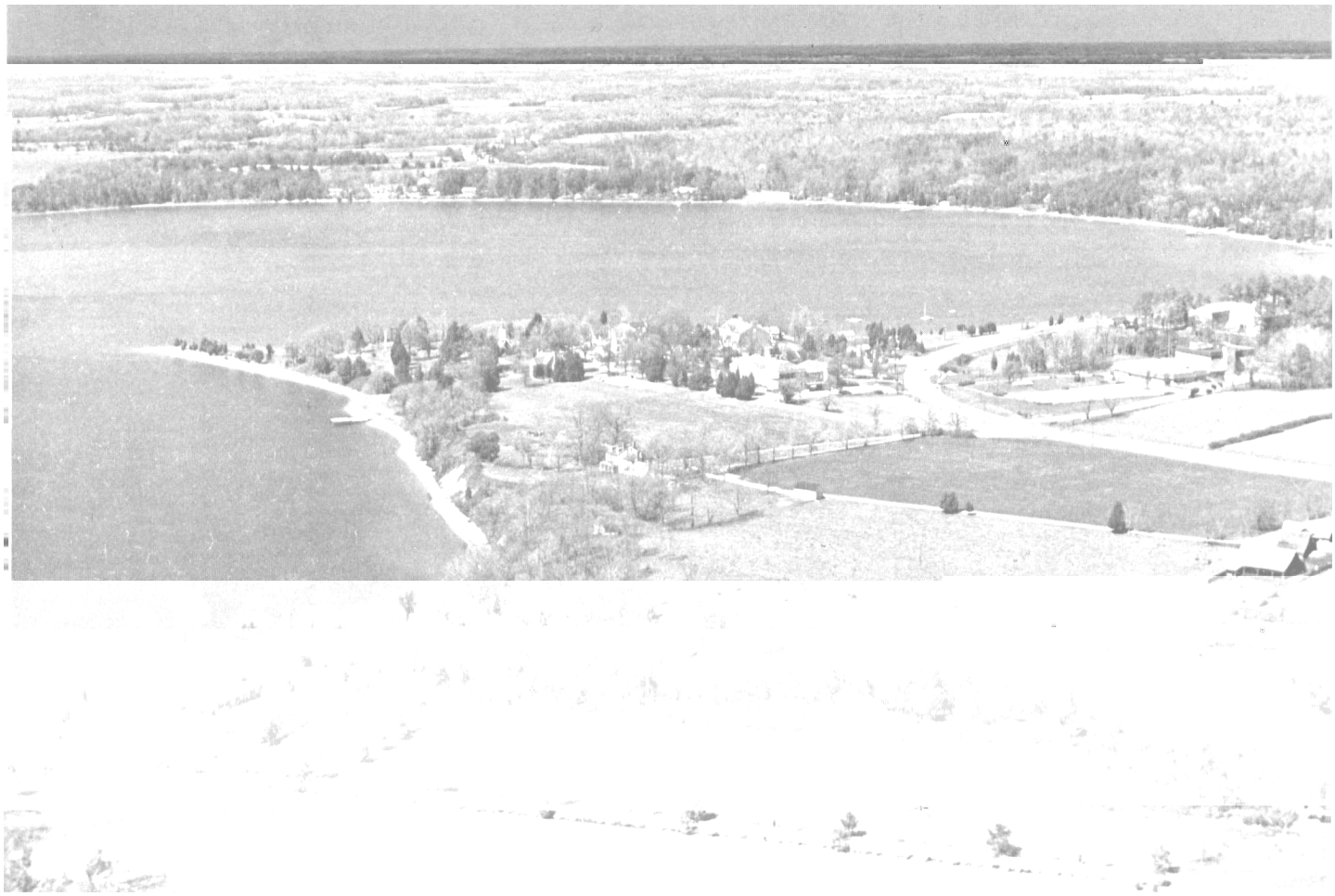
St. Marys County, Maryland



United States Department of Agriculture
Soil Conservation Service
In cooperation with
Maryland Agricultural Experiment Station

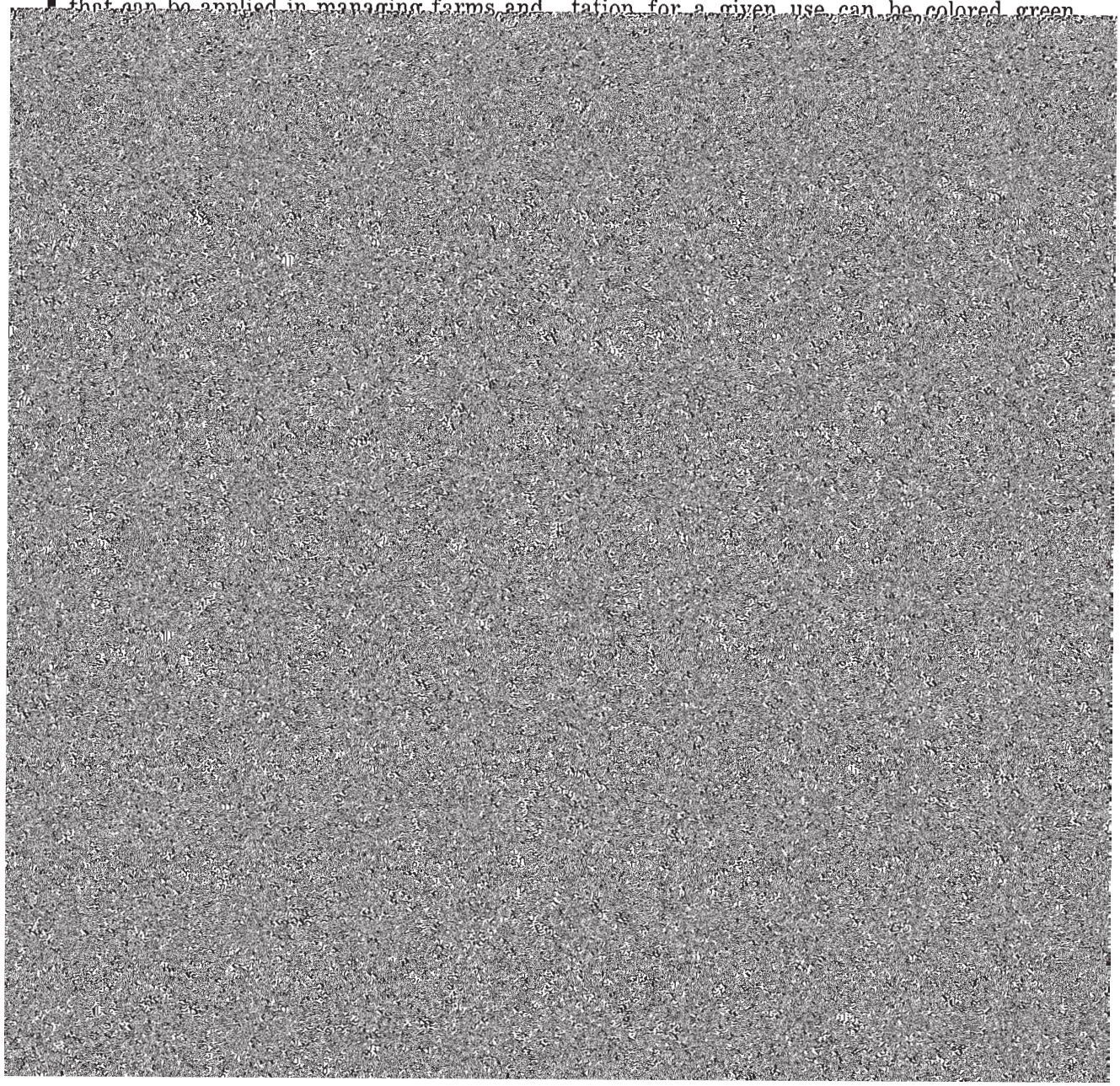
This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1941–74. Soil names and descriptions were approved in 1975. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1975. This survey was made cooperatively by the Soil Conservation Service and the Maryland Agricultural Experiment Station. It is part of the technical assistance furnished to the St. Marys Soil Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and ity. For example, soils that have a slight limitation for a given use can be colored green.



