, No. 26

Issued August 1963

SOIL SURVEY

Dorchester County Maryland

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
MARYLAND AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Dorchester County, Md., will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodlands; and add to our knowledge of soil science.

Locating Soils

Use the index to map sheets at the back of this report to locate areas on the large map. The index is a small map of the county that shows the location of each sheet on the large map. When the correct sheet of the large map has been found, it will be seen that boundaries of the soils are outlined, and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they occur on the map. The symbol is inside the area if there is enough room; otherwise it is outside the area and a pointer shows where the symbol belongs.

Finding Information

This report contains sections that will interest different groups of readers, as well as some sections that may be of interest to all.

Farmers and those who work with farmers can learn about the soils in the section "Descriptions of the Soils" and then turn to the section "Use and Management of the Soils." In this way, they first identify the soils on their farm and then learn how these soils can be managed and what yields can be expected. The "Guide to Mapping Units" at the back of the report will simplify use of the map and report. This guide lists each soil and land type mapped in the county, and the page where each is described. It also lists, for each soil and land type, the capability unit, the drainage, irrigation, and sewage disposal groups, and the woodland suitability group. The pages where each of these is described is indicated.

Foresters and others interested in woodlands can refer to the section "Woodland Management." In that section the soils in the county are grouped according to their suitability for trees, and factors affecting the management of woodland are explained.

Sportsmen and other users will find information about wildlife in the county in the section "Wildlife."

Engineers will want to refer to the section "Engineering Uses of Soils." Tables in that section show characteristics of the soils that affect engineering.

Scientists and others who are interested will find information about how the soils were formed and how they were classified in the section "Formation, Morphology, and Classification of Soils."

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

Newcomers in Dorchester County will be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the Area," which gives additional information about the county.

* * * * *

Fieldwork for this survey was completed in 1959. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time. The soil survey of Dorchester County was made as part of the technical assistance furnished by the Soil Conservation Service to the Dorchester Soil Conservation District.

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SOIL SURVEY OF DORCHESTER COUNTY, MARYLAND

SURVEY BY F. Z. HUTTON, SR., A. P. FAUST, R. FEUER, H. R. FRANTZ, F. J. GLADWIN, A. H. KODESS, AND J. E. McCUEN, SOIL CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE

REPORT BY EARLE D. MATTHEWS, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENT STATION

DORCHESTER COUNTY is in the west-central part of the peninsula known as the Eastern Shore (fig. 1). The county occupies about 371,200 acres, or 580 square miles. It is bounded on the west and south by Chesapeake Bay, and on the east, by Wicomico County and by Sussex County, Del. The Choptank River and Caroline County form the northern boundary. Cambridge, the largest city and the county seat, is on the navigable part of the Choptank River and is about 12 miles from the Bay. Hurlock, Vienna, Secretary, and East New Market are other towns in the county.

The early settlers in this area were of English descent and came mainly from the western shore of the Chesapeake Bay. The county was formed in 1669. Its early economy was based largely on seafood industries, but farming and lumbering soon became important. The population of the county was 23,110 in 1880. It had increased to 27,815 by 1950, and to 29,666 by 1960. Cambridge had a population of 12,239 in 1960. The population in the rest of the county, except in the marshy and swampy areas, is fairly evenly distributed.

In only about 56 percent of the land area in the county are the soils suited to cultivation. An additional 22 percent of the acreage consists of soils that are not well suited to cultivated crops, but that can be used for forests or, to some extent, for growing forage for livestock. The remaining acreage consists of marshes and of areas of beaches that are not suited to agriculture.

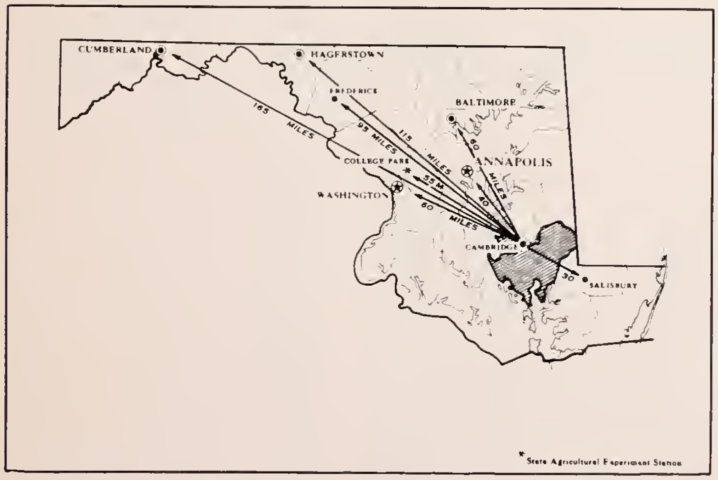

Figure 1.—**Location of Dorchester County in Maryland.**

Drainage is the most common problem in managing the soils. Only about 14 percent of the acreage suited to cultivation consists of soils that need no drainage or other special management practices. In about two-thirds of the acreage that can be cultivated, the soils are wet enough to need some artificial drainage before they can be used extensively for agriculture. Some of the soils need intensive drainage before they can be used for crops.

The climate is favorable both for general farming and for specialized types of farming, including the growing of strawberries, truck crops, and small fruits, and the raising of poultry. It is also suitable for trees, and lumbering is important.

The extensive areas of marsh and the areas along tidal streams and the shores of the Chesapeake Bay attract large numbers of migratory waterfowl. The opportunities for hunting and fishing also attract many sportsmen to the county. Urban development has not been extensive in this county, but some housing developments have been built in areas that were once important for agriculture.

General Nature of the Area

This section gives information about the physiography, relief, and drainage of the county. It also describes the climate and vegetation, gives facts about transportation, markets, and industries in the county, and describes the agriculture.

Physiography, Relief, and Drainage

Dorchester County occupies a part of the Atlantic Coastal Plain. In this area changes in elevation are generally gradual. Much of the county is nearly level, but there are some low, rounded ridges, particularly in the northeastern part of the county. The highest point in the county—about 57 feet above sea level—is in the northeastern part, but the elevation is less than 40 feet in most of the county. Large areas in the southern and southwestern parts of the county are barely above sea level.

In this county the drainage is entirely into the Chesapeake Bay. The Choptank and Nanticoke Rivers and their tributaries provide most of the drainage. Secondary streams are Fishing Creek, the Blackwater River, and Marshyhope Creek, which is a tributary of the Nanticoke. The Transquaking River and its chief tributary, the Chicamacomico River, are also secondary streams.

Because all of the main rivers are tidal streams, and because most of the county is nearly level or gently sloping, the overall drainage is rather slow. In addition, most of the soils in the county have some degree of impeded drainage. About 27 percent of the acreage consists of areas of Tidal marsh and of fresh-water swamps.

Climate

Dorchester County has a humid, semicontinental climate. The winters are mild and the summers are rather hot. Spring and fall are the most pleasant seasons.

In this area the prevailing winds are from the west during most of the year, and, therefore, the warming influence of the Atlantic Ocean does not have full effect. Nevertheless, the winds that blow frequently from the east, normally associated with winter storms to the south, bring warmer, moist air off the ocean and tend to make the temperature higher in winter than is normal for this general area. The Appalachian Mountains and the waters of the Chesapeake Bay also have a moderating effect on the cold air from the northwest. In summer, the temperature is lowered by cool air from the water. In the afternoon, breezes from the water cool the areas close to shore.

The county is low and nearly level. The elevation is less than 20 feet in three-fourths of the area; only in the northeastern part is the altitude as high as 50 feet. Hence, there is little variation in climate throughout the county and the data given for Cambridge in table 1 should be representative of most areas.

Average and extreme temperatures are given in table 1. The hottest month is July. During that month, the average temperature in the shade is in the upper eighties in the afternoon. It can be expected that temperatures will reach about 100° F. sometime during the summer. A record high of 106° was reported in July of 1930. The coldest months are January and February, when the temperature in the early morning averages about 28°. During an average winter, however, the temperature falls to about 7° on at least one morning. The lowest temperature reported at Cambridge was 6° below zero in February 1934 and in January 1961.

The temperature at night varies somewhat, depending on the cloud cover, wind, and topography. For example, the difference in elevation may be only 10 to 25 feet from the bottom of a basin to the top of its rim, but, on a clear night, the temperature may be slightly lower in the basin. Also, frost may occur later in spring and earlier in fall in low areas.

Cold air from the northwest and tropical air from the south or southwest account for marked changes in temperature within even a few days. For example, the highest temperature on March 1, 1961, was 41°; on March 5, 80°; and on March 10, 40°. Sudden changes are much less extreme in summer than during other seasons of the year because unmodified polar air seldom reaches the area.

Probability of freezing temperatures on or after given dates in spring and on or before given dates in fall have not been computed for Dorchester County. In table 2, however, the dates given for Solomons should be representative of the southwestern part of the county, and those for Easton should be representative of the northeastern part.

In this county precipitation is fairly evenly distributed throughout the year. Records of precipitation have been kept for a period of about 65 years at Cambridge. Figures showing the average temperatures and precipitation during that period are given in table 1. Only July and August have an average of more than 4 inches of rainfall. To some extent, this additional rainfall compensates for the greater amount of evaporation during

TABLE 1.—*Temperature and*

Month	Temperature										
	Average daily maximum	Average daily minimum	Highest	Year of occurrence	Lowest	Year of occurrence	Average monthly maximum	Average monthly minimum	Average number of days		
									Maximum of 90 degrees or higher	Minimum of 32 degrees or lower	Minimum of 14 degrees or lower
	°F	°F	°F		°F		°F	°F	°F	°F	°F
January	45. 0	28. 1	78	1950	−6	1961	64	11	0	21	3
February	45. 8	27. 8	83	1930	−6	1934	65	12	0	20	2
March	55. 0	35. 2	91	1907	8	1934	75	20	(1)	13	(1)
April	65. 5	43. 8	93	1915	17	1923	84	30	(1)	2	0
May	76. 3	54. 0	100	1914	31	1920	91	40	2	(1)	0
June	83. 7	62. 7	102	1921	36	1938	93	50	7	0	0
July	87. 7	67. 6	106	1930	48	1952	97	55	12	0	0
August	85. 7	65. 9	104	1918	43	1934	96	55	8	0	0
September	80 2	59. 8	99	1953	36	1942	92	44	3	0	0
October	69. 5	48. 9	94	1941	24	1930	83	34	(1)	1	0
November	57. 5	38. 6	86	1950	8	1930	73	23	0	8	(1)
December	46. 8	30. 2	73	1951	−2	1917	64	15	0	20	1
Annual	66. 6	46. 9	106	--------	−6	--------	99	7	32	85	6

[1] Less than one-half day.

those months and for the great amount of water that is used during that period.

Rainfall in summer, however, is more variable and less dependable than in winter; as little as 0.25 inch and as much as 17.34 inches have fallen in August. In summer, local thunderstorms are common. Within 2 hours, as much as 2 inches of rain may fall in one area, but a few miles away, only a few drops of rain may fall. General storms cover large areas in winter.

Droughts are frequent in summer in Dorchester County. Although rainfall is generally adequate for good yields of crops, the unequal distribution of the showers in summer and the occasional dry periods make irrigation necessary for maximum yields.

The average annual snowfall is only about 15 inches in this county. The amount of snowfall varies greatly from year to year; the range is from only a trace during the winter of 1918–19 to 43 inches in 1904–5. The heaviest snowfall recorded at Cambridge was in January 1922, when 24 inches of snow fell within a 24-hour period and 27½ inches fell within about 36 hours. Snowfall is likely to be heavier in the northeastern part of the county, which is farther from the bay than the rest of the county.

In this county thunderstorms occur on an average of 30 to 35 days a year. They are frequent in summer; three-fourths of the storms occur in June, July, and August. Once or twice a year, hail accompanies these storms.

Tornadoes generally cause little damage and they occur infrequently. Hurricanes appear about once a year, generally in August or September. Most of them cause only minor damage, but, occasionally, the high winds, heavy rains, and high tides from a storm moving up the coast cause widespread damage.

Records of the average velocity of the wind have not been kept in this county, but the average velocity is estimated to be between 8 and 10 miles per hour. The velocity is somewhat greater in spring and less in summer. Winds of hurricane force or those that accompany severe thunderstorms, however, may reach a velocity of 50 to 60 or more miles per hour.

The relative humidity is generally highest in August and September in this county and lowest in winter and early in spring. Normally, the relative humidity is highest at sunrise; it is nearly 90 percent in August and September and ranges from 70 percent to 75 percent in winter and in spring. The humidity in the afternoon is about 60 percent in August and September, and it ranges from 50 percent to 55 percent in winter and spring.

Vegetation

Except for the marshy areas, this county was once occupied almost entirely by hardwood trees. Because of the impeded drainage in many areas, most species are the kinds that tolerate water. Oaks dominated in most areas, the particular species depending upon the wetness of the land. Other important trees were swamp maple, sweetgum, blackgum, holly, bay, dogwood, beech, and birch.

A few loblolly pines and Virginia pines probably grew in some areas, but they were not numerous and did not make up a pure stand until after many areas had been cleared. Loblolly pine, sometimes known as oldfield pine, encroaches on many abandoned or heavily cutover areas, particularly on soils that have impeded drainage. Virginia pine encroaches on sandier and droughtier soils.

The areas of Tidal marsh support coarse grasses and rushes. In some places there are also shrubs and small trees that tolerate salt, or at least that tolerate brackish water.

precipitation at Cambridge, Md.

Precipitation													
								Snowfall					
Average monthly total	Wettest year (1948)	Year of occurrence	Driest year (1930)	Year of occurrence	Maximum during a 24-hour period	Year of occurrence	Average number of days with 0.01 inch or more	Average monthly total	Maximum during a month	Year of occurrence	Maximum during a 24-hour period	Year of occurrence	Average number of days with 0.1 inch or more
Inches	*Inches*		*Inches*		*Inches*			*Inches*	*Inches*		*Inches*		
3.6	8.43	1937	0.94	1955	2.76	1936	9	5	31.0	1940	24.0	1922	2
3.3	7.19	1896	.40	1901	4.00	1896	9	4	15.0	1936	13.0	1936	2
3.9	9.08	1912	.90	1915	3.38	1912	10	2	11.3	1947	11.0	1942	1
3.6	8.39	1918	.65	1942	3.20	1918	9	(2)	6.0	1915	6.0	1915	(1)
3.7	8.48	1960	.36	1911	3.07	1906	9	0	0	--------	0	--------	0
3.7	8.09	1935	.64	1954	3.56	1929	8	0	0	--------	0	--------	0
4.5	11.78	1922	.85	1929	5.12	1893	9	0	0	--------	0	--------	0
4.9	17.34	1955	.25	1943	5.50	1931	9	0	0	--------	0	--------	0
3.5	16.26	1935	.47	1914	10.30	1935	6	0	0	--------	0	--------	0
3.3	9.55	1917	.66	1918	4.35	1949	6	(2)	2.0	1925	2.0	1925	(1)
3.1	9.38	1948	.66	1905	3.35	1952	9	(2)	6.0	1938	3.5	1952	(1)
3.2	6.30	1957	.61	1955	2.90	1941	9	3	21.5	1904	16.0	1908	1
44.2	66.54	1948	23.63	1930	10.30	1935	102	15	38.5	1922	24.0	1922	6

[2] Trace.

TABLE 2.—*Probabilities of last freezing temperatures in spring and first in fall*

[Data from Easton, Talbot County, Md., and Solomons, Calvert County, Md.]

Probability	Dates for given probability and temperature					
	32° or lower		24° or lower		16° or lower	
	Easton	*Solomons*	*Easton*	*Solomons*	*Easton*	*Solomons*
Spring:						
9 years in 10 later than	Mar. 25	Mar. 13	Feb. 21	Feb. 13	Jan. 26	Jan. 22
3 years in 4 later than	Apr. 3	Mar. 21	Mar. 2	Feb. 22	Feb. 4	Jan. 31
2 years in 3 later than	Apr. 6	Mar. 24	Mar. 6	Feb. 25	Feb. 8	Feb. 3
1 year in 2 later than	Apr. 13	Mar. 30	Mar. 13	Mar. 3	Feb. 15	Feb. 9
1 year in 3 later than	Apr. 20	Apr. 5	Mar. 20	Mar. 9	Feb. 22	Feb. 15
1 year in 4 later than	Apr. 23	Apr. 8	Mar. 24	Mar. 12	Feb. 26	Feb. 18
1 year in 10 later than	May 2	Apr. 16	Apr. 2	Mar. 21	Mar. 7	Feb. 27
Fall:						
1 year in 10 earlier than	Oct. 14	Nov. 7	Nov. 11	Nov. 24	Nov. 27	Dec. 2
1 year in 4 earlier than	Oct. 21	Nov. 13	Nov. 19	Dec. 1	Dec. 3	Dec. 9
1 year in 3 earlier than	Oct. 23	Nov. 16	Nov. 22	Dec. 3	Dec. 6	Dec. 11
1 year in 2 earlier than	Oct. 28	Nov. 20	Nov. 28	Dec. 8	Dec. 10	Dec. 16
2 years in 3 earlier than	Nov. 2	Nov. 24	Dec. 4	Dec. 13	Dec. 14	Dec. 21
3 years in 4 earlier than	Nov. 4	Nov. 27	Dec. 7	Dec. 15	Dec. 17	Dec. 23
9 years in 10 earlier than	Nov. 11	Dec. 3	Dec. 15	Dec. 22	Dec. 23	Dec. 30

Transportation and Markets

In colonial days transportation was mainly by water and all of the settlements were on or near navigable bodies of water. The waterways are still an important means of transportation, but the economy of the county is no longer dependent upon them. Modern highways now cross the county, and there are many paved or hard-surfaced secondary roads.

Since the opening of the Chesapeake Bay Bridge, Dorchester County has been easily accessible by highway from the State capital at Annapolis and from other points west of the Bay. The Baltimore and Eastern Railroad and the Cambridge Branch of the Pennsylvania Railroad also serve the county. Thus, Dorchester County has ready access to agricultural markets by highway, rail, and water. Wilmington, Baltimore, and Philadelphia have been the traditional markets for the products of the county. They are probably still the most important, but Washington, D.C., and other cities west of Chesapeake Bay are now easily accessible.

Industries

The industries of Dorchester County are closely related to agriculture and to the natural resources of the area. There are canneries, packinghouses for truck crops and seafood, and facilities for the marketing of fresh fish, oysters, clams, and crabs. The county also has fertilizer plants and outlets for farm machinery. Lumbering is still an important industry, but it is less important now than it was in the past.

Agriculture

Responsive soils and a temperate climate with well-distributed rainfall and a fairly long growing season make this county favorable for agriculture. There were 729 farms in the county in 1960. The farms occupy a total of 157,050 acres, a decrease of about 12 percent since 1950.

Some of the soils are well suited to general farming or to the growing of truck crops. Most of them, however, will need artificial drainage before they will be well suited to most agricultural enterprises. The agriculture of the county is somewhat diversified.

In the following pages some facts about the types and sizes of farms, crops grown in the county, pastures, livestock, farm tenure, and farm power and mechanical equipment are discussed. The statistics used are from "Comparative Census of Maryland Agriculture by Counties." [1]

Types and sizes of farms

In 1960, cash-grain farms were more numerous than other types of farms in Dorchester County. There were comparatively few general farms, vegetable farms, poultry farms, and livestock or dairy farms. Of the total farms, 500 were commercial farms, 155 were part-time farms, and 74 were unclassified.

The average-sized farm in 1960 consisted of 215.4 acres. There were 43 farms less than 10 acres in size, 124 farms of 10 to 49 acres, 131 farms of 50 to 99 acres, 355 farms of 100 to 499 acres, and 76 farms of 500 acres or larger. The number of farms of all sizes, except those of 500 acres or larger, decreased sharply between 1950 and 1960. The average size of individual farms increased by 45 percent during the same period.

Crops

In Dorchester County crops were harvested on 87,004 acres in 1960. Table 3 gives the acreage of the most important field crops and vegetable crops grown in the county in 1960 and also the number of fruit trees. The field crop grown the most extensively was soybeans, harvested mostly for beans. Other crops, in order of their importance, were corn, vegetables grown for sale, wheat, and barley.

[1] HAMILTON, A. B. COMPARATIVE CENSUS OF MARYLAND AGRICULTURE, BY COUNTIES. Maryland Univ., Ext. Serv., College Park, Md., Misc. Ext. Pub. No. 55, 52 pp. 1961. [Mimeographed.]

The income from vegetables sold was probably greater in 1960 than that received from the sale of field crops if measured by gross receipts. Only the most important vegetables are listed in table 3. Other vegetables or truck crops of some importance were cabbage, melons, peppers, and pimentos.

TABLE 3.—*Acreage of principal crops and number of fruit trees of all ages in 1960*

Crop	Unit	Rank in State
	Acres	
Corn for grain	26, 563	6
Corn, sweet	2, 380	7
Corn, silage or forage	510	(1)
Wheat	9, 892	8
Oats	805	17
Barley	6, 261	2
Rye	1, 987	3
Soybeans for beans	36, 860	1
Hay	3, 382	20
Vegetables harvested for sale	10, 815	1
Tomatoes	2, 061	2
Snap beans	1, 991	2
Cucumbers	1, 462	1
Green peas	693	3
Lima beans	116	6
Strawberries	19	8
	Number	
Peach trees	7, 254	10
Apple trees	276	21

[1] Not determined.

Pastures

A total of 6,013 acres was pastured in Dorchester County in 1960, a decrease of nearly 64 percent since 1950. Of this acreage, 3,770 acres was cropland used temporarily for pasture.

The acreage in pastures is small, considering the size of the county. In this county, however, livestock is of only minor importance and little pasture is needed.

Livestock and livestock products

Livestock raising is much less important in this county than the growing of field crops and truck crops. In 1960, there were only 4,352 cattle and calves on farms, including 1,741 milk cows. In addition, there were 274 horses and mules, 2,824 hogs and pigs, and 793 sheep and lambs. The horses and mules are used mainly as work stock, but some are kept for riding purposes.

In 1960, poultry and poultry products accounted for most of the income derived from the sale of livestock and livestock products. Table 4 gives information about the number of chickens and turkeys sold in that year and the number of eggs sold. A greater number of chickens was sold in 1960 than in 1950, but the economic importance of the poultry industry in this county has declined since 1960. This decline was probably the result of a decrease in the prices received by farmers for their poultry and poultry products.

Farm tenure

Owners operated 57 percent of the farms in the county in 1960. Part owners operated 28 percent, tenants operated 14 percent, and managers operated 1 percent. Most of the tenants operated on a share basis, but many of them rented the farms they operated.

TABLE 4.—*Poultry and poultry products in 1960*

Poultry and poultry products	Number	Rank in State
Mature chickens on farms	61, 718	12
Broilers sold	1, 511, 000	6
Other chickens sold	42, 000	(1)
Eggs sold ... dozens	529, 000	12
Turkeys raised	6, 380	12

[1] Not determined.

For many years, the number of operators not residing on the farm has increased steadily. It had increased to more than 10 percent by 1960.

Farm power and mechanical equipment

In this county mechanized equipment is much more important as a source of power than horses and mules. Tractors were reported on a total of 638 farms in 1960, and there were two tractors on the average farm. The tractors were mainly of the wheeled type and were used for nearly all farm operations. Trucks were reported on 584 farms, grain combines on 321 farms, cornpickers on 233 farms, and hay balers on 72 farms. There were milking machines on 55 farms.

General Soil Map

After study of the soils in a locality and the way they are arranged, it is possible to make a general map that shows several main patterns of soils, called soil associations. Such a map is the colored general soil map in the back of this report. Each association, as a rule, contains a few major soils and several minor soils, in a pattern that is characteristic although not strictly uniform.

The soils within any one association are likely to differ from each other in some or in many properties; for example, slope, depth, stoniness, or natural drainage. Thus, the general soil map shows, not the kind of soil at any particular place, but patterns of soils, in each of which there are several different kinds of soils.

Each soil association is named for the major soil series in it, but, as already noted, soils of other series may also be present. The major soils of one soil association may also be present in another association, but in a different pattern.

The general map showing patterns of soils is useful to people who want a general idea of the soils, who want to compare different parts of a county, or who want to know the possible location of good-sized areas suitable for a certain kind of farming or other land use.

1. Sassafras-Galestown-Woodstown association

Moderately coarse textured and coarse textured soils that are dominantly well drained

This association is made up mainly of broad, nearly level fields and pastures and of more sloping, wooded areas. It also includes a few steeper areas, where the slope is as much as 40 percent. The sloping and steep areas occupy a larger proportion of the acreage than in other associations; the slope is greater than 2 percent in about one-third of the association.

The association occupies most of the northeastern part of the county. Except for a fairly extensive break near Finchville, it extends in a northeasterly direction from Cambridge along the Choptank River to Caroline County and thence east to the State of Delaware and the Nanticoke River. The association occupies nearly 18 percent of the county. Moderately coarse textured and coarse textured Sassafras and Galestown soils make up more than half of the association. Moderately coarse textured Woodstown soils make up about 9 percent.

The Sassafras soils are more extensive than the other soils. They are mainly deep, well-drained sandy loams and loamy sands, and they are nearly level to hilly or steep. The more nearly level areas are important for agriculture.

The Galestown soils are somewhat excessively drained loamy sands and sands, and they are nearly level to rolling or hilly. The Galestown soils are more sandy than the Sassafras, and they are underlain by water-bearing sandy loam to light sandy clay loam at a depth of 4 to 6 feet. This deep substratum is important because it forms a reservoir where plants can obtain moisture during dry periods.

The Woodstown soils are somewhat sandy throughout and have a mottled subsoil. These soils are moderately well drained. Their drainage must be improved before they can be used for some crops.

About 5 percent of the association is made up of poorly drained Fallsington soils. The association also includes a small acreage of other soils, about 800 acres of Tidal marsh, and slightly more than 1,000 acres of Swamp. The Fallsington and some of the other minor soils need to be drained before they can be used to the fullest extent for crops.

The soils in much of this association are low in productivity. Their capacity to store moisture and to supply it to plants is low to moderate. Nevertheless, more than half of the association is used to grow general crops and truck crops. About one-third is wooded, and the rest is in pasture, is in miscellaneous nonagricultural uses, or is idle. In the areas where the soils are rather droughty, the pastures and field crops need supplemental irrigation during dry periods. The soils in some areas need to be protected from erosion by water and wind.

2. *Fallsington-Woodstown-Sassafras-Pocomoke association*

Medium-textured to moderately coarse textured soils that are very poorly drained to well drained

Most of this association lies south of the Sassafras-Galestown-Woodstown association, but an arm extends northward to the boundaries of Caroline County and the State of Delaware. The soils are mainly nearly level, although the slope is greater than 2 percent in about 11 percent of the acreage. In only a few places is it greater than 5 percent. The association occupies approximately 17 percent of the county, or about 64,000 acres.

Medium-textured to moderately coarse textured Fallsington, Woodstown, Sassafras, and Pocomoke soils make up nearly 75 percent of the association, and Matapeake, Rutlege, Galestown, and Elkton soils occupy slightly less than 5,000 acres. Tidal marsh occupies about 700 acres, and Swamp, more than 5,000 acres. Other soils also occupy a small acreage. The Fallsington soil is poorly drained, the Woodstown soils are moderately well drained, the Sassafras soils are well drained, and the Pocomoke soils are very poorly drained.

The Fallsington and Pocomoke soils must be drained before they can be used extensively for agriculture, and the Rutlege, Elkton, and some areas of the Woodstown soils also require drainage. The sloping areas, especially the sloping areas of Sassafras soils, are subject to erosion by water. Some of the sandy soils are likely to be eroded by wind if the surface is not well protected. All of the soils are naturally low in productivity, but they respond well to fertilizer. Under very careful management, their productivity can be increased until it is moderate or fairly high.

About 51 percent of this association is wooded, but approximately 42 percent is used to grow truck crops and general crops, such as corn and soybeans. The rest is pastured, idle, or in miscellaneous nonagricultural uses. In the areas that have been drained, crops may be damaged during dry weather. They are less likely to be damaged, however, than crops grown on the soils of the Sassafras-Galestown-Woodstown association. Supplemental irrigation, if available, would be valuable during periods of drought.

3. *Elkton-Othello association*

Moderately fine textured to medium-textured soils that are dominantly poorly drained

This association occupies most of the western and southwestern parts of the county. It extends from the Choptank River on the north, and from the Chesapeake Bay on the west, southward to Wingate, and Lower Hooper Island. A broad band, 6 to 8 miles wide, extends from a point just below Cambridge to a point below Vienna on the Nanticoke River. The association is the most extensive in the county. It occupies approximately 180,000 acres, or nearly half of the county.

Most of the association is nearly level. In only a small part of the acreage is the slope greater than 2 percent. It is less than 1 percent in most areas.

Poorly drained Elkton and Othello soils occupy more than 60 percent of the association. About 7 percent consists of moderately well drained Mattapex soils, and about 5 percent, of well drained Matapeake soils. The rest consists of small areas of Keyport, Bayboro, and Pocomoke soils, and of rather large areas of Tidal marsh and Swamp.

Although the Mattapex and Matapeake soils make up only a minor part of the association, they are better suited to agriculture than the other soils, and a larger proportion of their acreage is used for crops. The Othello soils are less desirable for agriculture, because they are naturally poorly drained. They can be drained fairly easily, however, because they are underlain by sandy material, and, as a result, about 38 percent of their acreage is used for crops. In contrast, the Elkton soils have a very heavy, tough subsoil, are difficult to drain, and, therefore, are not cropped extensively. Elkton silty clay loam, which occupies approximately 28,000 acres in the association, is even less well suited to crops than the other Elkton soils. It is not only difficult to drain but is also very difficult to work after it is drained.

Elkton silty clay loam and the other soils not well suited to cultivated crops are used to only a limited extent for pasture. They could be used more extensively for crops if they were drained and well managed.

Most of the soils in this association are low in fertility. The Matapeake and Mattapex soils, however, are more productive than the others. Only about 26 percent of the association is used for crops, and about 3 percent is pastured. More than 52 percent is wooded, and 17 percent is idle. The rest is in miscellaneous nonagricultural uses. The cultivated areas are used mainly to grow corn and soybeans, but strawberries and other truck crops are grown in some areas. The Matapeake soils are used more extensively to grow strawberries than the other soils.

4. *Tidal marsh association*

Areas subject to flooding by salt water

Most of this association consists of areas of Tidal marsh that are subject to flooding by salt water. The association occupies approximately 61,500 acres. Nearly 95 percent of the acreage is affected by tides.

About 5 percent of the association consists of small areas of Matapeake, Mattapex, Othello, Plummer, and Woodstown soils. These soils are in small areas, chiefly in the vicinity of Toddville, Crocheron, Bishops Head, and Elliott. About 800 acres of Swamp is also included.

Except for some of the small areas of included soils, this association is not used for agriculture. The association is useful for other purposes, however, notably as refuges for wildlife. The Blackwater Migratory Bird Refuge is located entirely within the association.

How Soil Surveys Are Made

In making a soil survey, soil scientists examine soils in every field and parcel of land. To examine the subsoil and deeper layers, they bore holes with an auger or dig with a spade. They also study soils in banks, roadcuts, and in pits and other excavations.

Each boring, or hole, reveals a soil profile. Each profile consists of one or more distinct layers, called horizons, over a substratum of hard or soft rock, gravel, river sediments, or other material.

The soil scientists designate different kinds of horizons by capital letters. The A horizon is the upper layer, just beneath the leaf litter or vegetation. It consists of the surface soil and, in some places, of a subsurface soil. The B horizon is a subsoil that developed as the result of the processes of soil formation. The C horizon is the parent material from which the soil formed. The D horizon is beneath the C horizon, or beneath the A or the B horizon if some of the other layers are missing. The D horizon may not be the same kind of material as that from which the soil itself formed.

Each major horizon, A, B, C, or D, consists of one or more layers, or subhorizons, each different from the other. Thus, one soil may have A_1, A_2, B_1, B_2, and C horizons; another soil may have A_1, B_2, B_3, C, and D horizons; and still another, A_{11}, A_{12}, C_1, C_2, and D horizons.

The properties and thicknesses of the various horizons and their arrangement help in characterizing and classifying the soil.

Texture, color, and other properties generally vary in the different horizons of a soil. In Dorchester County the surface layer in most soils is darker colored than the lower layers; the subsoil layers are brighter and are colored more intensely; and mottling may be present in the lower horizons. The characteristics described in the following paragraphs are among the more important ones considered by soil scientists.

Texture refers to the content of sand, silt, and clay in the soil. Texture of the soil is judged by the feel and, to some extent, by the appearance of the soil, and it can also be checked by mechanical analysis in the laboratory. The finest particles are clay. Individual particles of clay are so fine that they can scarcely be seen through a microscope. Soils that consist principally of clay are generally plastic and sticky when wet and rather hard when dry. Water moves slowly through clay soils. These soils retain moisture and plant nutrients well.

Medium-sized particles, large enough to be seen with a microscope, are called silt. Silty soils are smooth and velvety; some are silky to the touch. They are generally not so hard when dry nor so sticky and plastic when wet as clay soils.

The larger particles, smaller than gravel, are called sand. Individual particles of sand can be seen with the naked eye. Water moves rapidly through sandy soils, and those soils retain relatively little water for plants. Some soils in Dorchester County also contain fine gravel, but this does not directly affect the texture of the soil.

Most soils contain variable amounts of clay, silt, and sand. Few soils anywhere are pure silt or pure sand, and none are known that are pure clay. Within any one soil, the different horizons may have different proportions of sand, silt, and clay.

Structure is the arrangement of individual soil particles in clumps or aggregates. Some soils are loose and crumbly; others can be broken down into small clods that resemble blocks; and still others have small, flattened aggregates that resemble plates. The structure of a soil horizon helps determine whether air, water, and plant roots will penetrate easily or with difficulty. The structure varies among soils, and sometimes it is different in the different horizons of the same soil.

Color indicates other soil properties. The dark-colored soils are generally higher in organic matter than the light-colored soils. Other things being equal, soils containing more organic matter are more productive and are more easily tilled. Color also indicates the degree of natural drainage in a soil. In Dorchester County most of the well-drained soils are reddish brown, yellowish brown, brownish yellow, yellowish red, or reddish yellow. Poorly drained soils have a subsoil that is dominantly gray and generally mottled with yellow, red, or brown. In areas that are the most poorly drained, the subsoil is slightly bluish or greenish in places.

The wetness of an area, the color of the soil, and the position of the soil in the landscape are factors that indicate the degree of drainage. In Dorchester County drainage varies widely, and this is a major cause of the differences in the suitability of the soils for crops. The terms used to denote the successive grades, or degrees, of soil drainage are *excessively drained, somewhat excessively drained, well drained, moderately well drained,* *somewhat poorly drained*, *poorly drained*, and *very poorly drained*.

Acidity and other chemical properties help to indicate the way in which soils were formed, the management they may need, and how productive they may be.

Topography, or the lay of the land, is frequently associated with fairly definite combinations of soil characteristics. Some soils occur only on flood plains, others occur only in depressions, and still others occur only on rolling uplands.

Different combinations of soil characteristics, such as those we have discussed, are the basis for separating one soil from another. In determining the kinds of soils mapped in the county, combinations of soil properties are emphasized that are important in agriculture and in other soil uses and management. The kinds of soils are then grouped into soil series, types, and phases.

A soil series is a group of soils that, except for the texture of the surface layer, have the same profile characteristics and the same general range in color, structure, consistence, and sequence of horizons. All soils of the same series formed in the same kind of parent material. Soils of a given series may vary in slope and in other external characteristics but are reasonably uniform in internal characteristics. Each soil series is given a name that is generally taken from the locality where the series was first recognized and described. For example, the Elkton series in Dorchester County was first recognized and described near the town of Elkton, Md.

A soil type is a subdivision of a soil series. The texture of the surface layer determines the type within a series. A series may consist of only one or of many types. Thus, Elkton loam, Elkton silt loam, and Elkton silty clay loam are soil types within the Elkton series.

Variations within the soil type—chiefly in such external characteristics as surface slope, stoniness, or accelerated erosion—are designated as soil phases. Thus, in Dorchester County, Woodstown sandy loam, 0 to 2 percent slopes, and Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded, are two of the phases within the soil type, Woodstown sandy loam. If erosion has been slight or negligible, it is not mentioned in the name of the soil phase, but, if it has been moderate, severe, or very severe, the erosion is mentioned in the phase name. Also, if a soil phase is nearly level, slope is not given in its name.

Some areas shown on a soil map are not true soils and are called land types. Examples are Swamp, Tidal marsh, Coastal beaches, Mixed alluvial land, and Made land. The names of most of these land types are self explanatory. Mixed alluvial land, however, consists of two or more kinds of soil materials on flood plains. The soil materials are so intricately mixed that they cannot be shown separately on a map of the scale used.

Soils do not change abruptly at political or other manmade boundaries. Many of the soils that occur in Dorchester County also occur in other States from New Jersey and Pennsylvania southward to Florida and the gulf coast. Valuable information about the use and management of these soils may be developed in counties or States other than in Dorchester County. For example, practices used to grow truck crops in New Jersey or Delaware can be used in Dorchester County if the same kind of soil is in both places. By assigning the same name to the same soil, wherever that soil is mapped, such comparisons of management practices and of the soils themselves are made easier.

The process of assigning uniform names to soils of various areas is called *soil correlation*. This is a part of the nationwide system of mapping and classifying soils. Its purpose is to show similarities and differences among soils of each surveyed area and the rest of the United States. To do this, a soil that has the same combination of soil characteristics is given the same name, wherever it occurs.

Descriptions of the Soils

In this section the soils of the county are arranged alphabetically by soil series, and the characteristics of each series are described. A detailed description is given of the profile of a typical soil in each series. Other soils in the same series are described partly by telling how their profile differs from the typical one. The approximate acreage and proportionate extent of each soil mapping unit are shown in table 5. Most of the mapping units are dominantly one kind of soil, a type or a phase; a few contain more than one kind and are so named; a few others are land types, such as Mixed alluvial land, Swamp, or Tidal marsh.

The location and distribution of the individual mapping units are shown on the soil map at the back of this report. The "Guide to Mapping Units," also at the back of the report, lists the map symbol of each mapping unit and land type and the page where that mapping unit or land type is described. In addition, it lists, for each mapping unit and land type, the capability unit and the drainage, irrigation, sewage disposal, and woodland suitability groups and the pages where each of these is described. Some terms that may be unfamiliar to the reader are defined in the Glossary at the back of the report.

Bayboro Series

The Bayboro series consists of very poorly drained soils that have a very dark gray to black surface layer. The soils developed in acid clay and are on flats and in depressions. In many places they are adjacent to areas of Tidal marsh or salt water.

The Bayboro soils developed in the same kind of material as the Elkton and Keyport soils, but they are more poorly drained than those soils and have a much darker surface layer. They are not so silty as the Portsmouth soils, and their substratum is less sandy. Their subsoil and substratum are much less sandy than those of the Pocomoke or Rutlege soils.

Many areas of Bayboro soils are so difficult to drain that they are not used for crops. Where the soils have been drained, crops are grown occasionally, but most areas are used for grazing or remain in forest.

Profile of Bayboro silt loam in a plowed area at a bend in State road 356, about 1 mile north of Lakesville:

A_{1p} 0 to 10 inches, black (10YR 2/1) silt loam; weak, very fine, crumb structure; friable when moist; roots abundant; medium acid (probably limed); clear, smooth boundary; horizon is 8 to 12 inches thick.

A_{12} 10 to 18 inches, dark-gray (10YR 4/1) silt loam; weak, very fine, crumb structure; friable when moist; roots few; medium acid; gradual, smooth boundary; horizon is 6 to 10 inches thick.

Table 5.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Bayboro silt loam	3,608	1.0
Bayboro silty clay loam	1,859	.5
Bibb silt loam	196	.1
Coastal beaches	212	.1
Elkton loam	1,273	.3
Elkton silt loam	25,452	6.9
Elkton silt loam, low	18,074	4.9
Elkton silty clay loam	13,144	3.5
Elkton silty clay loam, low	15,931	4.3
Fallsington sandy loam	22,600	6.1
Galestown loamy sand, 0 to 2 percent slopes	4,340	1.2
Galestown loamy sand, 2 to 5 percent slopes	4,517	1.2
Galestown loamy sand, 5 to 10 percent slopes	437	.1
Galestown loamy sand, 10 to 15 percent slopes	215	.1
Galestown sand and loamy sand, 15 to 40 percent slopes	402	.1
Galestown sand, 0 to 2 percent slopes	523	.1
Galestown sand, 2 to 5 percent slopes	1,944	.5
Galestown sand, 5 to 10 percent slopes	769	.2
Galestown sand, 10 to 15 percent slopes	371	.1
Johnston loam	962	.3
Keyport loam, 0 to 2 percent slopes	383	.1
Keyport silt loam, 0 to 2 percent slopes	5,661	1.5
Keyport silt loam, 2 to 5 percent slopes	830	.2
Klej loamy sand, 0 to 2 percent slopes	5,282	1.4
Klej loamy sand, 2 to 5 percent slopes	298	.1
Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes	755	.2
Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes	673	.2
Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes	92	(1)
Lakeland sand, clayey substratum, 0 to 5 percent slopes	285	.1
Lakeland sand, clayey substratum, 5 to 15 percent slopes	87	(1)
Made land	85	(1)
Matapeake fine sandy loam, 0 to 2 percent slopes	301	.1
Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	499	.1
Matapeake silt loam, 0 to 2 percent slopes	5,936	1.6
Matapeake silt loam, 2 to 5 percent slopes	985	.3
Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	1,377	.4
Matapeake silt loam, 5 to 10 percent slopes	181	(1)
Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	103	(1)
Matapeake silt loam, 10 to 15 percent slopes	71	(1)
Mattapex fine sandy loam, 0 to 2 percent slopes	299	.1
Mattapex silt loam, 0 to 2 percent slopes	11,333	3.1
Mattapex silt loam, 2 to 5 percent slopes	656	.2
Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	850	.2
Mixed alluvial land	2,019	0.5
Othello silt loam	26,168	7.0
Othello silt loam, low	12,433	3.3
Plummer loamy sand	665	.2
Pocomoke loam	3,898	1.1
Pocomoke sandy loam	2,611	.7
Portsmouth silt loam	1,641	.4
Rutlege loamy sand	1,778	.5
Sassafras loam, 0 to 2 percent slopes	2,392	.6
Sassafras loam, 2 to 5 percent slopes, moderately eroded	336	.1
Sassafras loam, heavy substratum, 0 to 2 percent slopes	116	(1)
Sassafras loamy sand, 0 to 2 percent slopes	8,928	2.4
Sassafras loamy sand, 2 to 5 percent slopes	5,212	1.4
Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded	4,140	1.1
Sassafras loamy sand, 5 to 10 percent slopes	517	.1
Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded	138	(1)
Sassafras loamy sand, 5 to 10 percent slopes, severely eroded	170	(1)
Sassafras loamy sand, 10 to 15 percent slopes	242	.1
Sassafras loamy sand, 15 to 40 percent slopes	130	(1)
Sassafras sandy loam, 0 to 2 percent slopes	19,041	5.1
Sassafras sandy loam, 2 to 5 percent slopes	1,474	.4
Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	3,931	1.1
Sassafras sandy loam, 5 to 10 percent slopes	251	.1
Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	181	(1)
Sassafras sandy loam, 10 to 15 percent slopes	148	(1)
Sassafras sandy loam, 15 to 30 percent slopes	169	(1)
Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes	569	.2
Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded	178	(1)
Sassafras sandy loam, thick solum, 0 to 2 percent slopes	1,296	.3
Sassafras sandy loam, thick solum, 2 to 5 percent slopes	359	.1
Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded	632	.2
Swamp	17,413	4.7
Tidal marsh	81,692	22.0
Woodstown loam, 0 to 2 percent slopes	1,240	.3
Woodstown sandy loam, 0 to 2 percent slopes	14,247	3.8
Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded	502	.1
Gravel pits, borrow, etc	462	.1
Total	371,200	100.0

[1] Less than 0.1 percent.

B_{1g} 18 to 22 inches, dark-gray (10YR 4/1) silty clay; a few, fine, distinct mottles of yellow and yellowish brown (5Y 7/6 and 10YR 5/4); weak, fine, subangular blocky structure; very firm when moist, plastic and sticky when wet; no visible roots; strongly acid; gradual, smooth boundary; horizon is 3 to 5 inches thick.

B_{2g} 22 to 42 inches, dark-gray (10YR 4/1) clay; many, coarse, distinct mottles of yellow and yellowish brown (5Y 7/6 and 10YR 5/6); moderate, fine, subangular blocky structure; extremely firm when moist; very plastic and very sticky when wet; no roots; very strongly acid; clear, wavy boundary; horizon is 8 to 12 inches thick.

C_g 42 to 60 inches +, gray (10YR 5/1) clay; common, coarse, distinct mottles of yellowish brown (10YR 5/6); massive to weak, fine, blocky structure; extremely firm when moist, very plastic and very sticky when wet; no roots; strongly to very strongly acid.

The surface layer ranges from 8 to 15 or more inches in thickness. It is somewhat mucky, particularly in areas under forest. In some areas the B_{1g} and B_{2g} horizons are nearly black and have little or no mottling. In such areas they can be distinguished from the A horizons by their finer texture and moderately well developed, blocky or subangular blocky structure. In many places the B_{2g} and C_g horizons are thinner than those in the profile described and are underlain by a nonconforming D horizon, consisting of sand, loamy sand, or sandy loam. The lowest lying areas of Bayboro soils are sometimes flooded by salt water. The lower part of the profile in areas that are flooded is slightly saline and is less acid than in areas that are not flooded. In places the areas that are flooded merge gradually with areas of salty Tidal marsh.

Bayboro silt loam (Ba).—This soil is nearly level and is in small to fairly large areas in slight depressions. Its profile is the one described for the series.

Because this soil is difficult to drain, much of the acreage is still forested. If the soil is adequately drained, however, it is suitable for many of the crops commonly grown and can be used for wetland pasture. This soil occupies 3,608 acres. It is in capability unit IIIw–5; drainage group 9–6B; sewage disposal group 7; and woodland suitability group 7.

Bayboro silty clay loam (Bb).—The profile of this soil is like that of Bayboro silt loam, except that the surface layer is finer textured. Even in areas where it has been drained, this soil is so firm and tough when moist, so sticky and plastic when wet, and so hard when dry that regular cultivation is impractical. The soil is suitable for pasture if it is not grazed when too wet, and it will support wetland forest. It occupies 1,859 acres and is in capability unit VIw–2; drainage group 9–6A; sewage disposal group 7; and woodland suitability group 7.

Bibb Series

The Bibb series consists of poorly drained soils on flood plains, or first bottoms along some of the major streams throughout the county. The soils are composed of moderately fine textured or medium-textured alluvium that originally washed from areas of Matapeake, Mattapex, Othello, Elkton, and other silty soils.

