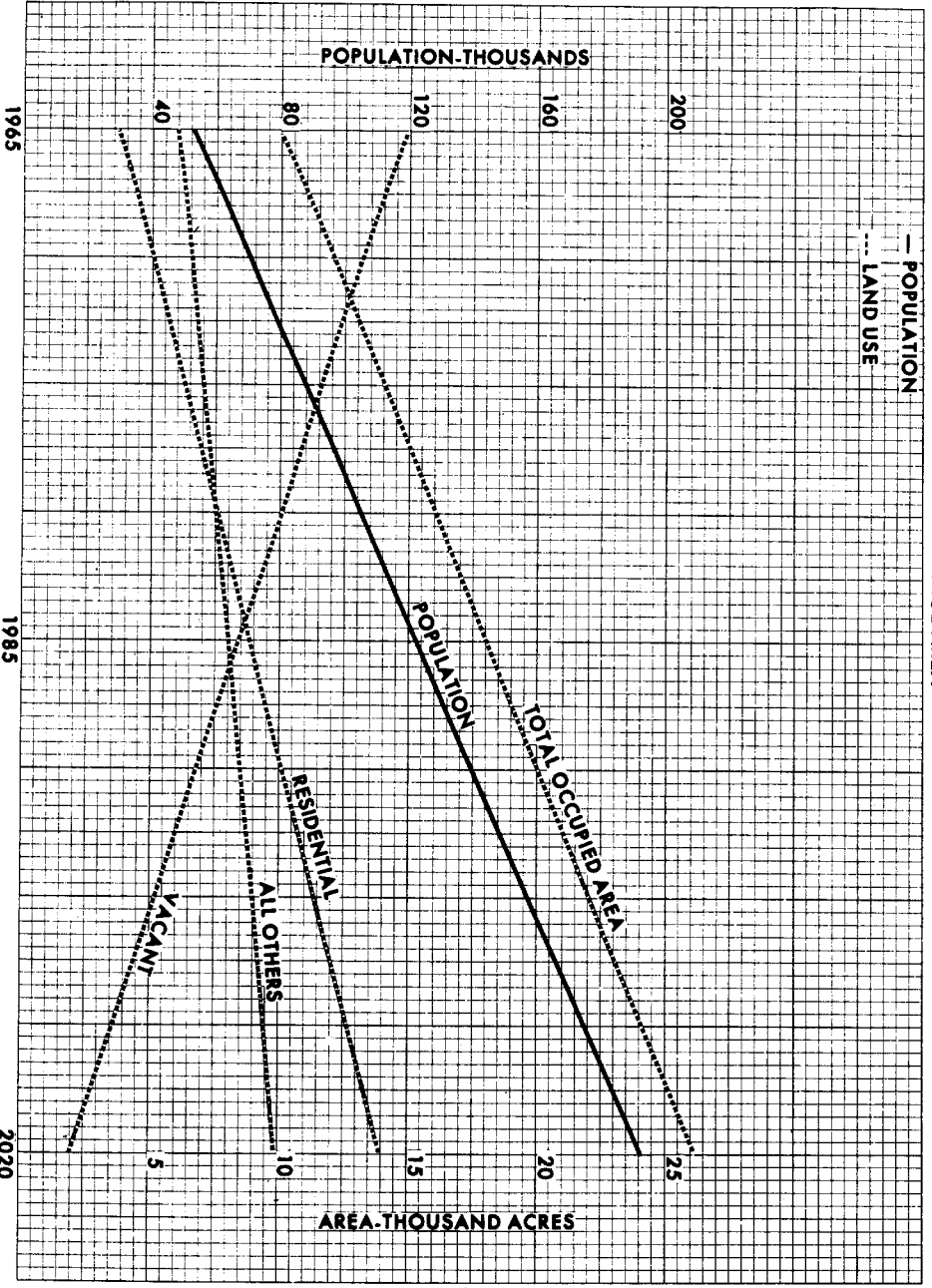
Table 5 and Map 7 indicates the anticipated development by 2020. It is expected that approximately 93% of the basin will be occupied by urban and semi-urban developments. Residential acreage will have a minimum density of 12 persons per acre and will account for 54% of the total acreage in the basin. Graph 2 presents the general relationships, present and

future, between population growth and land use. Agriculture on a commercial scale will not exist in the basin by 2020. Table 5 indicates 2,000 acres of vacant land in the drainage area by 2020. This acreage is expected to be found along the western portions of the water supply canal and will serve primarily as an area of access to the catchment area for recreational purposes.

TABLE 5 - ESTIMATED LAND UTILIZATION
C-17 DRAINAGE AREA, 2020

<u>Land Use Classification</u>	<u>Acres</u>	<u>% Total Land</u>	<u>% Occupied Land</u>
Residential	14,240	54.3	58.7
Commercial	1,200	4.6	4.9
Industrial	1,000	3.8	4.1
Non-Residential	2,500	9.5	10.2
Transportation	3,200	12.2	13.1
Water	2,100	8.0	8.6
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Total Occupied Area	24,240	92.4	100.0
Vacant	<u>2,000</u>	<u>7.6</u>	---
Total Area	26,240	100.0	---

C-17 DRAINAGE AREA



SOURCE DATA FOR THIS REPORT WAS OBTAINED FROM THE FOLLOWING:

1. 1955, 1964, 1968 aerial photographs
2. Field and aerial surveys

PERSONAL INTERVIEWS AND PRINTED MATERIAL FROM THE FOLLOWING:

3. Palm Beach County Agricultural Agent
4. Palm Beach County Area Planning Board
5. Palm Beach County Engineering Department
6. Palm Beach County Development Board
7. Palm Beach - Broward Soil and Water Conservation District
8. City of West Palm Beach Water and Sewer Department
9. Palm Beach County Building and Zoning Department
10. Palm Beach County Office of the Tax Assessor
11. United States Bureau of the Census, Washington, D. C.
12. Florida Statistical Abstract, 1967
13. Florida State Employment Service.