Contents

	Page
Index to soil mapping units	ii
Summary of tables	iv
General nature of the county	1
Climate	2
How this survey was made	3
General soil map	4
1. Beltsville-Croom-Sassafras association	5
2. Beltsville-Caroline association	5
3. Evesboro-Westphalia-Sassafras association	5
4. Beltsville-Croom-Evesboro association	6
5. Chillum-Beltsville-Sassafras association	7
6. Sassafras-Beltsville association	7
7. Faceville association	8
8. Elkton-Keyport association	8
9. Othello-Mattapex association	8
10. Matapeake-Mattapex-Sassafras association	9
11. Evesboro association	9
12. Bibb-Tidal Marsh association	10
Descriptions of the soils	10
Alluvial land	11
Alluvial land, wet	11
Beaches	13
Beltsville series	13
Bibb series	15
Bourne series	17
Caroline series	18
Chillum series	19
Croom series	21
Cut and fill land	22
Elkton series	22
Evesboro series	23
Faceville series	25
Fallsington series	25
Gravel pits	26
Kempsville series	26
Keyport series	28
Kitchen middens	29
Klej series	29
Leonardtown series	30
Marr series	31
Matapeake series	32
Mattapex series	34
Othello series	36
Rumford series	37
Sassafras series	38
Tidal marsh	40
Westphalia series	40
Woodstown series	41
Use and management of the soils	43
Capability grouping	43
General management practices	45
Drainage	45
Irrigation	45
Soil amendments	45
Cropping systems	46
Tillage	46
Residue management	46
Estimated yields	46
Use of soils for woodland	47
Woodland suitability groups	47
Use of soils for wildlife habitat	58
Uses of suitability ratings	58
Habitat elements	59
Classes of wildlife	59
Engineering uses of the soils	62
Engineering classification systems	63
Estimated engineering properties	66
Engineering interpretations of soils	74
Engineering test data	76
Town and country planning	76
Use of soils for recreational development	76
Genesis, morphology, and classification of soils	81
Genesis and morphology	81
Parent material	85
Climate	85
Plant and animal life	86
Relief	87
Time	87
Interrelationships of soils	87
Classification of soils	87
Literature cited	89
Glossary	89
Guide to mapping units Following	91

Issued March 1978

Index to soil mapping units

	Page
Aa—Alluvial land	11
Ad—Alluvial land, wet	11
Be—Beaches	13
BlA—Beltsville silt loam, 0 to 2 percent slopes	14
BlB2—Beltsville silt loam, 2 to 5 percent slopes, moderately eroded	15
BlB3—Beltsville silt loam, 2 to 5 percent slopes, severely eroded	15
BlC2—Beltsville silt loam, 5 to 10 percent slopes, moderately eroded	15
BlC3—Beltsville silt loam, 5 to 10 percent slopes, severely eroded	15
Bm—Bibb silt loam	16
BrB2—Bourne fine sandy loam, 2 to 5 percent slopes, moderately eroded	17
BrC3—Bourne fine sandy loam, 5 to 10 percent slopes, severely eroded	17
CaB2—Caroline silt loam, 2 to 5 percent slopes, moderately eroded	18
CaC2—Caroline silt loam, 5 to 10 percent slopes, moderately eroded	18
CaC3—Caroline silt loam, 5 to 10 percent slopes, severely eroded	19
FaB—Faceville silt loam, 0 to 5 percent slopes	25
Fs—Fallsington sandy loam	26
Gp—Gravel pits	26
KeC2—Kempsville fine sandy loam, 5 to 10 percent slopes, moderately eroded	27
KeC3—Kempsville fine sandy loam, 5 to 10 percent slopes, severely eroded	27
KeD2—Kempsville fine sandy loam, 10 to 15 percent slopes, moderately eroded	27
KeD3—Kempsville fine sandy loam, 10 to 15 percent slopes, severely eroded	28
KpA—Keyport fine sandy loam, 0 to 2 percent slopes	28
KpB2—Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded	29
KrA—Keyport silt loam, 0 to 2 percent slopes	29
KrB2—Keyport silt loam, 2 to 5 percent slopes, moderately eroded	29
KrC2—Keyport silt loam, 5 to 10 percent slopes, moderately eroded	29
Kz—Klej loamy sand, 0 to 5 percent slopes	30

	Page
SaA—Sassafras sandy loam, 0 to 2 percent slopes	38
SaB2—Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	38
SaC2—Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	39
SaC3—Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	39
SaD2—Sassafras sandy loam, 10 to 15 percent slopes, moderately eroded	39
SaD3—Sassafras sandy loam, 10 to 15 percent slopes, severely eroded	39
SfA—Sassafras loam, 0 to 2 percent slopes	39
SfB2—Sassafras loam, 2 to 5 percent slopes, moderately eroded	39
SmC2—Sassafras-Chillum complex, 6 to 12 percent slopes, moderately eroded	40
SmC3—Sassafras-Chillum complex, 6 to 12 percent slopes, severely eroded	40
Tm—Tidal marsh	40
WeB2—Westphalia fine sandy loam, 2 to 6 percent slopes, moderately eroded	41
WeC2—Westphalia fine sandy loam, 6 to 12 percent slopes, moderately eroded	41
WeC3—Westphalia fine sandy loam, 6 to 12 percent slopes, severely eroded	41
WsA—Woodstown sandy loam, 0 to 2 percent slopes	42
WsB—Woodstown sandy loam, 2 to 5 percent slopes	42
WsC2—Woodstown sandy loam, 5 to 10 percent slopes, moderately eroded	42

Summary of tables

	Page
General nature of the county	
Temperature and precipitation (Table 1)	2
Probability dates of last freezing temperatures in spring and first in fall (Table 2)	3
Descriptions of the soils	
Approximate acreage and proportionate extent of the soils (Table 3)	12
Estimated yields	
Estimated average acre yields of principal crops under improved management (Table 4)	48
Use of soils for woodland	
Factors affecting woodland management (Table 5)	54
Use of soils for wildlife habitat	
Suitability of the soils for elements of wildlife habitat and kinds of wildlife (Table 6)	60
Engineering uses of the soils	
Estimated engineering properties of soils (Table 7)	64
Engineering interpretations of soils (Table 8)	68
Engineering test data (Table 9)	74
Town and country planning	
Limitations of soils for town and country planning (Table 10)	77
Use of soils for recreational development	
Degree and kind of limitations for specified recreational uses (Table 11)	82
Genesis, morphology, and classification of soils	
Soil series relationships in terms of position, parent material, and drainage (Table 12)	88
Soil series classified according to the current system (Table 13)	89

SOIL SURVEY OF ST. MARYS COUNTY, MARYLAND

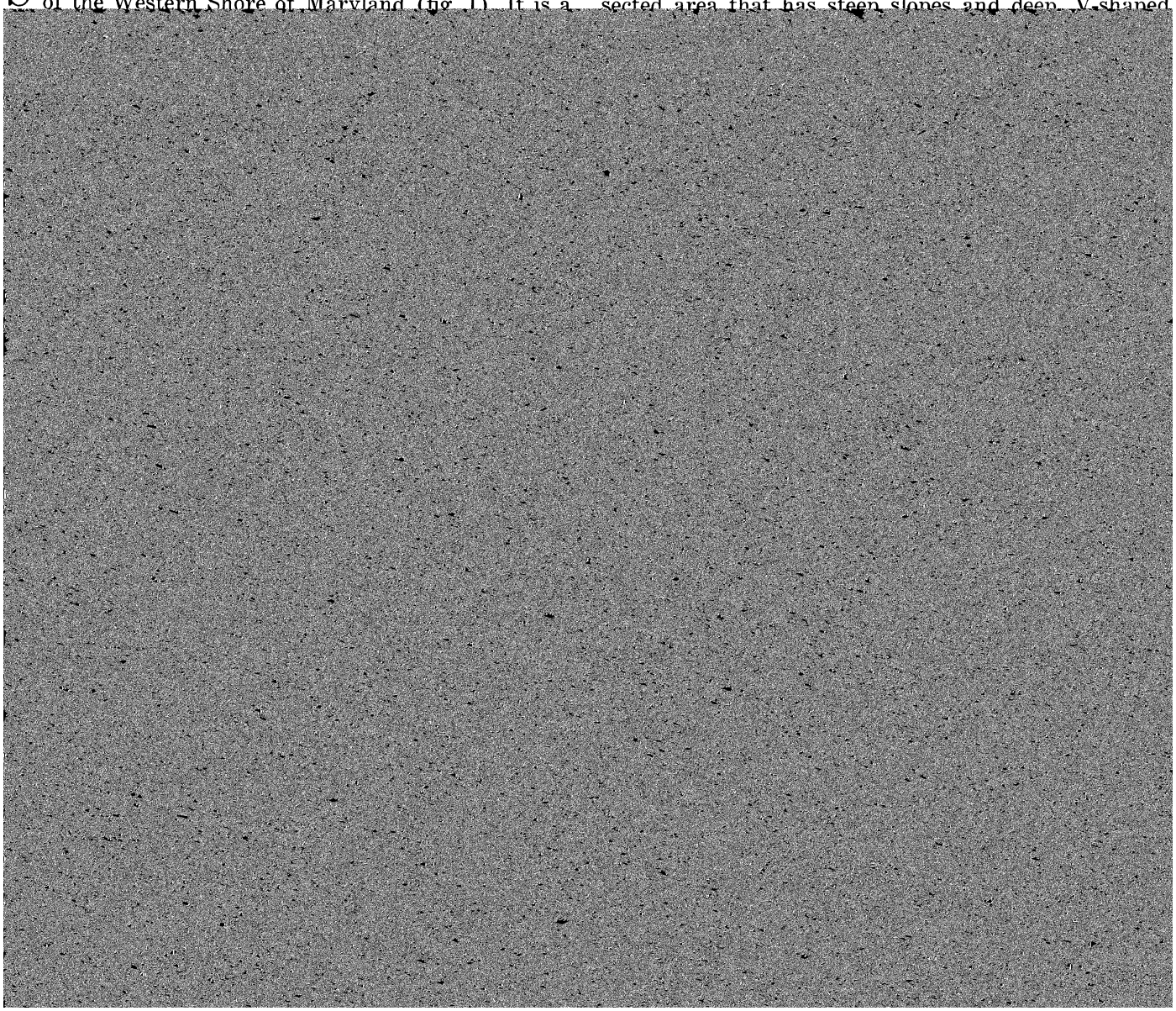
By Joseph W. Gibson, Soil Conservation Service