The Bibb soils are associated with soils of the Johnston series and with areas of mixed, unclassified alluvium. In some places they merge with areas of Swamp or Tidal marsh. The Bibb soils have slightly better drainage and are finer textured than the Johnston soils. Their surface layer is also lighter colored.

Profile of Bibb silt loam in a forested area on the flood plain of Little Blackwater River, about 1 mile southwest of Thompson:

A_{11} 0 to 2 inches, dark grayish-brown (2.5Y 4/2) silt loam; numerous very dark brown specks of organic matter; very weak, medium, crumb structure; friable when moist, slightly plastic and slightly sticky when wet; numerous fibrous and common woody roots; strongly acid; abrupt, wavy boundary; horizon is 1 to 4 inches thick.

A_{12} 2 to 7 inches, light olive-gray (5Y 6/2) silt loam; common, fine, distinct mottles of light gray and yellowish brown (N 6/0 and 10YR 5/4); very weak, fine, crumb structure; friable to firm when moist, slightly plastic and slightly sticky when wet; common fibrous and woody roots; very strongly acid; gradual, smooth to wavy boundary; horizon is 4 to 8 inches thick.

C_g 7 to 26 inches, light-gray (5Y 6/1) heavy silt loam with many, medium and coarse, prominent mottles of light yellowish brown and strong brown (10YR 6/4 and 7.5 YR 5/6); coarse, very weak, blocky structure; firm when moist, plastic and sticky when wet; a few woody and very few fibrous roots; light olive-gray (5Y 6/2) coatings of silt on the faces of some aggregates; very strongly acid; abrupt, smooth boundary; horizon is 15 to 20 inches thick.

D_g 26 to 48 inches +, gray (5Y 5/1), stratified sandy clay loam; common, coarse, distinct to prominent, irregular blotches of yellowish brown and strong brown (10-YR 5/6 and 7.5YR 5/6); firm when moist, plastic and sticky when wet; practically no roots; contains thin lenses and irregular inclusions of sand, loamy sand, and sandy loam; very strongly acid.

In cultivated areas the plow layer is generally grayish brown (2.5Y 5/2). In some places the substratum has a slightly bluish cast. The D_g horizon may be any one of many different textures except silt loam. In places it consists of soil material of mixed textures. In some places the D_g horizon is at a depth greater than 48 inches.

Bibb silt loam (Bm).—The profile of this soil is the one described for the series. The soil is generally rather difficult to drain, and some areas are likely to be damaged by flooding. If the soil is adequately drained, it is suitable for many crops commonly grown in the county. The soil occupies 196 acres. It is in capability unit IIIw–7; drainage group 11–A; sewage disposal group 8; and woodland suitability group 4.

Coastal Beaches

This miscellaneous land type consists of areas of sandy beaches. The noncoherent, loose sand in these areas has been worked and reworked by the wind and waves. The sand shows no soil development and supports little, if any, vegetation.

Coastal beaches (Co).—This land type consists of beaches along the shores of the Chesapeake Bay and along the major rivers in the county. Some of the areas are smooth; others are somewhat hummocky and have short slopes.

Little vegetation grows on this land type, but there is a sparse cover of American beachgrass, beach goldenrod, or occasional clumps of switchgrass. Loblolly and Virginia pines grow on a few of the older, partly stabilized areas, but the land has no real value for agriculture. This land type occupies 212 acres. It is in capability unit VIIIs–2 and woodland suitability group 9.

Elkton Series

The Elkton series consists of poorly drained soils that have a fine-textured, very slowly permeable subsoil. The soils developed mainly in thick beds of clay, silty clay, or silty clay loam, but in places their substratum is somewhat sandy. Their subsoil is heavy textured, intractable, and very slowly permeable to water, air, and roots. The soils are in broad, nearly level areas, mainly at an elevation of less than 20 feet. In places they are only slightly above sea level.

The Elkton soils are closely associated with the Othello soils. They are a little less sandy than those soils, their subsoil has much more clay and is less wet, and they are more difficult to drain. They are also less easily managed after they are drained. The Elkton soils developed in the same kind of material as the moderately well drained Keyport and very poorly drained, dark-colored Bayboro soils.

The Elkton soils occupy nearly 74,000 acres, or about 20 percent of the county. They occupy much of the western and central parts. The areas lie between areas of better drained, more sandy soils to the northeast and areas of Tidal marsh to the south. Because the Elkton soils are poorly drained and are difficult to manage after they are drained, most of the acreage is still wooded. A small acreage is used for crops, and a small acreage, for pasture.

Profile of Elkton silt loam in a loblolly forest at a point just off Hills Point Road, about one-half mile west of Lloyds:

A_1 0 to 1 inch, dark olive-gray (5Y 3/2), smooth silt loam or silt; weak, fine, crumb structure; friable when moist, slightly plastic and slightly sticky when wet; fibrous and woody roots fairly plentiful; very strongly acid; clear, smooth boundary; horizon is ½ inch to 2 inches thick.

A_2 1 to 6 inches, light-gray or gray (5Y 6/1) silt loam; weak, coarse, crumb to fine, subangular blocky structure; friable when moist, slightly plastic and slightly sticky when wet; roots rather few; extremely acid; clear, wavy boundary; horizon is 1 to 7 inches thick

B_{1g} 6 to 10 inches, gray (5Y 5/1 silty clay loam; common, coarse, prominent mottles of yellowish brown (10YR 5/4); compound, very weak, medium, platy and strong, coarse, blocky structure; firm when moist, plastic and sticky when wet; roots few; dark-gray (N 4/0), thin coatings in root channels and on aggregates; extremely acid; gradual, wavy boundary; horizon is up to 6 inches thick, but in places it is absent or nearly so.

B_{21g} 10 to 24 inches, light-gray or gray (5Y 6/1) silty clay; common, coarse, prominent mottles of strong brown (7.5YR 5/8); compound, weak, thick, platy and strong, coarse, blocky structure; firm when moist, very plastic and very sticky when wet; very few roots; a few fine pores; dark-gray (N 4/0) coatings of silt and clay in pores, in root channels, and on aggregates; extremely acid; diffuse boundary; horizon is 12 to 20 inches thick.

B_{22g} 24 to 40 inches, gray (N 5/0) heavy silty clay; common to many, coarse, prominent mottles of strong brown (7.5YR 5/6); compound, weak, thick, platy and very strong, coarse, blocky structure; very firm when moist, very sticky and extremely plastic when wet; very few roots; a few fine pores; very dark gray (N 3/0) coatings of silt or clay in pores, in root channels, and on aggregates; very strongly acid; clear, smooth boundary; horizon is 12 to 18 inches thick.

CD 40 to 54 inches +, gray (5Y 5/1) fine sandy clay loam or very fine sandy clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/4); massive to very weak, coarse, blocky structure; friable to firm when moist, plastic and sticky when wet; no roots; very strongly acid.

In cultivated areas the plow layer is generally gray to dark gray (5Y 5/1 to 4/1). In some places the subsoil is even thicker than that in the profile described. It extends to a depth of more than 50 inches in some areas. In many places the substratum contains more sand than that in the profile described. In most places the texture of the substratum is sandy loam to almost pure sand, but there is practically no sand in some areas.

Elkton loam (Ek).—The surface layer of this soil contains much more sand or fine sand and much less silt than the surface layer in the profile described for the series. If the soil has been drained, it is fairly easy to work and to manage. Like the other Elkton soils, it is difficult to drain because of the very slow permeability of its subsoil. This soil occupies 1,273 acres. It is in capability unit IIIw–9; drainage group 8–2B; sewage disposal group 7; and woodland suitability group 7.

Elkton silt loam (Em).—The profile of this soil is the one described for the series. The soil is one of the most extensive ones in the county. It is not used widely for crops, but it has a strong influence on the agricultural development of the county. Most of the areas are practically level, but in places the slope is as much as 2 percent or slightly greater. This soil occupies 25,452 acres. It is in capability unit IIIw–9; drainage group 8–2B; sewage disposal group 7; and woodland suitability group 7.

Elkton silt loam, low (En).—This soil is like Elkton silt loam, but it is only slightly above the level of the areas of Tidal marsh. Because of its low position, it is almost impossible to drain. At times this soil is flooded when tides are extremely high. In places its substratum has been affected by salt and is less acid than that in the normal Elkton silt loam.

This soil is not suitable for crops, but it will furnish some grazing. In many places loblolly pine appears to be the climax vegetation, although loblolly pine grows slowly on this soil because of the salt. The trees are stunted in some areas or have been killed by excess salt. This soil occupies 18,074 acres. It is in capability unit Vw–1; drainage group 10; sewage disposal group 7; and woodland suitability group 8.

Elkton silty clay loam (Eo).—The surface layer of this soil is finer textured than that of Elkton loam or of the Elkton silt loams. The soil material is so intractable under nearly all ranges of moisture that normal cultivation is almost impossible. This soil is more difficult to drain than Elkton loam or the Elkton silt loams, but it is suitable for pasture or woodland. It occupies 13,144 acres and is in capability unit VIw–2; drainage group 8–2A; sewage disposal group 7; and woodland suitability group 7.

Elkton silty clay loam, low (Et).—This soil is like Elkton silty clay loam, except that it is very close to sea level. It is only slightly above the level of the areas of Tidal marsh. This soil is suitable only for trees or for limited grazing. It occupies 15,931 acres and is in capability unit VIw–2; drainage group 10; sewage disposal group 7; and woodland suitability group 8.

Fallsington Series

The Fallsington series consists of poorly drained soils that developed in beds of mixed sand, silt, and clay over very sandy deposits. The soils are on uplands. Their surface layer is grayish and is moderately coarse textured. The subsoil is a heavy sandy loam to sandy clay loam and overlies a sandy substratum.

The Fallsington soils developed in the same kind of material as the well drained Sassafras, the moderately well drained Woodstown, and the very poorly drained Pocomoke soils. Their profile is similar to that of the Othello soils, but it contains much more sand and less silt.

Profile of Fallsington sandy loam in a forested area, about one-half mile southeast of Mt. Holly Cemetery:

A_1 0 to 3 inches, very dark grayish-brown (2.5Y 3/2) sandy loam; weak, medium, granular structure; very friable when moist; numerous woody, and abundant fibrous roots; very strongly acid; clear, wavy boundary; horizon is 2 to 5 inches thick.

A_2 3 to 9 inches, gray (10YR 5/1) sandy loam; very weak, medium, granular structure; very friable when moist; common woody and fibrous roots; very strongly acid; gradual, wavy boundary; horizon is 5 to 10 inches thick.

B_{21g} 9 to 16 inches, gray (10YR 5/1) light sandy clay loam; common, medium, distinct mottles of light yellowish brown (10YR 6/4); weak, medium to coarse, subangular blocky structure; friable when moist, slightly plastic and slightly sticky when wet; few roots; very strongly acid; diffuse boundary; horizon is 5 to 10 inches thick.

B_{22g} 16 to 25 inches, light-gray (5Y 7/1) sandy clay loam; common, coarse, prominent mottles of yellowish brown (10YR 5/8); medium, weak to moderate, blocky and subangular blocky structure; friable to somewhat firm when moist, plastic and sticky when wet; few woody and very few fibrous roots; very strongly acid to extremely acid; clear, wavy boundary; horizon is 6 to 12 inches thick.

C_g 25 to 32 inches, gray (5Y 5/1) sandy loam; common, very coarse, prominent mottles of yellowish brown (10YR 5/6); stratified; friable when moist, slightly sticky but nonplastic when wet; very few scattered roots; yellowish-brown (10YR 5/6 or 5/8) stains in a few old root channels; very strongly acid; abrupt, smooth to slightly wavy boundary; horizon is 4 to 12 inches thick.

D_g 32 to 48 inches +, light-gray (2.5Y 7/2), stratified sand to loamy sand; few, coarse, distinct mottles of yellowish brown (10YR 5/4); loose to very friable; very few single roots; contains some thin lenses of sandy loam or light sandy clay loam; very strongly acid to extremely acid.

In cultivated areas the plow layer is generally a uniform gray or grayish brown. The surface layer ranges from about 7 to 12 or more inches in thickness. In areas where the surface layer is thin, it generally contains less sand than in areas where it is thick. The soil material above the substratum ranges from about 18 to 30 inches in thickness, but in most places it is 24 to 27 inches thick. In places the C_g horizon is absent and the subsoil rests directly on the very sandy D_g horizon. Mottling in the subsoil and substratum is much weaker than that in the profile described. In some places the D_g horizon is light gray and has little or no mottling.

Fallsington sandy loam (Fa).—The profile of this soil is the one described for the series, but in some large areas the surface layer is almost as fine textured as a loam. Most areas of this soil are nearly level, but in some places the slope is about 2 percent or slightly greater.

This soil is important for agriculture. If adequately drained, it is suited to nearly all of the crops commonly grown in the area. The soil occupies 22,600 acres. It is in capability unit IIIw-6; drainage group 7-B; sewage disposal group 7; and woodland suitability group 3.

Galestown Series

The Galestown series consists of somewhat excessively drained, very sandy soils that have a distinctly brown, very sandy subsoil. The soils are level to rolling or hilly. They are on uplands and on old terraces, or natural levees, above the major streams. These soils have developed in sand or loamy sand. Their substratum is at a depth of 4 to 6 feet and consists of water-bearing sandy loam to light sandy clay loam. This deep substratum is of great importance to crops because it forms a reservoir of moisture for plants to use during dry seasons.

In many places the Galestown soils are closely associated with soils of the Lakeland and Sassafras series. Their profile is similar to that of the Lakeland soils, but their subsoil is browner and less yellowish. Their surface layer and subsoil are coarser textured than those of the Sassafras soils.

Except for the areas that are steep or very sandy, the Galestown soils are important for agriculture. They are especially well suited to truck crops.

Profile of Galestown loamy sand, 0 to 2 percent slopes, in a cultivated area, about midway between Hurlock and Harrison Ferry Bridge:

A_p 0 to 10 inches, dark-brown (10YR 4/3) loamy sand; weak, very fine, crumb structure to single grain; very friable to loose; many roots; strongly to very strongly acid; abrupt, smooth boundary; horizon is 8 to 10 inches thick.

B_1 10 to 18 inches, brownish-yellow (10YR 5/4) loamy sand; single grain and very weak, fine, granular structure; most of the grains of sand have a thin coating; strongly acid; clear, wavy boundary; horizon is 6 to 10 inches thick.

B_2 18 to 40 inches, strong-brown (7.5YR 5/6) loamy sand; single grain and weak, fine, granular or weak, medium, subangular blocky structure; loose when moist, slightly sticky when wet; most of the grains of sand are coated with a film that is yellowish brown or strong brown, and bridges between the grains are common; contains a few lenses, ½ inch to 2 inches thick, and lumps, 1 to 2 inches in diameter, that are slightly firmer, darker colored, and slightly more clayey than the material in the matrix; this horizon contains slightly more clay than the A_p and B_1 horizons, but the content of clay is not great enough to make the layer a textural B horizon; very strongly acid; diffuse boundary; horizon is 15 to 30 inches thick.

C 40 to 60 inches, pale-brown (10YR 6/3) sand grading toward light gray (10YR 7/2) with increasing depth; loose; structureless; contains a few, small pebbles; very strongly acid; abrupt, smooth boundary; horizon is 10 to 30 inches thick.

D_g 60 to 70 inches +, light-gray (2.5Y 7/2) light sandy clay loam; massive; firm when moist, slightly sticky but nonplastic when wet; contains a few, coarse, distinct blotches of brownish yellow (10YR 6/8); extremely acid.

The A_1 horizon in wooded areas is generally 4 to 6 inches thick and is grayish brown to very dark grayish brown. In some areas that are undisturbed, there is a thin, bleached A_2 horizon of light yellowish brown, loose loamy sand. In all areas the grains of sand in the B_1 and B_2 horizons are partly or completely coated with a fine-textured material. However, the slightly firmer, darker, slightly more clayey lumps described in the B_2 horizon are not present in all areas.

Galestown loamy sand, 0 to 2 percent slopes (GaA).—The profile of this soil is the one described for the series. The soil is low in fertility and is rather low in moisture-storing capacity. It is not highly productive unless fertilizer and organic matter are added. The crops on this soil would benefit greatly from supplemental irrigation during the driest parts of the growing season. This soil occupies 4,340 acres. It is in capability unit IIIs-1; irrigation group 1; sewage disposal group 1; and woodland suitability group 2.

Galestown loamy sand, 2 to 5 percent slopes (GaB).—In some places this soil has slopes that are fairly long and smooth. In other places the slopes are broken and are complex or hummocky, which suggests that some of the soil material may have been reworked by wind. In some areas wind or water has removed part of the soil material, but these areas are generally of minor extent. If this soil is properly managed, it can be used regularly for cultivated crops. It occupies 4,547 acres and is in capability unit IIIs-1; irrigation group 1; sewage disposal group 1; and woodland suitability group 2.

Galestown loamy sand, 5 to 10 percent slopes (GaC).—This soil is suitable for cultivated crops, but it requires different and more intensive management than the soils that are less steep. This soil must be protected from erosion. It occupies 437 acres, and is in capability unit IVs-1; irrigation group 1; sewage disposal group 2; and woodland suitability group 2.

Galestown loamy sand, 10 to 15 percent slopes (GaD).—Risk of erosion, droughtiness, and low fertility make this soil generally unsuited to regular cultivation. The soil is suited to carefully managed grazing, however, and it can be used for orchards. It is also suited to woodland use. The soil occupies 215 acres. It is in capability unit VIs–1; sewage disposal group 2; and woodland suitability group 2.

Galestown sand, 0 to 2 percent slopes (GsA).—The profile of this soil is like that of Galestown loamy sand, 0 to 2 percent slopes, except that the surface layer and subsoil contain little fine-textured material and are loose and extremely sandy. As a result, this soil is even more droughty and is lower in fertility than Galestown loamy sand, 0 to 2 percent slopes. Nevertheless, with special management, this soil can be used more or less regularly to grow watermelons and other high-value crops. This soil occupies 523 acres. It is in capability unit IVs–1; irrigation group 1; sewage disposal group 1; and woodland suitability group 5.

Galestown sand, 2 to 5 percent slopes (GsB).—This soil is hummocky in those places where part of the surface layer has been removed by wind. It can be used about the same as Galestown sand, 0 to 2 percent slopes, however, and its management is about the same. This soil occupies 1,944 acres. It is in capability unit IVs–1; irrigation group 1; sewage disposal group 1; and woodland suitability group 5.

Galestown sand, 5 to 10 percent slopes (GsC).—This soil is not suitable for cultivated crops, but it is suited to regulated grazing or to woodland use. It can also be used for orchards or for special crops. The soil occupies 769 acres. It is in capability unit VIs–1; sewage disposal group 2; and woodland suitability group 5.

Galestown sand, 10 to 15 percent slopes (GsD).—Sandy texture and strong slope make this soil generally unsuitable for regular cultivation, but it can be used as woodland or for wildlife or recreational areas. The soil occupies 371 acres. It is in capability unit VIIs–1; sewage disposal group 2; and woodland suitability group 5.

Galestown sand and loamy sand, 15 to 40 percent slopes (GeF).—This unit consists of scattered, small areas of Galestown loamy sand and Galestown sand. The soils are so steep that they are suitable only for woodland use, for extremely limited grazing, or for wildlife or recreational areas. This unit occupies 402 acres. It is in capability unit VIIs–1; sewage disposal group 3; and woodland suitability group 5.

Johnston Series

The Johnston series consists of very poorly drained, very dark colored soils of first bottoms, or flood plains. The soils consist of alluvium washed from soils of the uplands. They have a large amount of organic matter in the surface layer, but no B horizon has developed.

The Johnston soils are more poorly drained than the other soils of flood plains. They are even more poorly drained and darker colored than the Bibb soils. The Johnston soils are much like the Rutlege soils, which are also very poorly drained but are in depressions in the uplands. They are finer textured than the Rutlege soils.

The Johnston soils are wet and support only wetland forest vegetation on most of the acreage. The areas that have been cleared, adequately drained, and protected from flooding, however, are suited to many of the crops commonly grown in the county.

Profile of Johnston loam in a forested area on Middletown Road, 1⅕ miles southwest of Salem:

A_1 0 to 11 inches, black (5Y 2/1), highly organic loam, very weak, medium, granular structure; friable when moist, nonplastic and nonsticky; roots plentiful to abundant in upper 2 inches; many, uncoated, white grains of quartz sand; extremely acid; abrupt, wavy to irregular boundary; horizon is 8 to 15 inches thick.

C_g 11 to 23 inches, light-gray (5Y 6/1) heavy sandy loam; few, very coarse, distinct mottles or large, irregular blotches or smears of light yellowish brown and light olive brown (10YR 6/4 and 2.5Y 5/4); massive to very weak, coarse, blocky structure; very friable when moist, nonplastic and nonsticky; few roots; extremely acid; gradual, irregular to diffuse boundary; horizon is 10 to 20 inches thick.

D_g 23 to 48 inches +, variable light-gray to white (5Y 7/1 to 8/1), loose, structureless loamy sand; irregular streaks and large blotches of grayish brown (2.5Y 5/2); low density; tends to flow when saturated; no roots; extremely acid.

In areas under forest the texture of the surface layer is somewhat mucky in places. The texture and thickness of the A_1 horizon vary, even within small areas. In most places the texture of the A_1 horizon is loam, but in some places it is sandy loam or mucky sandy loam. The thickness of the A_1 horizon ranges from 10 to 30 inches. In places, where its texture is sandy loam or mucky sandy loam, the A_1 horizon is generally thinner than in areas where it is finer textured. The C_g horizon is absent in some places, and in such areas the D_g horizon is generally very sandy. In other places, where the profile contains a C_g horizon, the D_g horizon may be any one of many different textures. Also, in small areas where there is a C_g horizon, a sandy D_{1g} horizon and a finer textured and more slowly permeable D_{2g} horizon are within 4 or 5 feet of the surface.

Johnston loam (Jo).—The profile of this soil is the one described for the series. This soil is generally difficult to drain and to protect from flooding. Because it has a dense cover of wetland forest vegetation, it is difficult and expensive to clear. If the soil is adequately drained and protected, however, it can be used regularly to grow suitable cultivated crops. The soil occupies 962 acres. It is in capability unit IIIw–7; drainage group 11–A; sewage disposal group 8; and woodland suitability group 4.

Keyport Series

The Keyport series consists of moderately well drained soils that have a slowly to very slowly permeable subsoil. The soils developed in clay and silty clay that is underlain in many places by sandier material.

The Keyport soils are better drained than the Elkton and Bayboro soils, although they developed in the same kind of material or in similar material. Their profile resembles that of the Woodstown soils, but they have a subsoil of tough silty clay loam to clay rather than one that contains sand and is friable.

The Keyport soils are important for agriculture. They need some drainage, but, under the best management, moderate to fairly high yields are obtained.

Profile of Keyport silt loam, 0 to 2 percent slopes, in a cultivated area west of the Nanticoke River, about 3 miles south of Henrys Crossroads:

A_p 0 to 7 inches, grayish-brown (10YR 5/2) silt loam; moderate, fine, crumb structure; friable when moist, slightly plastic and slightly sticky when wet; roots plentiful to abundant; slightly acid (probably limed); clear, wavy boundary; horizon is 6 to 9 inches thick.

B_{21} 7 to 19 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate, very fine, subangular blocky structure; hard when dry, firm when moist, and plastic and sticky when wet; roots fairly plentiful in upper part of horizon, fewer below; medium to strongly acid; gradual, irregular boundary; horizon is 6 to 15 inches thick.

B_{22g} 19 to 42 inches, yellowish-brown (10YR 5/6) silty clay; common, fine, faint to distinct mottles of grayish brown (10YR 5/2); strong, very fine, subangular blocky structure; very hard when dry, very firm and tough when moist, and plastic and very sticky when wet; very few roots; some discontinuous yellowish-brown coatings of clay on the aggregates and in old root channels; very strongly acid; gradual, irregular boundary; horizon is 15 to 25 inches thick.

D_g 42 to 48 inches +, gray (10YR 5/1) sandy clay loam becoming more sandy with increasing depth; common, medium, distinct mottles of yellow and yellowish brown (2.5Y 7/6 and 10YR 5/6); massive to very weak, coarse, blocky structure; firm when moist, sticky and slightly plastic when wet; no roots; strongly to very strongly acid.

In forested areas there is a thin, dark-gray A_1 horizon and an A_2 horizon. The A_2 horizon is somewhat thicker than the A_1, and in most places it is light yellowish brown (10YR 6/4). Depth to the mottled B_{22g} horizon ranges from about 15 to 24 inches, and depth to the substratum, from about 30 to 45 inches. In some places a C_g horizon of silty clay or clay lies between the B_{22g} and D_g horizons. The texture of the D_g horizon ranges from sandy loam to sandy clay. The D_g horizon generally contains more sand than either the surface layer or the subsoil.

Keyport loam, 0 to 2 percent slopes (KeA).—The surface layer of this soil contains less silt and more sand than the surface layer in the profile described. The soil material is somewhat more friable and easier to work than that in the Keyport silt loams. In places the soil needs surface drainage, but it is not difficult to drain.

If this soil is properly drained, it is suited to all the crops commonly grown in the county. Under good management, yields are high. The soil occupies 383 acres. It is in capability unit IIw–8; drainage group 6–2A; irrigation group 5; sewage disposal group 7; and woodland suitability group 6.

Keyport silt loam, 0 to 2 percent slopes (KpA).—The profile of this soil is the one described for the series. The soil is used about the same as Keyport loam, 0 to 2 percent slopes. It has about the same management problems, and crops grown on it make about the same yields, but in some places it is slightly harder to work and to drain.

This soil occupies 5,661 acres. It is in capability unit IIw–8; drainage group 6–2A; irrigation group 5; sewage disposal group 7; and woodland suitability group 6.

Keyport silt loam, 2 to 5 percent slopes (KpB).—This soil has a subsoil of silty clay that is very slowly permeable. As a result, most of the water from rainfall and snowmelt runs off and does not soak in. The soil erodes easily; heavy rains or quick thaws have already caused serious erosion in some places. A few scattered areas where the slope is slightly greater than 5 percent are mapped with this soil.

Keyport silt loam, 2 to 5 percent slopes, occupies 830 acres. It is in capability unit IIe–13; drainage group 6–2A; irrigation group 5; sewage disposal group 7; and woodland suitability group 6.

Klej Series

The Klej series consists of moderately well drained to somewhat poorly drained soils that developed in sandy material. The soils are underlain, at a considerable depth, by nonconforming strata of silt, clay, and sand. These soils have a distinct A horizon, but they lack a B horizon. Their substratum is mottled at a depth between about 15 and 25 inches. The mottling was caused by impeded drainage. These soils are level to gently sloping. In places they are in slight depressions in the uplands, generally at an elevation of less than 40 feet.

The Klej, Galestown, Lakeland, Plummer, and Rutlege soils all formed in similar material, but the Klej soils are not so well drained as the Galestown and Lakeland soils, and they are better drained than the Plummer and Rutlege soils. The Klej soils lack the fine-textured B horizon that is typical of the Woodstown soils.

Impeded drainage is the most important problem in managing the Klej soils. The soils are also low in moisture-storing capacity and in natural fertility. There is little if any hazard of erosion.

Profile of Klej loamy sand, 0 to 2 percent slopes, in a cultivated area about 1 mile north of Finchville Crossroads:

A_p 0 to 9 inches, very dark gray (10YR 3/1) loamy sand; very weak, fine, granular structure to single grain; soft when dry, loose to very friable when moist, nonplastic and nonsticky; roots abundant; strongly acid; clear, smooth boundary; horizon is 8 to 10 inches thick.

C_1 9 to 16 inches, grayish-brown (10YR 5/2), structureless loamy sand; loose to very friable; roots fairly common in upper portion; strongly acid; gradual, smooth boundary; horizon is 6 to 9 inches thick.

C_{2g} 16 to 34 inches, grayish-brown (10YR 5/2), structureless sand to light loamy sand; common, medium, distinct mottles of pale brown and yellowish brown (10YR 6/3 and 10YR 5/6); loose; a very few roots in upper part; strongly acid; abrupt, wavy boundary; horizon is 12 to 20 inches thick.

D_g 34 to 42 inches +, mottled yellowish-brown and light brownish-gray (10YR 5/4 and 2.5Y 6/2), stratified material that consists of alternating, thin bands, or layers, of sandy clay loam, sandy loam, and sand; loose or friable to somewhat firm when moist, but the clayey material is sticky and slightly plastic when wet; no roots; strongly acid.

In places the plow layer is grayish brown or dark grayish brown (10YR 5/2 or 4/2). In forested areas there is a dark-colored A_1 horizon that is commonly thin; there is also a thin, dark-gray A_{12} horizon in some places.

Klej loamy sand, 0 to 2 percent slopes (KsA).—In most places the profile of this soil is like the one described for the series. In some places, however, there are areas where the profile contains slightly more silt and clay than typical. These areas are too small to be mapped separately.

Klej loamy sand, 0 to 2 percent slopes, can be used regularly for cultivated crops if it is drained adequately and a good supply of plant nutrients is maintained. In some areas crops would benefit from irrigation during dry seasons. In most areas the soil is easy to drain enough for ordinary crops to grow. This soil occupies 5,282 acres. It is in capability unit IIIw–8; drainage group 4; irrigation group 1; sewage disposal group 7; and woodland suitability group 3.

Klej loamy sand, 2 to 5 percent slopes (KsB).—In most places this soil has slopes of 2 to 5 percent, but in a few places the slope is slightly more than 5 percent. Impeded drainage is the most important management problem, but there is a slight hazard of erosion. This soil occupies 298 acres. It is in capability unit IIIw–8; drainage group 4; irrigation group 1; sewage disposal group 7; and woodland suitability group 3.

Lakeland Series

The Lakeland series consists of somewhat excessively drained, very sandy soils developed in old deposits of sand and loamy sand. The sandy material was probably deposited by water. In some places it has been reworked by wind.

In Dorchester County the Lakeland soils, like the Galestown, are commonly underlain by fine-textured material at a moderate depth. This fine-textured material remains wet during most of the year and furnishes a reservoir of moisture for trees and other deep-rooted plants to use.

The Lakeland soils are much more yellowish than the Galestown soils, and they are much less strongly colored. The lower part of their profile lacks the strong-brown coloring that is typical in the Galestown soils. The Lakeland soils also lack a B horizon.

The Lakeland soils are not extensive in Dorchester County and are important only locally. In this county they are in the northern part of their range of distribution.

These soils are used mainly to grow truck crops, but they are also used for general crops and pasture. Because they are sandy, their moisture-storing capacity is low and they tend to be droughty in dry seasons. The soils are fairly productive under good management, especially if they are irrigated during dry periods.

Profile of Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes, in a cultivated area about one-half mile southwest of Galestown:

A_{1p} 0 to 9 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, crumb structure to single grain; loose; roots plentiful; strongly acid; clear, smooth boundary; horizon is 8 to 10 inches thick.

A_{12} 9 to 16 inches, light yellowish-brown (2.5Y 6/4), loose, structureless loamy sand; roots fairly plentiful; strongly acid to very strongly acid; clear, smooth to wavy boundary; horizon is 6 to 10 inches thick.

C_1 16 to 35 inches, brownish-yellow (10YR 6/6), loose, structureless loamy sand; a few widely separated roots; contains occasional lumps or bands of slightly finer textured material, particularly in lower part; very strongly acid; gradual, wavy to irregular boundary; horizon is 12 to 25 inches thick.

C_2 35 to 53 inches, pale-yellow (2.5Y 7/4), loose, structureless sand to very light loamy sand, that is paler with increasing depth (2.5Y 8/4) and is slightly streaked with light gray in lower part; no roots; contains a few lumps or bands of slightly finer material; very strongly acid; abrupt, smooth to wavy boundary; horizon is 15 to 30 inches thick.

D_g 53 to 60 inches +, light-gray (2.5Y 7/2) sandy clay loam; faint, horizontal streaks of pale yellow (2.5Y 8/4); massive; firm when moist, plastic and sticky when wet; no roots; very strongly acid to extremely acid.

In areas under forest the surface layer above the A_{12} horizon is mainly grayish brown (2.5Y 5/2) to a depth of 4 to 6 inches. In places, the C_1 horizon is either more yellowish (10YR 7/6) or is browner (10YR 5/6) than that in the typical profile. In some places the soil material in bare, cleared areas has been blown about by the wind and has been deposited in low hills that resemble dunes. Depth to the C_1 horizon in such areas ranges from a few inches to as much as 24 or more inches within a short distance. Although these soils are mainly gently sloping, in some places the slope is 15 percent or greater.

Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes (LaA).—This soil has been but little affected by erosion. Its profile is the one described for the series. The soil is low in moisture-supplying capacity and is rather low in productivity unless large amounts of fertilizer have been added. During unusually dry seasons, crops grown on this soil need supplemental irrigation for good yields. The soil occupies 755 acres. It is in capability unit IIIs–1; irrigation group 1; sewage disposal group 1; and woodland suitability group 2.

Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes (LaB).—In some areas this soil is slightly hummocky and has irregular slopes. Some areas that have been cleared have a windblown appearance. In a few small areas, there has been a moderate amount of erosion. This soil occupies 673 acres. It is in capability unit IIIs–1; irrigation group 1; sewage disposal group 1; and woodland suitability group 2.

Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes (LaD).—Because of its strong slope, this soil is much more difficult to manage than Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes, particularly because of the threat of erosion by water and wind. Under especially careful management, however, it can be used for crops. This soil occupies 92 acres. It is in capability unit IVs–1; irrigation group 1; sewage disposal group 2; and woodland suitability group 2.

Lakeland sand, clayey substratum, 0 to 5 percent slopes (LcB).—This soil contains little loam or other fine material and is mainly pure sand. It is somewhat less productive than Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes, and it is more droughty in dry seasons. This soil is suitable, however, for watermelons, sweetpotatoes, and other special crops. It occupies 285 acres and is in capability unit IVs–1; irrigation group 1; sewage disposal group 1; and woodland suitability group 5.

Lakeland sand, clayey substratum, 5 to 15 percent slopes (LcD).—This sandy soil is somewhat more droughty than Lakeland sand, clayey substratum, 0 to 5 percent slopes. It is also more susceptible to erosion. This soil is not suited to cultivated crops, but it is suited to regulated grazing or to trees. This soil occupies 87 acres. It is in capability unit VIs–1; sewage disposal group 2; and woodland suitability group 5.

Made Land

This miscellaneous land type consists of small areas where the soil material has been disturbed or modified and can no longer be identified by soil type or soil series. It consists of fill material or of areas from which the soil material has been removed as the result of leveling operations. It also consists of other land that has been shifted about or reworked by man.

Made land (Ma).—This land type has no agricultural use. It occupies 85 acres and is in woodland suitability group 10.

Matapeake Series

The Matapeake series consists of deep, well-drained soils of uplands. The soils developed in silty material, probably loess, that is underlain by sand. In many places the silty material contained some fine sand and very fine sand.

The material in which the Matapeake soils developed contained much less sand than that in which the Sassafras soils developed. The Matapeake soils have more silt in the surface layer and subsoil than the Sassafras soils. The subsoil of the Matapeake soils is heavy silt loam to silty clay loam instead of sandy clay loam like that of the Sassafras soils. The Matapeake soils developed in the same kind of material as the moderately well drained Mattapex soils, the poorly drained Othello soils, and the very poorly drained Portsmouth soils. The Matapeake soils are among the most productive and important agricultural soils in the county.

Profile of Matapeake silt loam, 0 to 2 percent slopes, in a cultivated area at the crossroads at Indianbone:

A_p 0 to 8 inches, brown (10YR 5/3) light silt loam; moderate, fine, crumb structure; friable when moist, slightly plastic and slightly sticky when wet; roots abundant; reaction neutral (the soil from which this profile was taken had been limed; the unlimed soil is medium acid to strongly acid); clear, smooth boundary; horizon is 6 to 9 inches thick.

A_2 8 to 14 inches, yellowish-brown (10YR 5/4) light silt loam; moderate, medium, crumb structure; friable when moist, slightly sticky and slightly plastic when wet; roots rather plentiful; reaction about neutral; clear, smooth boundary; horizon is 6 to 8 inches thick.

B_{21} 14 to 24 inches, yellowish-brown (10YR 5/6) heavy silt loam; moderate, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; roots rather few; slightly acid; gradual, smooth boundary; horizon is 8 to 12 inches thick.

B_{22} 24 to 37 inches, yellowish-brown (10YR 5/8) silty clay loam; moderate, medium, subangular blocky structure; friable to somewhat firm when moist, sticky and slightly plastic when wet; very few roots; some faint coatings of yellowish-brown clay (10YR 5/4 and 5/6) on aggregates; slightly acid; gradual, irregular boundary; horizon is 12 to 20 inches thick.

B_3 37 to 40 inches, dark yellowish-brown (10YR 4/4) loam; weak, medium, subangular blocky structure; friable when moist, slightly plastic and slightly sticky when wet; no roots; medium acid, clear, wavy boundary; horizon is 3 to 6 inches thick.

D 40 to 48 inches +, pale-brown (10YR 6/3), structureless, very light sandy loam; very friable when moist, nonplastic and nonsticky; no roots; medium acid to strongly acid.

In wooded areas there is a thin, dark A_1 horizon over a thicker A_2 horizon. The texture of the surface layer ranges from silt loam to fine sandy loam. In some places the soil lacks a B_3 horizon; the B_{22} horizon rests directly on the D horizon, which in places is even more sandy than the one in the profile described. In other places the soil contains a B_3 horizon that is a transitional zone between the very silty soil material in the B_{22} horizon and the sandy substratum.

Figure 2.—**Harvesting yellow waxbeans on Matapeake silt loam, 0 to 2 percent slopes.**

Matapeake fine sandy loam, 0 to 2 percent slopes (MfA).—The surface layer of this soil contains more fine sand and less silt than that in the profile described. This soil is deep and well drained and is rather high in moisture-supplying capacity and productivity. It is one of the better agricultural soils of the county. The soil occupies 301 acres. It is in capability unit I–4; irrigation group 4; sewage disposal group 1; and woodland suitability group 1.

Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded (MfB2).—This soil is more susceptible to erosion than Matapeake fine sandy loam, 0 to 2 percent slopes. In most places running water has removed part of the original surface layer. In areas that have been plowed, the present surface layer consists partly of material that was formerly subsoil. Nevertheless, under proper management, the soil is still well suited to regular cultivation. It occupies 499 acres and is in capability unit IIe–4; irrigation group 4; sewage disposal group 1; and woodland suitability group 1.

Matapeake silt loam, 0 to 2 percent slopes (MkA).—The profile of this soil is the one described for the series. In a few small areas, however, the surface layer is slightly less silty than that in the profile described. The soil is probably the most productive of any of the soils in the county, and practically all of it is used for agriculture (fig. 2). It is well drained and fertile, and there is no serious hazard of erosion. This soil occupies 5,936 acres. It is in capability unit I–4; irrigation group 4; sewage disposal group 1; woodland suitability group 1.

Matapeake silt loam, 2 to 5 percent slopes (MkB).—This soil has stronger slopes than Matapeake silt loam, 0 to 2 percent slopes. It has not been appreciably eroded, but there is a serious hazard of erosion if it is not adequately protected. The soil occupies 985 acres. It is in capability unit IIe–4; irrigation group 4; sewage disposal group 1; and woodland suitability group 1.

Matapeake silt loam, 2 to 5 percent slopes, moderately eroded (MkB2).—This soil is like Matapeake silt loam, 2 to 5 percent slopes, but it is moderately eroded. In a few small areas, erosion has been severe. This soil requires special practices to protect it from further erosion. It occupies 1,377 acres and is in capability unit IIe–4;

irrigation group 4; sewage disposal group 1; and woodland suitability group 1.

Matapeake silt loam, 5 to 10 percent slopes (MkC).—This soil is not eroded, but its strong slope makes it more susceptible to erosion than Matapeake silt loam, 2 to 5 percent slopes. Under good management, however, it can be used regularly for cultivated crops. This soil occupies 181 acres. It is in capability unit IIIe–4; irrigation group 4; sewage disposal group 2; and woodland suitability group 1.

Matapeake silt loam, 5 to 10 percent slopes, moderately eroded (MkC2).—All of this soil is at least moderately eroded, and erosion has been severe in a few small areas. The soil needs a cropping system similar to that used for Matapeake silt loam, 5 to 10 percent slopes, and it requires about the same kind of management practices. The management should include practices to protect it from further erosion. This soil occupies 103 acres. It is in capability unit IIIe–4; irrigation group 4; sewage disposal group 2; and woodland suitability group 1.

Matapeake silt loam, 10 to 15 percent slopes (MkD).—The surface layer in a few areas of this soil is somewhat less silty than that in the profile described. The strong slopes cause the hazard of erosion to be severe. Row crops should be grown infrequently, and a cover of close-growing plants ought to be kept on the soil most of the time. This soil occupies 71 acres. It is in capability unit IVe–3; sewage disposal group 2; and woodland suitability group 1.

Mattapex Series

The Mattapex series consists of deep, moderately well drained soils developed in silty material over a sandy substratum. The silty material is like that in which the well-drained Matapeake, the poorly drained Othello, and the very poorly drained Portsmouth soils developed. The Mattapex soils are less brown and are more yellowish throughout than the Matapeake soils. In addition, the lower part of their subsoil is mottled and rather compact in most places, and in most areas it is somewhat platy. The Mattapex soils are much like the Woodstown soils in many respects, but their subsoil is silty clay loam instead of sandy clay loam, and they are more silty throughout.

The Mattapex soils are fairly extensive in this county. They are highly important for agriculture.

Profile of Mattapex silt loam, 0 to 2 percent slopes, in a cultivated area about 1 mile north of Bucktown:

A_p 0 to 8 inches, dark grayish-brown (2.5Y 4/2) silt loam; moderate, medium, crumb structure; friable when moist, slightly sticky but nonplastic when wet; roots plentiful; reaction about neutral (limed); clear, smooth boundary; horizon is 6 to 8 inches thick.

A_2 8 to 12 inches, light olive-brown (2.5Y 5/4) silt loam; weak, fine, subangular blocky structure; friable when moist, slightly plastic and slightly sticky when wet; roots fairly common; slightly acid; gradual, smooth boundary; horizon is 4 to 6 inches thick.

B_{21} 12 to 23 inches, light olive-brown (2.5Y 5/4) light silty clay loam; moderate, medium, subangular blocky structure; friable to slightly firm when moist, plastic and sticky when wet; few roots; slightly acid; clear, smooth boundary; horizon is 8 to 12 inches thick.

B_{22g} 23 to 32 inches, light olive-brown (2.5Y 5/6) light silty clay loam; common, coarse, distinct mottles of pale olive (5Y 6/3) and a few, medium, distinct mottles of yellowish brown (10YR 5/8); compound weak, medium, platy and weak, fine, subangular blocky structure; firm when moist, plastic and sticky when wet; very few roots; a few coating of light olive-brown (2.5Y 5/4) clay on the aggregates; slowly permeable; strongly acid; gradual, irregular boundary; horizon is 8 to 15 inches thick.

D_{1g} 32 to 42 inches, finely and evenly variegated light olive-gray and yellowish-brown (5Y 6/2 and 10YR 5/6) very light sandy clay loam; a few, fine, distinct to prominent mottles of strong brown (7.5YR 5/8); weakly stratified; moderately firm when moist, slightly plastic and slightly sticky when wet; no roots; strongly acid; gradual, irregular boundary; horizon is 8 to 20 inches thick.

D_{2g} 42 to 48 inches +, evenly variegated light olive-gray and yellowish-brown (5Y 6/2 and 10YR 5/6) sandy loam; massive or single grain; friable when moist, very slightly sticky but nonplastic when wet; no roots; very strongly acid.

In forested areas or areas that have not been plowed, there is a dark-colored A_1 horizon, generally 2 to 4 inches thick, over the A_2 horizon. In places the B_{21} horizon is yellowish brown (10YR 5/4 or 5/6). The B_{22g} horizon in some places has a stronger structure and is firmer than that in the profile described, or even somewhat brittle. The soil is moderately fine textured from the surface downward through the B_{22g} horizon. It is coarser textured at a greater depth.

Mattapex fine sandy loam, 0 to 2 percent slopes (MpA).—The surface layer of this soil contains more sand and less silt than that in the profile described. Because the B_{22g} horizon restricts drainage, the soil tends to remain wet for fairly long periods, especially during the planting season and early in the growing season. Removing the excess surface water during those seasons is the most important management problem. If the soil is adequately drained, it can be used for most of the crops commonly grown in the county. It occupies 299 acres and is in capability unit IIw–1; drainage group 2–A; irrigation group 4; sewage disposal group 7; and woodland suitability group 1.

Mattapex silt loam, 0 to 2 percent slopes (MsA).—In most places the profile of this soil is like the one described for the series. In a few small included areas the surface layer is somewhat less silty. Excessive wetness is the most important problem. This soil requires the same general management as Mattapex fine sandy loam, 0 to 2 percent slopes. It occupies 11,333 acres and is in capability unit IIw–1; drainage group 2–A; irrigation group 4; sewage disposal group 7; and woodland suitability group 1.

Mattapex silt loam, 2 to 5 percent slopes (MsB).—In most places the surface layer of this soil is silt loam, but in a few places it is slightly sandy. The soil has better surface drainage than Mattapex silt loam, 0 to 2 percent slopes. Runoff is more rapid than on soils that are better drained, but internal drainage is slow. Erosion is a significant hazard and is the most important management problem. This soil occupies 656 acres. It is in capability unit IIe–13; drainage group 2–A; irrigation group 4; sewage disposal group 7; and woodland suitability group 1.

Mattapex silt loam, 2 to 5 percent slopes, moderately eroded (MsB2).—All of this soil is at least moderately eroded, but in a few places erosion has been more severe. In some areas the soil is somewhat sandy. Its management is the same as that of Mattapex silt loam, 2 to 5

Figure 3.—Farm pond in an area of Mixed alluvial land not suited to crops. The pond replaces an unsightly area and provides fire protection and recreation.

percent slopes. Management should include practices to control erosion. This soil occupies 850 acres. It is in capability unit IIe–13; drainage group 2–A; irrigation group 4; sewage disposal group 7; and woodland suitability group 1.

Mixed Alluvial Land

This miscellaneous land type consists of unconsolidated alluvium on bottom lands or flood plains along streams. The material was deposited recently by floodwaters and is subject to frequent change as the result of overflow. It is generally stratified and varies widely in texture. In most areas the drainage is poor, but some areas are better drained.

The soil material in areas of Mixed alluvial land ranges from sand or loamy sand to loam or silt loam within short distances. The color ranges from light gray to dark gray or black, depending on the amount of organic matter that has accumulated.

Mixed alluvial land (Mx).—This miscellaneous land type is along some of the streams in Dorchester County. Because the soil material is mixed and is commonly wet, the land is seldom, if ever, used for agriculture (fig. 3). In addition, most of the areas are subject to yearly or more frequent flooding. This land occupies 2,019 acres. It is in capability unit VIw–1; sewage disposal group 8; and woodland suitability group 4.

Othello Series

The Othello series consists of poorly drained soils developed in a mantle of silty deposits over somewhat sandy to very sandy material. The soils are not so well drained as the Matapeake or Mattapex soils, but they are better drained than the Portsmouth soils. All of these soils developed in the same or in similar material. The profile of the Othello soils is similar to those of the Elkton and Fallsington soils, but the Elkton soils developed in silty clay to clay, and the Fallsington soils, in sandy material.

In spite of their poor drainage, the Othello soils are important to agriculture. If they are adequately drained, the soils may be used for most of the crops commonly grown in the county. Many areas, now in forest, were probably once used for cultivated crops. This is indicated by the old drainage ditches that still remain in many places now covered by pine and hardwood forests.

Profile of Othello silt loam in a loblolly pine forest, at a point about 4 miles west of Cambridge and about 1 mile south of Horn Point:

A_1 0 to 4 inches, dark-gray (5Y 4/1) silt loam; weak, medium, granular to crumb structure; friable when moist, slightly plastic and slightly sticky when wet; roots abundant; strongly acid; clear, smooth boundry, but in a few places very narrow tongues of material from this horizon extend downward into the lower horizons along old root channels; horizon is 3 to 5 inches thick.

A_2 4 to 8 inches, light-gray (5Y 6/1) silt loam; weak, fine, granular structure; friable when moist, sticky and slightly plastic when wet; roots plentiful; strongly to very strongly acid; clear, irregular boundary; horizon is 2 to 6 inches thick.

B_{2g} 8 to 25 inches, gray (5Y 5/1) silty clay loam; common, medium, prominent mottles of yellowish brown (10YR 5/8), weak, fine to medium, blocky and subangular blocky structure; firm when moist, plastic and sticky when wet; few roots; extremely acid; gradual, wavy boundary; horizon is 15 to 20 inches thick.

B_{3g} 25 to 32 inches, gray (5Y 5/1) heavy sandy loam; few, medium to coarse, prominent mottles of yellowish brown (10YR 5/4); compound very weak, medium, platy and moderate, very fine, blocky structure; firm when moist, slightly plastic and slightly sticky when wet; practically no roots; extremely acid; abrupt, smooth boundary; horizon is 6 to 9 inches thick.

D_g 32 to 40 inches +, light-gray (N 6/0), stratified loamy sand; a few, medium to coarse, prominent mottles of yellowish brown (10YR 5/4); friable when moist, nonplastic and nonsticky when wet; no roots; extremely acid.

In cultivated areas the plow layer is mainly dark gray (10YR 4/1 or 5Y 4/1) to grayish brown (2.5Y 5/2). In many places the soil lacks a B_{3g} horizon. The B_{2g} horizon in such areas is generally somewhat thicker than the one in the profile described. In places it is divided into two subhorizons that differ in texture or structure, or both, but differ little if any in color. In some small areas the surface layer is somewhat more sandy than the one described in the profile.

Othello silt loam (Oh).—The profile of this soil is the one described for the series. This is one of the most extensive soils in Dorchester County, and it is important for agriculture. If the soil is properly drained, it is suited to all the crops commonly grown in the county. It occupies 26,168 acres and is in capability unit IIIw–7; drainage group 8–1A; sewage disposal group 7; and woodland suitability group 3.

Othello silt loam, low (Ot).—This soil is close to sea level. Occasionally it is flooded temporarily when the tide is unusually high, but tide gates have been provided in some places to control the level of the water (fig. 4). The soil tends to remain wet for longer periods than the normal Othello silt loam, and it is difficult or almost impossible to drain. This soil is generally not suitable for cultivated crops. Under good management, it can be used for pasture or woodland. The soil occupies 12,433 acres. It is in capability group Vw–1; drainage group 10; sewage disposal group 7; and woodland suitability group 8.

Figure 4.—**Tide gate through a dike. The gate prevents water from high tides entering the pipe and flooding areas of Othello silt loam, low. At low tide, the gate opens and excess water is released.**

Plummer Series

The Plummer series consists of poorly drained soils developed in sandy material. The soils are in depressions and in other low-lying areas. They are generally level, or nearly level, but in places, near the borders of low-lying areas, they are gently sloping. The surface layer of these soils is dark gray because it contains organic matter. No B horizon has developed, and the surface layer rests directly on the sandy, light-colored substratum. In many places the substratum is streaked or splotched with gray or brown.

The Plummer soils have developed in about the same kind of material as the somewhat excessively drained Galestown and Lakeland soils and the moderately well drained Klej soils. In areas that have not been drained, the water table is high, and the soils are saturated during most of the year. In some places water stands on the surface for long periods.

These soils are very strongly acid to extremely acid and are not very productive. They are generally of little importance for agriculture.

Profile of Plummer loamy sand in a forested area just south of River Road, about 1¼ miles southwest of Allens Corner and about ¼ mile north of Marshyhope Creek:

A_1 0 to 4 inches, dark-gray (5Y 4/1), nearly loose, structureless loamy sand; roots fairly plentiful; very strongly acid; clear, slightly wavy boundary; horizon is 4 to 6 inches thick.

C_{1g} 4 to 16 inches, light olive-gray (5Y 6/2), loose, structureless loamy sand, grading to light brownish gray (2.5Y 6/2); streaks or variegations of gray in places; very few roots; extremely acid; gradual, irregular boundary; horizon is 6 to 15 inches thick.

C_{2g} 16 to 48 inches, light-gray (5Y 7/2), loose sand or very light loamy sand, grading to white (5Y 8/1); streaks and splotches of grayish brown (2.5Y 5/2) that are more abundant with increasing depth; no roots; when saturated the soil material is like quicksand and tends to flow; extremely acid.

In areas that have been cultivated, the plow layer is generally light gray. After rains, however, the surface layer in some areas is almost white after it has dried. Locally, the substratum is gray (5Y 5/1 or 6/1), but in some places it is mottled or blotched with brown or yellowish brown. In some places a D_g horizon that is finer textured than the horizons in the profile described is within 48 inches of the surface. Generally, the depth to this horizon is less than 6 or 8 feet.

Plummer loamy sand (Pm).—This soil is mainly in small, scattered areas in the more sandy parts of the county. Its profile is the one described for the series.

Although this soil is sandy, extremely acid, and low in productivity, its most important mangement problem is drainage. Some of the areas are difficult and expensive to drain, and, even if they are drained, the soil is low in nutrients and difficult to manage. Nevertheless, it is easy to work and does not form clods, even if worked when wet. The areas that have been drained are used to some extent for truck crops, corn, and home gardens. This soil occupies 665 acres. It is in capability unit IVw-8; drainage group 9-1; sewage disposal group 7; and woodland suitability group 3.

Pocomoke Series

The Pocomoke series consists of very poorly drained, dark-colored soils developed in sandy and silty material of the Coastal Plain. The surface layer of these soils is black or nearly black and is moderately coarse textured to medium textured. The subsoil is heavy sandy loam to sandy clay loam and overlies a sandier substratum.

The Pocomoke soils developed in about the same kind of material as the well drained Sassafras soils, the moderately well drained Woodstown soils, and the poorly drained Fallsington soils. They are much like the Portsmouth soils, but they developed in material that was much less silty, and they are much coarser textured throughout. The Pocomoke soils are also somewhat like the Johnston and Rutlege soils, but they have a distinct B horizon, which is lacking in the Johnston and Rutlege soils.

If the Pocomoke soils are drained, they are important for agriculture. They are used for most of the crops commonly grown in the county. Blueberries are also grown in some areas.

Profile of Pocomoke sandy loam in a forested area about 1¼ miles west of Reids Grove:

A_1 0 to 6 inches, black (5Y 2/1) sandy loam; weak, medium, crumb structure; very friable when moist, slightly sticky but nonplastic when wet; roots plentiful to abundant; strongly acid; high in organic matter; diffuse, wavy boundary; horizon is 5 to 8 inches thick.

B_{1g} 6 to 11 inches, very dark grayish-brown (2.5Y 3/2) heavy fine sandy loam; weak, fine, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and very slightly plastic when wet; few roots; strongly to very strongly acid; gradual, wavy boundary; horizon is 4 to 7 inches thick.

B_{21g} 11 to 19 inches, very dark grayish-brown (2.5Y 3/2) fine sandy clay loam; few, medium, faint mottles of gray (10YR 5/1); weak, fine, subanglar blocky structure; moderately hard when dry, friable to somewhat firm when moist, slightly plastic and slightly sticky when wet; very few roots; very strongly acid; gradual to diffuse, wavy boundary; horizon is 8 to 12 inches thick.

B_{22g} 19 to 28 inches, gray (5Y 5/1) heavy sandy loam; faint streaks and mottles of light gray (10YR 6/1); weak, fine, blocky structure; slightly to moderately hard when dry, friable to somewhat firm when moist, slightly plastic and slightly sticky when wet; no roots; strongly acid; clear, wavy boundary; horizon is 8 to 12 inches thick.

D_{1g} 28 to 46 inches, light-gray (5Y 7/2) sand; a few, coarse, distinct mottles of light yellowish brown (10YR 6/4); loose and structureless; no roots; very strongly acid; clear, wavy boundary; horizon is 10 to 20 inches thick.

D_{2g} 46 to 54 inches +, light olive-gray (5Y 6/2), thinly stratified sand and sandy loam; a few, coarse, prominent mottles of brown (10YR 5/3); loose to very friable; no roots; strongly acid to very strongly acid.

The surface layer in areas that have been cultivated is slightly lighter colored than that in areas under forest because it contains less organic matter. The texture of the surface layer ranges from sandy loam to loam. Where the surface layer is loam, the texture of the B horizons is slightly finer than that in the B horizons of the profile described. In some areas there is no B_{1g} horizon. The A_1 horizon in such areas is generally several inches thicker than that in the profile described. In places the B_{21g} and B_{22g} horizons have mottles that are yellowish brown or strong brown.

Pocomoke loam (Po).—The profile of this soil is similar to the one described for the series, but there is much less sand in the soil material above the substratum, the surface layer contains much more silt, and the subsoil contains somewhat more clay. If the soil is properly drained, it is suited to most of the crops commonly grown in the county. This soil occupies 3,898 acres. It is in capability unit IIIw–7; drainage group 9–3A; sewage disposal group 7; and woodland suitability group 3.

Pocomoke sandy loam (Ps).—The profile of this soil is the one described for the series. It is sandier throughout than Pocomoke loam. Therefore, it is somewhat easier to drain and is easier to work after it is drained. This soil occupies 2,611 acres. It is in capability unit IIIw–6; drainage group 9–3B; sewage disposal group 7; and woodland suitability group 3.

Portsmouth Series

The Portsmouth series consists of very poorly drained soils developed in a mantle of silt over sandy deposits of the Coastal Plain. The surface layer of these soils is very dark gray to black.

These soils developed in about the same kind of material as the well drained Matapeake soils, the moderately well drained Mattapex soils, and the poorly drained Othello soils. They are similar to the Pocomoke soils, but their surface layer and subsoil are finer textured. Their substratum tends to be sandy, but in most places it is slightly finer textured than the substratum of the Pocomoke soils. In some places the Portsmouth soils grade to areas of Bayboro soils. The subsoil of the Portsmouth soils is less fine textured than that of the Bayboro soils, and the Portsmouth soils are not so wet.

Many areas of Portsmouth soils are rather difficult to drain, and they remain in wetland forest. Where the soils have been drained, they are important for growing truck crops and general crops.

Profile of Portsmouth silt loam in a wooded area just south of Griffith Neck Road along the north edge of Bare Swamp, about 3½ miles east of Bestpitch:

A_1 0 to 8 inches, black (5Y 2/1) silt loam, high in organic matter; weak, medium, crumb structure; friable when moist, slightly plastic and slightly sticky when wet; common woody and plentiful fibrous roots; very strongly acid; abrupt, smooth to slightly wavy boundary; horizon is 7 to 10 inches thick.

B_{2g} 8 to 22 inches, olive-gray (5Y 5/2) silty clay loam; a few, medium, prominent mottles of brown (10YR 5/3); weak to moderate, medium, blocky structure; firm when moist, plastic and sticky when wet; roots few to common; very strongly acid; clear, smooth boundary; horizon is 14 to 20 inches thick.

B_{3g} 22 to 27 inches, olive-gray (5Y 5/2) heavy sandy loam; a few, medium, prominent mottles of brown or dark brown (10YR 4/3); very weak, medium to coarse, blocky structure; friable when moist, nonplastic but slightly sticky when wet; few roots; very strongly acid to extremely acid; gradual, smooth boundary; horizon is 4 to 6 inches thick.

D_g 27 to 40 inches +, pale-yellow (5Y 7/3), structureless sandy loam or heavy loamy sand; a few, medium, distinct mottles of olive yellow (5Y 6/6) and a few, medium, prominent mottles of brown (10YR 5/3); very friable when moist, nonplastic and nonsticky when wet; a very few roots; contains a few small lumps and thin lenses of sandy clay loam or sandy clay; very strongly acid.

In areas that have been drained and cultivated, the surface layer is very dark gray or very dark grayish brown instead of black. In some places the B_{2g} horizon is almost a silty clay and the B_{3g} horizon is finer textured than the one in the profile described.

Portsmouth silt loam (Pt).—Because this soil is difficult to drain, about three-fourths of the acreage is still in forest. The rest is used mainly for cultivated crops, but some small, scattered areas are used for pasture or are idle. If this soil is adequately drained and properly managed, however, it can be used regularly for cultivated crops. It occupies 1,641 acres and is in capability unit IIIw–7; drainage group 9–4A; sewage disposal group 7; and woodland suitability group 3.

Rutlege Series

The Rutlege series consists of very poorly drained soils that are very wet and very sandy. The surface layer of these soils is fairly high in organic matter, and it is thick and dark colored. The soils are in depressions and in other low-lying areas. They are nearly level; their slope is no greater than 1 percent in most places. In areas that have not been drained, the water table is high and the soils are typical of very sandy areas of Swamp.

The Rutlege soils developed in the same kind of sandy material as the poorly drained Plummer soils and the somewhat excessively drained Galestown and Lakeland soils. They are not well suited to agriculture.

Profile of Rutlege loamy sand in a forest of loblolly and pond pine, on Vienna Road about 4 miles northeast of Vienna and about 2 miles west of the junction of Marshyhope Creek and the Nanticoke River:

A_{11} 0 to 8 inches, black (10YR 2/1 to N 2/0) loamy sand; very weak, medium, crumb structure; loose to very friable; roots fairly plentiful; high content of organic matter; somewhat mucky in places; very strongly acid to extremely acid; gradual, smooth boundary; horizon is 6 to 10 inches thick.

A_{12g} 8 to 18 inches, variable very dark gray (5Y 3/1 to N 3/0), loose, structureless light loamy sand; a few roots; extremely acid; gradual, wavy to irregular boundary; horizon is 8 to 20 inches thick.

C_g 18 to 42 inches +, grayish-brown (2.5Y 5/2), loose, structureless sand, streaked, splotched, and mottled with light gray, pale yellow, and light yellowish brown (5Y 7/1, 2.5Y 8/4, and 2.5Y 6/4); practically no roots; when saturated, the soil material is like quicksand and tends to flow; extremely acid.

In areas that have been drained and cultivated, the plow layer in many places is gray to dark gray instead of black, and white grains of sand show distinctly against the darker background. In places the A_{12} horizon is slightly lighter colored than that in the profile described and extends to a depth of about 30 inches. Some of the streaks in the substratum are brown (10YR 5/3) or yellowish brown (10YR 5/4). A D_g horizon of sandy clay underlies the substratum in some places, generally at a depth of 40 to 60 inches.

Rutlege loamy sand (Ru).—This soil is mostly in the eastern part of the county in areas bordered by the Nanticoke River and by Marshyhope Creek. Its profile is the one described for the series.

This soil has little use unless it is drained. If it is adequately drained, however, it is suited to many of the crops commonly grown in the county, especially to truck crops and corn. This soil occupies 1,778 acres. It is in capability unit IVw–8; drainage group 9–5B; sewage disposal group 7; and woodland suitability group 3.

Sassafras Series

The Sassafras series consists of deep, well-drained, medium-textured soils of uplands. The soils formed in mixed deposits of sand, silt, and clay. They are characterized by a well-drained subsoil of brown sandy clay loam that is finer textured than the surface layer. In some areas the surface layer is loamy sand, the combined A horizons are about 16 to 24 inches thick, and there is a single, strongly developed B horizon of brown sandy clay loam that is 6 to 12 inches thick. In other areas the surface layer is sandy loam, the combined A horizons are about 7 to 16 inches thick, and the B horizon is much thicker.

The Sassafras soils are similar to the Matapeake soils, but they developed in sand, silt, and clay rather than in deposits high in silt. They developed in essentially the same kind of material as the moderately well drained Woodstown soils, the poorly drained Fallsington soils, and the very poorly drained Pocomoke soils.

In this county the Sassafras soils are among the most productive of the well-drained soils of uplands. They are used for all of the crops commonly grown in the county.

Profile of Sassafras sandy loam, 0 to 2 percent slopes, in a wooded area about 1¼ miles southeast of Hurlock:

A_1 0 to 5 inches, very dark grayish-brown (10YR 3/2) sandy loam; weak, medium, crumb structure; friable to very friable when moist, nonplastic and nonsticky when wet; abundant, fine, fibrous and common, woody roots; medium acid; clear, wavy boundary; horizon is 2 to 6 inches thick.

A_2 5 to 11 inches, light olive-brown (2.5Y 5/4) sandy loam; weak, fine, crumb structure; friable when moist, nonplastic and nonsticky when wet; roots common to plentiful; strongly acid; clear, wavy boundary; horizon is 5 to 10 inches thick.

B_1 11 to 14 inches, light yellowish-brown (10YR 6/4) light sandy clay loam; weak, medium, subangular blocky structure; friable when moist, slightly plastic and slightly sticky when wet; roots fairly common; strongly acid; gradual, wavy boundary; horizon is 2 to 6 inches thick.

B_{21} 14 to 22 inches, brown (7.5YR 5/4) sandy clay loam; moderate, medium, subangular blocky structure; friable to rather firm when moist, sticky and slightly plastic when wet; roots rather few; a few, thin, patchy clay films on aggregates; strongly acid, diffuse boundary; horizon is 6 to 10 inches thick.

B_{22} 22 to 32 inches, strong-brown (7.5YR 5/6) sandy clay loam; moderate, medium, blocky and subangular blocky structure; friable to somewhat firm when moist, plastic and sticky when wet; roots few; some thin, patchy clay films on the aggregates; strongly acid; clear, smooth to wavy boundary; horizon is 8 to 12 inches thick.

C 32 to 48 inches +, yellowish-brown (10YR 5/8) loamy sand, slightly variegated with strong brown and yellowish red (7.5YR 5/8 and 5YR 5/6); structureless; loose to somewhat compact; nonplastic and nonsticky when wet; no roots; strongly acid.

In places the texture of the A horizons is loam. In other places it is sandy loam, and in still other places it is loamy sand. In areas where the texture of these horizons is loamy sand, depth to the B_1 horizon ranges from 12 inches to as much as 24 inches. In areas that have been cultivated, the plow layer is generally dark grayish brown (10YR 4/2). In some areas the entire profile, but especially the subsoil, is somewhat more reddish than the profile described, and the surface layer is browner and less grayish or yellowish. The soil material in some places is much thicker over the substratum than that in the profile described. In places, at a depth between 30 and 60 inches, the texture of the substratum is sandy clay loam or sandy clay instead of loamy sand.

Sassafras loam, 0 to 2 percent slopes (SaA).—The surface layer of this soil contains somewhat less sand, more silt, and probably a little more clay than that in the profile described for the series. The subsoil is also somewhat finer textured and more firm. Because of the finer texture of the subsoil, this soil retains moisture better and is likely to be slightly more productive than the Sassafras soils that have a surface layer of sandy loam, but it is slightly harder to work and to manage. This soil occupies 2,392 acres. It is in capability unit I–4; irrigation group 4; sewage disposal group 1; and woodland suitability group 1.

Sassafras loam, 2 to 5 percent slopes, moderately eroded (SaB2).—This soil is like Sassafras loam, 0 to 2 percent slopes, but it has stronger slopes and is moderately eroded. The soil requires practices to protect it from further erosion. It occupies 336 acres and is in capability unit IIe–4; irrigation group 4; sewage disposal group 1; and woodland suitability group 1.

Sassafras loam, heavy substratum, 0 to 2 percent slopes (ShA).—This soil is like Sassafras loam, 0 to 2 percent slopes, but, at a depth between 30 and 60 inches, it has a substratum of sandy clay or sandy clay loam instead of loamy sand. The finer texture of the substratum increases its moisture-storing capacity and makes the soil somewhat more productive during seasons that are unusually dry. This soil occupies 116 acres. It is in capability unit I–4; irrigation group 4; sewage disposal group 1; and woodland suitability group 1.

Sassafras loamy sand, 0 to 2 percent slopes (SmA).—In this soil the A horizons are coarser textured and thicker than those in the profile described for the series. The B horizon is at a depth of 12 to 24 inches and is about 6 to 12 inches thick.

This soil is especially extensive near Hurlock, and it is important for agriculture. It is used largely to grow truck crops, but, for high yields, a large amount of fertilizer is required. The moisture-supplying capacity is rather low, and irrigation is needed to get good yields. This soil occupies 8,928 acres. It is in capability unit IIs-4; irrigation group 2; sewage disposal group 1; and woodland suitability group 2.

Sassafras loamy sand, 2 to 5 percent slopes (SmB).—This soil has slopes that are generally smooth, but in some places it is hummocky or there are low hills that resemble dunes. The soil is used and managed about the same as Sassafras loamy sand, 0 to 2 percent slopes. It occupies 5,212 acres and is in capability unit IIs-4; irrigation group 2; sewage disposal group 1; and woodland suitability group 2.

Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded (SmB2).—This soil has been eroded both by wind and water. In other respects it is similar to Sassafras loamy sand, 2 to 5 percent slopes, and about the same management practices are required to protect it from further erosion. The soil occupies 4,140 acres. It is in capability unit IIs-4; irrigation group 2; sewage disposal group 1; and woodland suitability group 2.

Sassafras loamy sand, 5 to 10 percent slopes (SmC).—This soil is much more susceptible to erosion than Sassafras loamy sand, 2 to 5 percent slopes. Protection from erosion is the most important management problem. The soil is low in moisture-supplying capacity. If it is used regularly for cultivated crops, it will need large amounts of fertilizer for good yields. This soil occupies 517 acres. It is in capability unit IIIe-33; irrigation group 2; sewage disposal group 2; and woodland suitability group 2.

Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded (SmC2).—This soil has lost part of the original surface layer through erosion, but it can still be used regularly for cultivated crops. The practices required to protect it from further erosion are the same as those used for Sassafras loamy sand, 5 to 10 percent slopes. This soil occupies 138 acres. It is in capability unit IIIe-33; irrigation group 2; sewage disposal group 2; and woodland suitability group 2.

Sassafras loamy sand, 5 to 10 percent slopes, severely eroded (SmC3).—Erosion has removed most of the original surface layer of this soil, and the present plow layer consists of material that was formerly part of the subsoil. If good management is used, the soil can be used occasionally for cultivated crops, but it requires practices to protect it from further erosion. It is low in moisture-supplying capacity, but irrigation may not be practical. This soil occupies 170 acres. It is in capability unit IVe-5; sewage disposal group 2; and woodland suitability group 2.

Sassafras loamy sand, 10 to 15 percent slopes (SmD).—This soil is not significantly eroded, but in most places its strong slope causes the hazard of erosion to be severe. The same kind of practices as those used for Sassafras loamy sand, 5 to 10 percent slopes, severely eroded, will effectively protect this soil from erosion. This soil occupies 242 acres. It is in capability unit IVe-5; sewage disposal group 2; and woodland suitability group 2.

Sassafras loamy sand, 15 to 40 percent slopes (SmF).—This soil is highly susceptible to erosion, and most of it has never been cleared. The strong slope makes the soil unsuitable for cultivated crops. Under especially careful management, however, it might be used for very limited grazing. This soil occupies 130 acres. It is in capability unit VIe-2; sewage disposal group 3; and woodland suitability group 2.

Figure 5.—Harvesting peppers on Sassafras sandy loam, 0 to 2 percent slopes.

Sassafras sandy loam, 0 to 2 percent slopes (SnA).—This is the most extensive Sassafras soil in the county, and its profile is the one described for the series. This soil has no particular limitations. If ordinary good farming methods are used, it can be used regularly for cultivated crops (fig. 5), but much fertilizer will be needed for high yields. During the drier seasons, crops grown on this soil will benefit greatly from irrigation. This soil occupies 19,041 acres. It is in capability unit I-5; irrigation group 3; sewage disposal group 1; and woodland suitability group 2.

Sassafras sandy loam, 2 to 5 percent slopes (SnB).—This soil has not been appreciably eroded, but its slope makes it susceptible to erosion. It requires management that will protect it from damage by water and wind. The soil occupies 1,474 acres. It is in capability unit IIe-5; irrigation group 3; sewage disposal group 1; and woodland suitability group 2.

Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded (SnB2).—All of this soil is at least moderately eroded, and in about 24 acres erosion has been severe. The soil requires practices that will protect it from further erosion. It occupies 3,931 acres and is in capability unit IIe-5; irrigation group 3; sewage disposal group 1; and woodland suitability group 2.

Sassafras sandy loam, 5 to 10 percent slopes (SnC).—This soil requires intensive practices that will help to control erosion. It needs to be stripcropped and tilled on the contour. Close-growing crops should be grown in long rotations. This soil occupies 251 acres. It is in capability unit IIIe-5; irrigation group 3; sewage disposal group 2; and woodland suitability group 2.

Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded (SnC2).—All of this soil is at least moderately eroded, and erosion has been severe in a few areas. Mapped with it are small areas in which drainage is slightly poorer than that in the typical Sassafras soils. The included areas occupy about 15 acres and are scattered throughout the county.

Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded, needs management that will protect it from further erosion. The practices used for Sassafras sandy loam, 5 to 10 percent slopes, are suitable. This soil occupies 181 acres and is in capability unit IIIe-5; irrigation group 3; sewage disposal group 2; and woodland suitability group 2.

Sassafras sandy loam, 10 to 15 percent slopes (SnD).—The strong slope makes this soil highly susceptible to erosion, and some areas are already eroded. The soil can be used only to a limited extent for cropping; very careful management is required to protect it from erosion.

Mapped with this soil are small areas in which drainage is slightly impeded. These areas occupy approximately 30 acres and are scattered throughout the county.

Sassafras sandy loam, 10 to 15 percent slopes, occupies 148 acres. It is in capability unit IVe-5; sewage disposal group 2; and woodland suitability group 2.

Sassafras sandy loam, 15 to 30 percent slopes (SnE).—On this steep soil the hazard of erosion is extremely severe. The soil is not suited to cultivated crops. It can be grazed to a limited extent, however, if it is carefully managed and protected from erosion, and some of the areas are suitable for sodded orchards. This soil occupies 169 acres. It is in capability unit VIe-2; sewage disposal group 3; and woodland suitability group 2.

Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes (SsA).—The profile of this soil is like the one described for the series, except that its substratum is sandy clay loam or sandy clay instead of loamy sand. Because it has a finer textured substratum, this soil retains more moisture and is somewhat more productive than the soils that have a substratum of loamy sand. Mapped with it are small areas where the surface layer is somewhat more sandy than that in the typical soil.

Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes, occupies 569 acres. It is in capability unit I-5; irrigation group 3; sewage disposal group 1; and woodland suitability group 2.

Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded (SsB2).—This soil has stronger slopes than Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes, and it is moderately eroded. Mapped with it are a few small areas where the slope is slightly greater than 5 percent, and about 43 acres where the surface layer is somewhat more sandy than that in the typical soil.

Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded, occupies 178 acres. It is in capability unit IIe-5; irrigation group 3; sewage disposal group 1; and woodland suitability group 2.

Sassafras sandy loam, thick solum, 0 to 2 percent slopes (StA).—The profile of this soil is similar to the one described for the series, except that the solum is thicker. Because of its thicker solum, this soil retains more moisture for plants to use than the typical Sassafras soils, and it is, therefore, somewhat more productive for most crops. This soil occupies 1,296 acres. It is in capability unit I-5; irrigation group 3; sewage disposal group 1; and woodland suitability group 2.

Sassafras sandy loam, thick solum, 2 to 5 percent slopes (StB).—This soil has lost little soil material as the result of erosion, but it is susceptible to erosion because of its slope. If the soil is used for cultivated crops, it needs to be protected from erosion. The soil occupies 359 acres. It is in capability unit IIe-5; irrigation group 3; sewage disposal group 1; and woodland suitability group 2.

Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded (StB2).—This soil is similar to Sassafras sandy loam, thick solum, 2 to 5 percent slopes, except that it is moderately eroded. It needs management practices that will protect it from further erosion. This soil occupies 632 acres. It is in capability unit IIe-5; irrigation group 3; sewage disposal group 1; and woodland suitability group 2.

Swamp

This miscellaneous land type consists of areas that are naturally wooded and are covered by water during most of the year. The soil material in these areas consists of sand, silt, clay, and muck, or of a mixture of material of these textures.

Swamp (Sw).—This miscellaneous land type is made up of areas of fresh water swamp. It is unsuitable for agriculture and has a cover consisting of a few pond pines and of hardwoods that tolerate water. Some timber is produced on the areas, but, otherwise, the land is suited only to wildlife. It occupies 17,413 acres and is in capability unit VIIw-1; sewage disposal group 8; and woodland suitability group 10.

Tidal Marsh

This miscellaneous land type consists of areas that are flooded periodically by tidal waters and are covered with rushes, grasses, cattails, and similar plants. The soil material in these areas is of many different textures.

Tidal marsh (Tm).—This miscellaneous land type is more extensive in Dorchester County than in other counties in Maryland. It consists of areas flooded periodically by tidal waters (fig. 6). This land type occupies much of the southern part of the county, particularly the southeastern part. Smaller areas occur in practically all parts of the county adjacent to the salt waters of Chesapeake Bay and its tidal tributaries. In addition, many of

Figure 6.—Concrete structure and tide gate used to control tidal waters on an area of wetland so that adjoining areas will not be flooded by salt water.

the islands that are part of this county consist almost entirely of Tidal marsh.

The areas of this land type are salty, and in many areas there are large concentrations of sulfur compounds, particularly where the soil material is clayey. Although saltgrass hay was once obtained from the areas, Tidal marsh has no agricultural use at the present time. It occupies 81,692 acres and is in capability unit VIIIw–1; sewage disposal group 8; and woodland suitability group 10.

Woodstown Series

The Woodstown series consists of moderately well drained soils of uplands. The soils developed in deposits of unconsolidated sand, silt, and clay of the Coastal Plain. They are somewhat sandy throughout and have a subsoil of sandy clay loam. Their somewhat impeded drainage causes the lower part of the subsoil to be mottled and poorly aerated.

The Woodstown soils developed in about the same kind of material as the well-drained Sassafras soils, the poorly drained Fallsington soils, and the very poorly drained Pocomoke soils. They are similar to the Mattapex soils, but they developed in mixed sands, silt, and clay rather than in silty material, and they are sandy throughout instead of silty. The Woodstown soils also resemble the Keyport soils, but they developed in coarser textured material. As a result, they are coarser textured throughout than those soils.

The Woodstown soils can be used for many of the crops commonly grown in the county. They need to have drainage improved, however, before they will be suitable for some of the commonly grown crops.

Profile of Woodstown sandy loam, 0 to 2 percent slopes, in a forest of loblolly pine about 1¼ miles southwest of Secretary:

A_1 0 to 1 inch, very dark grayish-brown (10YR 3/2) sandy loam; weak, medium, crumb structure; very friable when moist, nonplastic and nonsticky when wet; roots abundant; medium acid; clear, wavy boundary; horizon is ½ inch to 2 inches thick.

A_2 1 to 9 inches, light yellowish-brown (2.5Y 6/4) light sandy loam; very weak, medium, crumb structure; very friable when moist, nonplastic and nonsticky when wet; roots plentiful; medium acid; clear, wavy boundary; horizon is 6 to 12 inches thick.

B_{21} 9 to 16 inches, light yellowish-brown (10YR 6/4) light sandy clay loam; weak, medium, subangular blocky structure; friable when moist, slightly plastic and slightly sticky when wet; roots fairly common; a few, faint coatings of silt or clay on the aggregates; strongly acid; diffuse boundary; horizon is 5 to 8 inches thick.

B_{22} 16 to 23 inches, yellowish-brown (10YR 5/6) light sandy clay loam; weak to moderate, medium, blocky and subangular blocky structure; friable to somewhat firm when moist, sticky and slightly plastic when wet; a few fibrous and common woody roots; thin, discontinuous coatings of silt and clay on some aggregates; strongly acid; clear, slightly wavy boundary; horizon is 6 to 12 inches thick.

B_{23g} 23 to 30 inches, light brownish-gray (2.5Y 6/2) sandy clay loam; many, medium, distinct mottles of pale yellow and light yellowish brown (5Y 7/4 and 10YR 6/4); moderate, medium, blocky and subangular blocky structure; moderately firm when moist, sticky and moderately plastic when wet; a very few roots; a few, thick, discontinuous clay flows and coatings of yellowish brown (10YR 5/6); strongly acid; clear, smooth boundary; horizon is 6 to 10 inches thick.

C_g 30 to 38 inches, olive-gray (5Y 5/2) sandy loam; common, medium, prominent mottles of strong brown (7.5YR 5/6); massive; very friable; practically no roots; strongly to very strongly acid; gradual, smooth boundary; horizon is 8 to 10 inches thick.

D_g 38 to 48 inches +, light brownish-gray (2.5Y 6/2), somewhat gravelly loamy sand; streaks or splotches of light yellowish brown (10YR 6/4); loose and structureless; no roots; very strongly acid.

In most areas that have been cultivated, the plow layer is grayish brown (10YR 5/2). Depth to the mottled B_{23g} horizon ranges from 15 to 30 inches, but in most places that horizon is at a depth between 18 and 24 inches. In some areas the substratum is dominantly gray, has little or no mottling, and contains a fairly large amount of fine or very fine gravel.

Woodstown loam, 0 to 2 percent slopes (WdA).—The profile of this soil is like the one described for the series, except that the surface layer is loam instead of sandy loam. Also, the subsoil has a slightly finer texture. For this soil, drainage is the most important management problem. This soil occupies 1,240 acres. It is in capability unit IIw–1; drainage group 2–A; irrigation group 4; sewage disposal group 7; and woodland suitability group 1.

Woodstown sandy loam, 0 to 2 percent slopes (WoA).—This is one of the most extensive soils in the county, and it is important for agriculture. Its profile is the one described for the series. Because it is somewhat sandy, the soil is easier to work and to manage than Woodstown loam, 0 to 2 percent slopes, but it needs to have its drainage improved. This soil occupies 14,247 acres. It is in capability unit IIw–5; drainage group 2B; irrigation group 3; sewage disposal group 7; and woodland suitability group 2.

Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded (WoB2).—This soil, like the other Woodstown soils, needs improvement in drainage. Even more necessary, however, are practices that help to control further erosion. This soil occupies 502 acres. It is in capability unit IIe–13; drainage group 2B; irrigation group 3; sewage disposal group 7; and woodland suitability group 2.

Use and Management of the Soils

This section has six main parts. In the first, the system of capability classification used by the Soil Conservation Service is explained, the capability units of Dorchester County are briefly defined, and management practices are suggested for the soils of each capability unit. In the second, basic management practices suitable for all the soils are described. In the third, estimated average acre yields are shown for specified crops under two levels of management. After that, facts are given about woodland management, management of wildlife, and engineering uses of the soils.

Capability Groups of Soils

The capability classification is a grouping of soils that shows, in a general way, how suitable they are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be as many as four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, very sandy, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is a climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it have little or no susceptibility to erosion but have other limitations that limit their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe-4 or IIIe-5.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible, but unlikely, major reclamation projects. The county has approximately 29,500 acres of soils in class I, 64,000 acres in class II, 105,700 acres in class III, 7,200 acres in class IV, 30,500 acres in class V, 31,800 acres in class VI, 20,000 acres in class VII, and 82,000 acres in class VIII.

The soils have been grouped into the following classes, subclasses, and capability units. The numbers of the capability units in the following outline are not consecutive because a statewide system for numbering capability units is used, and only some of these capability units are represented in Dorchester County.

Class I.—Soils that have few limitations that restrict their use.
- (No subclasses)
  - Unit I-4.—Deep, well-drained, nearly level soils that are medium textured.
  - Unit I-5.—Deep, well-drained, nearly level soils that are moderately coarse textured.

Class II.—Soils that have some limitations that reduce the choice of plants or that require moderate conservation practices.
- Subclass IIe.—Soils subject to moderate erosion if they are not protected.
  - Unit IIe-4.—Deep, well-drained, nearly level to gently sloping soils that are medium textured.
  - Unit IIe-5.—Deep, well-drained, nearly level to gently sloping soils that are moderately coarse textured.
  - Unit IIe-13.—Moderately well drained, gently sloping to sloping, medium and moderately coarse textured soils that are moderately limited by wetness.
- Subclass IIw.—Soils that have moderate limitations because of excess water.
  - Unit IIw-1.—Moderately well drained, nearly level, medium-textured soils that have a moderately permeable subsoil.
  - Unit IIw-5.—Moderately well drained, nearly level, moderately coarse textured soil that has a moderately permeable subsoil.
  - Unit IIw-8.—Moderately well drained, nearly level, medium-textured soils that have a subsoil that is slowly to very slowly permeable.
- Subclass IIs.—Soils that have moderate limitations of moisture capacity or tilth.
  - Unit IIs-4.—Deep, well-drained, nearly level to moderately sloping soils that have a coarse-textured surface layer and a finer textured subsoil.

Class III.—Soils that have severe limitations that reduce the choice of plants, or require special conservation practices, or both.
- Subclass IIIe.—Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe-4.—Deep, well-drained, sloping to somewhat rolling, medium-textured soils.
  - Unit IIIe-5.—Deep, well-drained, sloping to somewhat rolling, moderately coarse textured soils.
  - Unit IIIe-33.—Deep, well-drained, sloping to somewhat rolling, coarse-textured soils that have a subsoil that is finer textured than the rest of the profile.
- Subclass IIIw.—Soils that have severe limitations because of excess water.
  - Unit IIIw-5.—Very poorly drained, medium-textured soil that has a very slowly permeable, fine-textured subsoil.
  - Unit IIIw-6.—Poorly drained and very poorly drained, moderately coarse textured soils that have a moderately permeable subsoil.
  - Unit IIIw-7.—Poorly drained and very poorly drained, medium-textured soils that have a subsoil in which permeability is moderate to moderately slow.
  - Unit IIIw-8.—Somewhat poorly drained to moderately well drained, coarse-textured soils that have a subsoil in which permeability is moderately rapid.
  - Unit IIIw-9.—Poorly drained, medium-textured soils that have a subsoil in which permeability is slow to very slow.
- Subclass IIIs.—Soils that have severe limitations of moisture capacity or tilth.
  - Unit IIIs-1.—Deep, somewhat excessively drained, nearly level to moderately sloping

soils that are coarse textured and rapidly permeable.

Class IV.—Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe.—Soils subject to very severe erosion if they are cultivated and not protected.

Unit IVe-3.—Deep, well-drained, strongly sloping, medium-textured soil.

Unit IVe-5.—Deep, well-drained, moderately sloping and strongly sloping, moderately coarse textured and coarse textured soils that are severely eroded.

Subclass IVw.—Soils that have very severe limitations for cultivation because of excess water.

Unit IVw-8.—Poorly drained and very poorly drained, coarse-textured, rapidly permeable soils.

Subclass IVs.—Soils that have very severe limitations of low moisture capacity or other soil features.

Unit IVs-1.—Deep, somewhat excessively drained and excessively drained, nearly level to strongly sloping, coarse-textured, very rapidly permeable soils.

Class V.—Soils that have little or no hazard of erosion but with other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.

Subclass Vw.—Soils too wet for cultivation; drainage or protection not feasible.

Unit Vw-1.—Poorly drained, medium-textured soils of bottom lands that have a subsoil that is slowly to very slowly permeable.

Class VI.—Soils that have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass VIe.—Soils severely limited, chiefly by risk of erosion if protective cover is not maintained.

Unit VIe-2.—Deep, well-drained, steep soils.

Subclass VIw.—Soils severely limited by excess water and generally unsuited to cultivation.

Unit VIw-1.—Nearly level, wet, variable soil that is subject to flooding.

Unit VIw-2.—Poorly drained and very poorly drained, very slowly permeable soils.

Subclass VIs.—Soils generally unsuited to cultivation and limited for other uses by their moisture capacity or other soil features.

Unit VIs-1.—Deep, somewhat excessively drained and excessively drained, strongly sloping to rolling, coarse-textured, very rapidly permeable soils.

Class VII.—Soils that have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIw.—Soils very severely limited by excess water.

Unit VIIw-1.—Very wet, unclassified soil material.

Subclass VIIs.—Soils very severely limited by moisture capacity or other soil features.

Unit VIIs-1.—Deep, somewhat excessively drained and excessively drained, steep soils that are coarse textured and rapidly permeable.

Class VIII.—Soils and landforms having limitations that preclude their use for commercial production of plants and restrict their use to recreation, wildlife, water supply, or esthetic purposes.

Subclass VIIIw.—Extremely wet or marshy land.

Unit VIIIw-1.—Land regularly subject to flooding by high tides.

Subclass VIIIs.—Rock or soil material that has little potential for production of vegetation.

Unit VIIIs-1.—Land where soil has been removed.

Unit VIIIs-2.—Almost bare, noncoherent, loose sand.

Management by capability units

Soils in one capability unit have about the same limitations to use and similar risks of damage. The soils in one unit, therefore, need about the same kind of management, though they may have formed from different kinds of parent material and in different ways. The capability units are described briefly in table 6. For each unit, the soils are listed and management suitable for all the soils of the unit is suggested.

General Management Requirements

Some management practices needed to obtain the maximum practical yields are similar on all the soils of the county. These include draining the soils that are wet all or part of the year, using the proper soil amendments, choosing a suitable rotation, and tilling the soils properly. In this section these basic management practices are discussed. Management for irrigated crops, such as fruits and vegetables, is discussed in the section "Soil Groups for Irrigation." Irrigation is expensive, and it is not profitable unless a large amount of fertilizer is added to the soils used to grow truck crops, and the soils are managed according to the practices described in this section.

Drainage

Improving drainage is one of the principal management needs in Dorchester County. More than half of the acreage of soils suitable for crops needs to be drained. Yields are often poor or the crop may fail completely unless drainage is well established and is well maintained and controlled. This is especially true in the southern and western parts of the county.

Only a few farms, chiefly in the northeastern part of the county, are located entirely on well-drained soils. In that area the elevation is higher than it is in the southern and western parts.

About one-third of the total acreage of the soils that require drainage is made up of moderately well drained soils. In areas where the soils are only moderately well drained, some kind of drainage is needed, if merely to remove excess surface water during wet periods. The kind and amount of artificial drainage depend on the crop to be grown.

Other soils that require drainage are the poorly drained and very poorly drained soils. These soils must have marked improvement in drainage if most crops are to be grown successfully. Examples of the poorly drained or very poorly drained soils are the Bayboro soils, the Elkton

TABLE 6.—*Capability classification, uses, and management requirements of the soils*

General description of capability unit and name of soil	Requirements for use and management
Unit I–4 (8,800 acres): Deep, well-drained, nearly level soils that are medium textured. Matapeake fine sandy loam, 0 to 2 percent slopes. Matapeake silt loam, 0 to 2 percent slopes. Sassafras loam, 0 to 2 percent slopes. Sassafras loam, heavy substratum, 0 to 2 percent slopes.	The soils of this unit are the best for agriculture of any in the county. They retain moisture and plant nutrients well and are easy to work. Under good management they are suited to intensive cultivation. The soils are highly productive and are suited to many different uses. They are excellent for growing peaches and strawberries. Corn, soybeans, and small grains are also grown extensively, and vegetables, hay crops, and pasture crops are grown to a lesser extent. For high yields, the supply of plant nutrients must be kept high, lime should be applied as needed, and legumes and green-manure crops grown. The soils do not need artificial drainage, nor do they need special practices to help control erosion.
Unit I–5 (21,000 acres): Deep, well-drained, nearly level soils that are moderately coarse textured. Sassafras sandy loam, 0 to 2 percent slopes. Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes. Sassafras sandy loam, thick solum, 0 to 2 percent slopes.	The soils of this unit are friable. Under good management they can be cultivated intensively over a long period of time. They are somewhat more sandy than the soils of capability unit I–4; therefore, they do not hold moisture and plant nutrients so well. Nevertheless, if a good supply of plant nutrients is maintained, yields should be as high as those obtained on the soils of capability unit I–4. These soils are suited to the same kinds of crops as are grown on the soils of capability unit I–4, but they are perhaps better suited to truck crops and strawberries and are even easier to work. They do not need artificial drainage, nor do they need special practices to protect them from erosion.
Unit IIe–4 (3,200 acres): Deep, well-drained, nearly level to gently sloping soils that are medium textured. Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded. Matapeake silt loam, 2 to 5 percent slopes. Matapeake silt loam, 2 to 5 percent slopes, moderately eroded. Sassafras loam, 2 to 5 percent slopes, moderately eroded.	The soils of this unit are similar to the soils of capability unit I–4, but they have stronger slopes and there is a moderate hazard of erosion. Erosion has already been active in most areas, but it has not been severe. The soils need to be tilled on the contour, and they require a longer rotation than the soils of capability unit I–4. Otherwise, they are used and managed about the same. Hay or some other close-growing crop needs to be included in the cropping system.
Unit IIe–5 (6,600 acres): Deep, well-drained, nearly level to gently sloping soils that are moderately coarse textured. Sassafras sandy loam, 2 to 5 percent slopes. Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded. Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded. Sassafras sandy loam, thick solum, 2 to 5 percent slopes. Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded.	The soils of unit IIe–5 have moderate limitations to use because of the risk of erosion. They need to be tilled on the contour and require a longer rotation than the soils of capability unit I–5. In addition, close-growing crops need to be included in the rotation. Except for practices to help control erosion, these soils have the same uses and require the same management as the soils of capability unit I–5.
Unit IIe–13 (2,800 acres): Moderately well drained, gently sloping to sloping, medium and moderately coarse textured soils that are moderately limited by wetness. Keyport silt loam, 2 to 5 percent slopes. Mattapex silt loam, 2 to 5 percent slopes. Mattapex silt loam, 2 to 5 percent slopes, moderately eroded. Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.	The soils of unit IIe–13 have somewhat impeded drainage. Because of their slope and slowly permeable subsoil, runoff is rapid enough that protecting them from erosion is more important than improving drainage. The soils are too wet during some periods, however, and too dry during others. Good management not only includes practices to help control erosion, but it also includes practices to remove excess surface water. A good supply of plant nutrients must be maintained, and lime may be required. The soils are not well suited to alfalfa and similar crops that are damaged by frost heaving in winter. They are well suited to corn, soybeans, hay crops other than alfalfa, and pasture.
Unit IIw–1 (13,000 acres): Moderately well drained, nearly level, medium-textured soils that have a moderately permeable subsoil. Mattapex fine sandy loam, 0 to 2 percent slopes. Mattapex silt loam, 0 to 2 percent slopes. Woodstown loam, 0 to 2 percent slopes.	The soils of this unit are moderately wet. They are somewhat similar to the soils of capability unit IIe–13, except that they are nearly level and there is little or no hazard of erosion. The soils are suited to most crops that are commonly grown if adequate drainage is provided, but they are not well suited to alfalfa and similar crops that are damaged by frost heaving in winter. Tile or open ditches, properly spaced and installed, are needed to carry off and dispose of excess water. The ditches should be shallow enough that they do not extend into the sandy substratum, because the sandy material tends to flow and to cave into the channels. A good supply of plant nutrients needs to be maintained, and the soils may also require lime.
Unit IIw–5 (14,000 acres): Moderately well drained, nearly level, moderately coarse textured soil that has a moderately permeable subsoil. Woodstown sandy loam, 0 to 2 percent slopes.	This soil is sandier throughout and is more easily worked than the soils of capability unit IIw–1, but it is used and managed about the same. Yields tend to be somewhat lower on this soil, however, unless a high level of fertility is maintained Drainage is the most important management problem. If adequate drainage is provided, the soil tends to warm up more quickly in spring than other soils that have impeded drainage. Ditches used to carry off excess water should not extend into the sandy substratum.