Soils surveyed by Moulton A. Bailey, E.Z.W. Compy, Joseph W. Gibson, Richard L. Hall, and Robert M. Kirby, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in cooperation with the Maryland Agricultural Experiment Station

ST. MARYS COUNTY is in the southernmost part of the Western Shore of Maryland (fig. 1). It is a

Test Center to the Charles County line is a very dis- sected area that has steep slopes and deep, V-shaped



About 80 percent of the land area of the county, including some areas now wooded, is suitable for cultivation. The rest of the land is so steep, so eroded, or so wet that it is best suited to woodland, wildlife habitat, or recreational uses. On about 55 percent of the land suitable for cultivation, there is a moderate to severe hazard of further erosion. About 28 percent of the land area needs some degree of artificial drainage before it can be used intensively for farming. About 8 percent is moderately to severely limited by sandiness and low available water capacity. About 4 percent of the soils have few, if any, limitations for farming and need no special management.

The major farm crops grown in the county are tobacco, soybeans, corn, wheat, and hay. Tobacco has always been the leading cash crop and the most important farm crop. The most important soils for production

reached by drilling, and yield water generally of good quality. The extensive sheet-like deposits of Pleistocene age consist largely of permeable sand and gravel and yield moderate supplies of water, mostly to shallow dug wells. Most of these wells are in the higher central part of the county.

Climate [2]

St. Marys County has a continental type climate with well defined seasons. The Chesapeake Bay, the Potomac River, and their tributaries exert a considerable modifying influence on the climate, especially in moderating extreme temperatures in nearby areas.

Temperature and precipitation data for the Leonardtown cooperative weather station, which is located at

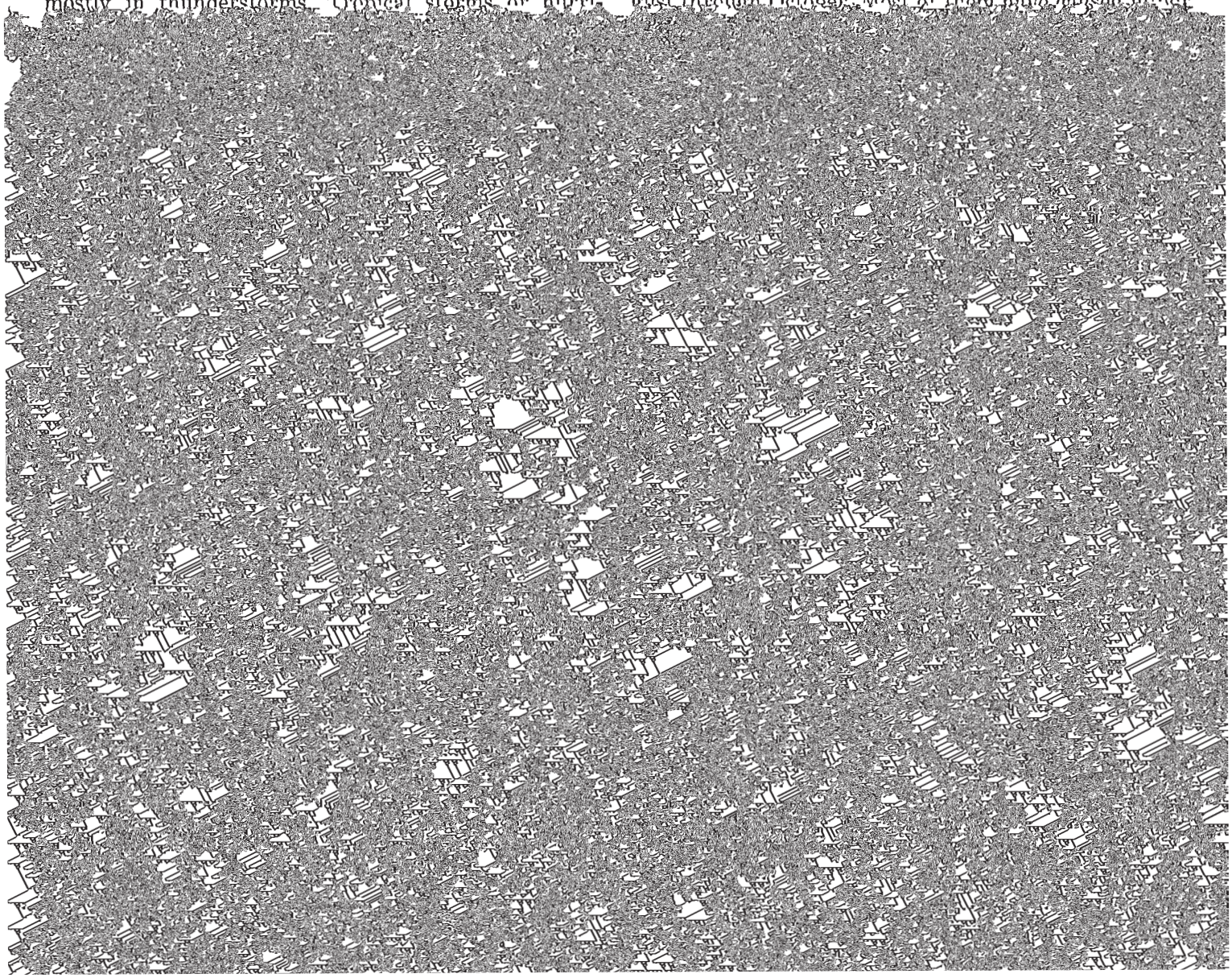
half of July when the maximum afternoon temperature averages 89° F. Temperatures of 90° or higher occur on an average of 38 days per year. Records from the Leonardtown stations near the bay differ very little from these temperatures. The coldest period of the year is the end of January and the beginning of February when early morning minimum temperatures average about 23° F. Temperatures at the other Leonardtown stations have averaged 26° F. Temperatures of 32° F. or lower occur an average of 100 days per year except in areas near the bay, where they occur an average of only 86 days per year.

The annual precipitation averages 41.05 inches. The monthly distribution, based on a much longer period of record than is given in table 1, is fairly uniform during the year. The wettest month is generally June or July, and the driest is January or October. Heavy precipitation during the colder part of the year is the result of low-pressure systems moving north or northeast along the coast. In summer, precipitation occurs mostly in thunderstorms. Tropical storms or hurri-

ference between the two is worthy of note. The period between the last frost (32° F) in spring and the first in fall, often defined as the growing season, averages 169 days at the Leonardtown station and 202 days at the Breton Bay station. In most areas in the county the growing season is likely to range between 180 and 200 days.

Prevailing winds are from the west-northwest to northwest except during the warm part of the year when they become more southerly. The average windspeed is about 9 miles per hour, although winds may reach 50 to 60 miles per hour and even higher in thunderstorms, hurricanes, and severe winter storms.