Table 6.—*Capability classification, uses, and management requirements of the soils*—Continued

General description of capability unit and name of soil	Requirements for use and management
Unit IIw–8 (6,000 acres): Moderately well drained, nearly level, medium-textured soils that have a slowly to very slowly permeable subsoil. Keyport loam, 0 to 2 percent slopes. Keyport silt loam, 0 to 2 percent slopes.	The soils of this unit are only moderately well drained. Water infiltrates slowly and drains through the profile very slowly. The soils should be cultivated only within a narrow range of moisture content. In areas that have been cultivated, the surface layer tends to pack after heavy rains. Drainage is the most important management problem, but V-type ditches that are properly spaced are generally adequate for removing excess water. Tile is not suitable for draining the soils, because of the fine texture of the subsoil. If the soils are properly drained, cultivated only when they are neither too wet nor too dry, and otherwise well managed, moderate to high yields are obtained of most of the crops commonly grown in the area. The soils are not well suited to alfalfa, however, because of heaving in winter.
Unit IIs–4 (18,000 acres): Deep, well-drained, nearly level to moderately sloping soils that have a coarse-textured surface layer and a finer textured subsoil. Sassafras loamy sand, 0 to 2 percent slopes. Sassafras loamy sand, 2 to 5 percent slopes. Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded.	The surface layer of the soils of this unit is thick and consists of friable loamy sand. The subsoil is thin and consists of friable sandy clay loam, underlain by sand at a depth below 24 to 30 inches. The soils are low in plant nutrients and organic matter, and they are rather low in moisture-storing and in moisture-supplying capacity. Supplemental irrigation is desirable in all areas, and it is necessary in some areas to keep sufficient moisture in the soil. The soils are well suited to most crops, and they are used rather extensively for sweetpotatoes and other truck crops. If adequate moisture is supplied and a high level of fertility is maintained, fair to good yields are obtained.
Unit IIIe–4 (280 acres): Deep, well-drained, sloping to somewhat rolling, medium-textured soils. Matapeake silt loam, 5 to 10 percent slopes. Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.	The soils of this unit have strong slopes and are susceptible to erosion. They are suited to about the same crops as the soils of capability units I–4 and IIe–4, and about the same yields are obtained if good management is used. The soils need a longer rotation than the soils of capability units I–4 and IIe–4; hay or other close-growing crops need to be grown for a greater part of the time. Planting buffer strips and tilling on the contour will help to protect the soils from further erosion. Sodded waterways are needed to carry off excess surface water.
Unit IIIe–5 (430 acres): Deep, well-drained, sloping to somewhat rolling, moderately coarse textured soils. Sassafras sandy loam, 5 to 10 percent slopes. Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.	These soils are similar to the soils of capability units I–5 and IIe–5, but they have stronger slopes and are more susceptible to erosion. They are somewhat more sandy than the soils of capability unit IIIe–4, and are more easily worked and managed than those soils. Yields are slightly lower than on the soils of capability unit IIIe–4 unless a good supply of plant nutrients is maintained.
Unit IIIe–33 (660 acres): Deep, well-drained, sloping to somewhat rolling, coarse-textured soils that have a subsoil that is finer textured than the rest of the profile. Sassafras loamy sand, 5 to 10 percent slopes. Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded.	The soils of this unit have stronger slopes than the soils of capability unit IIs–4, but they are similar in other respects. Protection from erosion is the principal management need. For good yields, however, a good supply of moisture must be maintained; supplemental irrigation is desirable in all areas, and it is necessary in some areas. Stripcropping and tilling on the contour are good management practices to use to help reduce erosion. The rotation should be longer on these soils than on less sloping soils.
Unit IIIw–5 (3,600 acres): Very poorly drained, medium-textured soil that has a very slowly permeable, fine-textured subsoil. Bayboro silt loam.	This soil is very poorly drained. It is very slowly permeable and is in low positions; thus, it is difficult to drain. Adequate drainage with V-type or other kinds of field ditches must be provided, however, if the soil is to be used for cultivated crops. The ditches need to be properly spaced, graded, and maintained. Tile is not suitable for draining the soil, because of the fine texture and very slow permeability of the subsoil. After the soil is drained, it is well suited to corn, soybeans, and grasses, but fertilizer and lime will be needed.
Unit IIIw–6 (25,000 acres): Poorly drained and very poorly drained, moderately coarse textured soils that have a moderately permeable subsoil. Fallsington sandy loam. Pocomoke sandy loam.	The Fallsington soil in this capability unit is poorly drained and has a gray surface layer. The Pocomoke soil is very poorly drained and has a very dark gray to black surface layer that is high in organic matter. Use of these soils for some crops is limited unless adequate artificial drainage is provided. The soils are well suited to tiling, but open ditches are difficult to maintain because the sand tends to cave and flow. If proper drainage is established and fertilizer and lime are added, good yields can be obtained. The soils are not well suited to alfalfa and lespedeza, and they are not used extensively to grow small grains.
Unit IIIw–7 (33,000 acres): Poorly drained and very poorly drained, medium-textured soils that have a subsoil in which permeability is moderate to moderately slow. Bibb silt loam. Johnston loam. Othello silt loam. Pocomoke loam. Portsmouth silt loam.	This capability unit has the largest acreage of soils that are cultivated of any capability unit in the county, and, therefore, proper management is highly important. The soils are similar to those of capability unit IIIw–6, but their surface layer is less sandy and they have a somewhat finer textured subsoil. Drainage is slightly more difficult than on the soils of capability unit IIIw–6, but after drainage has been established, yields are generally higher than they are on those soils. V-type ditches can be used, but they will require different spacing than those used to drain the soils of capability unit IIIw–6, and they should not be deep enough to penetrate the sandy substratum. The soils need fertilizer. Because they are strongly acid, they also ought to be tested frequently to determine the need for lime.

TABLE 6.—*Capability classification, uses, and management requirements of the soils*—Continued

General description of capability unit and name of soil	Requirements for use and management
Unit IIIw-8 (5,600 acres): Somewhat poorly drained to moderately well drained, coarse-textured soils that have a subsoil in which permeability is moderately rapid. Klej loamy sand, 0 to 2 percent slopes. Klej loamy sand, 2 to 5 percent slopes.	The soils of this unit have impeded drainage, and they are also very permeable, strongly acid, and low in plant nutrients. The soils are wet in wet seasons, but they store and supply little moisture to plants during dry seasons. Surface drainage is required if the soils are used for cultivated crops. A drainage system is difficult to maintain, however, because the sand tends to flow. Nevertheless, good yields can be obtained if supplemental irrigation is available during dry seasons and if a good supply of plant nutrients is maintained. The soils are well suited to the crops commonly grown in the area if they are properly managed, but yields are somewhat lower than on some of the better agricultural soils.
Unit IIIw-9 (27,000 acres): Poorly drained, medium-textured soils that have a subsoil in which permeability is slow to very slow. Elkton loam. Elkton silt loam.	The soils of this capability unit are very difficult to drain because their subsoil is fine textured and slowly permeable. Field ditches are generally used to remove excess water. If drainage is provided, corn, soybeans, grasses, and other crops can be grown, but the soils will need fertilizer and lime. They are not suited to small grains and alfalfa, but they could be used more extensively for pasture. The soils are hard when dry and sticky when wet; they can be cultivated only within a narrow range of moisture content.
Unit IIIs-1, (10,000 acres): Deep, somewhat excessively drained, nearly level to moderately sloping soils that are coarse textured and rapidly permeable. Galestown loamy sand, 0 to 2 percent slopes. Galestown loamy sand, 2 to 5 percent slopes. Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes. Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes.	The soils of this capability unit are acid, rapidly permeable, and low in plant nutrients. They also contain little organic matter. Because they are sandy and have rapid permeability, their capacity to retain moisture is low. The soils are susceptible to erosion by wind and need to be protected by a cover of plants. Proper management consists of including a close-growing crop in the rotation, planting crops in strips crosswise to the direction of prevailing winds, and establishing windbreaks. The supply of organic matter can be increased by keeping crop residues on the surface or plowing them into the surface layer. These areas are used to grow vegetables and other crops that have a high value per acre. They require some lime and large amounts of fertilizer, which should be applied according to the needs indicated by soil tests. Because the soils tend to be droughty, crops are likely to need supplemental irrigation.
Unit IVe-3 (70 acres): Deep, well-drained, strongly sloping, medium-textured soil. Matapeake silt loam, 10 to 15 percent slopes.	Except for stronger slopes, this soil is similar to the soils of capability units I-4, IIe-4, and IIIe-4, and there is a severe hazard of erosion. Practices to help control erosion include contour strip cropping, tilling on the contour, establishing a buffer strip, and retaining crop residues on the surface or plowing them into the surface layer. In some places terracing will be needed. Surface runoff, especially from the terrace channels, can be disposed of through diversions and sodded waterways, but the outlets need to be planned and maintained carefully. If these management practices are used, good yields can be obtained of the crops commonly grown in the area. It is especially necessary, however, to use a long rotation in which the surface is protected by a cover of plants most of the time. Soybeans are not a good crop to grow, because they make the soil more erodible.
Unit IVe-5 (560 acres): Deep, well-drained, moderately sloping and strongly sloping, moderately coarse textured and coarse textured soils that are severely eroded. Sassafras loamy sand, 5 to 10 percent slopes, severely eroded. Sassafras loamy sand, 10 to 15 percent slopes. Sassafras sandy loam, 10 to 15 percent slopes.	The soils of this capability unit have characteristics that are similar to those of the soils of capability units I-5, IIe-5, and IIIe-5, and they have some characteristics like those of the soils of capability unit IIIe-33. They have stronger slopes than the soils in any of those capability units, and they are, therefore, more susceptible to erosion. If crops are to be grown safely, the management should be similar to that used for the soils of capability unit IVe-3. The surface layer of these soils is more sandy than that of the soils of capability unit IVe-3, and these soils are easier to work. Yields are generally lower, however, than those obtained on the soils of capability unit IVe-3, unless a good supply of plant nutrients is maintained.
Unit IVw-8 (2,400 acres): Poorly drained and very poorly drained, coarse-textured, rapidly permeable soils. Plummer loamy sand. Rutlege loamy sand.	This capability unit is made up of poorly drained and very poorly drained, very sandy soils. The Plummer soil has a gray surface layer, and the Rutlege soil has a very dark gray to black surface layer that is high in organic matter. The poor drainage strongly limits the use of these soils for crops. Drainage that is carefully controlled is necessary to obtain even moderate yields of the crops commonly grown. These soils can be drained either by tile or ditches, but tile is expensive and the soils have rather low productivity. Ditches are difficult to maintain because the sand tends to cave and flow. After the soils are drained, they are suited to corn, soybeans, and some vegetable crops, but care must be taken to maintain a good supply of plant nutrients.
Unit IVs-1 (4,100 acres): Deep, somewhat excessively drained and excessively drained, nearly level to strongly sloping, coarse-textured, very rapidly permeable soils. Galestown loamy sand, 5 to 10 percent slopes. Galestown sand, 0 to 2 percent slopes. Galestown sand, 2 to 5 percent slopes. Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes. Lakeland sand, clayey substratum, 0 to 5 percent slopes.	The soils of this capability unit are sandy and droughty. They are low in moisture-holding capacity, contain only a small supply of plant nutrients, and are susceptible to erosion by wind and water. The soils are similar to the soils of capability unit IIIs-1, but some are more sandy. In some places they have stronger slopes, and all of them are more limited in use. The soils need the same management practices as are used for the soils of capability unit IIIs-1. They also need terraces, and they need contour tillage and other practices that help to control erosion. If these practices are used, fair to good yields of suitable crops can be obtained. Because the soils tend to be droughty, crops are likely to need irrigation.

TABLE 6. *Capability classification, uses, and management requirements of the soils*—Continued

General description of capability unit and name of soil	Requirements for use and management
Unit Vw-1 (30,000 acres): Poorly drained, medium-textured soils of bottom lands that have a subsoil that is slowly to very slowly permeable. Elkton silt loam, low. Othello silt loam, low.	The soils of this capability unit are only slightly above sea level. They are not subject to erosion, but they are wet during most of the year. Because of their low position, they are flooded occasionally when tides are high, and they are difficult to drain. The slow permeability of the subsoil adds to the difficulty in draining them. These soils are ordinarily not suited to cultivated crops. They are fairly well suited to pasture and can even be overgrazed without damage. The pastures can be improved by clearing the areas, destroying the brush, and then seeding or sprigging and adding fertilizer and lime. The areas should be mowed as needed. Some tame or wild hay may be cut when the soils are used for grazing.
Unit VIe-2 (300 acres): Deep, well-drained, steep soils. Sassafras loamy sand, 15 to 40 percent slopes. Sassafras sandy loam, 15 to 30 percent slopes.	The soils of this capability unit are too steep for cultivated crops, but they can be used to a limited extent for hay. They can also be used to some extent for forest trees or orchards, but the most common suitable use is for improved pasture. The areas to be pastured need to be prepared for seeding. Then, planting can be done by seeding or sprigging. The areas will require fertilizer, and lime should be added as needed. Care must be taken to protect the areas from overgrazing, because overgrazing would cause the soils to be left bare and serious erosion would result. Plants growing on the Sassafras loamy sand are more likely to be damaged by short periods of drought than plants growing on the Sassafras sandy loam.
Unit VIw-1 (2,000 acres): Nearly level, wet, variable soil that is subject to flooding. Mixed alluvial land.	This capability unit consists of variable soil material on flood plains. The areas are not suited to cultivated crops, because they are mostly poorly drained or very poorly drained and are subject to flooding. The areas can be used for hay or pasture if they are drained and well managed. They can also be used for woodland and for wildlife habitats.
Unit VIw-2 (31,000 acres): Poorly drained and very poorly drained, very slowly permeable soils. Bayboro silty clay loam. Elkton silty clay loam. Elkton silty clay loam, low.	These soils are too wet, too difficult to drain, and too difficult to work to be used for cultivated crops. They are flooded occasionally when tides are extremely high. Their surface layer is hard when dry, tough when moist, and sticky when wet, and their subsoil is so fine textured and so slowly permeable that drainage is impractical. The soils are mostly in forest, but some areas are used for grazing. The areas that are grazed can be improved by seeding, adding fertilizer and lime, and controlling the weeds.
Unit VIs-1 (590 acres): Deep, somewhat excessively drained and excessively drained, strongly sloping to rolling, coarse-textured, very rapidly permeable soils. Galestown loamy sand, 10 to 15 percent slopes. Galestown sand, 5 to 10 percent slopes. Lakeland sand, clayey substratum, 5 to 15 percent slopes.	The soils of this capability unit are strongly sloping to somewhat steep, and they are very sandy, droughty, and low in fertility. The soils are not suited to cultivated crops, but they can be used for limited grazing or forests. The soils can also be used for orchards if they are well managed. If pastures are established, they should be managed carefully because the soils will be damaged severely even if only slightly overgrazed.
Unit VIIw-1 (17,400 acres): Very wet, unclassified soil material. Swamp.	This capability unit consists of very wet soil material in swampy areas and on the flood plains of rivers. The areas are not used for cultivated crops, because drainage is impractical. They are generally suitable only for wetland forests. The areas provide shelter for wildlife, however, and they support limited grazing during periods of low water.
Unit VIIs-1 (400 acres): Deep, somewhat excessively drained and excessively drained, steep soils that are coarse textured and rapidly permeable. Galestown sand and loamy sand, 15 to 40 percent slopes. Galestown sand, 10 to 15 percent slopes.	This unit consists of steep areas of deep sands that are severely limited for crops by droughtiness. The soils are coarse textured, excessively drained, and rapidly permeable. They are not suited to cultivated crops, nor are they suitable for pasture, although they provide very limited grazing and shelter for livestock. They also provide shelter for wildlife, particularly deer, quail, rabbits, and squirrels. The soils are generally poorly suited to trees. If properly managed, however, Virginia pine can be grown for pulpwood, and planted loblolly pine grows well.
Unit VIIIw-1 (81,000 acres): Land regularly subject to flooding by high tides. Tidal marsh.	This capability unit consists of areas of Tidal marsh that are flooded regularly by high tides. The soil materials are too wet and salty to be used for agriculture. These areas and their tidal waterways are excellent for wildlife, and they provide habitats for ducks, geese, swans, rails, and other native and migratory waterfowl.
Unit VIIIs-1 (150 acres): Land where soil has been removed. Borrow and gravel pits.	This capability unit consists only of borrow pits and gravel pits. Unless the areas are completely reclaimed, they serve no useful purpose for agriculture.
Unit VIIIs-2 (200 acres): Almost bare, noncoherent, loose sand. Coastal beaches.	This capability unit consists entirely of sandy beaches that border the Chesapeake Bay and some of the larger rivers. The areas have no agricultural use, but they are suitable for recreation.

silty clay loams, and the low phases of the Elkton and Othello soils. All of these soils have a heavy, intractable surface layer. They are too wet to be suitable for cultivated crops unless very intensive artificial drainage is applied.

The following shows the general drainage requirements of the soils in Dorchester County. More complete information about the drainage needed can be found in the section "Soil Groups for Drainage."

1. Soils that require no artificial drainage: Galestown, Lakeland, Matapeake, Sassafras.
2. Soils that require moderate artificial drainage: Keyport, Klej, Mattapex, Woodstown.
3. Soils that require intensive artificial drainage: Bibb, Fallsington, Othello, Plummer, Elkton.
4. Soils that require very intensive artificial drainage: Bayboro, Portsmouth, Johnston, Pocomoke, Rutlege.

Soil amendments

All of the soils of Dorchester County are acid, and they are naturally fairly low in plant nutrients. Therefore, most crops grown in the county require lime and fertilizer. The amount of lime to use and the kinds and amounts of fertilizer needed can be judged by learning how well crops have responded in the past, by determining the yield level at which the farmer is operating, and by studying the record of previous management practices, especially the results obtained from chemical tests. For assistance in determining the specific needs of the soils for lime and fertilizer, contact the county agricultural agent. He can arrange to have soils tested at the Soil Testing Laboratory of the University of Maryland.

Lime generally needs to be applied about once every 3 years. Very sandy soils and well drained or moderately well drained soils need applications of about 1 to 1½ tons per acre. Most of the other soils need 2 to 3 tons per acre, but wet soils that are high in organic matter, for example, those of the Bayboro, Pocomoke, and Portsmouth series, require 3 to 5 tons per acre, or possibly more.

Different soils in the same field may require different amounts of lime. For example, in areas where the soils are well drained and sandy, 1 ton of lime per acre may be required. On the other hand, areas where the soils are very dark colored and are less well drained and less sandy, may need as much as 5 tons per acre. Using too much lime, particularly on a sandy soil, should be avoided just as carefully as using too little.

Soils that are cultivated year after year become deficient in nitrogen, phosphorus, and potassium unless these elements are replenished regularly. Unlike phosphorus and potassium, nitrogen does not come from the mineral part of the soil. Nitrogen compounds are produced by some plants, especially by soybeans and other legumes, but more commonly the nitrogen is supplied in fertilizer.

Nitrogen fertilizer is needed for all crops, except legumes, and some legumes benefit from additional nitrogen. Part of the nitrogen in plants is returned to the soil in plant residues that decompose to form organic matter, but most of it is removed in the crops that are harvested. The organic matter not only returns some nitrogen and other plant nutrients to the soil, but it also improves the water-holding capacity and the tilth. This, in turn, helps to reduce the susceptibility of the soils to erosion.

Manure furnishes large amounts of nitrogen and organic matter and smaller amounts of other plant nutrients. The amount of manure and the kinds and amounts of commercial fertilizer and crop residues depend on the kind of crop to be grown. Small grains need a complete fertilizer in addition to a topdressing of nitrogen. Generally, nitrogen for corn is supplied as a sidedressing. Legumes need phosphorus and potassium when they are seeded and, later, as a topdressing.

Rotations

Using a good crop rotation is an efficient way of maintaining organic matter in the soil. A good rotation also helps to prevent or to check the loss of soil material through erosion. One good system consists of growing a legume or green-manure crop before a corn crop. When the legume or green-manure crop is plowed under, it adds organic matter and nitrogen to the soil. As a result, the corn crop that follows generally produces a higher yield and is better able to withstand dry weather. The green-manure crop also makes the soil less susceptible to erosion.

A 3-year rotation ought to include corn or soybeans for 1 year. The corn or soybeans should be followed by a small grain, and the small grain, by a legume or hay crop that includes a legume. Such a rotation helps conserve the soil. It is well suited to the soils of capability classes I and II.

For soils in capability subclasses IIIe and IIIs, a rotation lasting at least 4 years needs to be used. The rotation should include at least 2 years of hay or other close-growing crops. Such a rotation may not be suitable for the soils of subclass IIIw, because there is little or no hazard of erosion on those soils. Most of the soils of subclasses IVe and IVs need at least a 5-year rotation, if feasible, or a 4-year rotation in which the small grain is omitted. Soybeans tend to make the soil more susceptible to erosion and should not be planted on the soils of subclass IVe. Because there is little or no hazard of erosion, a 5-year rotation may not be necessary for the soils of subclass IVw.

A good rotation helps to control weeds, and it also helps to control insects and soil-borne diseases. It slows down the rate at which some plant nutrients are depleted. In some places, where insecticides or fungicides have been applied heavily to vegetables or other crops, growing a different kind of crop for at least 1 or 2 years will help rid the soils of the residual effects of the chemicals.

Tillage

If maximum yields of crops are to be obtained, the soils must be kept in good condition. Tillage of any kind breaks down the structure of the soils, causes organic matter to be lost, and increases the hazard of erosion. Breakdown of the soil structure generally takes place gradually and is not easily noticed until the damage has become serious.

The continued use of the heavy machinery commonly used to cultivate corn and soybeans causes many of the poorly drained, fine-textured soils, such as the Elkton and Othello silt loams, to become compacted and hard to work. If the soils are too moist when the machinery is used, the result is more serious. Compaction decreases the rate at which water infiltrates, and it decreases the aeration of the soils. It also slows down internal drainage.

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which is important in these soils. If a sloping soil becomes compacted, the amount and rate of runoff are accelerated and the hazard of erosion is increased. Replenishing organic matter and growing a sod crop will help to restore good structure in such a soil.

On all of the soils in the county, tillage needs to be kept to a minimum. It is particularly important to cultivate only within a narrow range of moisture content so as to prevent puddling and compaction on many of the wet, fine-textured soils.

All of the sloping soils that are susceptible to erosion but that are suitable for cultivation (subclasses IIe, IIIe, and IVe) need to be tilled on the contour. In addition, contour stripcropping (growing alternate strips of clean-cultivated crops with strips of close-growing, untilled crops) is needed on the soils of subclasses IIIe and IVe. A good rotation can be used and the crops staggered on the various strips. The strips will be narrower in steep areas than in less sloping ones. A technician of the Soil Conservation Service may be consulted for help in planning and laying out the cropping strips.

Estimated Yields

The soils of Dorchester County vary considerably in productivity. Some are well suited to crops and will consistently produce fairly high yields of cultivated crops. Others are better suited to less intensive use.

Table 7 shows the estimated average acre yields of specified crops under two levels of management. In columns A are estimated average acre yields of specified crops obtained under the management commonly used in the county. In columns B are estimated average acre yields obtained under improved management. Estimated yields for lespedeza, grown either for hay or seed, are given only under columns B, because lespedeza is commonly grown only under very good management. No great improvement over the present yields is anticipated.

According to reports of the U.S. Bureau of the Census for Dorchester County, the average acre yield of corn was 54 bushels in 1959. Other average yields reported were 26 bushels of soybeans, 27.1 bushels of wheat, 1.6 tons of lespedeza grown for hay, and 300 pounds of lespedeza grown for seed.

TABLE 7.—*Estimated average acre yields of specified crops under two levels of management*

[In columns A are estimated yields obtained under the present average management; in columns B are estimated yields obtained under improved management. Where yields are not given, the soil is considered unsuitable for the crop or no information is available on which to base an estimate]

Soil	Corn		Soybeans		Wheat		Lespedeza		Pasture	
							Hay	Seed		
	A	B	A	B	A	B	B	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Lbs.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Bayboro silt loam	45	80							85	185
Bayboro silty clay loam									80	170
Bibb silt loam	45	80	25	30	25	35	1.0	240	60	130
Elkton loam	40	75	25	30			1.0	240	85	185
Elkton silt loam	40	75	25	30			1.0	240	85	185
Elkton silt loam, low									80	170
Elkton silty clay loam									80	170
Elkton silty clay loam, low									80	170
Fallsington sandy loam	45	80	25	30	25	40	1.3	270	60	130
Galestown loamy sand, 0 to 2 percent slopes	25	50	15	20			.6	160	40	
Galestown loamy sand, 2 to 5 percent slopes	25	50	15	20			.6	160	40	
Galestown loamy sand, 5 to 10 percent slopes	25	50	15	20			.6	160	40	
Galestown loamy sand, 10 to 15 percent slopes							.6	160	40	
Galestown sand, 0 to 2 percent slopes	20	50	15	20			.5	150	30	
Galestown sand, 2 to 5 percent slopes	20	50	15	20			.5	150	30	
Galestown sand, 5 to 10 percent slopes									30	
Galestown sand, 10 to 15 percent slopes							.5	150	30	
Johnston loam	40	80		25			.9	220		130
Keyport loam, 0 to 2 percent slopes	45	80	25	35	25	40	1.5	290	90	190
Keyport silt loam, 0 to 2 percent slopes	45	80	25	35	25	40	1.5	290	90	190
Keyport silt loam, 2 to 5 percent slopes	45	90	20	30	20	35	1.5	290	85	180
Klej loamy sand, 0 to 2 percent slopes	35	65	20	25			.9	220	50	120
Klej loamy sand, 2 to 5 percent slopes	35	65	20	25			.9	220	50	120
Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes	25	50	15	20			.6	160	40	
Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes	25	50	15	20			.6	160	40	
Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes	25	50	15	20			.6	160	40	
Lakeland sand, clayey substratum, 0 to 5 percent slopes	20	50	15	20			.5	150	30	
Lakeland sand, clayey substratum, 5 to 15 percent slopes	20	50	15	20			.5	150	30	
Matapeake fine sandy loam, 0 to 2 percent slopes	65	100	30	40	30	45	2.0	340	95	210
Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	60	100	25	40	25	40	2.0	340	90	200
Matapeake silt loam, 0 to 2 percent slopes	65	100	30	40	30	45	2.0	340	95	210
Matapeake silt loam, 2 to 5 percent slopes	65	100	30	40	30	45	2.0	340	95	210

See footnote at end of table.

TABLE 7.—*Estimated average acre yields of specified crops under two levels of management*—Continued

[In columns A are estimated yields obtained under the present average management; in columns B are estimated yields obtained under improved management. Where yields are not given, the soil is considered unsuitable for the crop or no information is available on which to base an estimate]

Soil	Corn		Soybeans		Wheat		Lespedeza		Pasture	
							Hay	Seed		
	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Lbs.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	60	100	25	40	25	40	2.0	340	90	200
Matapeake silt loam, 5 to 10 percent slopes	65	100	30	40	30	45	2.0	340	95	210
Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	60	100	25	40	25	40	2.0	340	90	200
Matapeake silt loam, 10 to 15 percent slopes	60	100	25	40	25	40	2.0	340	90	200
Mattapex fine sandy loam, 0 to 2 percent slopes	50	90	25	35	25	40	1.8	300	95	210
Mattapex silt loam, 0 to 2 percent slopes	50	90	25	35	25	40	1.8	300	95	210
Mattapex silt loam, 2 to 5 percent slopes	50	90	25	35	25	40	1.8	300	95	210
Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	45	85	20	30	20	35	1.8	300	90	200
Othello silt loam	45	80	25	30	25	35	1.4	280	90	190
Othello silt loam, low									85	180
Plummer loamy sand	30	55	15	20					40	110
Pocomoke loam	45	80	25	30	25	35			70	150
Pocomoke sandy loam	45	80	25	30	25	35			70	150
Portsmouth silt loam	50	90	25	30	25	35			75	160
Rutlege loamy sand	30	60	15	25					50	120
Sassafras loam, 0 to 2 percent slopes	65	100	30	40	30	45	2.0	340	90	200
Sassafras loam, 2 to 5 percent slopes, moderately eroded	60	100	25	35	25	40	2.0	340	85	190
Sassafras loam, heavy substratum, 0 to 2 percent slopes	65	100	30	40	30	45	2.0	340	90	200
Sassafras loamy sand, 0 to 2 percent slopes	40	75	20	25	20	30	1.0	240	75	170
Sassafras loamy sand, 2 to 5 percent slopes	40	75	20	25	20	30	1.0	240	75	170
Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded	35	70	20	25	20	30	1.0	240	65	160
Sassafras loamy sand, 5 to 10 percent slopes	35	70	20	25	20	30	1.0	240	70	165
Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded	35	70	20	25	20	30	1.0	240	65	160
Sassafras loamy sand, 5 to 10 percent slopes, severely eroded	25	60	15	25	15	25	.8	200	50	150
Sassafras loamy sand, 10 to 15 percent slopes	30	65	15	25	15	30	1.0	240	60	160
Sassafras loamy sand, 15 to 40 percent slopes									40	100
Sassafras sandy loam, 0 to 2 percent slopes	65	100	30	40	30	45	2.0	340	90	200
Sassafras sandy loam, 2 to 5 percent slopes	65	100	30	40	30	45	2.0	340	90	200
Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	60	100	25	40	25	40	2.0	340	85	190
Sassafras sandy loam, 5 to 10 percent slopes	60	100	30	40	30	45	2.0	340	90	200
Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	60	100	25	40	25	40	2.0	340	85	190
Sassafras sandy loam, 10 to 15 percent slopes	60	100	25	40	25	40	2.0	340	85	190
Sassafras sandy loam, 15 to 30 percent slopes							1.6	290	70	150
Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes	65	100	30	40	30	45	2.0	340	95	210
Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded	60	100	25	40	25	40	2.0	340	90	200
Sassafras sandy loam, thick solum, 0 to 2 percent slopes	65	100	30	40	30	45	2.0	340	95	210
Sassafras sandy loam, thick solum, 2 to 5 percent slopes	65	100	30	40	30	45	2.0	340	95	210
Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded	60	100	25	40	25	40	2.0	340	90	200
Woodstown loam, 0 to 2 percent slopes	45	85	20	30	20	35	1.8	300	90	200
Woodstown sandy loam, 0 to 2 percent slopes	40	85	20	30	20	35	1.8	300	85	200
Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded	35	75	20	30	20	30	1.8	300	75	190

[1] The number of days 1 acre will support one cow, horse, or steer without injury to the pasture.

To obtain the estimated yields shown in columns B, several or many of the following management practices are used:

1. Contour tillage, stripcropping, terracing, contour furrowing, or similar measures are used to help control erosion; the soils that need drainage are drained; excess water is disposed of safely; and irrigation is supplied to the soils that need it.
2. Rotations of adequate length are selected that generally consist of the following: A tilled crop to help control weeds; a deep-rooted crop to improve the permeability of the soils; legumes for 1 or more years to help maintain or improve the fertility of the soils; and a close-growing crop or a green-manure crop. A close-growing crop or a green-manure crop helps improve the structure and tilth of the soils, supplies organic matter, and helps control erosion.
3. Manure and crop residues are turned under to supply nitrogen and other nutrients and to improve the physical characteristics of the soils.
4. Fertilizer and lime are applied according to the needs indicated by soil tests; the county agent is consulted for information about making the tests.

5. Suitable methods of plowing, preparing the seedbed, and cultivating are used.
6. Planting, cultivating, and harvesting are done at the proper time and in tne proper way.
7. Weeds, diseases, and insects are controlled.

More information about management practices needed to obtain good yields can be found in table 6 in the section "Capability Groups of Soils" and in the section "General Management Requirements." Practices applied in irrigation and drainage of soils are described in the section "Engineering Uses of Soils."

The yields shown in columns B are not presumed to be the highest yields obtainable, but they set a goal that is practical for most farmers to reach if they use good management. Yields on the same soils will vary, of course, because of differences in the kind of management, in the weather, in the varieties of crops that are grown, and in the numbers and kinds of diseases and insects.

Woodland Management [2]

Practically no truly virgin forests remain in Dorchester County. A few tracts, however, show no evidence of having been altered by the activities of man or domestic animals. About 40 percent of the county, or about 149, 390 acres, consisted of wooded areas at the time the soil survey was made. In 1959, according to the U.S. Census of Agriculture, 50, 218 acres of woodland was on farms. At that time, the remaining acreage in woodland consisted of land that was publicly owned or was in other areas not classified as farm holdings. Interest in managing woodland has increased during the past few years.

The value of standing commercial timber sold from land that was privately owned was $83, 875 in 1949, $89,497 in 1954, and $138,584 in 1959.[3] No figures are available to show the actual amount of timber cut in those years. It can be assumed, however, that much of the increase in the value of timber cut was the result of a sharp increase in the unit price of timber products, particularly during 1959.

Woodland suitability groups

Just as soils are placed in capability classes, subclasses, and units, according to their need for management for field crops and pasture, they can also be grouped according to their suitability for woodland use. Each woodland suitability group is made up of soils on which similar kinds of wood crops are produced, that require similar conservation practices, and that have similar potential productivity.

The potential productivity of the soils for forest trees is measured by the site index. The site index is the average height, in feet, of the dominant trees in the stand at 50 years of age. The site indexes of trees on the Eastern Shore of Maryland have been determined only for loblolly pine because loblolly pine is the most important species grown commercially in the area.

A number of studies of site indexes were made to help determine the value of the soils for growing trees. The areas studied were all on the Coastal Plain of Maryland. They were located, not only in Dorchester County, but also in all of the counties on the Eastern Shore; in Calvert, Charles, and St. Marys Counties in southern Maryland; and in Sussex County, Del. The site indexes used in this report were taken from the results of the studies.

On some soils trees were measured on a fairly large number of sites. On others, only a few suitable sites were available where there was a good stand of loblolly pine. No measurements were taken on some soils, but the site index was assumed to be approximately the same as that for soils that had similar characteristics.

All of the soils in one woodland suitability group have approximately the same site index, and they are similar in certain other respects. For all the soils of a group, species priority is about the same, and the ratings for competition from other plants, limitations to the use of equipment, seedling mortality, and the hazard of windthrow are the same.

Table 8 shows the woodland suitability groups in Dorchester County. In that table the column showing the site index for loblolly pine has a single figure that shows the average site index. The figures in parentheses show the range in the site index. In the column that shows species priority, the various species are listed in order of priority; the species listed after the figure 1 have the highest priority for that particular group, and those listed after the figure 3, the lowest.

In table 8 competition from other plants, limitations to the use of equipment, seedling mortality, and the hazard of windthrow are all rated as slight, moderate, or severe. Competition from other plants refers to the degree of competition from other plants and the rate that undesirable species invade different soils when openings are made in the canopy. The rating given to show limitations to the use of equipment is based on those characteristics of the soils or of topographic features that restrict or prohibit the use of equipment commonly used in tending a crop of trees or in harvesting the trees.

Seedling mortality refers to the expected degree of mortality of naturally occurring or planted tree seedlings as influenced by the kind of soil. The rating for hazard of windthrow is determined on the basis of characteristics of the soils that control the development of tree roots.

WOODLAND SUITABILITY GROUP 1

This group (see table 8) consists of deep, moderately well drained and well drained soils that have a surface layer of fine sandy loam, loam, or silt loam. The subsoil of these soils is finer textured than the surface layer and is moderately permeable. The following soils are in this group:

(MfA) Matapeake fine sandy loam, 0 to 2 percent slopes.
(MfB2) Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.
(MkA) Matapeake silt loam, 0 to 2 percent slopes.
(MkB) Matapeake silt loam, 2 to 5 percent slopes.
(MkB2) Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.
(MkC) Matapeake silt loam, 5 to 10 percent slopes.
(MkC2) Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.

[2] Craig D. Whitesell, former research forester of the Maryland Department of Research and Education; A. R. Bond, assistant State forester, Maryland Department of Forests and Parks; and Silas Little, forester, Northeastern Forest Experiment Station, U.S. Forest Service, helped prepare this section.

[3] Hamilton, A. B. comparative census of maryland agriculture, by counties, Maryland Univ. Ext. Serv., College Park, Md., Misc. Ext. Pub. No. 55, 52 pp. 1961. [Mimeographed.]

TABLE 8.—*Estimated woodland suitability grouping of soils*

Description of woodland suitability group and map symbols for the soils	Site index for loblolly pine	Species priority	Competition from other plants	Limitations to the use of equipment	Seedling mortality	Hazard of windthrow
Group 1: Deep, moderately well drained and well drained soils that have a surface layer of fine sandy loam, loam, or silt loam and a moderately permeable subsoil that is finer textured than the surface layer. MfA, MfB2, MkA, MkB, MkB2, MkC, MkC2, MkD, MpA, MsA, MsB, MsB2, SaA, SaB2, ShA, WdA.	83 (77 to 88)	1. Yellow-poplar, oak, sweetgum. 2. Loblolly pine.	Moderate to severe.	Slight	Slight	Slight.
Group 2: Deep, moderately well drained and well drained to somewhat droughty soils that have a surface layer of sandy loam or loamy sand and a moderately permeable to rapidly permeable subsoil. GaA, GaB, GaC, GaD, LaA, LaB, LaD, SmA, SmB, SmB2, SmC, SmC2, SmC3, SmD, SmF, SnA, SnB, SnB2, SnC, SnC2, SnD, SnE, SsA, SsB2, StA, StB, StB2, WoA, WoB2.	83 (78 to 90)	1. Loblolly pine. 2. Shortleaf pine. 3. Virginia pine.	Moderate	Slight	Slight	Slight.
Group 3: Very poorly drained to moderately well drained soils that have a surface layer of loamy sand to silt loam and a subsoil that has moderately slow to rapid permeability. Fa, KsA, KsB, Oh, Pm, Po, Ps, Pt, Ru.	86 (80 to 95)	1. Loblolly pine. 2. Oak and sweetgum. 3. Yellow-poplar.	Moderate to severe.	Moderate to severe.	Slight	Slight to moderate.
Group 4: Poorly drained and very poorly drained, silty to sandy soils of flood plains that are subject to occasional flooding. Bm, Jo, Mx.	85 (80 to 90)	1. Oak and sweetgum. 2. Yellow-poplar. 3. Loblolly pine.	Severe	Severe	Slight	Slight.
Group 5: Deep, droughty, and very sandy soils. GsA, GsB, GsC, GsD, GeF, LcB, LcD.	74 (67 to 84)	1. Loblolly pine. 2. Shortleaf pine. 3. Virginia pine.	Slight to moderate.	Slight	Moderate	Slight.
Group 6: Moderately well drained medium-textured soils that have a fine-textured, slowly permeable subsoil. KeA, KpA, KpB.	76 (69 to 80)	1. Loblolly pine. 2. Sweetgum, oak, and yellow-poplar.	Moderate	Moderate	Slight	Moderate.
Group 7: Poorly and very poorly drained, silty soils that have a fine-textured, slowly permeable subsoil. Ba, Bb, Ek, Em, Eo.	82 (75 to 89)	1. Loblolly pine. 2. Oak and sweetgum.	Severe	Severe	Slight	Moderate.
Group 8: Poorly drained soils that have a silty surface layer and a slowly permeable subsoil; subject to occasional flooding by salt water. En, Et, Ot.	66 (59 to 70)	1. Loblolly pine.	Slight	Severe	Moderate	Moderate.
Group 9: Loose, extremely droughty sands. Co.	49 (41 to 56)	1. Virginia pine. 2. Loblolly pine.	Slight	Slight	Severe	Slight.
Group 10: Miscellaneous land types not suited to trees and too wet for woodland management. Ma, Sw, Tm.						

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(MkD) Matapeake silt loam, 10 to 15 percent slopes.
(MpA) Mattapex fine sandy loam, 0 to 2 percent slopes.
(MsA) Mattapex silt loam, 0 to 2 percent slopes.
(MsB) Mattapex silt loam, 2 to 5 percent slopes.
(MsB2) Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.
(SaA) Sassafras loam, 0 to 2 percent slopes.
(SaB2) Sassafras loam, 2 to 5 percent slopes, moderately eroded.
(ShA) Sassafras loam, heavy substratum, 0 to 2 percent slopes.
(WdA) Woodstown loam, 0 to 2 percent slopes.

About 26,675 acres, or 7.2 percent of the county, is in this woodland suitability group. For the soils of this group, the average site index is 83 for loblolly pine, but it ranges from about 77 to 88.

The soils are well suited to loblolly pine and to hardwoods. They are especially well suited to yellow-poplar, to oaks that are good for timber, and to sweetgum. Wherever these species of hardwoods grow, they should be favored and well managed. The hardwoods will replace pines readily in areas that have been cleared if no pines are left as seed trees and if the pines are not replanted. Ordinarily, special preparation of the site is essential if the pines are to regenerate because the hardwoods, shrubs, and other ground cover are aggressive.

Competition from other plants is moderate or severe on these soils, particularly in thick stands of hardwoods. In most areas limitations to the use of equipment are only slight. On the steeper slopes, however, limitations to the use of heavy equipment are somewhat more severe during wet seasons than they are in other areas. Seedling mortality is not a problem, nor is the hazard of windthrow. There is also no great hazard of erosion. Nevertheless, logging roads on soils of this group need to be run on the contour where feasible. Practices to control erosion are required on cuts or fills where the soils are sloping.

WOODLAND SUITABILITY GROUP 2

This group (see table 8) consists of deep, moderately well drained or well drained to somewhat droughty soils. The soils have a surface layer of sandy loam or loamy sand and a moderately permeable to rapidly permeable subsoil. The following soils are in this group.

(GaA) Galestown loamy sand, 0 to 2 percent slopes.
(GaB) Galestown loamy sand, 2 to 5 percent slopes.
(GaC) Galestown loamy sand, 5 to 10 percent slopes.
(GaD) Galestown loamy sand, 10 to 15 percent slopes.
(LaA) Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes.
(LaB) Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes.
(LaD) Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes.
(SmA) Sassafras loamy sand, 0 to 2 percent slopes.
(SmB) Sassafras loamy sand, 2 to 5 percent slopes.
(SmB2) Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded.
(SmC) Sassafras loamy sand, 5 to 10 percent slopes.
(SmC2) Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded.
(SmC3) Sassafras loamy sand, 5 to 10 percent slopes, severely eroded.
(SmD) Sassafras loamy sand, 10 to 15 percent slopes.
(SmF) Sassafras loamy sand, 15 to 40 percent slopes.
(SnA) Sassafras sandy loam, 0 to 2 percent slopes.
(SnB) Sassafras sandy loam, 2 to 5 percent slopes.
(SnB2) Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.
(SnC) Sassafras sandy loam, 5 to 10 percent slopes.
(SnC2) Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.
(SnD) Sassafras sandy loam, 10 to 15 percent slopes.
(SnE) Sassafras sandy loam, 15 to 30 percent slopes.
(SsA) Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes.
(SsB2) Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded.
(StA) Sassafras sandy loam, thick solum, 0 to 2 percent slopes.
(StB) Sassafras sandy loam, thick solum, 2 to 5 percent slopes.
(StB2) Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded.
(WoA) Woodstown sandy loam, 0 to 2 percent slopes.
(WoB2) Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.

This is one of the most extensive of the woodland suitability groups. The soils occupy about 58,765 acres, or 15.7 percent of the county.

The average site index for loblolly pine grown on these soils is 83, but the site index ranges from about 78 to 90. The soils are not well suited to hardwoods. Loblolly pine is the favored species, although shortleaf and Virginia pines also grow well. If shortleaf and Virginia pines are growing on the areas, they should be allowed to grow to a usable size, and then they ought to be harvested.

Competition from undesirable plants is moderate on these soils, but in most places seedling mortality is only slight. There are practically no limitations to the use of equipment and practically no hazard from windthrow or erosion. Clean areas that are newly planted, however, are susceptible to some erosion, particularly by wind, until the plants have become established.

WOODLAND SUITABILITY GROUP 3

This group (see table 8) consists of very poorly drained to moderately well drained soils that have a surface layer of loamy sand to silt loam. The permeability of the subsoil in these soils is moderately slow to rapid. The following soils are in this group:

(Fa) Fallsington sandy loam.
(KsA) Klej loamy sand, 0 to 2 percent slopes.
(KsB) Klej loamy sand, 2 to 5 percent slopes.
(Oh) Othello silt loam.
(Pm) Plummer loamy sand.
(Po) Pocomoke loam.
(Ps) Pocomoke sandy loam.
(Pt) Portsmouth silt loam.
(Ru) Rutlege loamy sand.

This woodland suitability group is the most extensive of any in the county. It occupies about 64,941 acres, or 17.5 percent of the county.

For the soils of this group, the average site index is 86 for loblolly pine, but the site index ranges from about 80 to 95. Loblolly pine is of first priority on the soils of this group. Valuable oaks and sweetgums that are growing on the areas should be well managed and then replaced by loblolly pine after the mature trees have been harvested (fig. 7). Yellow-poplar ought to be encouraged only on the better drained sites that have enough slope for adequate surface drainage.

Competition from other plants is moderate on some areas of these soils, but it is severe on the wetter areas. Limitations to the use of equipment are moderate to severe; they are the most severe on the Othello, Pocomoke, Portsmouth, and Rutlege soils during wet periods. Seed-

Figure 7.—**Loading logs of oak and gum from a 1,000-acre tract on Othello silt loam. This land will now be used for loblolly pine.**

ling mortality is slight on these soils. The hazard of windthrow is slight to moderate, and there is a slight hazard of erosion on the more sloping areas.

WOODLAND SUITABILITY GROUP 4

This group (see table 8) consists of silty to sandy soils on the flood plains of the county. The soils are poorly drained and very poorly drained. Although they are flooded one or more times each year, the floodwaters seldom remain for long periods; therefore, the standing water does not become stagnant. The following soils are in this group:

(Bm) Bibb silt loam.
(Jo) Johnston loam.
(Mx) Mixed alluvial land.

The soils of this group occupy only about 3,177 acres, or less than 1 percent of the county. Little information is available concerning the suitability of the soils for woodlands. The average site index for loblolly pine, however, is estimated to be about 85, and the range is from 80 to 90.

The soils of this group are well suited to hardwoods. Therefore, oaks that are valuable for timber should have priority over loblolly pine, and sweetgum should also have priority. Yellow-poplar ought to be encouraged on hummocks, on natural levees along streams, and in other areas where there is good surface drainage.

Competition from other plants is severe on these soils. Hardwoods tend to eliminate loblolly and other species of pine. Limitations to the use of equipment are severe because of wetness. Seedling mortality is slight on these soils. The hazard of windthrow is slight, and there is no hazard of erosion, except for some scouring during periods when the areas are flooded.

WOODLAND SUITABILITY GROUP 5

This group (see table 8) consists of soils that are deep, droughty, and very sandy. The following soils are in this group:

(GsA) Galestown sand, 0 to 2 percent slopes.
(GsB) Galestown sand, 2 to 5 percent slopes.
(GsC) Galestown sand, 5 to 10 percent slopes.
(GsD) Galestown sand, 10 to 15 percent slopes.
(GeF) Galestown sand and loamy sand, 15 to 40 percent slopes.
(LcB) Lakeland sand, clayey substratum, 0 to 5 percent slopes.
(LcD) Lakeland sand, clayey substratum, 5 to 15 percent slopes.

Only about 4,381 acres, or 1.2 percent of the county, is in this group. Information about the suitability of the soils for trees is limited. The average site index for loblolly pine, however, is estimated to be about 74, but the site index ranges from about 67 to 81. A more accurate estimate of the index needs to be obtained for soils that are very sandy and that are underlain at some depth by a layer that retains moisture. Examples of such soils are the clayey substratum phases of the Lakeland sands.

Lobolly pine should have first priority on these soils. Nevertheless, if Virginia or shortleaf pines are growing on the soils, they may be carried to marketable size, then cut, and the areas converted to loblolly pine. Loblolly and shortleaf pines are cleaner boled trees than Virginia pine.

Competition from other plants is less severe on the soils of this group than on the other major soils of the county. It is rated as slight to moderate. Limitations to the use of equipment are only slight. Because of drought in some seasons, seedling mortality is moderate. The hazard of windthrow is slight on these soils, and there is only a slight hazard of erosion.

WOODLAND SUITABILITY GROUP 6

This group (see table 8) consists of moderately well drained, medium-textured soils that have a fine-textured subsoil. The subsoil is slowly permeable. The following soils are in this group:

(KeA) Keyport loam, 0 to 2 percent slopes.
(KpA) Keyport silt loam, 0 to 2 percent slopes.
(KpB) Keyport silt loam, 2 to 5 percent slopes.

About 6,884 acres of these soils, or 1.9 percent of the county, is in this group. The average site index for loblolly pine growing on the soils is about 76, but the site index ranges from about 69 to 80.

Loblolly pine is the favored species on these soils, but hardwoods that are valuable for timber, particularly yellow-poplar, oak, and sweetgum, ought to be well managed until they reach maturity or at least until they reach marketable age. Only then should they be replaced by loblolly pine.

Competition from other plants is moderate on these soils. There are moderate limitations to the use of equipment, but seedling mortality is slight. The hazard of windthrow is moderate.

WOODLAND SUITABILITY GROUP 7

This group (see table 8) consists of poorly drained and very poorly drained, silty soils that have a slowly permeable, fine-textured subsoil. The Elkton soils of the group have a grayish color throughout, but the Bayboro soils have a surface layer that is almost black and contains a large amount of organic matter. The following soils are in this group:

(Ba) Bayboro silt loam.
(Bb) Bayboro silty clay loam.
(Ek) Elkton loam.
(Em) Elkton silt loam.
(Eo) Elkton silty clay loam.

This woodland suitability group occupies about 45,336 acres, or 12.2 percent of the county. For the soils of the group, the average site index for loblolly pine is 82, but the site index ranges from about 75 to 89.

Loblolly pine is the best species to grow on these soils, but any good stand of sweetgum and of oaks that are valuable for timber ought to be managed properly until the trees are ready to harvest. Then, the hardwoods should be replaced by loblolly pine. The soils of this group are generally not suited to yellow-poplar.

Competition from other plants is severe on these soils, and, because of wetness, there are severe limitations to the use of equipment. The soils are often wet throughout much of the year. Seedling mortality is slight. The hazard of windthrow is moderate because trees on these soils generally have shallow roots.

WOODLAND SUITABILITY GROUP 8

This group (see table 8) consists of poorly drained soils that have a silty surface layer and a slowly permeable subsoil. The soils are in low positions, and nearly all of the areas are adjacent to salt water. They are flooded occasionally by salt water. During periods of high winds, the vegetation may be affected by salt from the spray. The following soils are in this group:

(En) Elkton silt loam, low.
(Et) Elkton silty clay loam, low.
(Ot) Othello silt loam, low.

The soils of this group occupy about 46,438 acres, or 12.5 percent of the county. Probably, because of the effects of the salt, practically no forest vegetation, except loblolly pine, grows on the areas. Loblolly pine appears to be the only kind of forest tree native to this area that will tolerate any amount of salt. Its tolerance is not great, however, and loblolly pines in many of the coastal areas have been damaged extensively by salt. In scattered, small areas and in some large areas, the trees apparently were killed by salt; there remain only forests of dead tree trunks that are still standing or have fallen.

Where a good stand of loblolly pine has survived on these soils, the growth of the trees is slow. The average site index for loblolly pine is only about 66 on these soils, but the site index ranges from about 59 to 70. This index is the lowest for any of the soils studied in Maryland, except for some areas of Coastal beaches.

Competition from other plants is slight on the soils of this group. Limitations to the use of equipment are severe, especially during wet seasons or after the areas are flooded. Seedling mortality is moderate on these soils. There is a moderate hazard of windthrow but no hazard of erosion.

WOODLAND SUITABILITY GROUP 9

Only one land type—Coastal beaches (Co)—is in this woodland suitability group (see table 8). The areas consist of loose, extremely droughty sands that are not suited to agriculture. In most areas there are no forest trees, but pines have invaded in some areas.

This land type occupies only about 212 acres, or less than 0.1 percent of the county. The site index for loblolly pine that grows on this land is only about 49, but the site index ranges from about 41 to 56. Presumably, if loblolly pine will not grow at least this well, it probably will not invade such areas and survive for as long as 30 years.

Planting on this land type should be limited to Virginia pine. However, some areas have already been invaded by loblolly pine, and there are fairly good stands of that species. Where this has occurred, the loblolly pine ought to be managed the same as stands of loblolly pine in other areas.

Competition from other plants is slight on this land type, and limitations to the use of equipment are slight. Seedling mortality is severe during some periods because of the cutting effect of windblown sand, full exposure to the hot sun and beating rain, and temporary flooding or overwash by salt water. In areas that are not protected by a cover of plants, there may be some erosion by wind.

WOODLAND SUITABILITY GROUP 10

This group (see table 8) consists of miscellaneous land types that are not suited to trees and that are too wet for woodland management. The following land types are in this group:

(Ma) Made land.
(Sw) Swamp.
(Tm) Tidal marsh.

These land types have not been rated for loblolly pine or other species of trees. Made land consists of areas that have been filled artificially with earth or reworked by man; these areas generally are used for building sites. Swamp consists of extremely wet areas that have much vegetation that tolerates water, including trees. Some natural timber may be produced on areas of Swamp, but the land is too wet for woodland management to be worth while. The areas of Tidal marsh are unsuitable for trees. The most important uses of Swamp and Tidal marsh are as shelters for wildlife and as feeding grounds for waterfowl.

Wildlife [4]

Dorchester County has abundant wildlife, which is of three major kinds: animals and birds that frequent open land; those that frequent woodland, and those that frequent wetland. The species that frequent marshland, especially waterfowl, are the most abundant and are probably the most valuable. The open waters of the bays, rivers, and ponds throughout the county harbor thousands of migratory waterfowl, and other waterfowl feed in the nearby areas of marshland and swamps (fig. 8). There are many shooting blinds, both in the open water and in areas of marshland. Some of these are rented or leased and are an important source of income to the owner.

In addition to the waterfowl, fish, oysters, clams, and crabs are plentiful in this area. Large commercial yields are taken each year, and the waters also provide recreation for many sports fishermen.

The soils of the county need to be managed so that an even greater utilization for wildlife will be possible and so that the use of the soils for wildlife will fit into other uses, such as forestry and agriculture. Developing marshland for wildlife requires careful water control and careful management of plant life. If the soils of a marshland are drained, the number of waterfowl may be reduced and the aquatic life in nearby estuarine waters may be destroyed. Therefore, special consideration of wildlife must be given in connection with any plans for drainage. In addition, clayey areas should not be drained, because a certain kind of clay in marshy areas, sometimes called

[4] PHILIP F. ALLAN, biologist, LLOYD E. GARLAND, soil correlator, Soil Conservation Service, and CHESTER M. KERNS, chief of game management, Maryland Game and Inland Fish Committee, helped prepare this section.

Figure 8.—**Area of marshland in the Blackwater National Wildlife Refuge. This provides protection for ducks and wild geese.**

cat clay, becomes highly acid when it is exposed. In areas where this clay is exposed, the vegetation dies and the areas become practically worthless for wildlife or for any other use.

Although the marshland of the county is very important, about 275 miles of shoreline along rivers and bays is also important to wildlife. These can neither be indicated clearly on a map [5] nor measured accurately. The land consists of the areas between the highest and the lowest level reached by normal tides. The areas of this land are generally narrow, but continuous. They are generally devoid of vegetation or nearly so, but a few small areas have an abundant growth of sago pondweed, claspingleaf pondweed, widgeongrass, and pygmy spikerush.

At low tide these areas of shoreline are important feeding grounds for some kinds of waterfowl and other birds, and for a number of animals, especially raccoons. Dead crabs, fish, and shellfish are scavenged in the areas, and live ones are hunted. Any kind of pollution, including insecticides, will damage these feeding grounds.

One important source of damage to these feeding grounds is shore erosion, and a second is the deposition of soil material from the uplands on the areas. However, material suitable as food for wildlife, washed from areas of uplands and marshes, is used extensively as food for many kinds of fish.

In the following pages the soils of the county are rated according to their suitability for various elements of wildlife habitats and according to their suitability for different kinds of wildlife. In addition, the types of marsh plants growing in marshy areas are rated according to their suitability for food and cover for muskrats, raccoons, rails, nesting ducks, Wilson's snipes, migratory ducks in general, and geese.

Elements of wildlife habitats.—Table 9 shows the suitability of the soils for elements of wildlife habitats. In that table the soils are given a rating of 1, 2, 3, or 4, according to their suitability for the various elements. A rating of 1 denotes well suited or above average; 2 denotes suitable or average; 3 denotes poorly suited; and 4 denotes not suitable. Ratings are given for the following elements:

Grain. The soils are rated according to their suitability for corn, sorghum, millet, soybeans, buckwheat, cowpeas, wheat, barley, oats, and other grains used as food for wildlife.

Legumes and grasses. The soils are rated according to their suitability for native grasses, legumes, except woody legumes, and other forage crops commonly grown in the area. Cultivated legumes and grasses valuable for wildlife food and cover are sericea lespedeza, alfalfa, alsike clover, ladino clover, red clover, tall fescue, bromegrass, and bluegrass. Native plants that are also valuable include switchgrass and other panicgrasses, partridge-pea, desmodium (beggarticks), and various native lespedezas.

Upland hardwoods. The soils are rated according to their suitability for upland hardwoods and shrubs that produce vigorous growth and heavy crops of fruit or seed and that grow naturally or are planted. Trees and shrubs that are valuable for wildlife include sumac, dogwood, persimmon, sassafras, hazelnut, shrub lespedezas, multiflora rose, autumn-olive, oak, hickory, and wild cherry.

Lowland hardwoods. The soils are rated according to their suitability for lowland hardwoods and shrubs that produce vigorous growth and heavy crops of fruit or seed and that grow naturally or are planted. Lowland trees and shrubs that are valuable for wildlife include bayberry, blueberry, huckleberry, highbush cranberry, red-osier dogwood, silky dogwood, blackhaw, sweetgum, persimmon, holly, willow oak, pin oak, and swamp white oak.

Upland conifers. The soils are rated according to their suitability for coniferous shrubs and trees that are native or are planted on upland sites. Examples of upland conifers are Virginia pine, loblolly pine, shortleaf pine, red pine, and Norway spruce. The rating is based on whether young trees will make rapid growth and whether they will develop dense foliage, not necessarily large timber. A soil considered good for growing Christmas trees rates high in these respects.

Lowland conifers. The soils are rated according to their suitability for coniferous shrubs and trees that are native or are planted on lowland sites. Examples are Atlantic white-cedar, loblolly pine, and pond pine. The rating is based on whether young trees will make rapid growth and whether they will develop dense foliage, not necessarily large timber.

Wetland plants grown for food and cover. The soils are rated according to their suitability for wetland plants that provide food and cover for waterfowl and furbearing animals. Many of these plants are annual or biennial species, rather than perennials. Examples of wetland plants that are suitable as food for wildlife are smartweed, wildrice, barnyard grass, three-square, bulrush, spikerush, widgeongrass, rice cutgrass, pondweed, duckweed, and sedge. Wetland plants used primarily for cover are cordgrass, needlerush, arrow-arum, pickerelweed, buttonbush, waterwillow, spatterdock, and cattail.

[5] NICHOLSON, W. R., AND VAN DEUSEN, R. D. MARSHES OF MARYLAND. Joint publication of Md. Game and Inland Fish Comm., and Md. Dept. of Res. and Ed., 12 pp., illus. 1952.

TABLE 9.—*Suitability of soils for elements of wildlife habitats*

[A rating of 1 denotes well suited or above average; 2 denotes suitable or average; 3 denotes poorly suited or below average; and 4 denotes not suitable]

Soil series and map symbols	Suitability for—								
	Grain	Legumes and grasses	Upland hardwoods	Lowland hardwoods	Upland conifers	Lowland conifers	Wetland plants grown as food for wildlife	Shallow impoundments	Fishponds
Bayboro:									
Ba	2	1	4	1	4	2	1	1	1
Bb	4	3	4	1	4	2	1	1	1
Bibb:									
Bm	2	1	4	1	4	1	1	2	3
Elkton:									
Ek, Em	2	1	4	1	4	2	1	1	1
En, Et	4	3	4	4	4	4	1	1	4
Eo	4	3	4	1	4	2	1	1	1
Fallsington:									
Fa	2	1	4	1	4	1	1	3	2
Galestown:									
GaA, GaB, GaC, GsA, GsB	3	3	2	4	1	4	4	4	4
GaD, GsC, GsD, GeF	4	4	3	4	2	4	4	4	4
Johnston:									
Jo	2	1	4	1	4	1	1	2	3
Keyport:									
KeA, KpA, KpB	2	1	2	3	2	4	3	1	1
Klej:									
KsA, KsB	2	2	3	1	4	1	2	3	2
Lakeland:									
LaA, LaB, LaD, LcB	3	3	2	4	1	4	4	4	4
LcD	4	4	3	4	2	4	4	4	4
Matapeake:									
MfA, MfB2, MkA, MkB, MkB2, MkC, MkC2	1	1	1	4	1	4	4	3	3
MkD	3	1	1	4	1	4	4	4	4
Mattapex:									
MpA, MsA, MsB, MsB2	2	1	2	3	2	4	3	1	1
Mixed alluvial land:									
Mx	4	4	4	2	4	2	2	1	4
Othello:									
Oh	2	1	4	1	4	1	1	3	2
Ot	4	3	4	1	4	2	1	1	1
Plummer:									
Pm	3	3	4	1	4	1	1	3	2
Pocomoke:									
Po, Ps	2	1	4	1	4	1	1	1	1
Portsmouth:									
Pt	2	1	4	1	4	1	1	1	1
Rutlege:									
Ru	3	3	4	1	4	1	1	3	2
Sassafras:									
SaA, SaB2, ShA, SmA, SmB, SmB2, SmC, SmC2, SnA, SnB, SnB2, SnC, SnC2, SsA, SsB2, StA, StB, StB2	1	1	1	4	1	4	4	3	3
SmC3, SmD, SnD	3	1	1	4	1	4	4	4	4
SmF, SnE	4	3	1	4	1	4	4	4	4

TABLE 9.—*Suitability of soils for elements of wildlife habitats*—Continued

Soil series and map symbols	Suitability for—								
	Grain	Legumes and grasses	Upland hard-woods	Lowland hard-woods	Upland conifers	Lowland conifers	Wetland plants grown as food for wildlife	Shallow impound-ments	Fishponds
Swamp: Sw	4	4	4	2	4	2	2	1	4
Tidal marsh: Tm	4	4	4	4	4	4	1	1	4
Woodstown: WdA, WoA, WoB2	2	1	2	3	2	4	3	1	1

Shallow impoundments. The soils are rated according to their suitability for the construction of impoundments in which the water level can be controlled. In these impoundments the level of the water can be manipulated within the range of the normal water table to an average height of 2 feet above ground level.

Fishponds. The soils are rated according to their suitability for the construction of ponds of either the dug-out or impoundment type; a part of the water area of these ponds is at least 6 feet deep.

Suitability of the soils for different kinds of wildlife.—In table 10 the soils are rated according to their suitability for the different kinds of wildlife in the county. The ratings are based on an average of the ratings given to elements of habitats in table 9. In table 10, for example, the suitability of a given soil for waterfowl involves consideration of its suitability for such elements of the habitat as grain crops or wetland food plants and the possibility of providing shallow impoundments.

Suitability of marsh types of vegetation.—The areas of marshland in this county are not suitable for pasture and field crops, nor are they suitable for trees. They are commonly used only for wildlife or for recreation. Differences in the range in tidal fluctuations, in the height of the water table, and in the degree of salinity or freshness of the tidal waters cause wide variations in the areas of marshland, particularly in the kind of plant cover. Nevertheless, five types, or kinds, of plants are dominant. These are the cattail type; the transitional marsh type; the three-square type; the three-square-cordgrass-needlerush type; and the needlerush-saltmeadow type. In table 11 these five different types are rated according to their suitability for muskrats, raccoons, rails, nesting ducks, Wilson's snipe, migratory ducks in general, and geese. A list of the plants that are common in marshland is given at the end of this section.

Type I may be called the cattail type, although pickerelweed, wildrice, arrow-arum, spatterdock, rice cutgrass, American three-square, spikerush, sedge, wildmillet, and smartweed also grow in the areas. The plants of this type occupy about 4 percent of the acreage of marshland and are in areas along the upper reaches of streams. In areas where they grow, there is little tidal action and the water is nearly fresh or only slightly saline.

Where plants of type I are dominant, muskrats are numerous and various kinds of rails are abundant. Food of high quality makes the areas excellent for migratory waterfowl and for waterfowl that spend the winter in the area. There is little nesting in these areas, however, except along the fringes, where wood ducks sometimes build their nests.

Type II consists of transitional marsh plants that occupy approximately 4 percent of the areas of marshland. It includes most of the plants that are in type I, but it also includes many other species that have a greater tolerance for salt than the plants of type I. The principal plants, in addition to those also listed in type I, are Olneys three-square, saltmarsh bulrush, big cordgrass, smooth cordgrass, and marshhay cordgrass. Muskrats are generally numerous where plants of type II are dominant, and Wilson's snipe, locally called jacksnipe, is commonly abundant during migrations in spring and fall. There are also several kinds of rails in the areas. Many kinds of waterfowl spend the winter where this type is dominant, and many black ducks and blue-winged teals nest in the marshes.

Type III is called the three-square type. In the areas where it is extensive, Olneys three-square is dominant, but there is some cordgrass, needlerush, saltgrass, and saltmarsh bulrush. The plants of this type occupy about 30 percent of the marshland in the county, but they grow mainly in marshes along the Blackwater River and its tributaries. In these areas differences in tidal fluctuations are not great, but the areas are low and are practically always wet.

Migratory waterfowl and waterfowl that spend the winter are less numerous in areas where type III plants are dominant than in areas of marshland where type II is dominant. Nesting black ducks are fairly common-however, as well as some of the smaller songbirds. Musk, rats are generally numerous in the areas.

Type IV marshland is called the three-square-cordgrass-needlerush type. In the areas where it is dominant, Olneys three-square, needlerush, marshhay cordgrass, and smooth cordgrass grow in about equal proportions, and saltmarsh bulrush grows in some places. The plants of this type occupy about 29 percent of the marshlands of the county. They grow in large, more or less continuous areas of marshland, mainly around the head of Fishing

Table 10.—*Suitability of soils for wildlife*

[A rating of 1 denotes successful production with minimum management; 2 denotes successful production with average amount of management; 3 denotes successful production difficult or doubtful; and 4 denotes successful production impractical or not feasible]

Soil series and map symbols	Deer	Rabbit	Squirrel	Quail	Raccoon	Muskrat	Waterfowl
Bayboro:							
Ba	1	1	2	1	1	1	1
Bb	2	2	2	3	1	1	1
Bibb:							
Bm	1	1	2	1	1	1	1
Coastal Beach:							
Co	4	1	4	4	4	1	4
Elkton:							
Ek, Em	1	1	2	1	1	1	1
En, Et	4	4	4	4	2	1	2
Eo	2	2	2	3	1	1	1
Fallsington:							
Fa	1	1	2	1	1	2	2
Galestown:							
GaA, GaB, GaC, GsA, GsB	2	2	3	3	2	4	4
GaD, GsC, GsD, GeF	3	3	3	4	3	4	4
Johnston:							
Jo	1	1	2	1	1	1	1
Keyport:							
KeA, KpA, KpB	2	2	2	2	2	2	2
Klej:							
KsA, KsB	1	1	2	2	1	2	2
Lakeland:							
LaA, LaB, LaD, LcB	2	2	3	3	2	4	4
LcD	3	3	3	4	3	4	4
Matapeake:							
MfA, MfB2	1	1	2	1	1	3	3
MkA, MkB, MkB2, MkC, MkC2, MkD	1	1	2	2	2	4	4
Mattapex:							
MpA, MsA, MsB, MsB2	2	2	2	2	2	2	2
Mixed alluvial land:							
Mx	3	3	3	4	2	1	2
Othello:							
Oh	1	1	2	1	1	2	2
Ot	4	4	4	4	2	1	2
Plummer:							
Pm	2	2	2	2	1	2	2
Pocomoke:							
Po, Ps	1	1	2	1	1	1	1
Portsmouth:							
Pt	1	1	2	1	1	1	1
Rutlege:							
Ru	2	2	2	2	1	2	2
Sassafras:							
SaA, SaB2, ShA, SmA, SmB, SmB2, SmC, SmC2, SnA, SnB, SnB2, SnC, SnC2, SsA, SsB2, StA, StB, StB2	1	1	2	1	1	3	3
SmC3, SmD, SnD	1	1	2	2	2	4	4
SnE, SmF	2	2	2	3	2	4	4
Swamp:							
Sw	2	3	2	4	2	1	2
Tidal marsh:							
Tm	3	4	4	4	2	1	1
Woodstown:							
WdA, WoA, WoB2	2	2	2	2	2	2	2

Table 11.—*Suitability of marsh types for species of wildlife*

Species	Type I	Type II	Type III	Type IV	Type V
Muskrat	Excellent food and cover.	Excellent food and cover.	Excellent food and cover.	Fair food and cover	Poor food and cover.
Raccoon	Excellent food and cover.	Excellent food and cover.	Excellent food and cover.	Fair food and cover	Poor food and cover.
Rail	Excellent	Excellent	Fair	Excellent for nesting.	Poor.
Nesting ducks	Excellent for wood ducks.	Good	Good	Excellent (teal and black ducks).	Good (black duck).
Wilson's snipe	(1)	Excellent	Fair	(1)	(1).
Migratory ducks in general.	Excellent	Excellent	Good	Good	Good.
Geese	Good	Good	Good	Poor	Poor.

[1] Not rated.

Bay and extending eastward to the Nanticoke River. The areas where the plants of this type grow are relatively dry and are only occasionally flooded by high tides.

Muskrats are generally not numerous in areas where plants of type IV are dominant; they are more numerous in the areas where Olneys three-square is abundant than in the other areas. Many rails, black ducks, blue-winged teals, and small songbirds build their nests in the areas where plants of type IV are dominant, and migratory ducks and wintering ducks are common.

Type V is the needlerush-saltmeadow cordgrass type. The areas are fairly high and are seldom flooded. High-tide bush, groundsel bush, and switchgrass are common on some of the higher areas. The plants of type V occupy about 33 percent of the marshland of the county. The areas are widely scattered and are along or near Chesapeake Bay. The largest areas are along the Honga River and along the lower reaches of Fishing Bay, but this type is also dominant on Bloodsworth Island and on many smaller bay islets.

Where plants of type V are dominant, large numbers of black ducks and small songbirds build their nests. Migrating waterfowl and waterfowl that spend the winter are less numerous than they are in areas along tidal waterways and ponds, muskrats are not abundant, and there are few other animals.

Plants of the Marshlands

Common name	*Scientific name*
American three-square	*Scirpus americanus.*
Arrow-arum	*Peltranda virginica.*
Big cordgrass	*Spartina cynosuroides.*
Buttonbush	*Cephalanthus occidentalis.*
Cattail	*Typha latifolia* and *T. angustifolia.*
Claspingleaf pondweed	*Potamogeton perfoliatus.*
Duckweed	*Lemna* spp. and *Spirodela* spp.
Groundsel bush	*Baccharis halimifolia.*
High-tide bush	*Iva frutescens.*
Marshhay cordgrass	*Spartina patens.*
Marshrose	*Rosa palustris.*
Needlerush	*Juncus roemerianus.*
Olneys three-square	*Scirpus olneyi.*
Pickerelweed	*Pontederia cordata.*
Pygmy spikerush	*Eleocharis nanus.*
Pondweed	*Potamogeton* spp.
Sago pondweed	*Potamogeton pectinatus.*
Saltgrass	*Distichlis spicata.*
Saltmarsh bulrush	*Scirpus robustus.*
Sedge	*Carex* spp.
Smartweed	*Polygonum* spp.
Smooth cordgrass	*Spartina alterniflora.*
Spatterdock	*Nymphaea.*
Spikerush	*Eleocharis* spp.
Switchgrass	*Panicum virgatum.*
Rice cutgrass	*Loersia oryzoides.*
Waterwillow	*Justicea americana.*
Wildmillet	*Echinochloa* spp.
Wildrice	*Zizania aquatica.*

Engineering Uses of Soils [6]

This part of the soil survey report is intended to be a guide to the properties of the soils and to the influence of those properties on problems related to engineering. The information was obtained by examining the soils closely in the field and by evaluating their characteristics with reference to engineering needs. Although extensive testing was not done in Dorchester County, many interpretations could be made by studying analyses of the same kinds of soils elsewhere, particularly in Norfolk County, Va.

It is not intended that the information in this section be used directly for engineering design. The facts and estimates given here are at best a guide; engineering design should be based on surveys made in the field and on the analyses of samples taken at the site of construction. The information in this section shows, for example, that the subsoil of Bayboro silt loam is not suitable to use for fill material that must support a heavy load. It also shows that the subsoil of the Sassafras loams is generally suitable for earthen dams for small ponds. It does not show, however, just how good the subsoil is for earthen dams or small ponds in any particular area of Sassafras soils. Tests at the site will be required to obtain that information.

This report contains information that can be used by engineers to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Assist in designing drainage and irrigation structures and in planning farm ponds, diversion terraces, and structures for water and soil conservation.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, airports, pipelines, and cables and

[6] This section was prepared with the assistance of Kendall P. Jarvis, State conservation engineer for the State of Maryland, Soil Conservation Service.

in planning detailed soil surveys of the selected locations.

4. Locate sand and gravel for use in structures.
5. Correlate performance of engineering structures with types of soil and thus develop information that will be useful in designing and maintaining structures.
6. Determine the suitability of soil units for cross-country movement of vehicles and construction equipment.
7. Supplement the information obtained from other published maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

Engineering descriptions and physical properties

A brief description of the soils of this county is given in table 12. The table lists the symbol for each soil that is shown on the detailed soil map and the name of the soil. It also gives the engineering classification of each significant horizon in each soil[7, 8]. Color and other characteristics not important to engineering have been omitted, but other general characteristics of the profile,

[7] AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. STANDARD SPECIFICATIONS FOR HIGHWAY MATERIALS AND METHODS OF SAMPLING AND TESTING. Designation: M 145–49, AASHO, 7th ed., 2 pts., illus. Washington, D.C. 1955.

[8] UNITED STATES ARMY, CORPS OF ENGINEERS. THE UNIFIED SOIL CLASSIFICATION SYSTEM. Tech. Memo. 3 357, 2 v. 1953.

TABLE 12.—*Brief*

[Dashes indicate information

Map symbol	Soil	Depth to seasonally high water table	Brief description of site and soil
		Feet	
Ba	Bayboro silt loam.	0	Very poorly drained soil, high in organic matter, developed in fine sediments; very wet; may be temporarily ponded.
Bb	Bayboro silty clay loam.	0	Same as for Bayboro silt loam, except that the surface layer is finer textured.
Bm	Bibb silt loam.	0 to 1	Poorly drained soil of the flood plains, developing in general alluvium from Coastal Plain sediments; wet; subject to flooding.
Co	Coastal beaches.	(1)	Undifferentiated soils worked by wave action and by the wind-------
Ek Em En	Elkton loam. Elkton silt loam. Elkton silt loam, low.	0 to 1	Poorly drained soils developed in moderately fine textured to fine textured sediments; wet; may be temporarily ponded; sandy below a depth of 60 inches; at times Elkton silt loam, low, is flooded by high tides; neutral below a depth of 40 inches.
Eo Et	Elkton silty clay loam. Elkton silty clay loam, low.	0 to 1	Same as for the Elkton loam and Elkton silt loams, except that the surface layer is finer textured.
Fa	Fallsington sandy loam.	0 to 1	Poorly drained soil that has a moderately fine textured subsoil; developed in coarse-textured sediments; wet; may be temporarily ponded.
GaA GaB GaC GaD	Galestown loamy sand, 0 to 2 percent slopes. Galestown loamy sand, 2 to 5 percent slopes. Galestown loamy sand, 5 to 10 percent slopes. Galestown loamy sand, 10 to 15 percent slopes.	5+	Somewhat excessively drained to excessively drained, deep, very sandy soils developed in coarse-textured sediments; windworked in places.
GsA GsB GsC GsD GeF	Galestown sand, 0 to 2 percent slopes. Galestown sand, 2 to 5 percent slopes. Galestown sand, 5 to 10 percent slopes. Galestown sand, 10 to 15 percent slopes. Galestown sand and loamy sand, 15 to 40 percent slopes.	5+	Excessively drained, extremely sandy soils developed in coarse-textured sediments; windworked in places.
Jo	Johnston loam.	0	Very poorly drained soils of flood plains, developing in general alluvium from Coastal Plain sediments; very wet; subject to flooding.
KeA KpA KpB	Keyport loam, 0 to 2 percent slopes. Keyport silt loam, 0 to 2 percent slopes. Keyport silt loam, 2 to 5 percent slopes.	2	Moderately well drained, medium-textured soils developed in moderately fine textured to fine textured sediments; moderately wet.
KsA KsB	Klej loamy sand, 0 to 2 percent slopes. Klej loamy sand, 2 to 5 percent slopes.		Moderately well drained, very sandy soils developed in coarse-textured sediments; moderately wet.
LaA	Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes.	5+	Somewhat excessively drained, deep, very sandy soils developed in coarse-textured sediments; windworked in places.

See footnotes at end of table.

the kind of parent material or other substratum, drainage characteristics, depth to the water table, where this is known and significant, and the presence of gravel or sand have all been described.

Unless otherwise indicated, the descriptions of physical properties apply to the soils that are only slightly eroded, but in some places the degree of erosion, the content of gravel, and other items are indicated.

The thickness of the soil horizons varies somewhat from place to place. The thickness and other properties described in the table are properties that actually exist in a specific profile of the soil described. In a soil that is severely eroded, little, if any, of the original surface soil remains, and in such severely eroded soils, the underlying horizons are closer to the surface than is indicated in the table.

The rate indicated for permeability of the soil is based on the rate that water moves through the soil material in areas that have not been disturbed. It depends largely upon the texture and structure of the soil.

The shrink-swell potential is an indication of the volume change to be expected with a change in the content of moisture. It is estimated primarily on the basis of the amount and type of clay present. In general, soils classified as CH and A–7 have a high shrink-swell potential.

Clean sands and gravels (single grain) and those that have a small amount of nonplastic to slightly plastic fines, as well as most other nonplastic to slightly plastic soil material, have a low shrink-swell potential.

description of soils

not applicable or not available]

Depth from surface	Engineering classification		Percentage passing—			Selected characteristics significant in engineering		
	Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Range in permeability	Reaction	Shrink-swell potential
Inches			*Percent*	*Percent*	*Percent*	*Inches per hour*	*pH*	
0 to 18	ML or OL	A–4 or A–5	100	100	75 to 95	<0. 20	4. 5 to 6. 0	Moderate.
18 to 60	CL or CH	A–6 or A–7	100	100	80 to 100	<0. 20	4. 0 to 5. 5	High.
0 to 18	CL or OL	A–6 or A–7	100	100	80 to 100	<0. 20	4. 5 to 6. 0	Moderate to high.
18 to 60	CL or CH	A–6 or A–7	100	100	80 to 100	<0. 20	4. 0 to 5. 5	High.
0 to 26	ML	A–4	100	100	50 to 70	<0. 20	4. 5 to 5. 5	Low.
26 to 48	SC or CL	A–4 or A–6	90 to 100	80 to 100	40 to 80	<0. 20	4. 5 to 5. 0	Moderate.
0 to 60	SP, SP–SM	A–3	90 to 100	60 to 90	0 to 10	>6. 3		Low.
0 to 6	ML	A–4	100	95 to 100	50 to 80	<0. 20	4. 0 to 5. 0	Low.
6 to 40	CL or CH	A–6 or A–7	95 to 100	90 to 100	60 to 90	<0. 20	4. 0 to 5. 0	Moderate to high.
40 to 54	SC or CL	A–6	95 to 100	90 to 100	40 to 60	<0. 20	4. 5 to 5. 5	Moderate.
0 to 6	CL	A–6	100	95 to 100	60 to 80	<0. 20	4. 0 to 5. 0	Moderate.
6 to 40	CL or CH	A–6 or A–7	95 to 100	90 to 100	60 to 90	<0. 20	4. 0 to 5. 0	Moderate to high.
40 to 54	SC or CL	A–6	95 to 100	90 to 100	40 to 60	<0. 20	4. 5 to 5. 5	Moderate.
0 to 9	SM	A–2 or A–4	100	95 to 100	15 to 40	0. 63 to 2. 0	4. 5 to 5. 0	Low.
9 to 25	SC	A–2, A–4	95 to 100	90 to 100	25 to 50	0. 20 to 0. 63	4. 0 to 5. 0	Moderate to low.
25 to 48	SM or SP	A–2 or A–3	95 to 100	90 to 100	5 to 15	2. 0 to 6. 3	4. 0 to 5. 0	Low.
0 to 40	SM	A–2	100	95 to 100	10 to 20	>6. 3	4. 5 to 5. 5	Low.
40 to 60	SP, SP–SM	A–3	95 to 100	95 to 100	0 to 10	>6. 3	4. 5 to 5. 0	Low.
60 to 70+	SM or SC	A–2 or A–4	95 to 100	95 to 100	25 to 40	0. 63 to 2. 0	4. 0 to 4. 5	Low to moderate.
0 to 60	SP, SP–SM	A–3	95 to 100	95 to 100	0 to 10	>6. 3	4. 5 to 5. 5	Low.
60 to 70+	SM or SC	A–2 or A–4	95 to 100	95 to 100	25 to 40	0. 63 to 2. 0	4. 0 to 4. 5	Low to moderate.
0 to 11	ML or OL	A–4, A–5	100	95 to 100	50 to 60	<0. 20	4. 0 to 4. 5	Low to moderate.
11 to 23	SM	A–2 or A–4	95 to 100	90 to 100	25 to 40	0. 20 to 0. 63	4. 0 to 4. 5	Low.
23 to 48	SM or SP	A–2 or A–3	95 to 100	90 to 100	5 to 15	0. 63 to 2. 0	4. 0 to 4. 5	Low.
0 to 7	ML	A–4	100	95 to 100	50 to 80	0. 20 to 0. 63	5. 6 to 6. 5	Low.
7 to 42	CL or CH	A–6 or A–7	95 to 100	95 to 100	70 to 90	<0. 20	4. 5 to 5. 5	Moderate to high.
42 to 48	SC	A–6	95 to 100	90 to 100	25 to 50	<0. 20	5. 1 to 5. 5	Moderate.
0 to 16	SM	A–2	100	95 to 100	10 to 20	>6. 3	5. 1 to 5. 5	Low.
16 to 42	SM or SP	A–2 or A–3	95 to 100	90 to 100	5 to 15	>6. 3	5. 1 to 5. 5	Low.
0 to 35	SM	A–2	100	95 to 100	10 to 20	>6. 3	4. 5 to 5. 5	Low.
35 to 53	SP, SP–SM	A–3	95 to 100	95 to 100	0 to 10	>6. 3	4. 5 to 5. 0	Low.

TABLE 12.—*Brief description*

Map symbol	Soil	Depth to seasonally high water table	Brief description of site and soil
		Feet	
LaB	Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes.		
LaD	Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes.		
LcB	Lakeland sand, clayey substratum, 0 to 5 percent slopes.	5+	Excessively drained, extremely sandy soils developed in coarse-textured sediments; windworked in places.
LcD	Lakeland sand, clayey substratum, 5 to 15 percent slopes.		
MfA	Matapeake fine sandy loam, 0 to 2 percent slopes.	5+	Well-drained, deep soils developed in a mantle of silt over sandy Coastal Plain sediments.
MfB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.		
MkA	Matapeake silt loam, 0 to 2 percent slopes.		
MkB	Matapeake silt loam, 2 to 5 percent slopes.		
MkB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.		
MkC	Matapeake silt loam, 5 to 10 percent slopes.		
MkC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.		
MkD	Matapeake silt loam, 10 to 15 percent slopes.		
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes.	1 to 2	Moderately well drained soils developed in a mantle of silt over sandy Coastal Plain sediments; moderately wet.
MsA	Mattapex silt loam, 0 to 2 percent slopes.		
MsB	Mattapex silt loam, 2 to 5 percent slopes.		
MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.		
Mx	Mixed alluvial land.	0 to 1	Extremely variable soils of flood plains; mostly poorly drained, wet, and subject to flooding.
Oh	Othello silt loam.	0 to 1	Poorly drained soils developed in a mantle of silt over sandy Coastal Plain sediments; wet; may be temporarily ponded; in places Othello silt loam, low, is flooded by tides; neutral below a depth of about 40 inches.
Ot	Othello silt loam, low.		
Pm	Plummer loamy sand.	0 to 1	Poorly drained, very sandy soil developed in coarse-textured sediments; wet; may be temporarily ponded.
Po	Pocomoke loam.	0	Very poorly drained soils that have a moderately fine textured subsoil; developed in coarse-textured sediments; very wet; may be temporarily ponded.
Ps	Pocomoke sandy loam.		
Pt	Portsmouth silt loam.	0	Very poorly drained soil developed in a mantle of silt over sandy Coastal Plain sediments; very wet; may be temporarily ponded.
Ru	Rutlege loamy sand.	0	Very poorly drained, very sandy soil developed in coarse-textured sediments; very wet; may be temporarily ponded.
SaA	Sassafras loam, 0 to 2 percent slopes	6+	Well-drained soils that have a moderately fine textured subsoil; developed in sandy Coastal Plain sediments.
SaB2	Sassafras loam, 2 to 5 percent slopes, moderately eroded.		
SnA	Sassafras sandy loam, 0 to 2 percent slopes		
SnB	Sassafras sandy loam, 2 to 5 percent slopes.		
SnB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.		
SnC	Sassafras sandy loam, 5 to 10 percent slopes		
SnC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.		
SnD	Sassafras sandy loam, 10 to 15 percent slopes.		
SnE	Sassafras sandy loam, 15 to 30 percent slopes.		
ShA	Sassafras loam, heavy substratum, 0 to 2 percent slopes.	6+	Well-drained soils that have a moderately fine textured subsoil; developed in sandy Coastal Plain sediments; the substratum is at a depth of 60 inches and consists of massive, clayey sands and sand-clay mixtures; in places there are thin lenses of sand in the substratum.
SsA	Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes.		
SsB2	Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded.		

See footnotes at end of table.

of soils—Continued

Depth from surface	Engineering classification		Percentage passing—			Selected characteristics significant in engineering		
	Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Range in permeability	Reaction	Shrink-swell potential
Inches			*Percent*	*Percent*	*Percent*	*Inches per hour*	*pH*	
53 to 60	SC	A-2, A-4 or A-6.	95 to 100	95 to 100	25 to 50	0. 63 to 2. 0	4. 0 to 5. 0	Low to moderate.
0 to 53	SP, SP-SM	A-3	95 to 100	95 to 100	0 to 10	>6. 3	4. 5 to 5. 0	Low.
53 to 60	SC	A-2, A-4 or A-6.	95 to 100	95 to 100	25 to 50	0. 63 to 2. 0	4. 0 to 5. 0	Low to moderate.
0 to 24	SM or ML	A-4	100	95 to 100	45 to 70	0. 63 to 2. 0	5. 1 to 6. 0	Low.
24 to 37	CL	A-6	100	90 to 100	60 to 80	0. 20 to 0. 63	6. 1 to 6. 5	Moderate.
37 to 48	SM	A-2 or A-4	100	90 to 100	20 to 40	0. 63 to 2. 0	5. 5 to 6. 5	Low.
0 to 12	SM or ML	A-4	100	95 to 100	45 to 70	0. 63 to 2. 0	6. 1 to 6. 5	Low.
12 to 42	CL	A-6	100	90 to 100	60 to 80	<0. 20	5. 1 to 6. 0	Moderate.
42 to 48	SM	A-2 or A-4	100	90 to 100	20 to 40	0. 63 to 2. 0	4. 5 to 5. 0	Low.
----------	SM, ML, CL	A-2, A-4, A-6	(2)	(2)	(2)	----------	----------	
0 to 8	ML	A-4	100	95 to 100	50 to 80	0. 20 to 0. 63	4. 5 to 5. 5	Low.
8 to 25	CL	A-6	95 to 100	95 to 100	60 to 80	<0. 20	4. 0 to 4. 5	Moderate.
25 to 32	SC	A-2 or A-4	95 to 100	90 to 100	20 to 40	<0. 20	4. 0 to 4. 5	Low to moderate.
32 to 40	SP-SM	A-2	95 to 100	90 to 100	5 to 15	0. 63 to 2. 0	4. 0 to 4. 5	Low.
0 to 16	SM	A-2	100	95 to 100	10 to 20	>6. 3	4. 0 to 5. 0	Low.
16 to 48	SP-SM	A-2 or A-3	95 to 100	90 to 100	5 to 15	>6. 3	4. 0 to 4. 5	Low.
0 to 11	SM to OL	A-2 or A-4	100	95 to 100	15 to 40	2. 0 to 6. 3	4. 5 to 5. 5	Low.
11 to 28	SC	A-2, A-4	95 to 100	90 to 100	25 to 50	0. 20 to 0. 63	4. 5 to 5. 5	Low to moderate.
28 to 54	SP-SM	A-3 to A-2	95 to 100	90 to 100	5 to 15	>6. 3	5. 1 to 5. 5	Low.
0 to 8	ML or OL	A-4 or A-5	100	95 to 100	50 to 80	0. 20 to 0. 63	4. 5 to 5. 0	Low to moderate.
8 to 22	CL	A-6	95 to 100	95 to 100	60 to 80	<0. 20	4. 5 to 5. 0	Moderate.
22 to 36	SM	A-2 or A-4	95 to 100	90 to 100	15 to 40	0. 63 to 2. 0	4. 5 to 5. 0	Low.
0 to 18	SM	A-2	100	95 to 100	10 to 20	>6. 3	4. 0 to 5. 0	Low.
18 to 42	SP, SP-SM	A-3	95 to 100	90 to 100	0 to 10	>6. 3	4. 0 to 4. 5	Low.
0 to 11	SM or ML	A-2 or A-4	95 to 100	95 to 100	20 to 50	2. 0 to 6. 3	5. 1 to 6. 0	Low.
11 to 32	SC	A-2 or A-4	95 to 100	90 to 100	30 to 50	0. 20 to 0. 63	5. 1 to 6. 0	Low to Moderate.
32 to 48	SM	A-2	95 to 100	90 to 100	10 to 20	2. 0 to 6. 3	5. 1 to 5. 5	Low.
0 to 11	SM or ML	A-2 or A-4	95 to 100	95 to 100	20 to 50	2. 0 to 6. 3	5. 1 to 6. 0	Low.
11 to 32	SC	A-2 or A-4	95 to 100	90 to 100	30 to 50	0. 20 to 0. 63	5. 1 to 6. 0	Low to moderate.
32 to 60	SC	A-2 or A-4	95 to 100	90 to 100	30 to 50	0. 20 to 0. 63	4. 5 to 5. 5	Low to moderate.