Thunderstorms occur on an average of about 32 days per year. Although they may occur in any one month, about 72 percent of them occur from May through August. Tornadoes are rare; the annual average for the state is only two and these have caused mostly minor damage. Tropical storms or hurricanes affect the county about once a year, usually occurring from August through October. Most of them have caused minor



into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kind of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kind of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants, and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the

1. Beltsville-Croom-Sassafras association

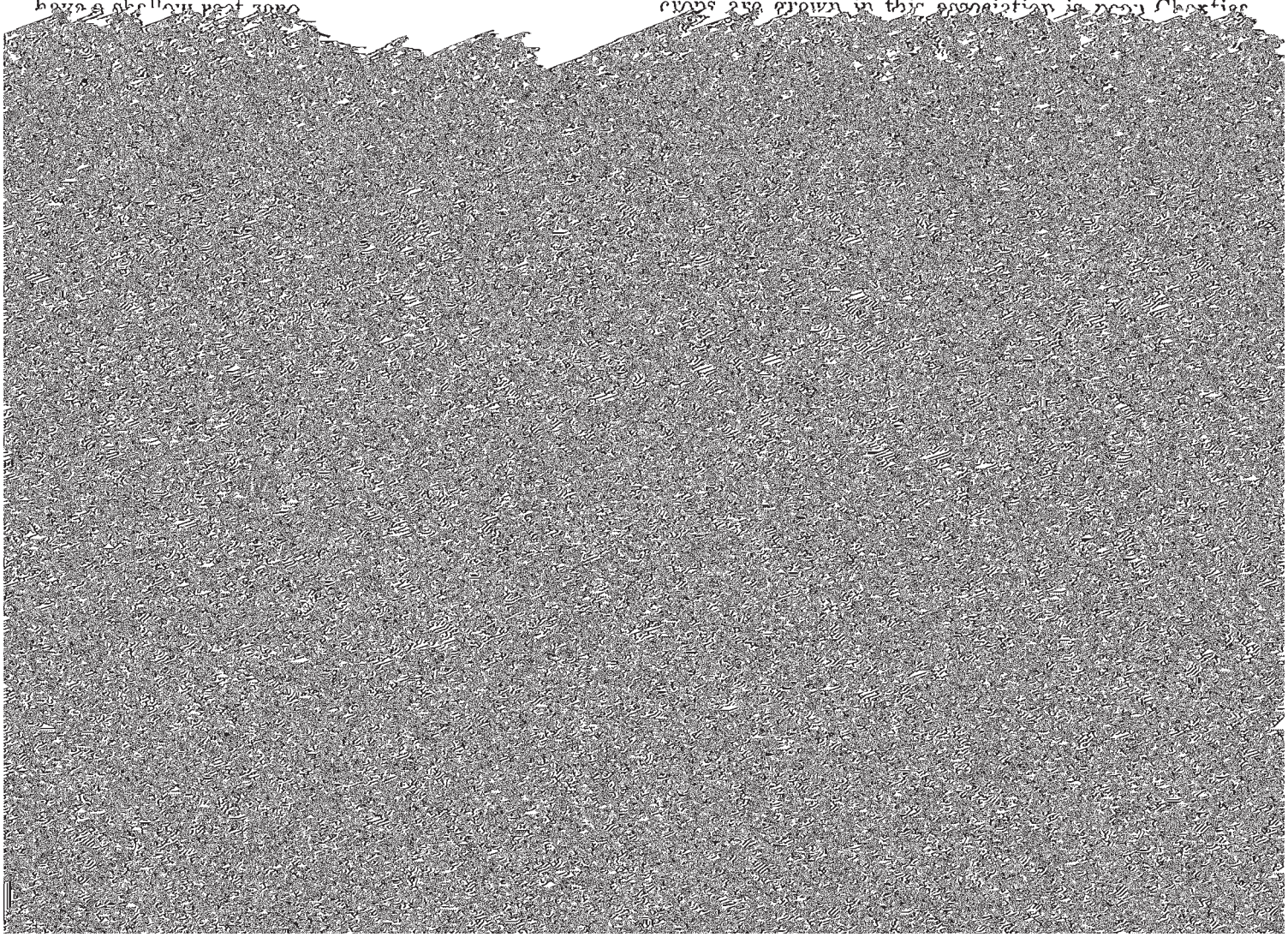
Level to strongly sloping, moderately well drained and well drained, silty and loamy soils, some of which have a fragipan or compact gravelly subsoil; on uplands

This association is almost entirely south of Route 235 along the length of the county. The area is well dissected except on small upland flats, and there are many V-shaped ravines. Nearly half of the soils are either severely eroded or are subject to a severe hazard of erosion.

This association makes up about 27 percent of the county. It is about 45 percent Beltsville soils, 22 percent Croom soils, 6 percent Sassafras soils, and 27 percent minor soils.

The moderately well drained Beltsville soils are very silty. They have a hard, dense, fragipan in the lower part of the subsoil that inhibits the extension of roots and prevents the downward movement of water. In some seasons the soil above the fragipan is saturated with water, but little or no free water is in the fragipan and immediately below. This condition is most common late in winter and early in spring.

The Croom soils are gravelly and have a compacted or cemented subsoil. They are somewhat droughty and have a shallow root zone.



ately sloping areas near drainageways are severely eroded.

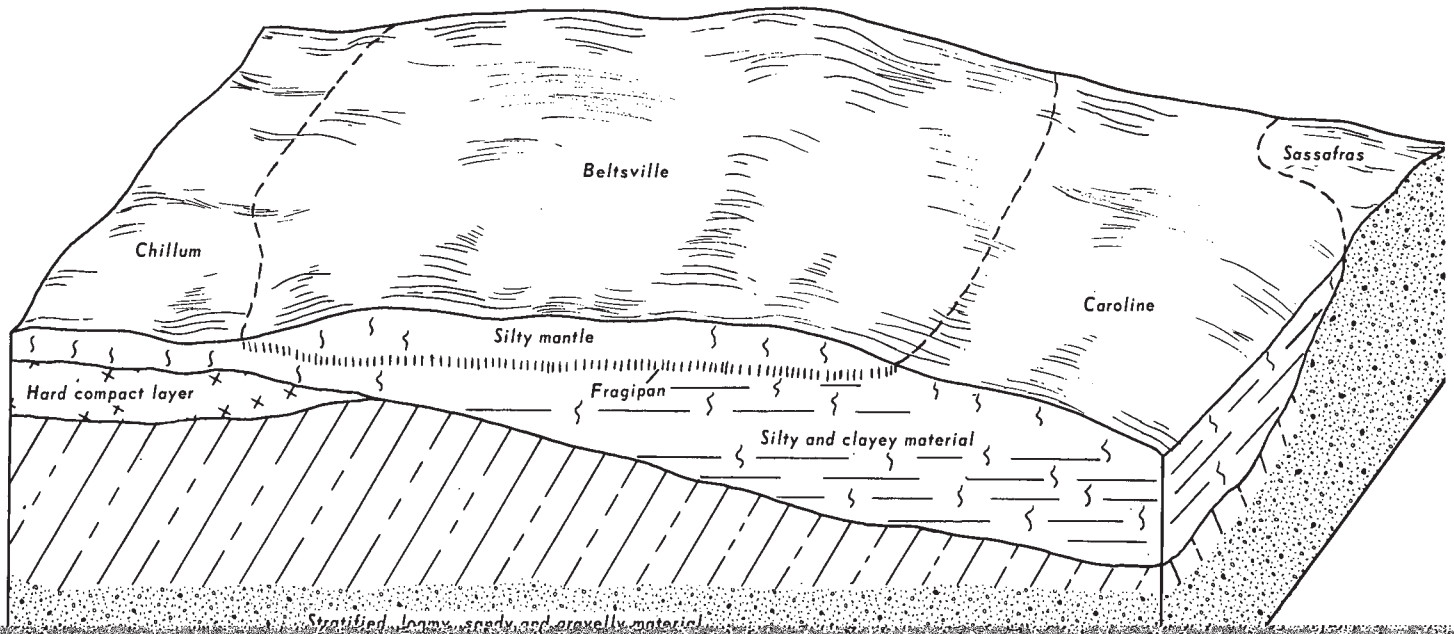
This association makes up about 11 percent of the county. It is about 40 percent Beltsville soils, 30 percent Caroline soils, and 30 percent minor soils.

The moderately well drained Beltsville soils are very silty. They have a hard, dense, fragipan in the lower part of the subsoil that inhibits the extension of roots and the downward movement of water. In some seasons, the soil above the fragipan is saturated with water, but little or no free water is in the fragipan and immediately below. This condition is most common late in winter and early in spring.

Caroline soils are well drained and have a silty surface layer. The subsoil is very thick and is mainly clay loam. These soils do not have a fragipan as do Beltsville soils, but water moves through the subsoil moderately slowly.

Some important minor soils in this association are the well drained Sassafras and Chillum soils and the poorly drained Bibb soils on the flood plains of streams.

A fairly large acreage of the association is presently cleared. Subdivisions cover the cleared spots around Lexington Park. The area where the most cultivated crops are grown in this association is near Chaptico.


Beltsville
Sassafras
Chillum
Caroline
Silty mantle
Hard compact layer
Fragipan
Silty and clayey material
Stratified loamy, sandy and gravelly material

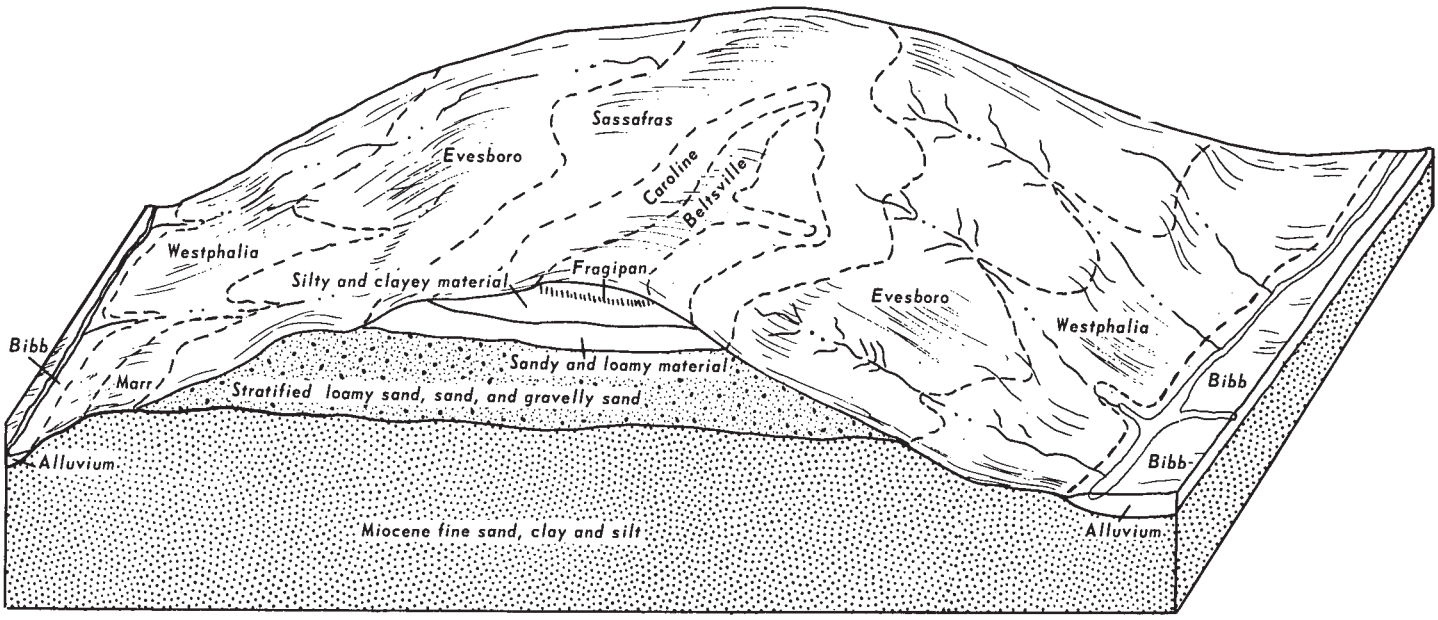


***Figure 3.*—Cross section of soil association 3 showing topography, important soils, and underlying material.**

soils; and the poorly drained Bibb soils along streams.

In places this association is used for general farming. Tobacco, however, is the most important single crop. Most of the steeper areas are in second growth of hardwoods mixed with Virginia pine.

Most of this association is near one of the major highways in the county and has or is undergoing rapid residential development.

Beltsville and Croom soils have severe limitations for septic tank disposal fields, so special types of sewage disposal systems are necessary. Other than slope, Evesboro soils have few limitations for nonfarm uses.

5. Chillum-Beltsville-Sassafras association

Nearly level to strongly sloping, well drained and moderately well drained, silty and loamy soils underlain by gravelly material that is dense and compact in places; on uplands and terraces

This association occupies four areas in St. Marys County. The largest is west and northwest of Helen. An associated small area is west of Chaptico. Another

sons the soil above the fragipan is saturated with water, but little or no free water is in the fragipan and immediately below. This condition is most common late in winter and early in spring.

The well drained Sassafras soils are deep. They have a surface layer of sandy loam or loam and a subsoil that is dominantly sandy clay loam.

Some important minor soils in this association are the moderately well drained Bourne soils and the poorly drained Bibb soils. Also included are some areas of gravelly materials.

The major soils of this association are generally suited to most crops grown in the area. Tobacco is the most important single crop. Although some areas of these soils are limited by shallow rooting depth, poor drainage, or both, crops respond well to good management.

Some areas of this association are being used for residential development. Individual septic tanks do not function properly on the soils that have impeded drainage or a compact substratum.

6. Sassafras-Beltsville association

erately dissected by drainageways that carry water mainly to McIntosh Run and the Patuxent River.

This association makes up about 5 percent of the county. It is about 65 percent Sassafras soils, 25 percent Beltsville soils, and 10 percent minor soils.

The well drained Sassafras soils have a surface layer of sandy loam or loam and a well developed subsoil of sandy clay loam.

The moderately well drained Beltsville soils are very silty. They have a dense, hard fragipan in the lower part of the subsoil that inhibits the extension of roots and prevents the downward movement of water. In some seasons the soil above the fragipan is saturated with water, but little or no free water is in the fragipan or immediately below. This condition is common late in winter and early in spring.

Some important minor soils in this association are the well drained Chillum soils, the excessively drained

8. Elkton-Keyport association

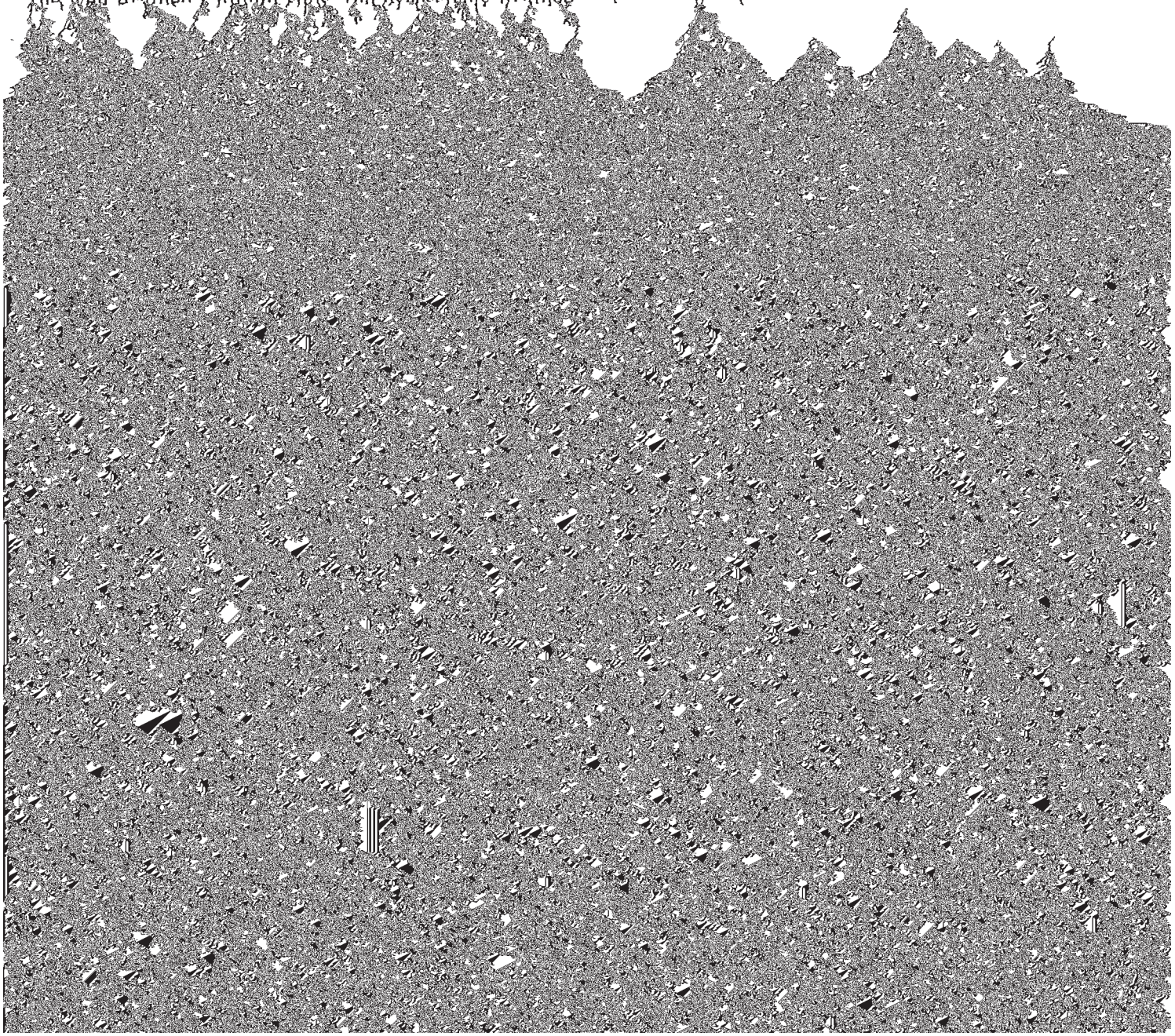
Nearly level to moderately sloping, poorly drained and moderately well drained, silty soils that have a clayey subsoil; on uplands and terraces