TABLE 12.—*Brief description*

Map symbol	Soil	Depth to seasonally high water table	Brief description of site and soil
		Feet	
StA	Sassafras sandy loam, thick solum, 0 to 2 percent slopes.	6+	Same as for heavy substratum phases of the Sassafras soils, except that the substratum is at a depth of 42 inches and consists of silty sands and sand-silt mixtures.
StB	Sassafras sandy loam, thick solum, 2 to 5 percent slopes.		
StB2	Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded.		
SmA	Sassafras loamy sand, 0 to 2 percent slopes.	6+	Well-drained to somewhat excessively drained, deep, sandy soils that have a thin, moderately fine textured subsoil; developed in coarse-textured sediments; windworked in places.
SmB	Sassafras loamy sand, 2 to 5 percent slopes.		
SmB2	Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded.		
SmC	Sassafras loamy sand, 5 to 10 percent slopes.		
SmC2	Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded.		
SmC3	Sassafras loamy sand, 5 to 10 percent slopes, severely eroded.		
SmD	Sassafras loamy sand, 10 to 15 percent slopes.		
SmF	Sassafras loamy sand, 15 to 40 percent slopes.		
Sw	Swamp.	0	Variable, extremely wet, unclassified soil material; ponded for most, or sometimes all, of the year; wooded.
Tm	Tidal marsh.	0	Variable, unclassified soil material; brackish to saline; flooded by high tides.
WdA	Woodstown loam, 0 to 2 percent slopes.	1 to 2	Moderately well drained soils that have a moderately fine textured subsoil; developed in sandy Coastal Plain sediments; moderately wet.
WoA	Woodstown sandy loam, 0 to 2 percent slopes.		
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.		

[1] The water table in Coastal beaches fluctuates with the tides and is brackish to saline.

Soil interpretations for engineering

Table 13 gives specific characteristics of each soil that will affect its suitability for different kinds of engineering work. These interpretations are based on information given in table 12, on various test data, and on the experience of engineers in the field. A soil may be suitable for one engineering purpose, but it may be poor or even unsuitable for some other use. For example, the soils of the Woodstown series are considered fair as a source of material for road fill and good as a source of topsoil. They are not suitable, however, for use as fields for septic tanks. The soils of the Galestown series, on the other hand, though poor as a source of material for road fill and only fair as a source of topsoil, are good fields for septic tanks.

Too, a subsoil of fine silty clay, such as that in the soils of the Portsmouth series, generally indicates that the soil is suitable as a site for a pond or reservoir, but poor for an embankment or dam. The fine texture of the subsoil greatly increases the difficulty of providing adequate drainage for such soils, and it limits the suitability of the soils for irrigation. The purpose of table 13 is to indicate either good or undesirable features that may require special consideration when a structure is planned and is designed and constructed.

The suitability of the soil material for wet-weather or winter grading depends largely on the texture of the soil material, its natural content of water, and the height of the water table. Very plastic, clayey soils that have a high water table, and highly organic soils are given a rating of "Not suitable." Some silty soils and moderately plastic clays that have a high water table are given a rating of "Poor" because they are difficult to work and to handle, dry, and compact. These soils, if frozen, should not be used in the compacted road section.

The rating of a soil as to its susceptibility to frost action depends on the texture of the soil material and on the depth to the water table during a freezing period. Silts and fine sands that have a high water table are given a rating of "High."

The suitability of the soil material for road fill depends largely on the texture of the soil material and on its natural content of water. Wet, plastic soils and organic soils are given a rating of "Not suitable." Wet, moderately plastic soils are given a rating of "Poor" because they are difficult to handle, dry, and compact. The highly erodible soils, such as those composed primarily of fine sands or silts, are given a rating of "Poor to fair" because they require a flatter slope, close moisture control during compaction, and fast-growing vegetation on the side slopes to protect them from erosion.

The interpretations in table 13 are general, but they will point out what the engineer can expect to find in any area of a soil that is shown on the detailed soil map. How-

of soils—Continued

Depth from surface	Engineering classification		Percentage passing—			Selected characteristics significant in engineering		
	Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Range in permeability	Reaction	Shrink-swell potential
Inches			*Percent*	*Percent*	*Percent*	*Inches per hour*	*pH*	
0 to 11	SM or ML	A-2 or A-4	95 to 100	95 to 100	20 to 50	2. 0 to 6. 3	5. 1 to 6. 0	Low.
11 to 42	SC	A-2 or A-4	95 to 100	90 to 100	30 to 50	0. 20 to 0. 63	5. 1 to 6. 0	Low to moderate.
42 to 60	SM	A-2	95 to 100	90 to 100	10 to 20	2. 0 to 6. 3	5. 1 to 5. 5	Low.
0 to 17	SM	A-2	95 to 100	95 to 100	10 to 20	>6. 3	4. 5 to 5. 5	Low.
17 to 28	SC	A-2 or A-4	95 to 100	90 to 100	20 to 40	0. 20 to 0. 63	4. 5 to 5. 0	Low to moderate.
28 to 36	SM or SP	A-2 or A-3	95 to 100	90 to 100	5 to 20	>6. 3	4. 5 to 5. 0	Low.
----------	----------	----------	(2)	(2)	(2)	----------	----------	
----------	SM to CL	A-2 to A-6	(2)	(2)	(2)	----------	----------	Low to high.
0 to 9	SM	A-2 or A-4	95 to 100	95 to 100	20 to 50	2. 0 to 6. 3	5. 6 to 6. 0	Low.
9 to 30	SC	A-2 or A-4	95 to 100	90 to 100	30 to 50	0. 20 to 0. 63	5. 1 to 5. 5	Low to moderate.
30 to 48	SM	A-2	90 to 100	85 to 100	10 to 25	2. 0 to 6. 3	4. 5 to 5. 5	Low.

[2] Variable.

ever, the interpretations do not give exact soil properties and evaluations of the soil at the precise point where the engineering project is planned.

Soil groups for irrigation

Rainfall in Dorchester County is generally adequate for agriculture, but it is not always well distributed during the growing season. There are frequently extended dry periods between June and September. As a result, many crops and pastures are damaged. If an adequate irrigation system and a good supply of water were readily available during such periods, yields would not be drastically reduced during periods of drought.

In this section the better agricultural soils of the county are grouped according to their suitability for conservation irrigation. By conservation irrigation is meant that the right amount of irrigation water is applied to maintain high yields, without wasting water and without damaging the soils. The type of irrigation referred to is sprinkler irrigation.

This section is not intended as a guide for the design of a sprinkler irrigation system, for engineers have already compiled such a guide for the State of Maryland.[9] The facts in the section are based on the best information available concerning the soils, supplies of water, climate, crops, and farming conditions in the county. This section can be used as a general reference, but it will not be a substitute for an investigation at the site.

If conservation irrigation is practiced, it should be a part of a complete farm program of soil and water conservation. Irrigation is expensive and should be used only on soils that are highly productive and that can be made more productive if the crops have adequate water. Such soils need to be fertilized liberally and to have adequate lime added. They also need to have a good rotation or other cropping system used that includes crops to help control erosion, minimize leaching, maintain good soil tilth, and furnish a supply of organic matter. Only the soils considered suitable for regular cultivation are included in the irrigation groups.

To be suitable for irrigation, the soils must have good drainage. Although some moderately well drained soils are included in the irrigation groups, they ought to be artificially drained if they are irrigated. Soils that are poorly drained or somewhat poorly drained are not included.

Irrigating a large area requires a large amount of water. The supply of water needs to be adequate to maintain the optimum moisture in the soil during a prolonged dry period. A common mistake is to attempt to irrigate when

[9] United States Department of Agriculture. maryland guide for sprinkler irrigation design. (In cooperation with the Md. Agr. Ext. Serv. and Md. Agr. Expt. Sta.) 17 pp. 1955. [Unpublished.]

TABLE 13.—*Soil characteristics*

[Dashes indicate information not

Soil series and map symbols	Suitability for grading during the winter or when the soil is wet	Susceptibility to frost action	Suitability as sites for septic tanks [1]	Suitability as source of—		
				Road fill	Topsoil [2]	Sand [3]
Bayboro (Ba, Bb)	Not suitable	High	Not suitable	Not suitable	Fair	Not suitable
Bibb (Bm)	Not suitable	High	Not suitable	Poor	Fair	Not suitable
Coastal beaches (Co)	----	----	----	----	----	----
Elkton (Ek, Em, En, Eo, Et)	Not suitable	High	Not suitable	Not suitable	Poor	Not suitable
Fallsington (Fa)	Poor	High	Not suitable	Fair	Good	Poor; overburden and high water table; sandy substratum.
Galestown (GaA, GaB, GaC, GaD, GeF, GsA, GsB, GsC, GsD).	Fair to good	Low	Good	Poor to fair above a depth of 5 feet; erodible; fair below.	Fair	Good
Johnston (Jo)	Not suitable	High	Not suitable	Poor to fair	Fair	Poor; overburden; high water table; sandy substratum.
Keyport (KeA, KpA, KpB)	Not suitable	High	Not suitable	Poor	Fair	Not suitable
Klej (KsA, KsB)	Fair to good	Moderate	Not suitable	Poor to fair; erodible.	Fair	Fair
Lakeland (LaA, LaB, LaD, LcB, LcD).	Fair to good above a depth of 4½ to 5 feet; poor below.	Low	Good	Poor to fair above a depth of 5 feet; erodible; poor below.	Fair above a depth of 4½ to 5 feet; unsuitable below.	Good
Matapeake (MfA, MfB2, MkA, MkB, MkB2, MkC, & MkC2, MkD).	Poor above a depth of 3 feet; fair below.	Moderate	Good	Fair	Good	Poor; overburden; sandy substratum; excess fines.
Mattapex (MpA, MsA, MsB, MsB2)	Poor	High	Not suitable	Poor	Fair	Poor; high water table; overburden; sandy substratum; excess fines.

See footnotes at end of table.

that affect engineering

available or not applicable]

Desired location of road gradeline	Suitability for sprinkler irrigation	Factors that affect engineering practices for—				Suitable type of farm pond
		Reservoir areas	Embankments	Drainage systems	Water ways [4]	
A minimum of 5 feet above the surface of the ground.	Not suitable	Very slowly permeable.	Very poor stability.	Very slowly permeable.	Highly erodible	Excavated.
A minimum of 3 feet above the level reached by high water.	Poor	Slowly permeable.	Poor stability	Slowly permeable.	Highly erodible	Excavated and impounded.
A minimum of 4 feet above the level reached by the water table.	Very poor	Very slowly permeable.	Poor stability	Very slowly permeable.	Highly erodible	Excavated or impounded.
A minimum of 4 feet above the level reached by the water table.	Fair	Permeable substratum.	Sandy substratum.	Permeable substratum.	Erodible	Excavated or impounded.[5]
Anywhere, if surface drainage is provided.	Good	Rapidly permeable.	Loose and permeable.	Not needed	Erodible	
A minimum of 3 feet above the level reached by high water.	Poor	Permeable substratum.	Sandy substratum.	Permeable substratum.	Erodible	Impounded.
A minimum of 4 feet above the level reached by the water table.	Fair	Very slowly permeable.	Poor stability	Very slowly permeable.	Highly erodible	Excavated or impounded.
A minimum of 4 feet above the level reached by the water table.	Fair	Permeable substratum.	Sandy substratum.	Permeable substratum.	Erodible	Impounded.[5]
Anywhere, if surface drainage is provided.	Good	Rapidly permeable.	Loose and permeable.	Not needed	Erodible	
Anywhere, if surface drainage is provided.	Good	Permeable substratum.	Sandy substratum.	Not needed	Erodible	Impounded.
A minimum of 4 feet above the level reached by the water table.	Fair	Permeable substratum.	Sandy substratum.	Permeable substratum.	Erodible	Impounded.

TABLE 13.—*Soil characteristics*

[Dashes indicate information not

Soil series and map symbols	Suitability for grading during the winter or when the soil is wet	Susceptibility to frost action	Suitability as sites for septic tanks [1]	Suitability as source of—		
				Road fill	Topsoil [2]	Sand [3]
Mixed alluvial land (Mx)	Variable	High	Not suitable	Variable	Poor	Variable
Othello (Oh, Ot)	Not suitable	High	Not suitable	Poor	Poor	Poor; overburden; sandy substratum; high water table.
Plummer (Pm)	Poor to fair	Moderate	Not suitable	Poor	Poor	Poor to fair; erodible.
Pocomoke (Po, Ps)	Not suitable to poor.	Not suitable to poor.	Not suitable	Poor to not suitable above a depth of 2 feet; fair below that depth.	Fair	Poor; overburden; sandy substratum; high water table.
Portsmouth (Pt)	Not suitable	High	Not suitable	Poor to not suitable above a depth of 2 feet; fair below that depth.	Fair	Poor; overburden; sandy substratum; high water table.
Rutlege (Ru)	Poor	High	Not suitable	Poor to fair; erodible.	Fair	Fair
Sassafras (SaA, SaB2, ShA, SmA, SmB, SmB2, SmC, SmC2, SmC3, SmD, SmF, SnA, SnB, SnB2, SnC, SnC2, SnD, SnE, SsA, SsB2, StA, StB, StB2).	Fair to good	Moderate	Good	Very good	Good	Poor; overburden; sandy substratum.[7]
Swamp (Sw)	Not suitable	----------	Not suitable	Not suitable	----------	Not suitable
Tidal marsh (Tm)	Not suitable	High	Not suitable	Not suitable	Not suitable	Not suitable
Woodstown (WdA, WoA, WoB2)	Poor to fair	High	Not suitable	Fair	Good	Poor; overburden; sandy substratum; high water table.

[1] Rating given only for field disposal of effluent from septic tanks on slopes of less than 5 percent.
[2] Rating for suitability of soil material as a source of topsoil is for surface layer, A_1 or A_p horizons only.
[3] Some soils, suitable as a source of sand, also have suitable gravel in the substratum.
[4] Rating is for the surface layer only.
[5] Suitable for farm ponds, provided the level of the water in the pond does not have to be kept higher than the natural water table of the soil.

that affect engineering—Continued

available or not applicable]

Desired location of road gradeline	Suitability for sprinkler irrigation	Factors that affect engineering practices for—				Suitable type of farm pond
		Reservoir areas	Embankments	Drainage systems	Water ways [4]	
A minimum of 3 feet above the level reached by high water.	Not suitable	Variable	Variable	Variable	Erodible	Impounded.[6]
A minimum of 4 feet above the level reached by the water table.	Poor	Permeable substratum.	Sandy substratum.	Permeable substratum.	Highly erodible	Impounded.[5]
A minimum of 4 feet above the level reached by the water table.	Poor	Rapidly permeable.	Loose and permeable.	Permeable substratum.	Erodible	Excavated.[5]
A minimum of 4 feet above the level reached by the water table.	Fair	Permeable substratum.	Sandy substratum.	Permeable substratum.	Erodible	Excavated or impounded.[5]
A minimum of 4 feet above the level reached by the water table.	Fair	Permeable substratum.	Sandy substratum.	Permeable substratum.	Erodible	Excavated or impounded.
A minimum of 4 feet above the level reached by the water table.	Poor to fair	Rapidly permeable.	Loose and permeable.	Permeable substratum.	Erodible	Excavated.[5]
Anywhere, if surface drainage is provided.	Good	Permeable substratum.[7]	Sandy substratum.[7]	Not needed	Erodible	Impounded.
A minimum of 3 feet above the level reached by high water.	Not suitable			Impractical		
A minimum of 2 feet above the level reached by high tides.[8]	Not suitable		Very poor stability.	Impractical		
A minimum of 4 feet above the level of the water table.	Fair to good	Permeable substratum.	Sandy substratum.	Permeable substratum.	Erodible	Impounded.

[6] Mixed alluvial land is suitable for farm ponds if investigation of the site indicates that the substratum is not highly permeable.
[7] Does not apply to the heavy substratum phases of the Sassafras soils; these soils are unsuitable as a source of sand, but they have a substratum that is more suitable for reservoir areas and for embankment materials than that of the other Sassafras soils.
[8] Road embankments in areas of Tidal marsh may need protection from the erosion caused by wave action or extremely high tides.

an adequate supply of water is not available. An ordinary farm pond, for example, will supply enough water for a very small home garden, but it will not supply enough water to irrigate a larger area.

Water for irrigation can be obtained from a well, a stream, or a reservoir. A permit to drill an irrigation well or to construct a pond or reservoir must be obtained from the State Department of Geology, Mines, and Water Resources, Johns Hopkins University, Baltimore, Md. This department also supplies information about whether there is a good supply of ground water in a specific area. A good practice is to have a test well drilled to determine if an adequate supply of water is available.

Only streams that have a continuous flow during extended periods of drought and that have not been contaminated by salt water are suitable as a source of water supply for irrigation. The streamflow should be measured and the water tested during a period of drought to determine if enough water of suitable quality will be available for irrigating during dry periods. The storage capacity of a surface reservoir must be large enough to meet the needs of a crop during the irrigation season and to make up for losses caused by seepage and evaporation. Generally, space to store ½ to 1 acre-foot of water is needed during the irrigation season for each acre to be irrigated. A smaller reservoir, large enough to store water for one application, can be used if it can be refilled between irrigations.

The quality of the water must be determined. If the suitability of the water is questionable, samples can be sent to the State Soil Testing Laboratory, Agronomy Department, University of Maryland, College Park, Md. There it can be analyzed for acidity, salt content, and other characteristics that may harm a crop. Runoff water may carry certain plant diseases that can infect plants of susceptible crops if the water is impounded in reservoirs and used for irrigation. The red stele disease of strawberries, for example, can be transmitted in this way. Runoff water from areas where strawberries have been grown should not be used to irrigate other fields of strawberries.

Laws and regulations govern the use of water from streams and wells. The landowner who plans to use water for irrigation from a channelized stream should obtain information regarding his rights and obligations from a qualified source before investing in irrigation equipment.

To be successful, irrigation must meet the needs of both crops and soils. Different crops need different amounts of water applied at different intervals. Some soils hold much water and others hold little; some soils absorb water readily, and others absorb it more slowly.

In table 14 a description of each irrigation group is given, and the names of the soils in the group are listed. Tomatoes, Irish potatoes, and a few other truck crops are listed separately in the table, but other truck crops are shown simply in truck-crop groups 1, 2, or 3. The following crops are included in each truck crop group:

Truck group 1 *Very shallow rooted crops*	Truck group 2 *Shallow rooted crops*	Truck group 3 *Moderately deep rooted crops*
Lettuce.	Beets.	Asparagus.
Onions.	Broccoli.	Eggplant.
Spinach.	Cabbage.	Lima beans.
Strawberries.	Cauliflower.	Melons.
	Celery.	Peppers.
	Cucumbers.	Pumpkins.
	Peas.	Squash.
	Snap beans.	

The grass mixtures listed in table 14 may consist of several kinds of grasses commonly used for pasture or hay grown with or without legumes. The word "Orchards" refers to those orchards in which apples, peaches, pears, cherries, plums, prunes, or pecans are grown. "Orchards with cover" indicates that a close-growing crop covers the soils between the fruit trees. "Orchards without cover" indicates that the soils between the trees is bare or nearly bare.

Group 1.—In this group are the sandiest agricultural soils in the county. The soils can be irrigated at a fairly rapid rate because water infiltrates rapidly. They will retain less moisture, however, than the other soils used for agriculture. Irrigation water should be applied fairly frequently and in relatively small amounts. The soils of this group are less suitable for agriculture than those in irrigation groups 3 and 4, but they are used extensively to grow truck crops and other annual crops of high value per acre.

Group 2.—The soils of irrigation group 2 are also less suitable for agriculture than the soils of groups 3 and 4. They are used extensively, however, to grow truck crops and other crops of high value per acre. These soils have a thick, sandy surface layer similar to that of the soils of group 1. Their subsoil is thin to moderately thick, but it is finer textured than the surface layer. As a result, these soils have a slightly greater moisture-holding capacity below a depth of about 18 inches than the soils of group 1; for most crops, irrigation water should be applied more slowly than on the soils of group 1.

Group 3.—The soils of irrigation group 3 are much less sandy than the soils of groups 1 and 2, and they have a higher moisture-holding capacity. The surface layer of these soils is sandy loam. The subsoil, in most places, is a light sandy clay loam. The subsoil is moderately permeable and has a rather high available moisture-holding capacity. In most places these soils are underlain by somewhat sandy material below a depth of about 30 inches, but in a few places they are underlain by a heavier, clayey material. The level or nearly level soils can be irrigated at a moderate rate, ranging from six-tenths of an inch per hour in clean-cultivated areas to about 1 inch per hour where the surface is protected by a cover of plants. These soils are among the best of the agricultural soils that are suitable for irrigation.

Group 4.—Like the soils of group 3, the soils of group 4 are much less sandy than the soils of groups 1 and 2, and they have a higher moisture-holding capacity. The soils have a somewhat finer textured surface layer and subsoil than the soils of group 3. In most places the surface layer or plow layer is loam or silt loam, but in a few places it is fine sandy loam. In some places the subsoil is slightly finer textured than typical and has a higher moisture-holding capacity. In such areas water needs to be applied at a slower rate than in other areas, but in most places it can be applied at a moderate rate (fig. 9). The soils of this group are among the best soils for agriculture of any in the county. Because of their high moisture-holding capacity, they store fairly large amounts of irrigation water; they need irrigation less frequently during dry periods than most soils of the county.

Group 5.—Irrigation group 5 consists of soils that are shallow over heavy clay, silty clay, or sandy clay. The subsoil is very slowly permeable, even though the soils are moderately well drained. Water needs to be applied

TABLE 14.—*Irrigation soil groups, suitable crops, and certain water relationships*

[Generally, only moderately well drained to somewhat excessively drained soils that are suited to regular cultivation are suitable for irrigation, but there are some exceptions]

Irrigation groups and soils	Estimated maximum rate of application on level and nearly level soils [1]	Suitable crops	Estimated average depth to which soil is to be irrigated	Estimated average available moisture-holding capacity [2]
Group 1. Moderately well drained to excessively drained sands and loamy sands that extend to a depth of 36 or more inches:	*In. per hr.*		*In.*	*In.*
Galestown loamy sand, 0 to 2 percent slopes. Galestown loamy sand, 2 to 5 percent slopes. Galestown loamy sand, 5 to 10 percent slopes. Galestown sand, 0 to 2 percent slopes. Galestown sand, 2 to 5 percent slopes. Klej loamy sand, 0 to 2 percent slopes.[3] Klej loamy sand, 2 to 5 percent slopes.[3] Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes. Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes. Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes. Lakeland sand, clayey substratum, 0 to 5 percent slopes.	1.0	Truck group 1	18	1.5
	1.0	Truck group 2	24	2.0
	1.0	Truck group 3	30	2.5
	1.0	Corn	27	2.3
	1.0	Sweet corn	24	2.0
	1.0	Alfalfa	36	3.0
	1.0	Irish potatoes	24	2.0
	1.0	Sweetpotatoes	24	2.0
	1.0	Tomatoes	27	2.3
	1.0	Orchard with cover	36	3.0
	1.0	Orchard without cover	36	3.0
	1.0	Grass mixture	24	2.0
Group 2. Well-drained to somewhat excessively drained loamy sands; the subsoil is at a depth of about 18 inches and is finer textured than the surface layer; it is 8 to 12 inches thick and overlies sand:				
Sassafras loamy sand, 0 to 2 percent slopes. Sassafras loamy sand, 2 to 5 percent slopes. Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded. Sassafras loamy sand, 5 to 10 percent slopes. Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded.	.9	Truck group 1	18	1.5
	.9	Truck group 2	18	1.5
	.9	Truck group 3	18	1.5
	.9	Corn	27	2.8
	.9	Sweet corn	24	2.5
	1.0	Alfalfa	27	2.8
	.9	Irish potatoes	18	1.5
	.9	Sweetpotatoes	18	1.5
	.9	Tomatoes	27	2.8
	1.0	Orchard with cover	27	2.8
	.9	Orchard without cover	27	2.8
	1.0	Grass mixture	24	2.5
Group 3. Moderately well drained and well drained sandy loams; the subsoil is sandy clay loam; it extends from a depth of about 10 inches to 30 inches or more:				
Sassafras sandy loam, 0 to 2 percent slopes. Sassafras sandy loam, 2 to 5 percent slopes. Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded. Sassafras sandy loam, 5 to 10 percent slopes. Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded. Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes. Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded. Sassafras sandy loam, thick solum, 0 to 2 percent slopes. Sassafras sandy loam, thick solum, 2 to 5 percent slopes. Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded. Woodstown sandy loam, 0 to 2 percent slopes.[3] Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.	.6	Truck group 1	12	1.7
	.6	Truck group 2	15	2.2
	.6	Truck group 3	18	2.7
	.6	Corn	24	3.7
	.6	Sweet corn	18	2.7
	1.0	Alfalfa	27	4.2
	.6	Irish potatoes	18	2.7
	.6	Sweetpotatoes	18	2.7
	.6	Tomatoes	24	3.7
	1.0	Orchard with cover	27	4.2
	.6	Orchard without cover	27	4.2
	1.0	Grass mixture	18	2.7

See footnotes at end of table.

TABLE 14.—*Irrigation soil groups, suitable crops, and certain water relationships*—Continued

Irrigation groups and soils	Estimated maximum rate of application on level and nearly level soils [1]	Suitable crops	Estimated average depth to which soil is to be irrigated	Estimated average available moisture-holding capacity [2]
Group 4. Moderately well drained and well drained fine sandy loams, loams, and silt loams; the subsoil is sandy clay loam or silty clay loam; it extends from a depth of about 10 inches to 30 inches or more:				
Matapeake fine sandy loam, 0 to 2 percent slopes.				
Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.				
Matapeake silt loam, 0 to 2 percent slopes.	*In. per hr.*		*In.*	*In.*
Matapeake silt loam, 2 to 5 percent slopes.	0.4	Truck group 1	12	2.0
Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.	.4	Truck group 2	15	2.5
Matapeake silt loam, 5 to 10 percent slopes.	.4	Truck group 3	18	3.0
Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.	.4	Corn	24	4.0
Mattapex fine sandy loam, 0 to 2 percent slopes.[3]	.4	Sweet corn	18	3.0
Mattapex silt loam, 0 to 2 percent slopes.[3]	.7	Alfalfa	27	4.5
Mattapex silt loam, 2 to 5 percent slopes.[3]	.4	Irish potatoes	18	3.0
Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.[3]	.4	Sweetpotatoes	18	3.0
Sassafras loam, 0 to 2 percent slopes.	.4	Tomatoes	24	4.0
Sassafras loam, 2 to 5 percent slopes, moderately eroded.	.7	Orchard with cover	27	4.5
Sassafras loam, heavy substratum, 0 to 2 percent slopes.	.4	Orchard without cover	27	4.5
Woodstown loam, 0 to 2 percent slopes.[3]	.7	Grass mixture	18	3.0
Group 5. Moderately well drained loams and silt loams; a slowly permeable subsoil of clay, silty clay, or sandy clay is at a depth of about 10 inches:				
	.3	Truck group 1	12	2.0
	.3	Truck group 2	15	2.5
Keyport loam, 0 to 2 percent slopes.[3]	.3	Truck group 3	18	3.0
Keyport silt loam, 0 to 2 percent slopes.[3]	.3	Corn	18	3.0
Keyport silt loam, 2 to 5 percent slopes.[3]	.3	Sweet corn	18	3.0
	.3	Irish potatoes	18	3.0
	.3	Tomatoes	18	3.0
	.5	Grass mixture	18	3.0

[1] The rates given in this column apply only to applications on level or nearly level soils. They must be adjusted to fit different conditions at the site, such as differences in slope, in degree of erosion, and in the structure of the soil. They must also be adjusted for different crops and as the result of differences in the history of the soils to be irrigated.

[2] The figures for available moisture-holding capacity are estimated and are intended to be averages for all the soils of the group. However, two soils of the same group will vary in moisture-holding capacity to some extent, because of differences in structure, in degree of slope, and in the amount of erosion.

[3] The soils of the Keyport, Klej, Mattapex, and Woodstown series are only moderately well drained. Before the soils will be suitable for irrigation, they will need artificial drainage for most crops, except possibly grass mixtures, to remove the excess surface water during wet seasons.

rather slowly. Attempts to irrigate the soils below a depth of about 18 inches, or possibly less, are generally not successful. These soils are not well suited to fruit trees, alfalfa, and other deep-rooted crops, and those crops are not included in the list of crops suggested as suitable for irrigation. Irrigating these soils may not be justified, except for special crops that will yield a high economic return for the amount invested.

Soil groups for drainage

In this section the soils of the county have been grouped according to similarity in their drainage requirements. All of the soils of a particular group have similar characteristics and about the same kind of drainage problems. Each group differs from the others in one or more ways, but mainly in the kind and intensity of the drainage practices required. Table 15 lists the soils in each of the 17 drainage groups, describes the major factors that affect drainage, and indicates the best kind of drainage system to use, according to the range of slope. Information for this table was taken from the "Drainage Guide for Maryland."[10]

Table 15 is not intended as a technical guide for solving all the drainage problems of the county. It shows the farmer and the drainage engineer the kind of drainage problems that can be expected for any specific soil shown on the map. It also shows the kind of practices that are needed to improve drainage and the intensity with which the practices must be applied. The details of a specific drainage system, especially the spacing and depth of the

[10] UNITED STATES DEPARTMENT OF AGRICULTURE. DRAINAGE GUIDE FOR MARYLAND. (In cooperation with the Md. Agr. Expt. Sta.) 1960. [Mimeographed.]

Figure 9.—Sprinkler irrigation on a field of Matapeake silt loam, 0 to 2 percent slopes, that is planted to spinach.

drains, will have to be worked out on the site for a particular field, farm, or area.

Some areas can be drained by open ditches, with diversions for sloping areas. For other areas, open field drains or V-type ditches may be suitable and bedding may be desirable, especially between V-type ditches. Still other areas can be drained by using a random system of tiling, that is, the tile are laid in the natural water courses and extra branch lines are laid in wet areas as needed. In other areas, where the soils are uniformly too wet for cultivation, a complete system of tile drainage is needed and the tile are laid in a definite pattern throughout the wet area. Involved, of course, in choosing the kind of drainage system to use is the cost. For some soils, the cost of installing a drainage system is too great to be justified. For a drainage system to be worth while, the returns per acre must be high enough to pay all of the cost of producing the crop, including the cost of the drainage system.

In areas where ditches are to be used for drainage, the kind of soil, its depth, and the characteristics of the underlying soil material must all be considered. Fairly shallow soils that are underlain by loose sand, such as those of the Fallsington and Pocomoke series, are not well suited to ditches, because a stable ditchbank is difficult to maintain. Water soon loosens the sand and causes it to clog the ditches. In the Elkton and in other deep, coherent soils, on the other hand, the ditches clog less readily and are generally less expensive and easier to maintain.

In cultivated areas a network of small lateral ditches can be used to remove the excess water. From the lateral ditches, the water flows into a larger ditch and, finally, into a natural drainageway. The number of lateral ditches needed depends on the characteristics of the soils. It is determined by the degree of wetness, by the texture of the soils, by the kind of crop to be grown, and, especially, by the permeability of the surface layer and subsoil. The Woodstown soils, for example, require only a few widely spaced lateral ditches. The Elkton soils, which have characteristics different from those of the Woodstown soils, require laterals that are spaced much more closely.

Many farmers "land" the soils by using a plow or other tool to build a low ridge midway between the lateral ditches. The sides of the ridge slope gradually toward the adjacent ditch. This is especially effective in areas of very wet soils, such as those of the Pocomoke, Rutlege, Bayboro, Bibb, Fallsington, Johnston, Othello, Portsmouth, and Elkton series.

In areas where tile drainage is used, the characteristics of the soil and the gradient of the slope largely determine the spacing of the tile. In the fine textured or moderately fine textured, slowly permeable soils, such as those of the Elkton series, the tile lines must be laid closer together than in porous, sandy soils, such as the Klej and Rutlege.

Soil groups for sewage disposal

Dorchester County is essentially rural. Adequate systems for disposing of sewage have been installed in the towns. In the strictly rural areas, however, or in small communities that are beyond the existing lines used for the disposal of sewage, it is necessary to use septic tanks.

A septic tank installed in dry weather may function properly until rainfall is heavy. Most failures occur where systems have been installed in poorly drained soils—soils having a dense, compact, or fine-textured subsoil. In wet weather and for long periods afterward, such soils are saturated so that the water table is near the surface; therefore, there is no space for outflow from the septic tank, and the movement of sewage effluent is very slow.

Other failures occur where the slopes are too steep to be suitable for fields for septic tanks, where soils are subject to seasonal flooding, or where soils are shallow over a dense substratum. These characteristics are readily apparent, and for this reason, failures resulting from such characteristics are fewer than those resulting from a high water table or from a slowly permeable subsoil.

The general suitability of the soils as fields for septic tanks is indicated in column 4 of table 13 in the section "Soil Interpretations for Engineering." The ratings are given only for soils that have slopes of less than 5 percent. The soils for which ratings are given are arranged alphabetically; hence, the ratings are not grouped or classified according to the suitability of the soils as fields for septic tanks.

Various agencies in Maryland have cooperated to determine the characteristics of the soils that should be considered before a septic tank is installed. They have arranged the soils in eight groups on a statewide basis according to the suitability of the soils as fields for septic tanks. The factors that limit and those that favor the functioning of a septic tank have been indicated in the description of each group. No soils of groups 4, 5, and 6 are mapped in the county.

By using this grouping, along with the detailed soil map, it is possible to locate areas where septic tanks can be expected to function satisfactorily. An intensive examination of the site, however, should be made before a septic tank is installed.

Group 1.—The soils in this group are suitable to use as fields for septic tanks. They are deep and well drained. The slope is no greater than 5 percent, and all of the soils are underlain by pervious, unconsolidated deposits.

TABLE 15.—*Drainage soil groups and suggested kinds and spacings of drainage systems for different land uses*

Soil group and included soils	Major problems	Slope range	Kind of drain	Remarks
		Percent		
Drainage group 2–A: Moderately well drained soils that have a moderately fine textured subsoil and a sandy substratum. (MpA) Mattapex fine sandy loam, 0 to 2 percent slopes. (MsA) Mattapex silt loam, 0 to 2 percent slopes. (MsB) Mattapex silt loam, 2 to 5 percent slopes. (MsB2) Mattapex silt loam, 2 to 5 percent slopes, moderately eroded. (WdA) Woodstown loam, 0 to 2 percent slopes.	Brief seasonal high water table and impeded drainage in the lower part of the subsoil.	0 to 2	Tile in a random system; tile in a patterned system; open ditches.	Land smoothing may be necessary.
		2 to 5	Tile in a random system; tile in a patterned system; diversions.	Reduce spacing between diversions and add waterways where necessary for control of erosion on sloping areas; use diversions for interceptors where needed.
Drainage group 2–B: Moderately well drained soils that have a moderately fine textured subsoil and a sandy substratum. (WoA) Woodstown sandy loam, 0 to 2 percent slopes. (WoB2) Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.	Brief seasonal high water table and impeded drainage in the lower part of the subsoil.	0 to 2	Tile in a random system; tile in a patterned system; open ditches.	Land smoothing may be necessary.
		2 to 5	Tile in a random system; tile in a patterned system; diversions.	Boundary drainage may be practical on soils of this group.
Drainage group 4: Moderately well drained soils that have a subsoil of loamy sand or sand. (KsA) Klej loamy sand, 0 to 2 percent slopes. (KsB) Klej loamy sand, 2 to 5 percent slopes.	Areas in depressions that have a seasonal high water table for long periods.	0 to 2	Tile in a random system; interceptor ditches.	Interceptor tile may be used with diversions; spacing varies with strip width and may be reduced where necessary for control of erosion.
		2 to 5	Tile in a random system; diversions.	
Drainage group 6–2A: Moderately well drained soils that have a subsoil and substratum of clay. (KeA) Keyport loam, 0 to 2 percent slopes. (KpA) Keyport silt loam, 0 to 2 percent slopes. (KpB) Keyport silt loam, 2 to 5 percent slopes.	Impeded subsoil drainage and a high water table for long periods.	0 to 2	Field ditch system; random ditches.	Land smoothing may be necessary.
		2 to 5	Diversions	For truck crops and general rotations, stripcropping, using graded rows and sodded waterways, may be supplemented by a system of terraces on sloping areas where erosion is a problem.
Drainage group 7–B: Poorly drained soil that has a subsoil of sandy clay loam and a sandy substratum. (Fa) Fallsington sandy loam.	Brief to long periods of high water table.	0 to 2	Tile in a patterned system; field ditches.	Tile may be used to intercept seepage from adjacent higher areas. Use graded rows for crops.
Drainage group 8–2A: Poorly drained, moderately fine textured soil that has a heavy-textured, very slowly permeable subsoil. (Eo) Elkton silty clay loam.	Long periods of high water table.	0 to 2	Field ditches	Land smoothing may be necessary.
Drainage group 8–1A: Poorly drained, medium-textured soil that has a subsoil of silty clay loam over sand. (Oh) Othello silt loam.	Long periods of high water table.	0 to 2	Field ditches	Use graded rows for crops; land smoothing may be necessary.
Drainage group 8–2B: Poorly drained, medium-textured soils that have a heavy-textured, very slowly permeable subsoil. (Ek) Elkton loam. (Em) Elkton silt loam.	Long periods of high water table.	0 to 2	Field ditches	Use graded rows for crops; land smoothing may be necessary.
Drainage group 9–1: Poorly drained soil that has a subsoil of loamy sand or sand. (Pm) Plummer loamy sand.	Areas in depressions that have long periods of high to very high water table.	0 to 2	Tile in a patterned system; field ditches.	Some areas subject to overflow; possible overdrainage during dry seasons.

TABLE 15.—*Drainage soil groups and suggested kinds and spacings of drainage systems for different land uses*—Continued

Soil group and included soils	Major problems	Slope range	Kind of drain	Remarks
		Percent		
Drainage group 9-3A: Very poorly drained, medium-textured soil that has a subsoil of sandy clay loam and a sandy substratum. (Po) Pocomoke loam.	Long to very long periods of high to very high water table.	0 to 2	Tile in a random system; field drains.	Bedding may be needed between open drains.
Drainage group 9-3B: Very poorly drained soil that has a subsoil of sandy clay loam and a sandy substratum. (Ps) Pocomoke sandy loam.	Long to very long periods of high to very high water table.	0 to 2	Field drains.	Bedding may be needed between open drains.
Drainage group 9-4A: Very poorly drained, medium-textured soil that has a subsoil of silty clay loam and a sandy substratum. (Pt) Portsmouth silt loam.	Long to very long periods of high to very high water table.	0 to 2	V-type ditches; field drains; bedding.	Bedding advisable for row crops.
Drainage group 9-5B: Very poorly drained soil that has a subsoil of loamy sand or sand. (Ru) Rutlege loamy sand.	Long to very long periods of high to very high water table.	0 to 2	V-type ditches; field drains; bedding.	Bedding advisable on high-row plantings between open drains.
Drainage group 9-6A: Very poorly drained, moderately fine textured soil that has a clay subsoil. (Bb) Bayboro silty clay loam.	Long to very long periods of high to very high water table.	0 to 2	V-type ditches; field drains.	
Drainage group 9-6B: Very poorly drained, medium-textured soil that has a clay subsoil. (Ba) Bayboro silt loam.	Long to very long periods of high to very high water table.	0 to 2	V-type ditches; field drains.	Bedding advisable on high-row plantings between drains.
Drainage group 10: Poorly drained, medium-textured to moderately fine textured soils that have a heavy, very slowly permeable subsoil. (En) Elkton silt loam, low. (Et) Elkton silty clay loam, low. (Ot) Othello silt loam, low.	Long to very long periods of high to very high water table, and occasional tidal overflow.	0 to 2	V-type ditches; field drains.	Dikes against high tides are indicated where technically and economically feasible.
Drainage group 11-A: Poorly drained and very poorly drained, medium-textured soils of flood plains. (Bm) Bibb silt loam. (Jo) Johnston loam.	Flooding, seepage from uplands, and long to very long periods of high to very high water table.	0 to 2	V-type ditches; field drains; tile interceptor.	Use tile interceptors to collect upland seepage; dikes and flood gates may be needed in some places.

These soils are not subject to flooding. The following soils are in this group:

(GaA) Galestown loamy sand, 0 to 2 percent slopes.
(GaB) Galestown loamy sand, 2 to 5 percent slopes.
(GsA) Galestown sand, 0 to 2 percent slopes.
(GsB) Galestown sand, 2 to 5 percent slopes.
(LaA) Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes.
(LaB) Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes.
(LcB) Lakeland sand, clayey substratum, 0 to 5 percent slopes.
(MfA) Matapeake fine sandy loam, 0 to 2 percent slopes.
(MfB2) Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.
(MkA) Matapeake silt loam, 0 to 2 percent slopes.
(MkB) Matapeake silt loam, 2 to 5 percent slopes.
(MkB2) Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.
(SaA) Sassafras loam, 0 to 2 percent slopes.
(SaB2) Sassafras loam, 2 to 5 percent slopes, moderately eroded.
(ShA) Sassafras loam, heavy substratum, 0 to 2 percent slopes.
(SmA) Sassafras loamy sand, 0 to 2 percent slopes.
(SmB) Sassafras loamy sand, 2 to 5 percent slopes.
(SmB2) Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded.
(SnA) Sassafras sandy loam, 0 to 2 percent slopes.
(SnB) Sassafras sandy loam, 2 to 5 percent slopes.
(SnB2) Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.
(SsA) Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes.
(SsB2) Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded.
(StA) Sassafras sandy loam, thick solum, 0 to 2 percent slopes.
(StB) Sassafras sandy loam, thick solum, 2 to 5 percent slopes.
(StB2) Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded.

There are few, if any, failures of septic tanks on these soils if the tanks are given proper care, especially if individual tanks are widely separated from others. Difficulty might develop, however, if a number of tanks were concentrated in a small area. This happens occasionlly where lots are small, as in a residential development where the houses are closely spaced.

Group 2.—The soils in this group are fairly suitable for use as fields for septic tanks. They have many of the same characteristics as the soils of group 1, but their slope ranges from 5 to 15 percent. The danger of surface seepage and of downslope pollution is, therefore, greater than on the soils of group 1, and the cost of excavating and grading is higher. The following soils are in this group:

(GaC) Galestown loamy sand, 5 to 10 percent slopes.
(GaD) Galestown loamy sand, 10 to 15 percent slopes.
(GsC) Galestown sand, 5 to 10 percent slopes.
(GsD) Galestown sand, 10 to 15 percent slopes.
(LaD) Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes.
(LcD) Lakeland sand, clayey substratum, 5 to 15 percent slopes.
(MkC) Matapeake silt loam, 5 to 10 percent slopes.
(MkC2) Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.
(MkD) Matapeake silt loam, 10 to 15 percent slopes.
(SmC) Sassafras loamy sand, 5 to 10 percent slopes.
(SmC2) Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded.
(SmC3) Sassafras loamy sand, 5 to 10 percent slopes, severely eroded.
(SmD) Sassafras loamy sand, 10 to 15 percent slopes.
(SnC) Sassafras sandy loam, 5 to 10 percent slopes.
(SnC2) Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.
(SnD) Sassafras sandy loam, 10 to 15 percent slopes.

Group 3.—The soils in this group are poorly suited to very poorly suited to use as fields for septic tanks. They have many of the same characteristics as the soils of groups 1 and 2, but they have slopes that are greater than 15 percent. If the areas are large enough and if there are adequate safeguards against pollution, some of the less sloping areas can be used as fields for septic tanks. Most areas, however, are too steep for that purpose. The following soils are in this group:

(GeF) Galestown sand and loamy sand, 15 to 40 percent slopes.
(SmF) Sassafras loamy sand, 15 to 40 percent slopes.
(SnE) Sassafras sandy loam, 15 to 30 percent slopes.

Group 7.—The soils in this group are either poorly suited to use as fields for septic tanks, or they are not suitable. They are poorly drained to moderately well drained and have a water table that is seasonally high. In some areas the permeability of the subsoil is very slow. In general, the soils are not subject to flooding. The impeded drainage, however, generally causes septic tanks located on these soils to fail if there is no special means of disposing of the effluent. Even if water moves through the soils, there is no place for it to go if the water table is high. The following soils are in this group:

(Ba) Bayboro silt loam.
(Bb) Bayboro silty clay loam.
(Ek) Elkton loam.
(Em) Elkton silt loam.
(En) Elkton silt loam, low.
(Eo) Elkton silty clay loam.
(Et) Elkton silty clay loam, low.
(Fa) Fallsington sandy loam.
(KeA) Keyport loam, 0 to 2 percent slopes.
(KpA) Keyport silt loam, 0 to 2 percent slopes.
(KpB) Keyport silt loam, 2 to 5 percent slopes.
(KsA) Klej loamy sand, 0 to 2 percent slopes.
(KsB) Klej loamy sand, 2 to 5 percent slopes.
(MpA) Mattapex fine sandy loam, 0 to 2 percent slopes.
(MsA) Mattapex silt loam, 0 to 2 percent slopes.
(MsB) Mattapex silt loam, 2 to 5 percent slopes.
(MsB2) Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.
(Oh) Othello silt loam.
(Ot) Othello silt loam, low.
(Pm) Plummer loamy sand.
(Po) Pocomoke loam.
(Ps) Pocomoke sandy loam.
(Pt) Portsmouth silt loam.
(Ru) Rutlege loamy sand.
(WdA) Woodstown loam, 0 to 2 percent slopes.
(WoA) Woodstown sandy loam, 0 to 2 percent slopes.
(WoB2) Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.

Group 8.—The soils of this group are unsuitable for use as fields for septic tanks. They are subject to flooding from streams or by normal high tides. The following soils are in this group:

(Bm) Bibb silt loam.
(Jo) Johnston loam.
(Mx) Mixed alluvial land.
(Sw) Swamp.
(Tm) Tidal marsh.

Use of the soil survey in community planning

In making plans for construction or zoning, a knowledge of the soils helps in determining the best use of an area. As a rule, the soils that are the best for agriculture are the ones that are also suitable for building sites. Therefore, some plan for land use is needed so that the most fertile soils will be reserved for agriculture.

In the section "Soil Groups for Sewage Disposal," the soils are grouped according to their suitability as fields for septic tanks, and this same grouping can also be used in planning the use of the areas for other purposes. Groups 1 and 2 include most of the soils that are the best for agriculture. Some of the soils in groups 7 and 8, however, can be improved for agricultural use if they are adequately drained. The soils of group 8, are flooded occasionally to very frequently.

The soils of group 7 can also be used as sites for residences if a complete system for disposing of sewage is installed. They are not suitable as fields for septic tanks, because they are likely to be wet during most of the year. A drainage system is needed that will drain the soils and that will also dispose of the excess surface water.

Suburban communities and some rural communities need land for public recreational areas. The soils that are difficult to manage for crops and that are not suitable for building sites should be reserved for that purpose. The sloping to steep soils of group 3 are best suited to recreational areas and parks. Because they are susceptible to erosion, the soils of group 3 need to be protected by a cover of plants, and many of the areas are now in forests. Some soils in groups 7 and 8, particularly in the scattered, small areas, should also be used for community parks.

If feasible, parks should be kept in forests. Few areas need to be cleared, and the areas that must be cleared can be reforested. Forests not only increase the esthetic value of an area, but they retard excessive runoff and help to reduce the hazards of erosion and flooding.