This association is mainly at low elevations, commonly less than 40 feet above sea level. It borders the rivers and some of the larger creeks of the county. The largest areas border the Potomac River and its tributaries and the Chesapeake Bay.

This association makes up about 3.5 percent of the county. It is about 55 percent Elkton soils, 30 percent Keyport soils, and 15 percent minor soils.

The poorly drained Elkton soils have a surface layer of silt loam and a subsoil of clay or silty clay.

The moderately well drained Keyport soils have a surface layer of silt loam and a subsoil that is mostly

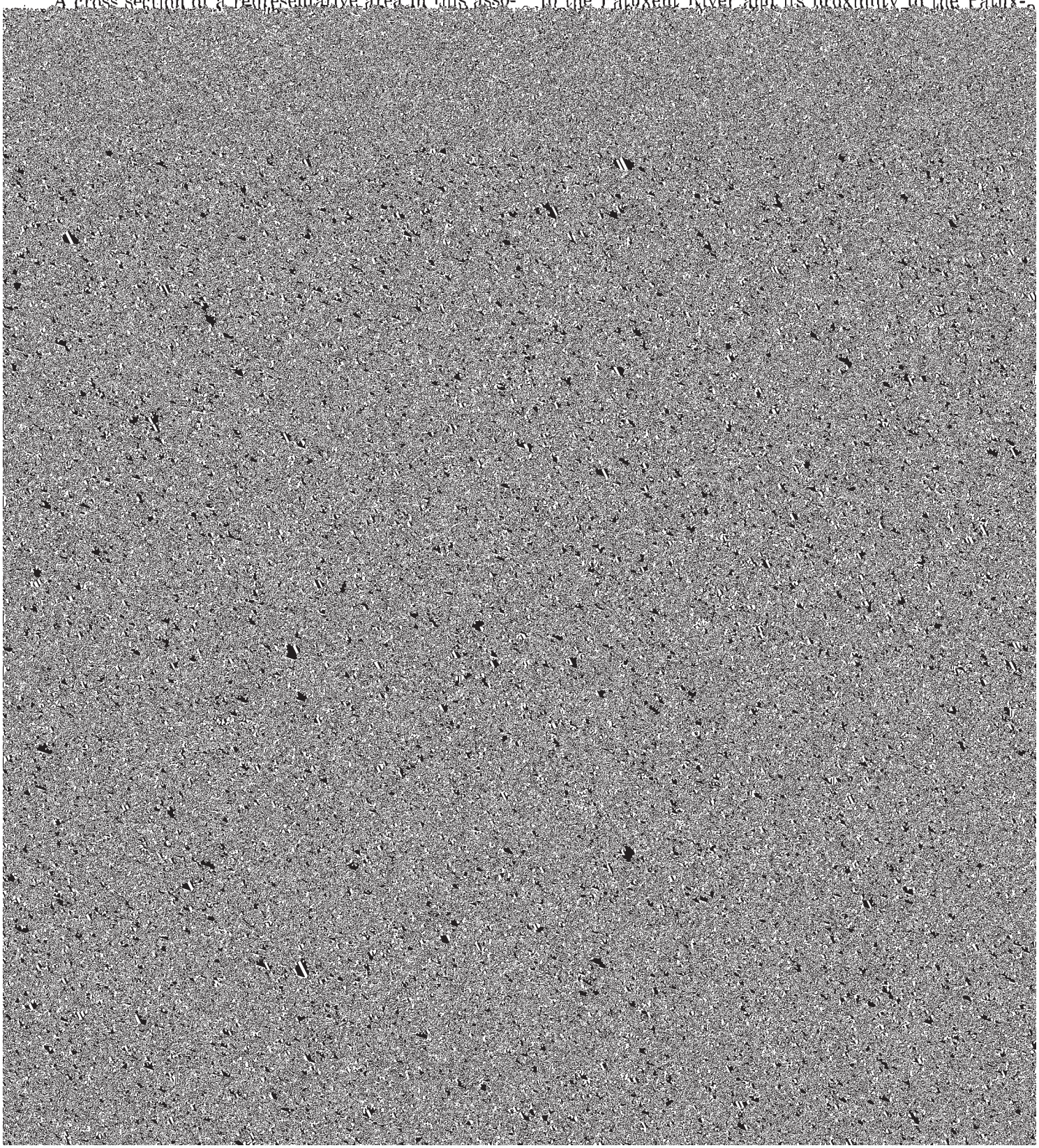


tank disposal fields is severely limited by wetness. Othello soils have severe limitations for nearly all nonfarm uses. Mattapex soils have slight to moderate limitations for most other nonfarm uses.

A cross section of a representative area in this asso-

some artificial drainage is needed for best results, especially if tobacco is to be grown.

Much of this association is used for residential development, chiefly because of its location in regard to the Patuxent River and its proximity to the Patux-



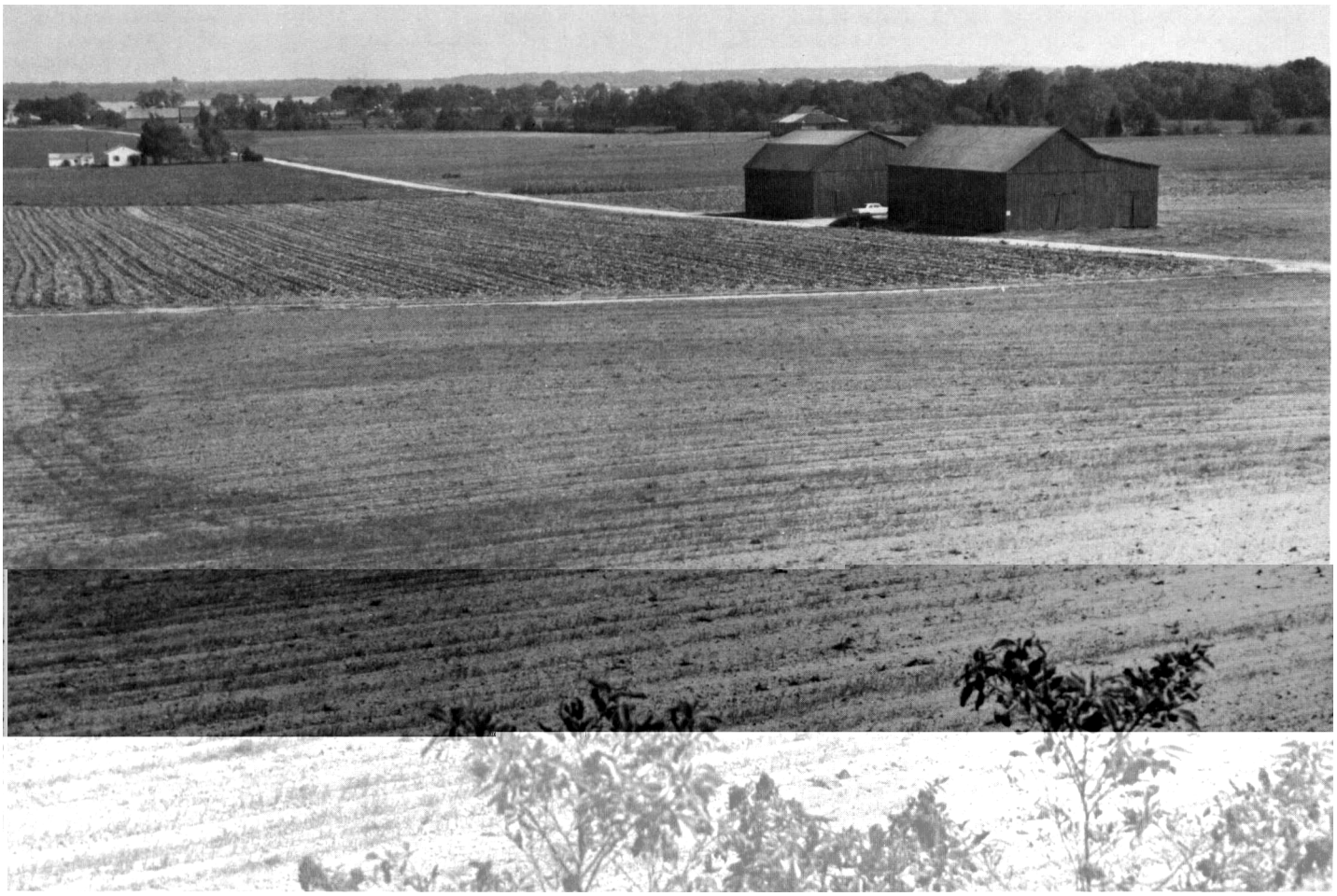


Figure 5.—**Landscape along the Patuxent River south of Golden Beach in the Matapeake-Mattapex-Sassafras association.**

However, under improved management and with supplemental irrigation, Evesboro soils produce favorable

Tidal marsh is wet, unstable soil material subject to flooding by saline to brackish water.

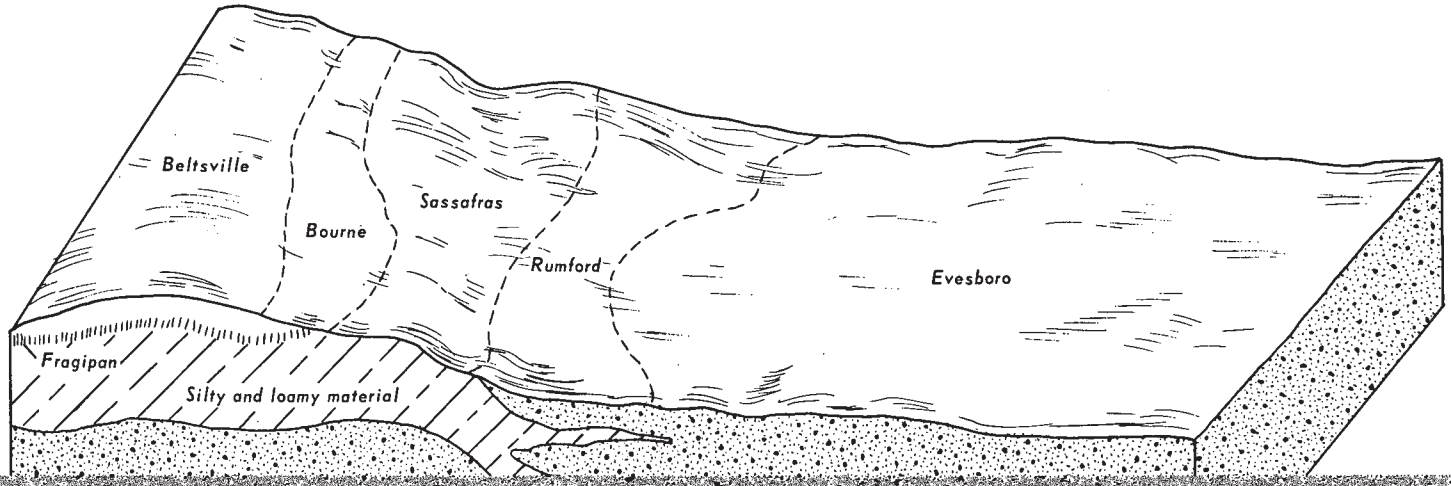

Beltsville
Bourne
Sassafras
Rumford
Evesboro
Fragipan
Silty and loamy material

TABLE 3.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Alluvial land	4,380	1.9
Alluvial land, wet	1,469	.6
Beaches	518	.2
Beltsville silt loam, 0 to 2 percent slopes	3,316	1.4
Beltsville silt loam, 2 to 5 percent slopes, moderately eroded	33,192	14.2
Beltsville silt loam, 2 to 5 percent slopes, severely eroded	552	.2
Beltsville silt loam, 5 to 10 percent slopes, [illegible]	[illegible]	[illegible]
Keyport silt loam, 0 to 2 percent slopes	1,531	0.7
Keyport silt loam, 2 to 5 percent slopes, moderately eroded	1,024	.4
Keyport silt loam, 5 to 10 percent slopes, moderately eroded	516	.2
Klej loamy sand, 0 to 5 percent slopes	572	.2
Leonardtown silt loam	257	.1
Marr fine sandy loam, 2 to 6 percent slopes, moderately eroded	460	.2
Marr [illegible]	[illegible]	[illegible]

and they are suitable habitat for various kinds of wildlife. Capability unit VIw–1; woodland suitability group 2w4.

Beaches

Be—Beaches are strips of land along some shores of the tidal parts of the Potomac, Patuxent, and Wicomico rivers, the Chesapeake Bay, and a few of

percent slopes, moderately eroded, in a wooded area about 2 miles east of St. Marys City:

A1—0 to 1 inch; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; very friable, slightly sticky; many fine roots; extremely acid; abrupt smooth boundary.

A2—1 to 6 inches; light yellowish brown (2.5Y 6/4) silt loam with some grayish brown (10YR 5/2) silt in old root channels;

Figure 7.—Farm pond on Beltsville silt loam, 2 to 5 percent slopes.

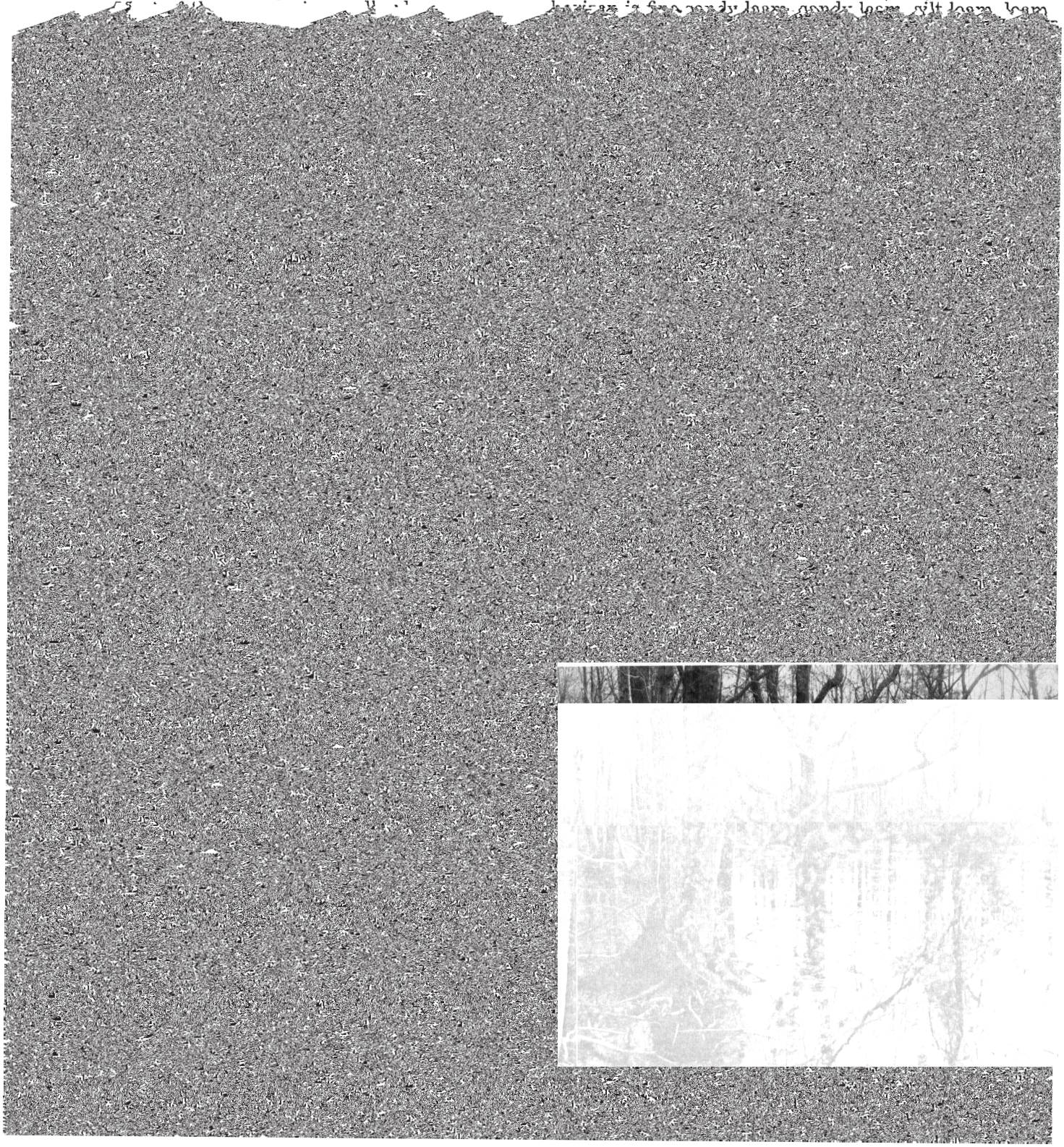
this soil in mapping are some areas where the surface layer has been completely eroded and the fragipan is exposed.