Topsoil of good quality is important in establishing a protective cover of plants on areas that have been disturbed. The cost is usually high for revegetating or otherwise stabilizing cuts, fills, roadbanks, shoulders, and other areas where the soil material has been disturbed. In table 13 in the section "Soil Interpretations for Engineering," the soils of the county are rated according to their suitability as a source of topsoil.

Formation, Morphology, and Classification of Soils

Soils are the products of soil-forming processes acting upon material deposited or accumulated by geologic forces. The five factors that affect the formation of soils are climate, plant and animal life, parent material, topography, and time.

Factors of Soil Formation

Climate and plant and animal life, particularly vegetation, are the active forces of soil formation. Their effect on the parent material is modified by topography and by the length of time the parent material has been in place. The relative importance of each factor differs from place to place. In some places one factor dominates and fixes most of the properties of the soil, but normally the interaction of all five factors determines the kind of soil that develops in any given place.

Climate

Dorchester County has the rather humid, temperate climate, typical of most of the coastal areas of the Middle Atlantic States. Facts about the temperature and precipitation in the county are given in tables 1 and 2 and in the section "General Nature of the Area." The climate is fairly uniform throughout the county. There are no significant differences in the elevation and no obstructions to the movement of winds, clouds, and rainstorms. Masses of air generally move through the county from a northerly or westerly direction, but they are warmed by the air that moves in periodically from the south and southwest.

This humid, temperate climate has caused most of the soils to be strongly weathered, leached, and acid and to be comparatively low in fertility. In many places the soil material is weathered to a great depth because it has been exposed to climatic forces for a fairly long period of geologic time. The only materials not deeply weathered are those that are highly resistant to weathering.

The soils of the county have no free carbonates, and in large part the bases have been leached out of them. All of the soils are naturally acid, and most of them are strongly acid to extremely acid. Most of the soils are low in plant nutrients, although some have a moderate supply. Many of the soils that are low in plant nutrients can be made much more productive if they are properly managed.

Plant and animal life

Before the county was settled, the native vegetation had been a major influence in the development of the soils. Although little is known about the effects of micro-organisms, earthworms, larvae, and other forms of animal life, the activities of these animals were important in the cycle of decay and regeneration of plants.

The first settlers found a dense forest that consisted mainly of hardwoods. Oak was the dominant species in most parts of the county. Loblolly pine, pond pine, Virginia pine, yellow-poplar, holly, gum, hickory, maple, and dogwood were also important, but there were probably few pure stands of pine before the county was settled. The fairly pure stands of pine that exist today, particularly those made up of loblolly pine, are generally in areas that were once cleared and cultivated.

Most hardwood trees use large amounts of calcium and other bases if they are available in the soils. Soils that are normally high in bases remain so under a cover of deciduous trees because, in large part, the bases are returned to the soil each year when the leaves fall. The bases reenter the soil when the leaves decompose, and they are again utilized by plants. Thus, in areas where the soils are naturally well supplied with bases, there is a never-ending cycle. The soils in Dorchester County, however, have never been very high in bases; consequently, they are acid even under a cover of hardwoods. Soils that are strongly acid and low in fertility are better suited to pines than to most hardwoods. Pines do not require large amounts of calcium and other bases, and their needles return little fertility to the soil.

As agriculture developed in the county, man became an important factor in the development of the soils. The clearing of the forests, cultivation of the areas, introduction of new kinds of crops and other plants, and improvements made in natural drainage have affected development of the soils and will affect their development in the future.

The most important changes brought about by man are (1) mixing the upper horizons of the soil to form a plow layer, (2) tilling sloping soils, which has caused erosion, and (3) liming and fertilizing to change the content of plant nutrients, especially in the upper horizons. The most obvious change in the vegetation has been the loss of the natural vegetation, for only about 149,390 acres of woodland remained in the county in 1959. There has also been a notable increase in the number of pines as compared to the number of hardwoods.

Parent material

The parent material of the soils in this county consisted of sediments transported mainly by water, although part of it may have been transported by wind, and part by ice floes carried by glacial meltwater. Some of the sediments were the size of particles of clay, but others were as large as pebbles. In places there were cobbles or small stones.

The stones and larger pebbles must have been transported by ice during the retreat of the last glaciers. The Eastern Shore of Maryland was not glaciated, but glaciers once extended into northern Pennsylvania. Fragments of ice of many different sizes and containing clay, gravel, and occasional stones may have descended into the area that is now the Eastern Shore through the valleys of rivers, such as the Susquehanna. As the ice floes drifted southward, they melted and dropped sediments in the shallow seas. The areas in which sediments were dropped later emerged to form the Delmarva Peninsula, of which Dorchester County is a part.

It is likely that the soil material in marshes and other low-lying areas consists of sediments that were recently deposited in shallow salt water. These sediments were elevated to sea level, either by slow uplift of the land or by fluctuations in the level of the sea and of Chesapeake Bay, or perhaps by both.

The texture of the soils is directly related to the texture of their parent material. Soils of the Galestown, Klej, Lakeland, Plummer, and Rutlege series, for example, developed in coarse-textured materials. There is some evidence, however, that their parent material, particularly that of the Galestown and Lakeland soils, was reworked by wind or by water, or both, between the time it was deposited and the time that it took the soils to develop. The Lakeland and Galestown soils occur, in part, on what appears to be old alluvial terraces along the major streams of the county.

Over large areas, the sediments that make up the parent material of many of the soils consist mainly of mixtures of sand and silt, but it generally includes a small, but variable, admixture of clay. In places these materials are stratified and the texture varies in alternating layers. Soils of the Fallsington, Pocomoke, Sassafras, and Woodstown series developed in this kind of material.

The Matapeake, Mattapex, Othello, and Portsmouth soils developed in a mantle of silt that overlies sand. The mantle of silt, or loess, probably was blown from glaciated areas to the north.

The finest textured sediments consist chiefly of clay and silty clay but partly of fine sand and very fine sand. Soils of the Bayboro, Elkton, and Keyport soils developed in this kind of sediments.

In this county there are also several kinds of sediments that have been deposited recently. Soils of the Bibb and Johnston series are forming in recent deposits of alluvium on flood plains; and Mixed alluvial land, a miscellaneous land type, consists of areas of unconsolidated alluvium. Tidal marsh consists of sediments from recent deposits, mostly clays, that were influenced by salt water and by the action of tides.

More than one kind of soil may develop in the same kind of parent material or in similar parent material. Thus, it is evident that factors other than parent material have also influenced the kinds of soils that have developed.

Topography

Dorchester County is entirely within the Atlantic Coastal Plain. Most of it is nearly level. Although the slope is generally less than 2 percent, in some small but important areas, it is between 2 and 10 percent. Most of the sloping areas are smooth, but some have complex slopes or are hummocky. In a few places the slope is between 10 and 30 percent or even greater. These steeper slopes are mainly on the breaks above drainageways, and they occupy less than 1 percent of the county.

Local differences in elevation are seldom more than a few feet. In only a few places are there differences in elevation of as much as 20 feet in 1 mile. The highest elevations are in the northern and northeastern parts of the county, and the highest point is 57 feet above sea level. This point is about 1½ miles south of Allens Corner and about ½ mile east of Marshyhope Creek.

The county slopes mainly toward the south, but it also slopes toward the west. The salt marshes along the shores of Chesapeake Bay are at sea level.

The nearly level relief in most of the county contributes to the slow drainage of many of the soils. Water flows very slowly into the main channels, especially from nearly level areas of fine-textured soils. It also moves slowly through many of the soils, which increases the problem of drainage.

Time

Geologically, the deposits of soil materials of the county range from very young, or immature, to fairly old. The most recent, or Holocene, deposits are those on alluvial flood plains and in marshy areas affected by tides. In those areas soil material is still being added from year to year when the areas are flooded. Somewhat older, geologically, are the sands, somewhat gravelly sands, and silts over sands, which are probably of Pleistocene age. Most of the older Coastal Plain deposits are probably of Miocene age, but some may be of Pliocene age.[11] [12]

Time accounts for many of the differences among soils. In steep areas, for example, no well-defined horizons have had time to develop in the soils, because the soil material has been removed by geologic erosion almost as rapidly as it was deposited. On the other hand, some soils formed in material deposited fairly recently show definite and, presumably, mature development. These soils are in nearly level areas, where there has been little or no geologic erosion, and the products of the soil-forming processes have remained in place as components of genetic soils.

Interrelationships of Soil Series

In table 16 the soil series of the county are grouped to show relationships in position, parent material, and drainage. Most of the soils are on uplands or terraces, but some are on flood plains or bottom lands. The texture of their parent material varies widely. Many of the soils are poorly drained or very poorly drained.

Soils of the uplands and terraces.—Although the soils on uplands and on terraces are in two different topographic positions, this difference does not affect the use and suitability of the soils. Soils of some series, such as the Galestown, are on both uplands and terraces.

The soils of uplands have developed in place from the underlying parent material. Those on terraces have developed in very old material, mostly sand, that was deposited by streams. The soils of uplands and terraces occupy about 72 percent of the county.

Soils of flood plains or bottom lands.—The flood plains or bottom lands consist of areas where soil material has been deposited only recently when streams overflowed their banks. The areas are still subject to flooding. Some of them are flooded only occasionally, but others are flooded every year or several times a year.

The floodwaters have left deposits of silt and sand, and in places there are deposits of clay or gravel. In most places the material in the deposits is of many different textures, but in some areas it has a fairly uniform texture. The soil material does not show much soil development. In places there has been some development of a surface layer, but generally none of a B horizon.

The soils of flood plains are not extensive in this county. They make up less than 1 percent of the total acreage.

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[11] Ryan, J. Donald. THE SEDIMENTS OF CHESAPEAKE BAY. State of Maryland, Dept. Geology, Mines, and Water Resources Bul. No. 12, 120 pp. 1953.

[12] Singewald, Joseph T., Jr. SHORE EROSION IN TIDEWATER MARYLAND. State of Maryland, Dept. Geology, Mines, and Water Resources Bul. No. 6, 141 pp. 1949.

TABLE 16.—*Soil series arranged to show relationships in position, parent material, and drainage*

SOILS OF UPLANDS AND TERRACES

Parent material	Somewhat excessively drained	Well drained	Moderately well drained	Poorly drained	Very poorly drained
Sand and loamy sand	Galestown; Lakeland		Klej [1]	Plummer	Rutlege.
Sand, silt, and clay		Sassafras	Woodstown	Fallsington	Pocomoke.
Mantle of silt over sand		Matapeake	Mattapex	Othello	Portsmouth.
Clay or silty clay			Keyport	Elkton	Bayboro.
SOILS OF FLOOD PLAINS OR BOTTOM LANDS					
Sand, silt, and clay				Bibb	Johnston.

[1] The Klej soils are moderately well drained to somewhat poorly drained.

The remaining 27 percent, other than the acreage occupied by uplands and terraces, consists of areas of Tidal marsh and Swamp. These areas are not included in this section, because they do not have a developed soil profile.

Morphology of Soils

In most of the soils of this county, morphology is expressed by evident horizonation. The young alluvial soils, however, show very little horizonation, nor do the soils on formations that resemble dunes and consist of fairly pure quartz sand.

The differentiation of horizons in the soils is the result of one or more of the following processes: (1) Accumulation of organic matter, (2) leaching of carbonates and of salts more soluble than calcium carbonate, (3) chemical weathering, chiefly by hydrolysis, of the primary minerals of the parent material into silicate clay minerals, (4) translocation of the silicate clay minerals, and probably of some silt-sized particles, from one horizon to another, and (5) chemical changes (oxidation, reduction, and hydration) and transfer of iron.

In almost all of the soils of the county, several of these processes have been active in the development of horizons. For example, the interaction of the first, second, third, and fourth processes is reflected in the strong horizons in soils of the Sassafras series, and all five processes have been active in the development of soils of the Keyport, Mattapex, and Woodstown series. Only the first and fifth processes have had any marked effect on the soils of the Bibb, Johnston, Plummer, and Rutlege series. In most soils, however, the second process, leaching of carbonates and salts, must have taken place in the soil materials before they were deposited, and possibly some of the other processes may have been active.

Some organic matter has accumulated in all of the soils to form an A_1 horizon. Through tillage, the material in this horizon, however, has been mixed with material from the underlying horizons. The A_1 horizon thus lost its identity and became a part of an A_p horizon. The amount of humus or the amount of organic matter varies in the different soils and ranges from very low to very high. Soils of the Galestown and Lakeland series all have a weak A_1 horizon that contains little organic matter. Those of the Bayboro, Johnston, Pocomoke, Portsmouth, and Rutlege series have a prominent A_1 horizon in which there is as much as 15 percent organic matter in places.

There have been no detailed studies of the clay mineralogy of the soils of the Eastern Shore of Maryland. The soil material in this area, however, consists of sediments that have been deposted by the waters of the Susquehanna and Potomac Rivers, and possibly by the waters of the Delaware River. These sediments originated in many parts of the Atlantic watershed; thus, the composition, as well as the origin, of the clay minerals in the present soils is extremely variable. In such soils as the Sassafras and some of the better oxidized, older soils, kaolinite is probably one of the chief clay minerals.

The translocation of silicate clay minerals has contributed strongly to the development of horizons in many soils of the county. Silicate clay minerals have been partly removed from the A_1 and A_2 horizons and partly immobilized in the B horizon. This is characteristic of the Bayboro, Elkton, Fallsington, Keyport, Matapeake, Mattapex, Othello, Pocomoke, Portsmouth, Sassafras, and Woodstown soils, and of all soils that have a genetic textural B horizon. To a slight degree, it may also be characteristic of soils of the Galestown and Klej series and of some other soils that do not have a distinct textural B horizon.

The reduction and transfer of iron has occurred to some degree in all the soils that have impeded drainage. In the large areas of naturally wet soils in Dorchester County, this process, known as gleying, has been of great importance. The soils of the Bayboro, Bibb, Elkton, Fallsington, Johnston, Othello, Plummer, Pocomoke, Portsmouth, and Rutlege series have all been affected by gleying.

Iron that has been reduced in areas where the soil is poorly aerated generally becomes mobile and may be removed from the soil entirely. In the soils of this county, however, iron has moved either within the horizon where it originated or to another nearby horizon. Part of this iron may become reoxidized and segregated to form the yellowish-brown, strong-brown, or yellowish-red mottles that indicate impeded drainage and are common in a gleyed horizon.

When silicate clay forms from primary materials, some iron generally is freed as a hydrated oxide. Depending on the degree of hydration, these oxides are more or less red. Even a small amount of the oxide will cause the subsoil to have a reddish color. Iron oxide colors the subsoil, even where there has not been enough accumulation of clay minerals to form a textural B horizon. This is characteristic of soils of the Galestown series.

A profile that is representative for each soil series in the county is given in the section "Descriptions of the Soils." In that section the morphology of the representative soils is described in detail.

Classification of Soils by Great Soil Groups

Soils are placed in narrow classes for the organization and application of knowledge about their use and management on individual farms or in counties. They are placed in broad classes for the study and comparison of large areas, such as continents. In the comprehensive system of soil classification that has been followed in the United States,[13] the soils are placed in six categories. Beginning with the most inclusive category, these are the order, suborder, great soil group, family, series, and type.

In the highest category the soils of the whole country are grouped into three orders, but thousands of soil types are recognized in the lowest category. The type and series are the categories most commonly used in discussing the soils of a county or other small area. Soils that are alike in fundamental characteristics are classified as one great soil group.

The great soil groups recognized in this county are the Sols Bruns Acides, Gray-Brown Podzolic soils, Humic Gley soils, Low-Humic Gley soils, and Regosols. Many of the soils of the county do not fit the modal, or central, concept of any one great soil group. They have many of the characteristics of soils in a given great soil group, but they have one or more characteristics like those of another group. These soils are called intergrades.

Sols Bruns Acides

In Dorchester County, Sols Bruns Acides have an evident A_1 horizon that is about 4 to 6 inches thick. In most places they have a faint A_2 horizon, but in some places the A_2 horizon is lacking. The B horizon contains little or no more clay than the horizons that lie above and below. It is distinguished chiefly by color and is redder in hue or of higher chroma than either the A or C horizons. The structure of the B horizon is similar to that of the A and C horizons. Sols Bruns Acides have a very low degree of base saturation and are generally very strongly acid. The Galestown soils are the only soils of this great soil group in the county.

Gray-Brown Podzolic soils

In areas that have not been disturbed, Gray-Brown Podzolic soils have a fairly thin litter of leaves and a fairly thin layer of humus on the surface. The mineral surface layer is dark colored and overlies a grayish-brown, leached horizon. Just below the leached horizon is the B horizon, which contains more clay than the A horizon and has blocky or subangular blocky structure. The B horizon is brown, yellowish brown, brownish yellow, or reddish brown. The solum of Gray-Brown Podzolic soils is moderately thick. In most places these soils are slightly acid, but the reaction ranges from medium acid to neutral.

[13] UNITED STATES DEPARTMENT OF AGRICULTURE. SOILS AND MEN. U.S. Dept. Agr. Ybk., pp. 979–1001. 1938.

In this county the Keyport, Matapeake, Mattapex, Sassafras, and Woodstown soils have been classified as Gray-Brown Podzolic soils. These soils are more leached than the true Gray-Brown Podzolic soils, however, and they are strongly acid throughout. Their subsurface layer, or A_2 horizon, is lighter colored, and their B horizon is dominantly red and yellow, instead of brown as in the typical Gray-Brown Podzolic soils. Therefore, these soils are not considered to be true Gray-Brown Podzolic soils but are intergrades toward the Red-Yellow Podzolic great soil group.

Humic Gley soils

Soils of the Humic Gley great soil group are poorly drained to very poorly drained and are hydromorphic. They have a thick, prominent A horizon that is high in organic matter. In some areas their B horizon is strongly reduced or mottled, but in other areas they lack a B horizon and have only a substratum. In some areas the mottling or gleying extends upward into the lower part of the A horizon.

Humic Gley soils have formed under a wet-forest or marsh type of vegetation in a humid or subhumid climate. In reaction they range from strongly acid to mildly alkaline. The Humic Gley soils in this county are strongly acid.

The Bayboro, Johnston, Pocomoke, Portsmouth, and Rutlege soils are in the Humic Gley great soil group. All of these soils are very poorly drained. They have a high water table, and all but the Johnston and Rutlege soils have a slowly permeable subsoil.

Low-Humic Gley Soils

Soils of the Low-Humic Gley great soil group are poorly drained. They generally have a thin surface layer that is moderately high in organic matter. The surface layer overlies a mottled, or partly gleyed, mineral subsoil or substratum. Illuviation has been moderate in these soils; thus, in most places there is some difference in texture between the various horizons. The A horizon of a Low-Humic Gley soil is thinner and less prominent than that of a true Humic Gley soil, and it contains less organic matter. The B horizon is also less strongly gleyed.

The Bibb, Elkton, Fallsington, Othello, and Plummer soils are representative of the Low-Humic Gley great soil group in this county. These soils are strongly acid and are generally wet.

Regosols

Soils of the Regosol great soil group consist of deposits of relatively unweathered rock or mineral material. The soils range from somewhat poorly drained to excessively drained and show practically no evidence of genetic soil development, except for a weakly developed A_1 horizon. The parent material of these soils is either too young to have time for soil horizons to develop, or is too resistant to weathering to show appreciable effects of the processes of soil development, regardless of time. Dune deposits consisting of quartz sand are an example of parent material that is too resistant to weathering to show appreciable effects of the processes of soil development.

In Dorchester County soils of the Klej and Lakeland series are classified as Regosols. These soils consist largely of quartz sand. In these soils, however, a small accumulation of organic matter has darkened the surface layer slightly. Weathering has had little effect on these soils. From the A horizon downward, there is only parent material and no significant formation of a B horizon. The Klej soils are very weakly gleyed in the lower substratum, but they are not considered to be intergrades toward any other great soil group.

Glossary

AASHO classification (engineering). The system of soil classification of the American Association of State Highway Officials.

Acidity, soil. The degree of acidity or alkalinity of a soil expressed in pH values, or in words, as follows:

	pH		pH
Extremely acid	Below 4.5	Mildly alkaline	7.4–7.8
Very strongly acid	4.5–5.0	Moderately alkaline	7.9–8.4
Strongly acid	5.1–5.5	Strongly alkaline	8.5–9.0
Medium acid	5.6–6.0	Very strongly alkaline	9.1 and higher.
Slightly acid	6.1–6.5		
Neutral	6.6–7.3		

Base exchange capacity. A measure of the absorptive capacity of a soil for bases, or the amount of bases that can be absorbed by a given amount of soil, expressed in milliequivalents of the nonvalent cation absorbed from a neutral solution by 100 grams of soil. Generally speaking, a soil that has a fairly high exchange capacity is preferred to one that has a low exchange capacity, because it will retain more plant nutrients and will be less subject to leaching.

Bases. The positive, generally metallic elements or combination of elements that make up the nonacidic plant nutrients. The most important of these in plant nutrition are calcium (Ca), potassium (K), magnesium (Mg), and ammonium (NH_4

California bearing ratio (engineering). The ratio of the ability of a soil to support weight to that of a standard crushed limestone, first standardized in California; abbreviated CBR. Thus, a soil with a CBR of 16 would support 16 percent of the load that would be supported by the crushed limestone per unit area and with the same degree of distortion.

Clay. (1) As a soil separate, the mineral soil particles less than 0.002 millimeter (0.000079 inch) in diameter. (2) As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Consistence, soil. The characteristics of soil material that are expressed by the degree and kind of cohesion and adhesion, or by the resistance of the soil material to deformation or rupture. These characteristics vary with the content of moisture. When dry, soil is said to be *loose, soft, slightly hard, hard, very hard,* or *extremely hard.* When moist, a soil is said to be *loose, very friable, friable, firm, very firm,* or *extremely firm.* When wet, a soil is said to be *nonplastic, slightly plastic, plastic,* or *very plastic,* and also *nonsticky, slightly sticky, sticky,* or *very sticky.*[14]

Diversion. Any structure, generally a terrace or ditch, used to divert runoff water from its natural course and thus to protect areas downslope from the effects of runoff.

Gleization, or gleying. The reduction, translocation, and segregation of soil compounds, notably of iron, normally in the subsoil or substratum; a result of poor aeration and drainage, expressed in the soil by mottled colors dominated by gray.

Great soil group. A broad group of soils having internal soil characteristics in common.

Horizon, soil. A layer of soil, approximately parallel to the surface, with characteristics produced by soil-forming processes. The relative positions of the several soil horizons in the soil profile and their nomenclature follow:

A horizon. The master horizon, consisting of (1) one or more mineral horizons of maximum organic accumulation; or (2) surface or subsurface horizons that are lighter in color than the underlying horizons and that have lost clay minerals, iron, and aluminum, with resultant concentration of the more resistant minerals; or (3) horizons belonging to both of these categories.

B horizon. The master horizon of altered material characterized by (1) an accumulation of clay, iron, or aluminum, with accessory organic material; or (2) blocky or prismatic structure together with other characteristics, such as stronger colors, unlike those of the A horizon or the underlying horizons of nearly unchanged material; or (3) characteristics of both these categories. Commonly, the lower limit of the B horizon corresponds to the lower limit of the solum.

C horizon. A layer of unconsolidated material, relatively little affected by the influence of organisms and presumed to be similar in chemical, physical, and mineralogical composition to the material from which at least a part of the overlying solum has formed.

D horizon. Any stratum underlying the C horizon, or the B if no C is present, which is unlike the C or unlike the material from which the solum has formed. The D_r horizon, however, is a consolidated stratum, underlying the C, from which the C horizon has formed.

Interceptor. A drainage ditch or tile line, generally at or near the base of a slope, to protect areas downslope from the effects of seepage water.

Internal drainage. That quality of a soil that permits the downward flow of excess water through it.

Liquid limit. The moisture content at which a soil material passes from a plastic to a liquid (free-flowing) state.

Marine deposits. Materials deposited in the waters of oceans and seas and exposed by elevation of the land or by the lowering of the water level.

Maximum density. The greatest amount of soil that can be compacted into any unit of volume; expressed as pounds of dry soil per cubic foot.

Mechanical analysis of soil. The determination of the percentage of the soil particles of all sizes—gravel, sand, silt, clay, and all their standard subdivisions; based on the mineral soil only, free of water and organic matter. *Grain size* refers to the size limits of any particular fraction of the soil, and *grain-size distribution* refers to the proportions of the various-sized fractions in the whole mineral soil.

Morphology, soil. The physical constitution of the soil, including the texture, structure, consistence, color, and other physical and chemical properties of the various soil horizons that make up the soil profile.

Mottles. Patches of contrasting color that vary in number and size; generally associated with poor drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.*

Natural drainage. Refers to those conditions that existed during the development of the soil as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may result from other causes, as natural deepening of channels or filling of depressions. The following terms are used to express natural drainage: *Excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.*

Percolation. The downward movement of water through the soil, especially the downward flow of water in saturated or nearly saturated soil.

Permeability, soil. That quality of a soil that enables it to transmit water or air.

Plastic limit. The moisture content at which a soil material passes from a solid to a plastic state.

Plasticity index. The difference, in percent moisture, between the plastic limit and the liquid limit of the soil; therefore, the range of moisture content over which a soil material remains plastic.

Poorly graded soil (engineering). A term used to indicate that a soil consists of particles chiefly of the same or very nearly the same size or diameter; having a narrow range of particle size and, thus, poor grain-size distribution. Such a soil can be increased in density only slightly by compaction.

Reaction. The degree of acidity or alkalinity of the soil. See also Acidity, soil.

Relief. The elevations or inequalities of the land surface, considered collectively.

Sand. Rock or mineral fragments, visible to the naked eye, between 0.05 millimeter (0.002 inch) and 2.0 millimeters (0.079 inch) in diameter. As a textural class, a soil that is 90 percent or more sand.

[14] UNITED STATES DEPARTMENT OF AGRICULTURE. SOIL SURVEY MANUAL. U.S. Dept. Agr. Handb. No. 18, 503 pp., illus. 1951.

Series, soil. A group of soils that have the same profile characteristics and the same general range in color, structure, consistence and sequence of horizons; the same general conditions of relief and drainage; and generally a common or similar origin and mode of formation.

Silt. Small mineral soil grains ranging from 0.002 millimeter (0.000079 inch) to 0.05 millimeter (0.002 inch) in diameter; not visible to the naked eye but readily visible under a microscope. As a textural class, silt consists of soil material that contains 80 percent or more silt and less than 12 percent clay.

Soil. The natural medium for the growth of land plants on the surface of the earth; composed of mineral and organic materials.

Solum. The genetic soil developed by soil-forming processes; the A and B horizons; does not include the parent material (C horizon).

Subgrade (engineering). The soil material in a cut or fill, which directly receives the load from the pavement section.

Structure, soil. The arrangement of the individual soil particles into aggregates that have definite shape and pattern. Common kinds of structure in Dorchester County are *single grain, crumb, granular, blocky, subangular blocky,* and *platy.*

Subgrade modulus (engineering). The resistance of the soil per unit area displacement under load, expressed in pounds per square inch. Hence, if a load of 1,000 pounds on 100 square inches of surface penetrates 1 inch, the modulus is 10.

Subsoil. Technically, the B horizon of soils that have distinct layers; in more general terms, that part of the soil profile below plow depth.

Substratum. Any layer beneath the B horizon; it may be a conforming C horizon or a nonconforming D horizon. See also Horizon, soil.

Surface soil. That part of the upper profile ordinarily moved in tillage, or its equivalent in uncultivated soil; about 5 to 8 inches in thickness.

Texture, soil. The relative proportions of sand, silt, and clay particles in the soil. A coarse-textured soil is one high in sand; a fine-textured soil contains a large proportion of clay. See also Sand; Silt; Clay.

Topsoil. Presumably fertile soil material used to topdress roadbanks, gardens, and lawns.

Unified soil classification system (engineering). The system of mechanical soil classification of the Corps of Engineers, Department of the Army. Used by the Soil Conservation Service, the Bureau of Reclamation, and other agencies and organizations in works dealing with soils engineering.

Upland (geologic). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plains or stream terraces.

Well graded (engineering). A term used to indicate that a soil consists of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction.

GUIDE TO MAPPING UNITS

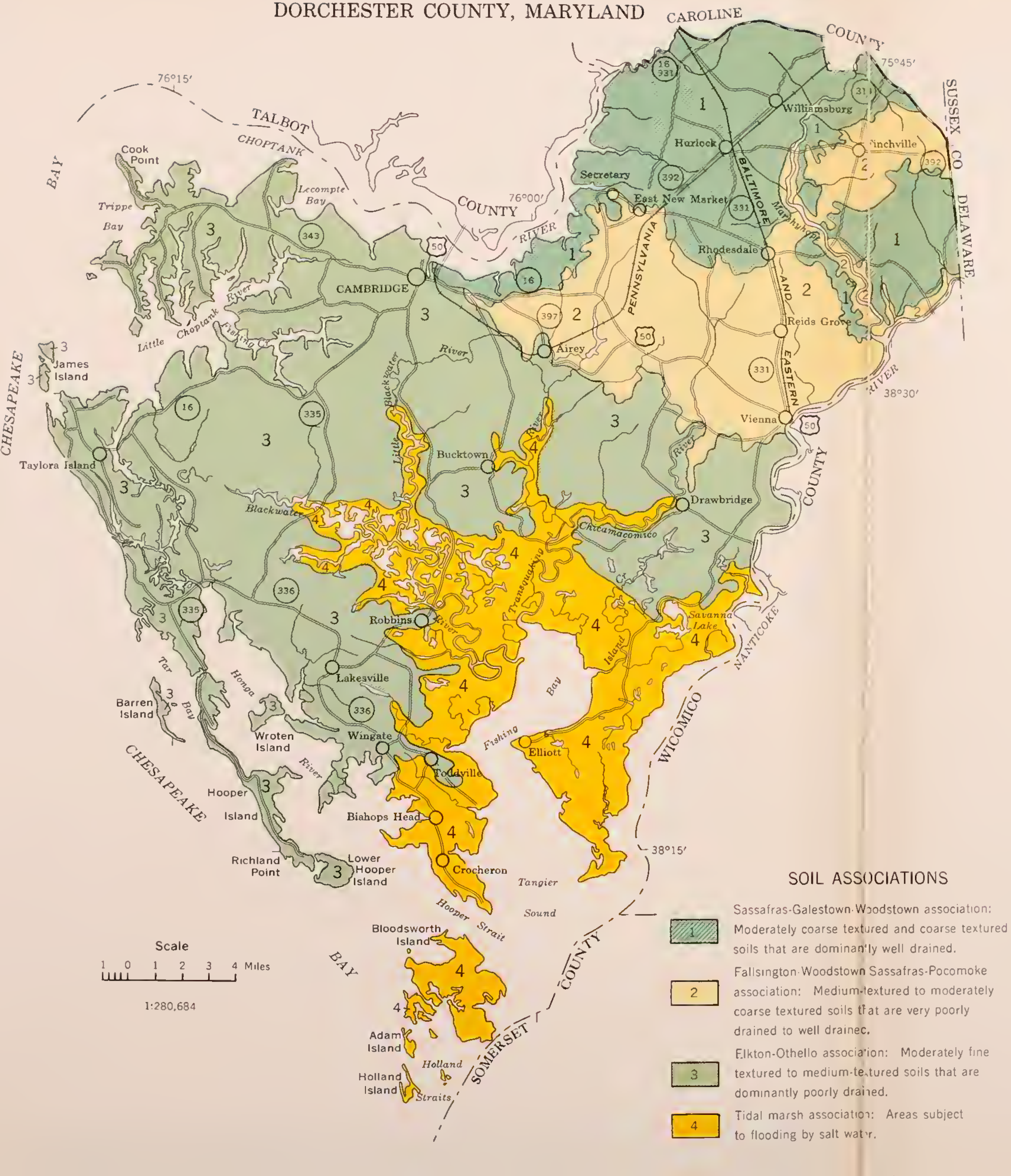
[See table 5, p. 9, for approximate acreage and proportionate extent of soils; table 7, p. 32, for estimated average acre yields. To learn about use of the soils for woodland, see the section beginning on p. 34; for information about engineering uses of the soils, including use for drainage, irrigation, and sewage disposal, see the section beginning on p. 43. Dashes indicate soil is not suitable for drainage, irrigation, or sewage disposal]

Map symbol	Mapping unit	Page	Capability unit		Drainage group		Irrigation group		Sewage disposal group		Woodland suitability group	
			Symbol	Page	Number	Page	Number	Page	Number	Page	Number	Page
Ba	Bayboro silt loam	10	IIIw-5	28	9-6B	59	------	--	7	60	7	37
Bb	Bayboro silty clay loam	10	VIw-2	30	9-6A	59	------	--	7	60	7	37
Bm	Bibb silt loam	10	IIIw-7	28	11-A	59	------	--	8	60	4	37
Co	Coastal beaches	10	VIIIs-2	30	------	--	------	--	------	--	9	38
Ek	Elkton loam	11	IIIw-9	29	8-2B	58	------	--	7	60	7	37
Em	Elkton silt loam	11	IIIw-9	29	8-2B	58	------	--	7	60	7	37
En	Elkton silt loam, low	11	Vw-1	30	10	59	------	--	7	60	8	38
Eo	Elktou silty clay loam	11	VIw-2	30	8-2A	58	------	--	7	60	7	37
Et	Elkton silty clay loam, low	11	VIw-2	30	10	59	------	--	7	60	8	38
Fa	Fallsington sandy loam	12	IIIw-6	28	7-B	58	------	--	7	60	3	36
GaA	Galestown loamy sand, 0 to 2 percent slopes.	12	IIIs-1	29	------	--	1	54	1	57	2	36
GaB	Galestown loamy sand, 2 to 5 percent slopes.	12	IIIs-1	29	------	--	1	54	1	57	2	36
GaC	Galestown loamy sand, 5 to 10 percent slopes.	12	IVs-1	29	------	--	1	54	2	60	2	36
GaD	Galestown loamy sand, 10 to 15 percent slopes.	13	VIs-1	30	------	--	------	--	2	60	2	36
GeF	Galestown sand and loamy sand, 15 to 40 percent slopes.	13	VIIs-1	30	------	--	------	--	3	60	5	37
GsA	Galestown sand, 0 to 2 percent slopes	13	IVs-1	29	------	--	1	54	1	57	5	37
GsB	Galestown sand, 2 to 5 percent slopes	13	IVs-1	29	------	--	1	54	1	57	5	37
GsC	Galestown sand, 5 to 10 percent slopes	13	VIs-1	30	------	--	------	--	2	60	5	37
GsD	Galestown sand, 10 to 15 percent slopes.	13	VIIs-1	30	------	--	------	--	2	60	5	37
Jo	Johnston loam	13	IIIw-7	28	11-A	59	------	--	8	60	4	37
KeA	Keyport loam, 0 to 2 percent slopes	14	IIw-8	28	6-2A	58	5	54	7	60	6	37
KpA	Keyport silt loam, 0 to 2 percent slopes.	14	IIw-8	28	6-2A	58	5	54	7	60	6	37
KpB	Keyport silt loam, 2 to 5 percent slopes.	14	IIe-13	27	6-2A	58	5	54	7	60	6	37
KsA	Klej loamy sand, 0 to 2 percent slopes	14	IIIw-8	29	4	58	1	54	7	60	3	36
KsB	Klej loamy sand, 2 to 5 percent slopes	15	IIIw-8	29	4	58	1	54	7	60	3	36
LaA	Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes.	15	IIIs-1	29	------	--	1	54	1	57	2	36
LaB	Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes.	15	IIIs-1	29	------	--	1	54	1	57	2	36
LaD	Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes.	15	IVs-1	29	------	--	1	54	2	60	2	36
LcB	Lakeland sand, clayey substratum, 0 to 5 percent slopes.	15	IVs-1	29	------	--	1	54	1	57	5	37
LcD	Lakeland sand, clayey substratum, 5 to 15 percent slopes.	15	VIs-1	30	------	--	------	--	2	60	5	37
Ma	Made land	16	(1)	--	------	--	------	--	------	--	10	38
MfA	Matapeake fine sandy loam, 0 to 2 percent slopes.	16	I-4	27	------	--	4	54	1	57	1	34
MfB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.	16	IIe-4	27	------	--	4	54	1	57	1	34
MkA	Matapeake silt loam, 0 to 2 percent slopes.	16	I-4	27	------	--	4	54	1	57	1	34
MkB	Matapeake silt loam, 2 to 5 percent slopes.	16	IIe-4	27	------	--	4	54	1	57	1	34
MkB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.	16	IIe-4	27	------	--	4	54	1	57	1	34
MkC	Matapeake silt loam, 5 to 10 percent slopes.	17	IIIe-4	28	------	--	4	54	2	60	1	34
MkC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.	17	IIIe-4	28	------	--	4	54	2	60	1	34
MkD	Matapeake silt loam, 10 to 15 percent slopes.	17	IVe-3	29	------	--	------	--	2	60	1	34
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes.	17	IIw-1	27	2-A	58	4	54	7	60	1	34
MsA	Mattapex silt loam, 0 to 2 percent slopes.	17	IIw-1	27	2-A	58	4	54	7	60	1	34
MsB	Mattapex silt loam, 2 to 5 percent slopes.	17	IIe-13	27	2-A	58	4	54	7	60	1	34
MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.	17	IIe-13	27	2-A	58	4	54	7	60	1	34
Mx	Mixed alluvial land	18	VIw-1	30	------	--	------	--	8	60	4	37
Oh	Othello silt loam	18	IIIw-7	28	8-1A	58	------	--	7	60	3	36
Ot	Othello silt loam, low	18	Vw-1	30	10	59	------	--	7	60	8	38
Pm	Plummer loamy sand	19	IVw-8	29	9-1	58	------	--	7	60	3	36
Po	Pocomoke loam	20	IIIw-7	28	9-3A	59	------	--	7	60	3	36
Ps	Pocomoke sandy loam	20	IIIw-6	28	9-3B	59	------	--	7	60	3	36
Pt	Portsmouth silt loam	20	IIIw-7	28	9-4A	59	------	--	7	60	3	36
Ru	Rutlege loamy sand	21	IVw-8	29	9-5B	59	------	--	7	60	3	36
SaA	Sassafras loam, 0 to 2 percent slopes	21	I-4	27	------	--	4	54	1	57	1	34
SaB2	Sassafras loam, 2 to 5 percent slopes, moderately eroded.	21	IIe-4	27	------	--	4	54	1	57	1	34
ShA	Sassafras loam, heavy substratum, 0 to 2 percent slopes.	21	I-4	27	------	--	4	54	1	57	1	34
SmA	Sassafras loamy sand, 0 to 2 percent slopes.	21	IIs-4	28	------	--	2	54	1	57	2	36
SmB	Sassafras loamy sand, 2 to 5 percent slopes.	22	IIs-4	28	------	--	2	54	1	57	2	36
SmB2	Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded.	22	IIs-4	28	------	--	2	54	1	57	2	36
SmC	Sassafras loamy sand, 5 to 10 percent slopes.	22	IIIe-33	28	------	--	2	54	2	60	2	36
SmC2	Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded.	22	IIIe-33	28	------	--	2	54	2	60	2	36
SmC3	Sassafras loamy sand, 5 to 10 percent slopes, severely eroded.	22	IVe-5	29	------	--	------	--	2	60	2	36
SmD	Sassafras loamy saud, 10 to 15 percent slopes.	22	IVe-5	29	------	--	------	--	2	60	2	36
SmF	Sassafras loamy sand, 15 to 40 percent slopes.	22	VIe-2	30	------	--	------	--	3	60	2	36
SnA	Sassafras sandy loam, 0 to 2 percent slopes.	22	I-5	27	------	--	3	54	1	57	2	36
SnB	Sassafras sandy loam, 2 to 5 percent slopes.	22	IIe-5	27	------	--	3	54	1	57	2	36
SnB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.	22	IIe-5	27	------	--	3	54	1	57	2	36
SnC	Sassafras sandy loam, 5 to 10 percent slopes.	22	IIIe-5	28	------	--	3	54	2	60	2	36
SnC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.	22	IIIe-5	28	------	--	3	54	2	60	2	36
SnD	Sassafras sandy loam, 10 to 15 percent slopes.	23	IVe-5	29	------	--	------	--	2	60	2	36
SnE	Sassafras sandy loam, 15 to 30 percent slopes.	23	VIe-2	30	------	--	------	--	3	60	2	36
SsA	Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes.	23	I-5	27	------	--	3	54	1	57	2	36
SsB2	Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded.	23	IIe-5	27	------	--	3	54	1	57	2	36
StA	Sassafras sandy loam, thick solum, 0 to 2 percent slopes.	23	I-5	27	------	--	3	54	1	57	2	36
StB	Sassafras sandy loam, thick solum, 2 to 5 percent slopes.	23	IIe-5	27	------	--	3	54	1	57	2	36
StB2	Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded.	23	IIe-5	27	------	--	3	54	1	57	2	36
Sw	Swamp	23	VIIw-1	30	------	--	------	--	8	60	10	38
Tm	Tidal marsh	23	VIIIw-1	30	------	--	------	--	8	60	10	38
WdA	Woodstown loam, 0 to 2 percent slopes.	24	IIw-1	27	2-A	58	4	54	7	60	1	34
WoA	Woodstown sandy loam, 0 to 2 percent slopes.	24	IIw-5	27	2-B	58	3	54	7	60	2	36
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.	24	IIe-13	27	2-B	58	3	54	7	60	2	36

[1] Not placed in a capability unit.

641669—63 (Face p. 66)

GENERAL SOIL MAP
DORCHESTER COUNTY, MARYLAND



INDEX TO MAP SHEETS
DORCHESTER COUNTY, MARYLAND

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F, shows the slope. Symbols without a slope letter are those of nearly level soils, such as Elkton loam, or of the miscellaneous land types, Coastal beaches, and Made land, that have considerable range in slope. A final number 2, or 3, shows that the soil is eroded, or severely eroded.

SYMBOL	NAME
Ba	Bayboro silt loam
Bb	Bayboro silty clay loam
Bm	Bibb silt loam
Co	Coastal beaches
Ek	Elkton loam
Em	Elkton silt loam
En	Elkton silt loam, low
Eo	Elkton silty clay loam
Et	Elkton silty clay loam, low
Fa	Fallsington sandy loam
GaA	Galestown loamy sand, 0 to 2 percent slopes
GaB	Galestown loamy sand, 2 to 5 percent slopes
GaC	Galestown loamy sand, 5 to 10 percent slopes
GaD	Galestown loamy sand, 10 to 15 percent slopes
GeF	Galestown sand and loamy sand, 15 to 40 percent slopes
GsA	Galestown sand, 0 to 2 percent slopes
GsB	Galestown sand, 2 to 5 percent slopes
GsC	Galestown sand, 5 to 10 percent slopes
GsD	Galestown sand, 10 to 15 percent slopes
Jo	Johnston loam
KeA	Keyport loam, 0 to 2 percent slopes
KpA	Keyport silt loam, 0 to 2 percent slopes
KpB	Keyport silt loam, 2 to 5 percent slopes
KsA	Klej loamy sand, 0 to 2 percent slopes
KsB	Klej loamy sand, 2 to 5 percent slopes
LaA	Lakeland loamy sand, clayey substratum, 0 to 2 percent slopes
LaB	Lakeland loamy sand, clayey substratum, 2 to 5 percent slopes
LaD	Lakeland loamy sand, clayey substratum, 5 to 15 percent slopes
LcB	Lakeland sand, clayey substratum, 0 to 5 percent slopes
LcD	Lakeland sand, clayey substratum, 5 to 15 percent slopes
Ma	Made land
MfA	Matapeake fine sandy loam, 0 to 2 percent slopes
MfB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded
MkA	Matapeake silt loam, 0 to 2 percent slopes
MkB	Matapeake silt loam, 2 to 5 percent slopes
MkB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded
MkC	Matapeake silt loam, 5 to 10 percent slopes
MkC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded
MkD	Matapeake silt loam, 10 to 15 percent slopes
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes
MsA	Mattapex silt loam, 0 to 2 percent slopes
MsB	Mattapex silt loam, 2 to 5 percent slopes
MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded
Mx	Mixed alluvial land

SYMBOL	NAME
Oh	Othello silt loam
Ot	Othello silt loam, low
Pm	Plummer loamy sand
Po	Pocomoke loam
Ps	Pocomoke sandy loam
Pt	Portsmouth silt loam
Ru	Rutlege loamy sand
SaA	Sassafras loam, 0 to 2 percent slopes
SaB2	Sassafras loam, 2 to 5 percent slopes, moderately eroded
ShA	Sassafras loam, heavy substratum, 0 to 2 percent slopes
SmA	Sassafras loamy sand, 0 to 2 percent slopes
SmB	Sassafras loamy sand, 2 to 5 percent slopes
SmB2	Sassafras loamy sand, 2 to 5 percent slopes, moderately eroded
SmC	Sassafras loamy sand, 5 to 10 percent slopes
SmC2	Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded
SmC3	Sassafras loamy sand, 5 to 10 percent slopes, severely eroded
SmD	Sassafras loamy sand, 10 to 15 percent slopes
SmF	Sassafras loamy sand, 15 to 40 percent slopes
SnA	Sassafras sandy loam, 0 to 2 percent slopes
SnB	Sassafras sandy loam, 2 to 5 percent slopes
SnB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded
SnC	Sassafras sandy loam, 5 to 10 percent slopes
SnC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded
SnD	Sassafras sandy loam, 10 to 15 percent slopes
SnE	Sassafras sandy loam, 15 to 30 percent slopes
SsA	Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes
SsB2	Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded
StA	Sassafras sandy loam, thick solum, 0 to 2 percent slopes
StB	Sassafras sandy loam, thick solum, 2 to 5 percent slopes
StB2	Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded
Sw	Swamp
Tm	Tidal marsh
WdA	Woodstown loam, 0 to 2 percent slopes
WoA	Woodstown sandy loam, 0 to 2 percent slopes
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded

Soil map constructed 1961 by Cartographic Division, Soil Conservation Service, USDA, from 1957 aerial photographs. Controlled mosaic based on Maryland plane coordinate system, Lambert conformal conic projection, 1927 North American datum.

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

- Highways and roads
  - Dual
  - Good motor
  - Poor motor
  - Trail
- Highway markers
  - National Interstate
  - U.S.
  - State
- Railroads
  - Single track
  - Multiple track
  - Abandoned
- Bridges and crossings
  - Road
  - Trail, foot
  - Railroad
  - Ferries
  - Ford
  - Grade
  - R. R. over
  - R. R. under
  - Tunnel
- Buildings
  - School
  - Church
  - Station
- Mines and Quarries
- Mine dump
- Pits, gravel or other — G. P.
- Borrow pit — B. P.
- Pipe lines
- Cemeteries
- Dams
- Levees
- Tanks
- Oil wells
- Forest fire or lookout station

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant

DRAINAGE

- Streams
  - Perennial
  - Intermittent, unclass.
- Canals and ditches — CANAL, DITCH
- Lakes and ponds
  - Perennial
  - Intermittent
- Wells — flowing
- Springs
- Marsh
- Wet spot

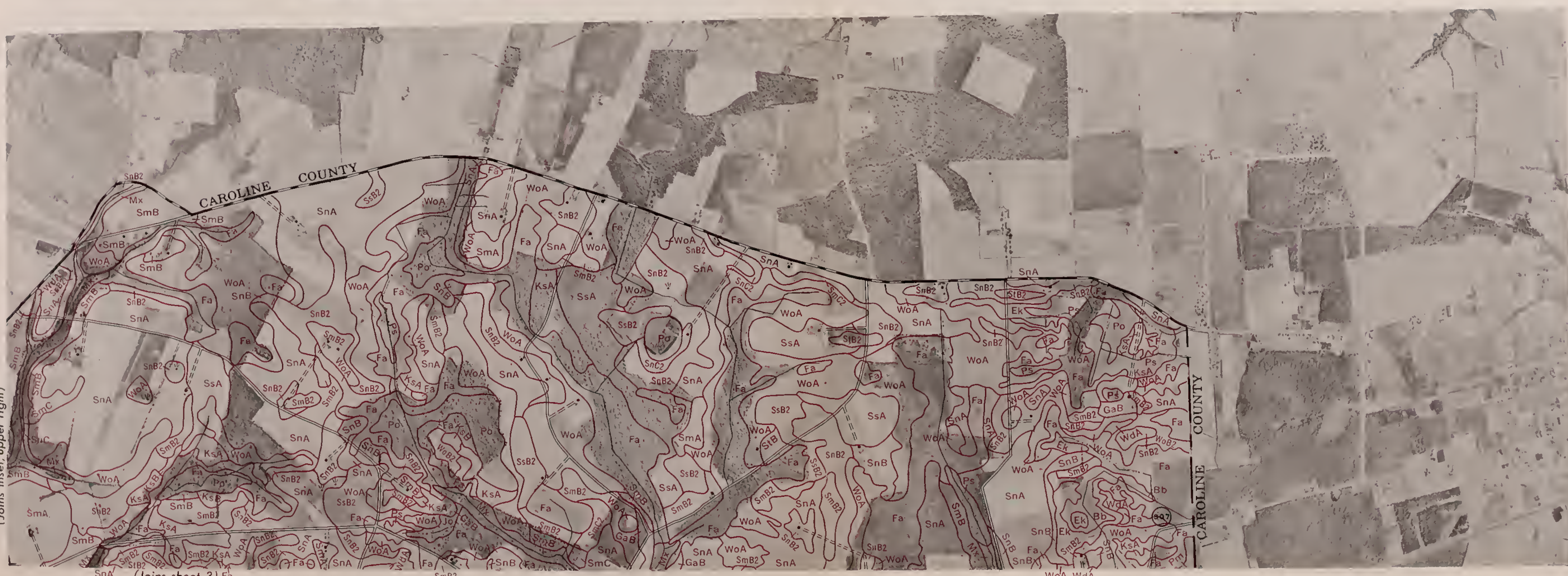
RELIEF

- Escarpments
  - Bedrock
  - Other
- Prominent peaks
- Depressions (Large, Small)
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol — Dx
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies

N



0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 1)

(Joins sheet 9)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

(Joins sheet 10)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

N
CHOPTANK RIVER
Cook Pt
Todds Point
TRIPPE BAY
Cook Point Cove
Covey Creek
Hills Point
343
(Joins sheet 6)
(Joins sheet 11)
0 1/2 1 Mile
Scale 1:20 000
0 5000 Feet


C H O P T A N K R I V E R
TALBOT COUNTY
Castle Haven
Castle Haven Point
L E C O M P T E B A Y
Horn Point
Lecompte Creek
Chapel Creek
Cornersville
(Joins sheet 12)
0 ½ 1 Mile
Scale 1:20000
0 5000 Feet

(Joins upper right)

(Joins inset, left)

(Joins sheet 14)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 2)

(Joins sheet 9)

(Joins sheet 15)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet


(Joins sheet 3)
9
N
Hurlock
Ennalls
MARSHYHOPE CREEK
Wrights Branch
Puckum Branch
Mill Creek
BALTIMORE AND EASTERN
PENNSYLVANIA
(Joins sheet 10)
(Joins sheet 16)
0
1/2
1 Mile
Scale 1:20000
0
5000 Feet

DORCHESTER COUNTY, MARYLAND - SHEET NUMBER 10

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 5)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet

(Joins sheet 18)

(Joins sheet 6)

(Joins sheet 19)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 20)

(Joins sheet 7)

(Joins sheet 21)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

DORCHESTER COUNTY, MARYLAND — SHEET NUMBER 15


(Joins sheet 9)
(Joins sheet 23)
Rhodesdale
Brookview
Eldorado
MARSHYHOPE
CREEK
Brohorn Creek
Bachelor Creek
Chicone Creek
Mill Creek
BALTIMORE AND EASTERN
Scale 1:20 000
0 ½ 1 Mile
0 5000 Feet

Scale 1:20 000

0 ½ 1 Mile

0 5000 Feet


(Joins sheet 11)
Cedar Point
HILLS POINT NECK
BROOKS CREEK
CASSON NECK
HUDSON CREEK
Back Creek
CROSS NECK
Butter Pot Pt
Mckeil Pt
RIVER
Rioll Cove
Casson Point
Ragged Point
CHOPTANK
MADISON BAY
LITTLE
Susquehanna Point
SUSQUEHANNA NECK
Woolford Creek
Madison
(Joins sheet 26)
0
1/2
1 Mile
Scale 1:20 000
0
5000 Feet

(Joins sheet 12)

(Joins sheet 27)

Scale 1:20 000

0 ½ 1 Mile

0 5 000 Feet

(Joins sheet 13)

(Joins sheet 21)

(Joins sheet 28)

Scale 1:20 000 — 0, 1/2, 1 Mile; 0, 5000 Feet

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 29)


(Joins sheet 15)
PENNSYLVANIA
Linkwood
Mt Pleasant Church
Salem
Big Mill Pond
CHICAMACOMICO RIVER
Middletown
Branch
(Joins sheet 30)
0
1/2
1 Mile
Scale 1:20 000
0
5000 Feet


(Joins sheet 16)
Reids Grove
Ralph
BALTIMORE AND EASTERN
Chicone Creek
(Joins sheet 31)
0 1/2 1 Mile
Scale 1:20 000
0 5000 Feet

(Joins sheet 17)

0 1/2 1 Mile

0 5,000 Feet

(Joins inset left)

(Joins upper center)

(Joins lower right)

(Joins sheet 32)

(Joins inset center)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 18)

(Joins sheet 32)

0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

(Joins sheet 19)

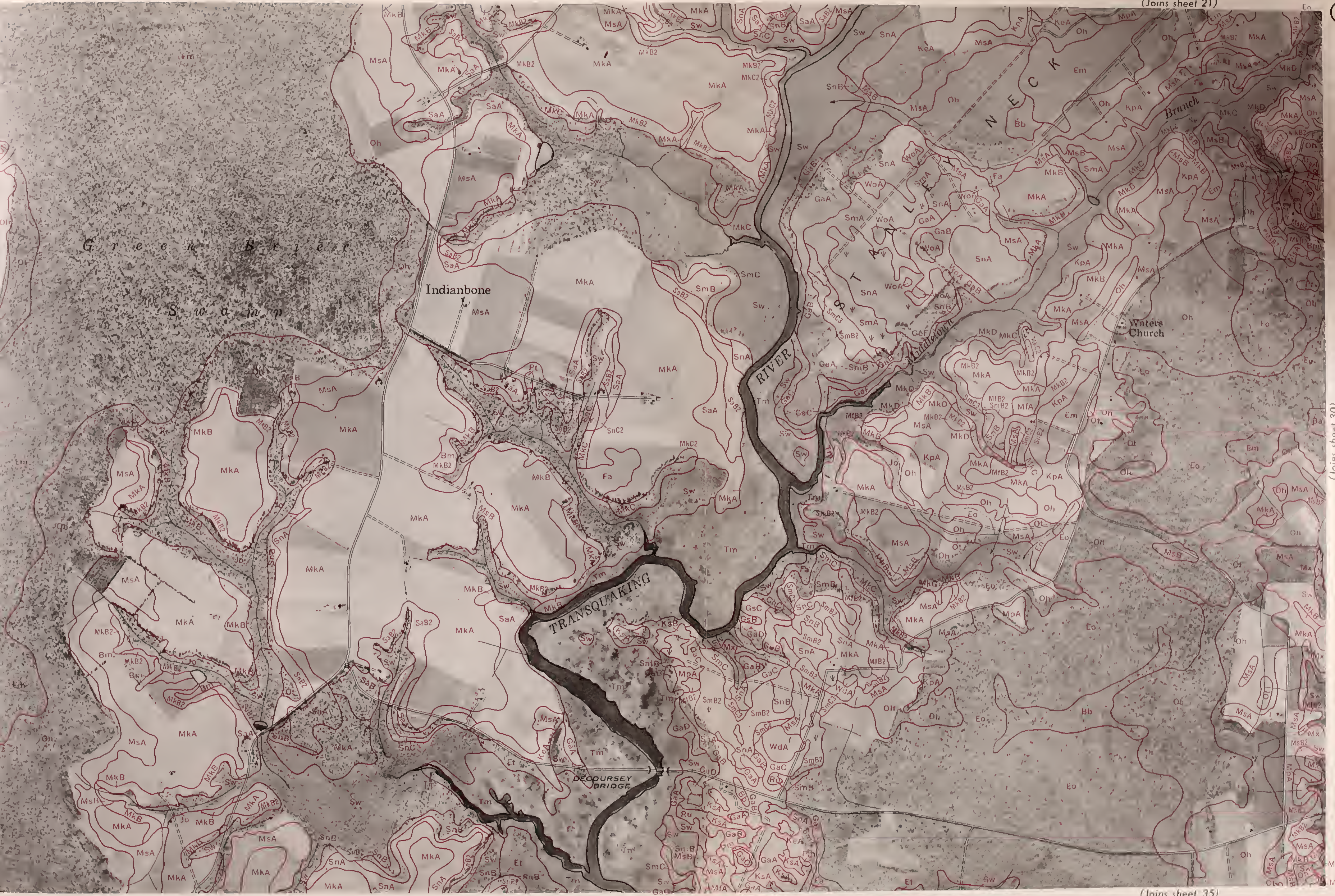
0 ½ 1 Mile
Scale 1:20 000
0 5000 Feet

(Joins sheet 33)

(Joins sheet 20)

(Joins sheet 34)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet



0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 22)

(Joins sheet 36)

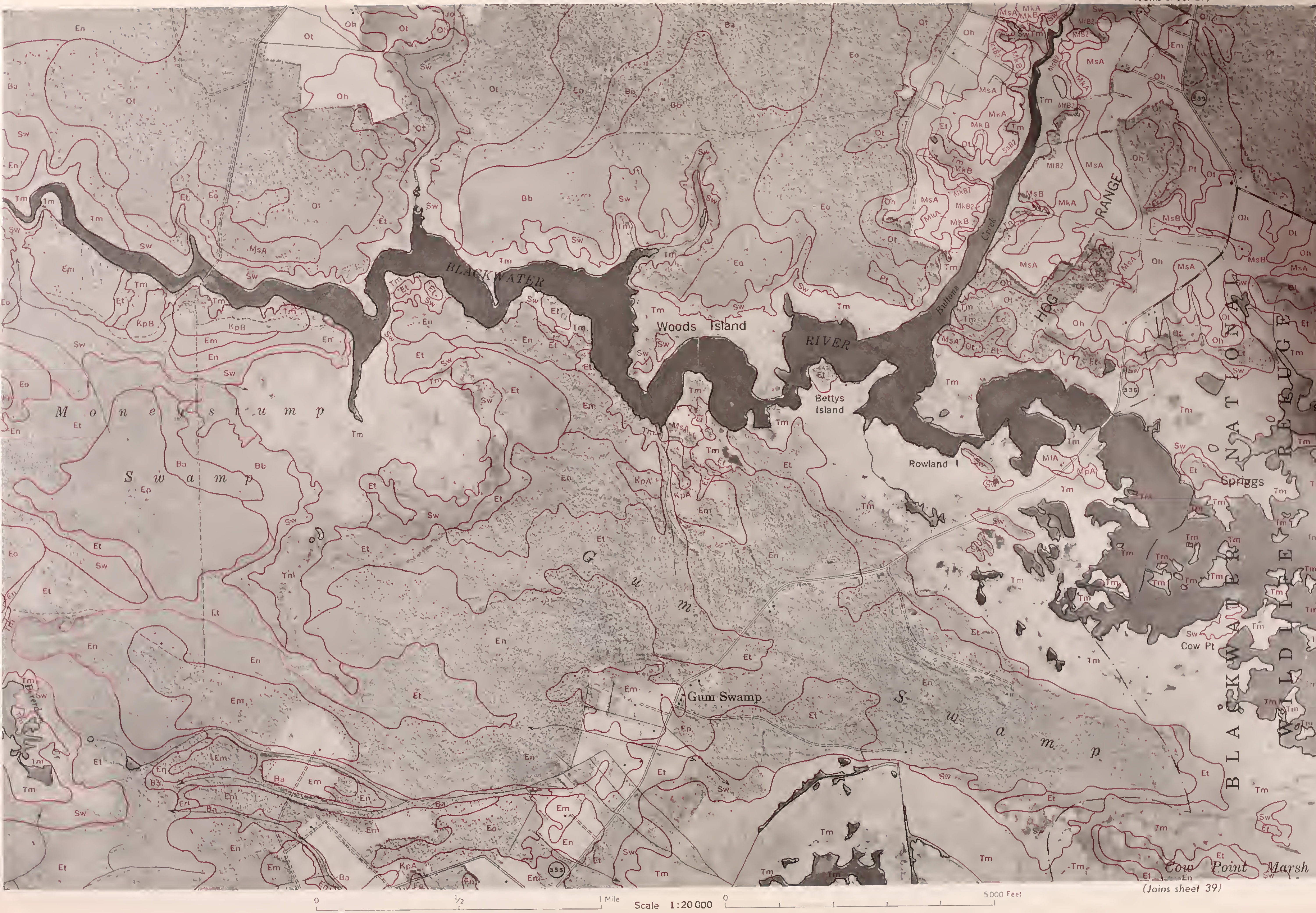
0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 23)

(Joins sheet 37)

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet


(Joins sheet 26)
(Joins sheet 38)
(Joins sheet 33)
SLAUGHTER CREEK BROADS
SLAUGHTER CREEK NARROWS
Hog Marsh Creek
James Island
Blackwater River
Moneystump Swamp
Piney Gut
Hog Marsh Gut
TAYLORS ISLAND WILDLIFE MANAGEMENT AREA
CHESAPEAKE BAY
ST JOHN CREEK
JACKS CREEK
Robinson Creek
Punch Island Creek
UPPER KEENE BROAD
BEAVERDAM CREEK
Scale 1:20 000
0 1/2 1 Mile
0 5000 Feet


(Joins sheet 27)
BLACKWATER
RIVER
Woods Island
Bettys Island
Rowland I
Buttons Creek
HOG RANGE
Moneystump Swamp
Gum Swamp
Gum Swamp
Spriggs
Cow Pt
Cow Point Marsh
BLACKWATER NATIONAL WILDLIFE REFUGE
(Joins sheet 39)
Scale 1:20 000
0
1/2
1 Mile
5000 Feet

(Joins sheet 28)

(Joins sheet 40)

Scale 1:20 000 — 0 ½ 1 Mile — 0 5000 Feet


(Joins sheet 29)
Bucktown
Green Brier Swamp
Longfield
TRANSQUAKING RIVER
Beaverdam Pond
CHICAMACOMICO RIVER
Hog Island
BLACKWATER NATIONAL WILDLIFE REFUGE
Backgarden Pond
Bestpitch
School Pond
Julie Pond
(Joins sheet 41)
Scale 1:20 000
1 Mile
5000 Feet

(Joins sheet 30)

(Joins sheet 42)

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 31)

(Joins upper right)

(Joins lower left)

(Joins sheet 42)

(Joins inset, sheet 47)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet


(Joins sheet 32)
DUNNOCK ISLAND
DUNNOCK SLOUGH
Dunnock Island Cr
MEEKINS NECK
Lower Keene Broad
GREAT MARSH CREEK
Golden Hill
CHESAPEAKE BAY
HONGA RIVER
Uncle Robert Creek
Boggs Gut
Codes Point
House Point
The Long Big Marshes
Broads
NECK
(Joins sheet 43)
Scale 1:20000
0 1/2 1 Mile
0 5000 Feet

DORCHESTER COUNTY, MARYLAND - SHEET NUMBER 39

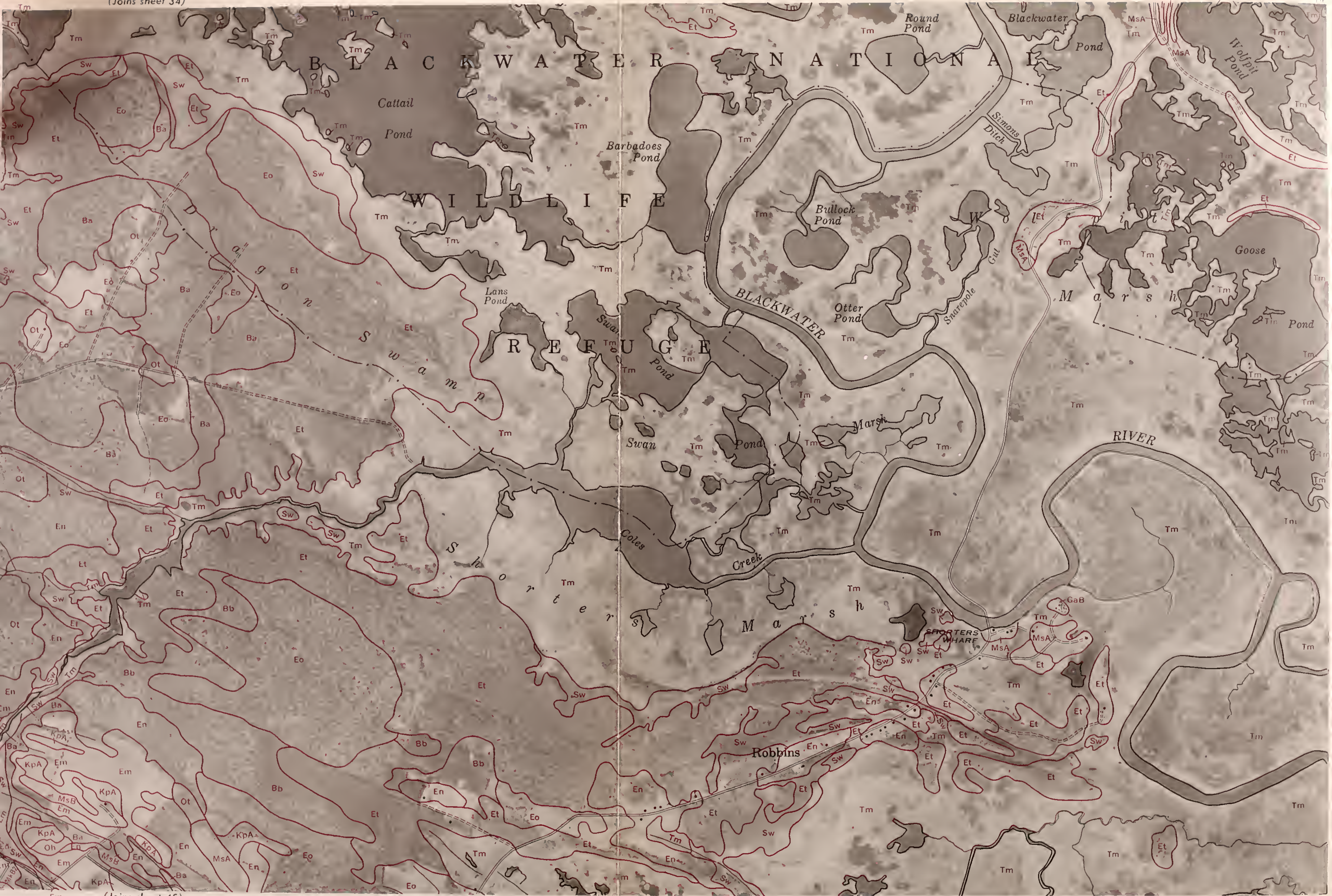
(Joins sheet 33)

(Joins sheet 44)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

DORCHESTER COUNTY, MARYLAND - SHEET NUMBER 40

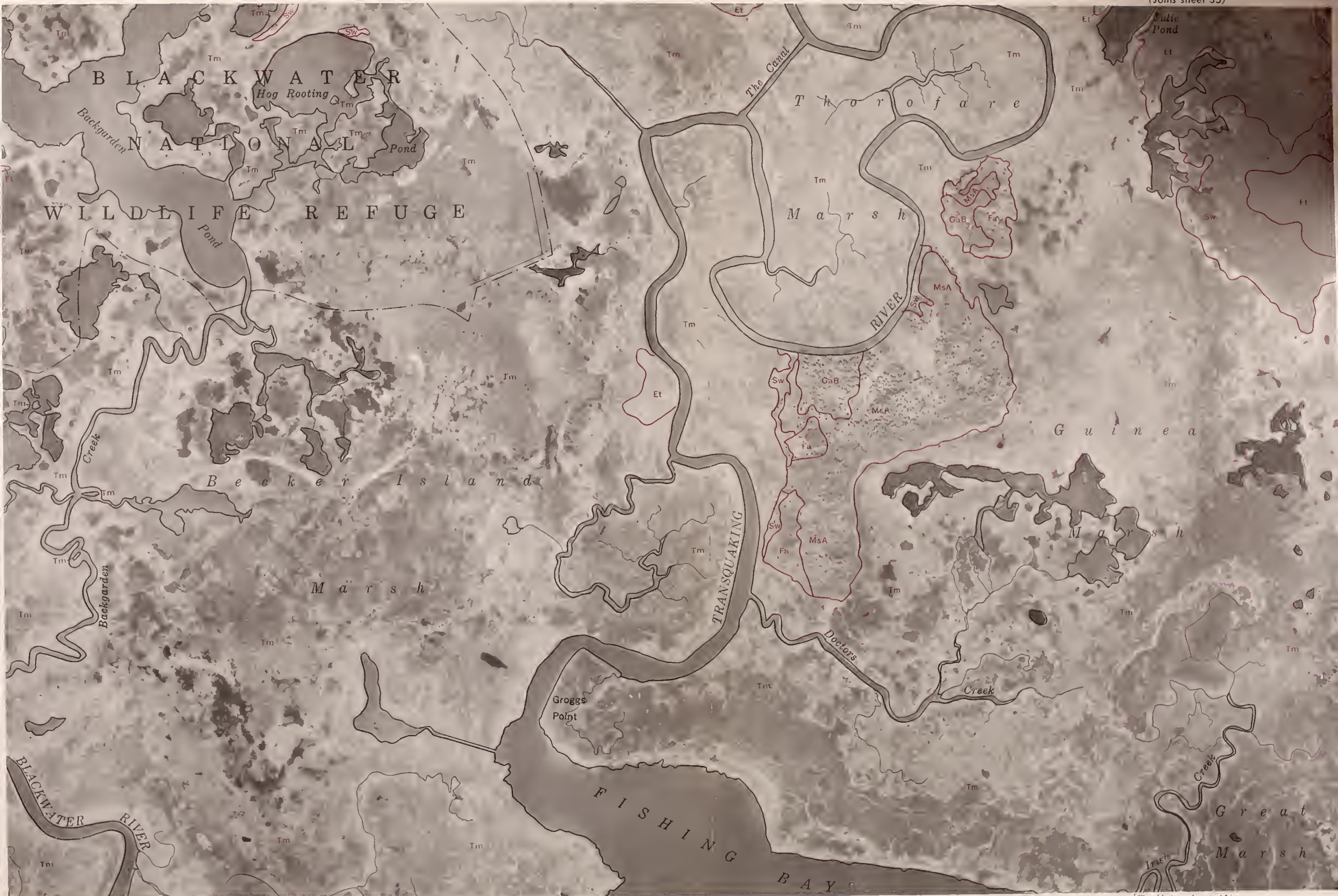
(Joins sheet 34)



(Joins sheet 45)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 35)



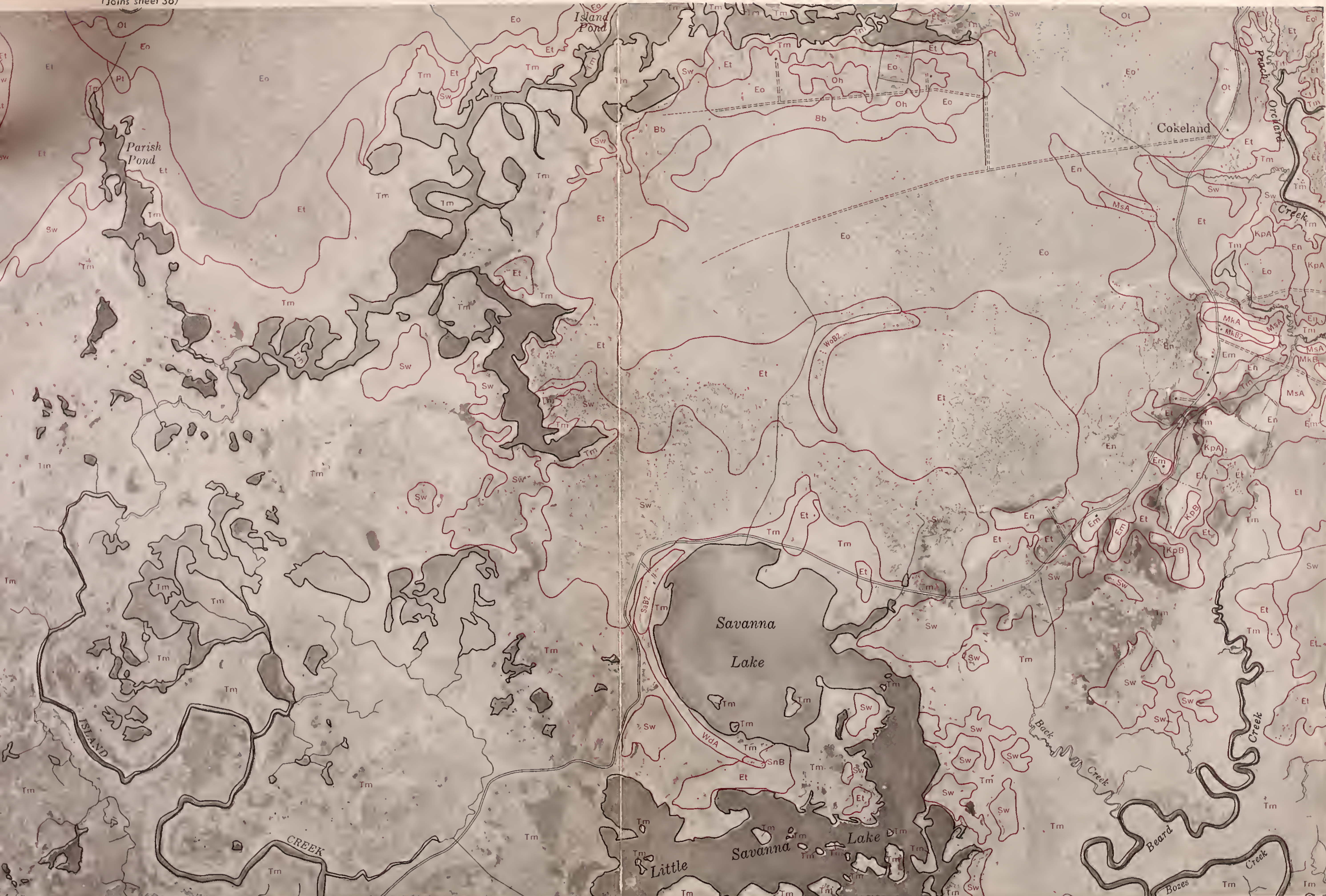
(Joins sheet 46)

Scale 1:20 000

0 ½ 1 Mile

0 5000 Feet

(Joins sheet 36)



(Joins sheet 47)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet


(Joins sheet 38)
Houston Point
Aaron Cove
Sol Point Gut
Cedar Point
Pot Island
Tyler Creek
MEEKINS NECK
HONGA RIVER
TAR BAY
Charity Point
Fishing Creek
Fishing Point
Barren Island Point
BARREN ISLAND
Great Cove
Opossum Island
Cove Point
Honga
UPPER HOOPER ISLAND
Long Cove
Docs Point
Fishing Creek
(Joins inset, left)
(Joins lower right)
Toms Point
Back Creek
BARREN ISLAND
TAR BAY
Horse Point
Sand Point
Pons Point
(Joins sheet 48)
CHESAPEAKE BAY
1 Mile
Scale 1:20 000
5000 Feet

(Joins sheet 39)

(Joins sheet 48)

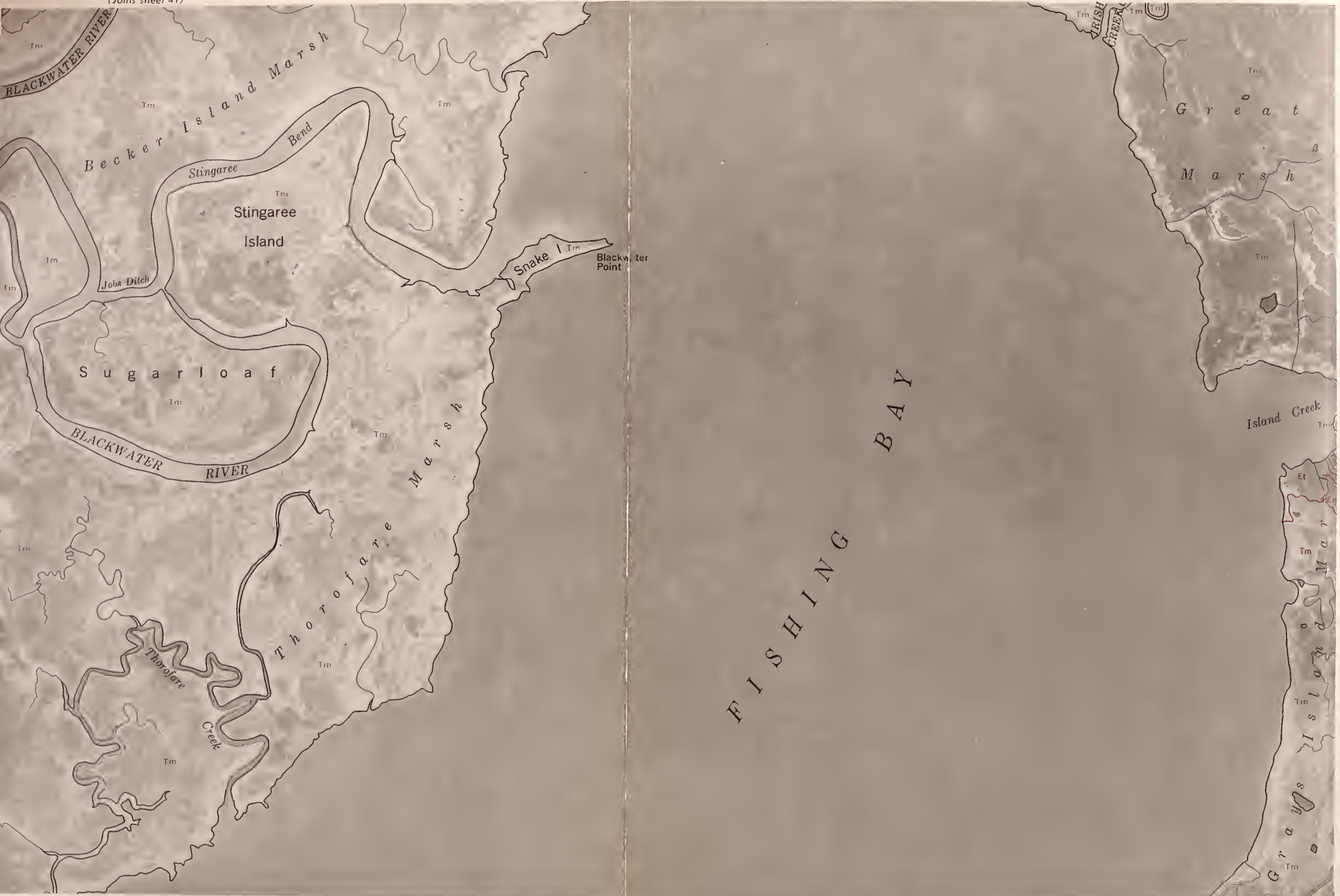
0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 40)

(Joins sheet 49)

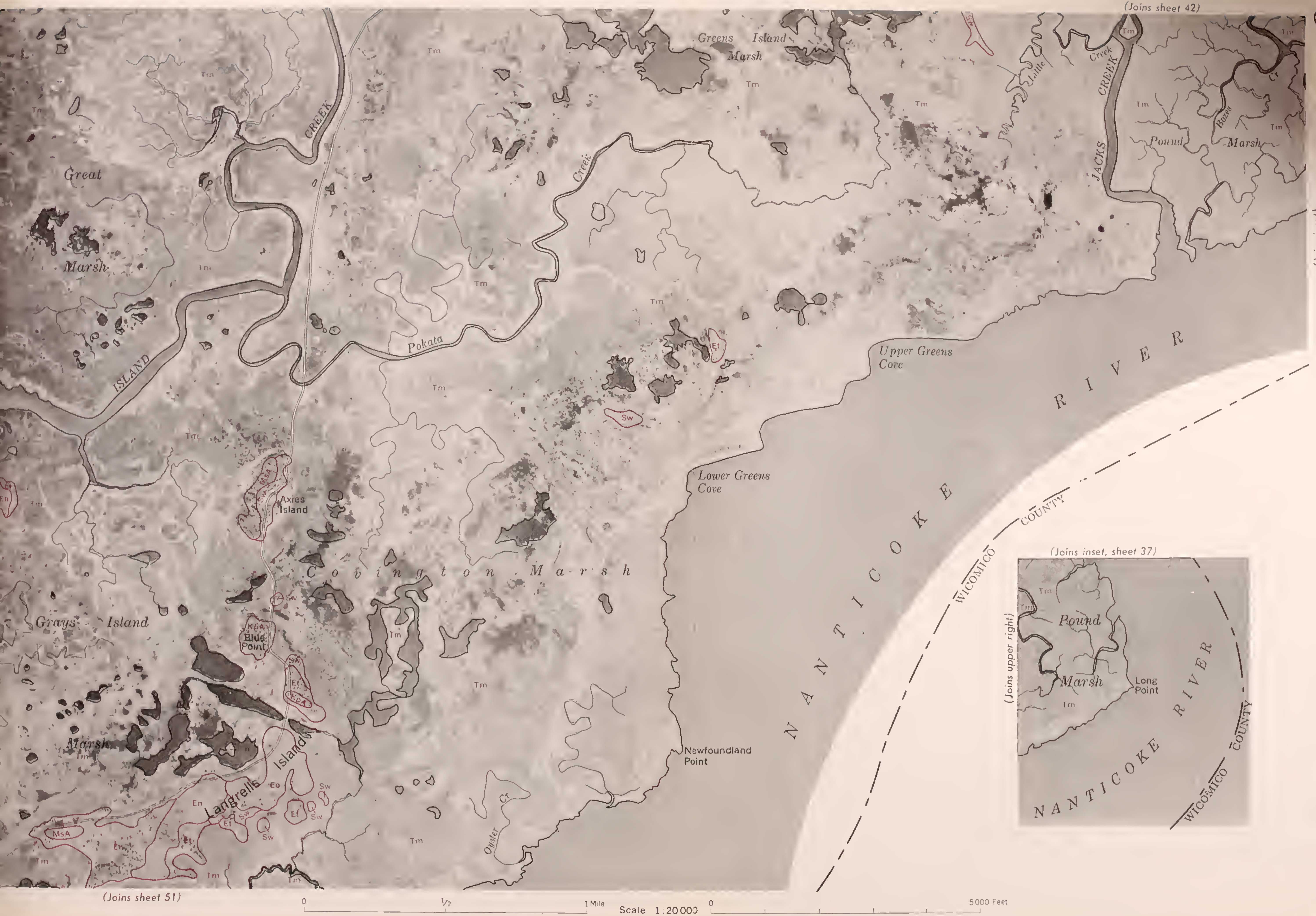
0 ½ 1 Mile Scale 1:20000 0 5000 Feet

(Joins sheet 41)



(Joins sheet 50)

0 ½ 1 Mile Scale 1:20000 0 5000 Feet


(Joins sheet 42)
Greens Island Marsh
Great Marsh
ISLAND CREEK
Pokata Creek
Little Creek
JACKS CREEK
Pound Marsh
Boxes Cr
Upper Greens Cove
Lower Greens Cove
NANTICOKE RIVER
Axies Island
Covington Marsh
Grays Island Marsh
Blue Point
Langrells Island
Newfoundland Point
Oyster Cr
WICOMICO COUNTY
(Joins inset, sheet 37)
(Joins upper right)
Pound Marsh
Long Point
NANTICOKE RIVER
WICOMICO COUNTY
(Joins sheet 51)
0
1/2
1 Mile
Scale 1:20000
0
5000 Feet

(Joins sheet 44)

(Joins sheet 52)

0 1/2 1 Mile Scale 1:20 000 0 5000 Feet


(Joins sheet 45)
Crapo
Wingate
Toddville
FARM CREEK
FISHING BAY
Old House Point
Cedar Creek
Little Creek Marsh
Great Marsh
Nigger Cove
Insley Cove
Kerwin Point
Fox Pt
FOX CREEK
Wingate Point
Wingate Cove
Johns Point
Piney Point
Hearns Cove
Paul Point
Paul Cove
GOOSE CREEK
(Joins sheet 53)
0
1/2
1 Mile
Scale 1:20 000
0
5000 Feet


(Joins sheet 46)
FISHING BAY
Cedar Creek Point
Fishing Point
Elliott
Poplar
Elliott Creek
McCreadys Cr
McCreadys Cove
FISHING BAY
Little Creek
Little Creek Marsh
Roasting Ear Point
Duck Island Creek
(Joins sheet 51)
(Joins sheet 54)
0 1/2 1 Mile
Scale 1:20000
0 5000 Feet

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 48)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet


(Joins sheet 49)
Hearns Cove
Long Point
DUCK POINT COVE
Fallins Cove
Bishops Head
GOOSE CREEK
Duck Point
Crab Point
Crab Point Cove
Jimson Wee Marsh
HONGA RIVER
Norman Cove
Tedious Creek
Hope Point
Crocheron
Ware Point
Ware Point Cove
Billys Point
LOWER HOOPER ISLAND
Creek Point
(Joins sheet 55)
0
1/2
1 Mile
Scale 1:20 000
0
5000 Feet

(Joins sheet 50)

(Joins sheet 55)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 53) | (Joins sheet 54)

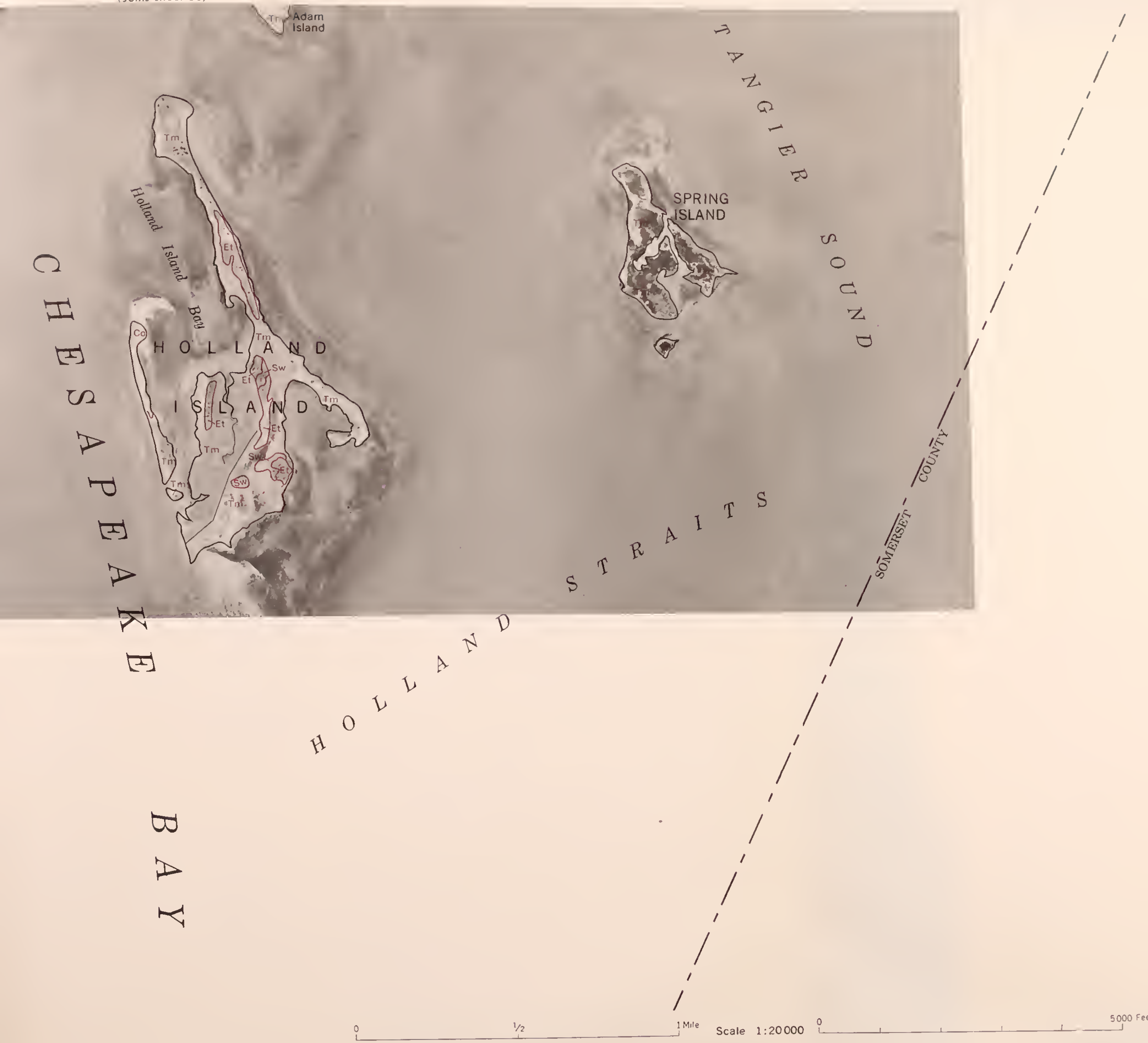
0 ½ 1 Mile Scale 1:20 000 0 5000 Feet

(Joins sheet 56)

(Joins sheet 55)

(Joins sheet 57)

0 ½ 1 Mile Scale 1:20 000 0 5000 Feet


Adam Island
TANGIER SOUND
SPRING ISLAND
Holland Island Bay
HOLLAND ISLAND
CHESAPEAKE BAY
HOLLAND STRAITS
SOMERSET COUNTY
Tm
Et
Sw
Co
0
1/2
1 Mile
Scale 1:20000
0
5000 Feet


E R
S O U N D
SOMERSET COUNTY
N
0
5000 Feet

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Station

Mines and Quarries

Mine dump

Pits, gravel or other — G. P.

Borrow pit — B. P.

Pipeline

Cemeteries

Dams

Levees

Tanks

Oil wells

Forest fire or lookout station

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.

Canals and ditches — CANAL, DITCH

Lakes and ponds
- Perennial
- Intermittent

Wells — flowing

Springs

Marsh

Wet spot

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

Depressions (Large, Small)
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol — Ox
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F, shows the slope. Symbols without a slope letter are those of nearly level soils, such as Elkton loam, or of the miscellaneous land types, Coastal beaches, and Made land, that have considerable range in slope. A final number 2, or 3, shows that the soil is eroded, or severely eroded.

SYMBOL	NAME
Ba	Bayboro silt loam
Bb	Bayboro silty clay loam
Bm	Bibb silt loam
Co	Coastal beaches
Ek	Elkton loam
Em	Elkton silt loam
En	Elktcn silt loam, low
Eo	Elkton silty clay loam
Et	Elkton silty clay loam, low
Fa	Fallsington sandy loam
GaA	Galestown loamy sand, 0 to 2 percent slopes
GaB	Galestown loamy sand, 2 to 5 percent slopes
GaC	Galestown loamy sand, 5 to 10 percent slopes
GaD	Galestown loamy sand, 10 to 15 percent slopes
GeF	Galestown sand and loamy sand, 15 to 40 percent slopes
GsA	Galestown sand, 0 to 2 percent slopes
GsB	Galestown sand, 2 to 5 percent slopes
GsC	Galestown sand, 5 to 10 percent slopes
GsD	Galestown sand, 10 to 15 percent slopes
Jo	Johnston loam
KeA	Keyport loam, 0 to 2 percent slopes
KpA	Keyport silt loam, 0 to 2 percent slopes
KpB	Keyport silt loam, 2 to 5 percent slopes
KsA	Klej loamy sand, 0 to 2 percent slopes
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MkD	Matapeake silt loam, 10 to 15 percent slopes
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MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded
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Ps	Pocomoke sandy loam
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Ru	Rutlege loamy sand
SaA	Sassafras loam, 0 to 2 percent slopes
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SmC2	Sassafras loamy sand, 5 to 10 percent slopes, moderately eroded
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SnD	Sassafras sandy loam, 10 to 15 percent slopes
SnE	Sassafras sandy loam, 15 to 30 percent slopes
SsA	Sassafras sandy loam, heavy substratum, 0 to 2 percent slopes
SsB2	Sassafras sandy loam, heavy substratum, 2 to 5 percent slopes, moderately eroded
StA	Sassafras sandy loam, thick solum, 0 to 2 percent slopes
StB	Sassafras sandy loam, thick solum, 2 to 5 percent slopes
StB2	Sassafras sandy loam, thick solum, 2 to 5 percent slopes, moderately eroded
Sw	Swamp
Tm	Tidal marsh
WdA	Woodstown loam, 0 to 2 percent slopes
WoA	Woodstown sandy loam, 0 to 2 percent slopes
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Soil map constructed 1961 by Cartographic Division, Soil Conservation Service, USDA, from 1957 aerial photographs. Controlled mosaic based on Maryland plane coordinate system, Lambert conformal conic projection, 1927 North American datum.

INDEX TO MAP SHEETS
DORCHESTER COUNTY, MARYLAND