This soil is suited to a few crops and to sown pasture. It is not suited to deep rooted crops or to crops subject to damage by frost heaving. The quality of tobacco is generally low to medium. Erosion is the most important management concern. Practices that retard erosion include planting on the contour, planting close growing crops in narrow strips on the contour, using cover crops and minimum tillage, providing interceptors and diversions in sodded waterways, and using and managing available crop residue well. Capability

nearly level soils on flood plains. These soils are subject to flooding at irregular intervals. They formed in recently deposited alluvium that was washed mainly from soils of the uplands in the county. The native vegetation is wetland hardwoods, mainly red maple (commonly called swamp maple), blackgum, birch, willow, and oaks, but pond pine and loblolly pine grow

In the A11 horizon hue is 10YR or 7.5YR, value is 4 to 7, and chroma is 1 or 2. Mottles are common or many. In the A12g horizon hue is 10YR, 2.5Y, 5Y, or is neutral; value is 4 to 7; and chroma is 1 or 2.

In the C horizon hue is 10YR to 5Y or is neutral, value is 4 to 7, and chroma is 0 to 2. Mottles in this horizon are in shades of red, brown, or yellow. The C



Bourne series

The Bourne series consists of moderately well drained, gently sloping to moderately sloping soils on

thick platy structure, firm, brittle and compact, slightly sticky and slightly plastic; patchy clay films on plates and

This soil is suited to some crops, sown pasture, and trees. It is sometimes used for tobacco, but the quantity is low to medium. The severe hazard of further erosion is the major management concern. Practices that retard erosion include growing clean-tilled crops at long intervals with close growing crops or pasture, growing clean-tilled crops in narrow strips on the contour, using minimum tillage and cover crops, and using and managing all available crop residue well. Even if erosion is controlled, this soil is better suited to hay, pasture, or woodland. Capability unit IVe–7; woodland suitability group 3w3.

Caroline series

The Caroline series consists of well drained, gently sloping to strongly sloping, deep soils on uplands. These soils formed in old unconsolidated deposits of clay, silt, and sand. The native vegetation is mostly mixed hardwoods and Virginia pine.

In a representative profile the surface layer is yellowish brown silt loam about 7 inches thick. The subsoil, to a depth of about 42 inches, is clay loam mottled or variegated with strong brown, yellowish brown, yellowish red, red, and gray. The lower part of the subsoil, to a depth of 60 inches, is heavy clay loam or clay mottled or variegated with colors similar to those in the upper part of the subsoil.

Caroline soils are moderately easy to work at a favorable moisture content, but care should be taken not to work them when too wet. Permeability is moderately slow, and available water capacity is high. They are low in natural plant nutrients and are commonly strongly acid. Impeded internal drainage, a seasonally perched water table in gently sloping areas, and the hazard of erosion are the major limitations

B22t—28 to 42 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/6), yellowish red (5YR 4/8), red (2.5YR 4/8), and gray (10YR 6/1) heavy clay loam; moderate medium subangular blocky structure; hard, firm, sticky and plastic; distinct continuous clay films of brown (7.5YR 5/4); very strongly acid; gradual smooth boundary.

B23t—42 to 60 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/8), yellowish red (5YR 4/8), red (10YR 4/6), and gray (10YR 6/1) clay; weak medium prisms parting to medium subangular and angular blocky structure; hard, firm, sticky and plastic; thin continuous clay films of dark brown (7.5YR 4/4) and yellowish red (5YR 5/6); very strongly acid.

The solum is 60 inches or more in thickness. In the A horizon hue is 10YR, 7.5YR, or 5YR; value is 4 to 6; and chroma is 2 to 8.

The B horizon is mottled or variegated and hue is 10YR, 7.5YR, 5YR, and 2.5YR; value is 4 to 6; and chroma is 1 through 8. The B horizon is commonly clay loam but ranges to clay or silty clay.

Carolina soils resemble Beltsville, Bourne, Keyport, Mattapex, and Woodstown soils in natural drainage. They lack the fragipan of Beltsville and Bourne soils. The subsoil of Caroline is thicker and more clayey than that of Mattapex and Woodstown soils.

CaB2—Caroline silt loam, 2 to 5 percent slopes, moderately eroded. This gently sloping soil is on uplands. It has the profile described as representative of the series. In practically all cleared areas some surface soil has been lost through erosion.

Water runs off this soil readily, especially when the

on the contour, using winter cover crops and minimum tillage, providing interceptors and diversions in sodded waterways, and using all available crop residue well. Capability unit IIIe–13; woodland suitability group 3w3.

CaC3—Caroline silt loam, 5 to 10 percent slopes, severely eroded. This moderately sloping soil is on uplands. Most of the original surface layer and, in places, some of the subsoil have been lost through erosion. Some shallow and deep gullies have formed. The present surface layer is sticky and difficult to work when it is too wet or when it is dry.

Runoff is rapid, and the hazard of further erosion is very severe.

Erosion is a severe limitation to use of this soil for tilled crops. The soil is better suited to hay, pasture, or close-growing crops than to other uses. Controlling erosion is the major management concern. Practices which retard erosion include growing clean-tilled crops at long intervals in a cropping system that includes close-growing crops or pasture plants, growing clean-tilled crops in narrow strips that are laid out on the contour, using minimum tillage, placing interceptors and diversions in sodded waterways, using cover crops, and using all available crop residue well. Capability unit IVe–9; woodland suitability group 3w3.

CaD2—Caroline silt loam, 10 to 15 percent slopes, moderately eroded. This strongly sloping soil is on uplands. The surface layer is thin, and if the soil is plowed, subsoil material is exposed. Shallow gullies are common.

In unprotected areas, runoff is rapid. The hazard of further erosion is severe. Most of the acreage is in woodland, most of which is second or third growth.

Erosion is a severe limitation to use of this soil for tilled crops. The soil is better suited to hay, pasture, close-growing crops, or woodland than to other uses. Controlling erosion is the major management concern. Practices which retard erosion include growing clean-tilled crops at long intervals in a cropping system that includes close-growing crops or pasture plants, growing clean-tilled crops in narrow strips that are laid out on the contour, using minimum tillage, placing interceptors and diversions in sodded waterways, using cover crops, and using all available crop residue well. Capability unit IVe–9; woodland suitability group 3w3.

CaD3—Caroline silt loam, 10 to 15 percent slopes, severely eroded. This strongly sloping soil is on uplands. This soil is gullied in nearly all areas, and subsoil material is exposed (fig. 10). Runoff is rapid.

This soil is very poorly suited to tilled crops because of severe erosion. It is suited to sown pasture, limited hay production, and woodland. The surface needs to be kept under vegetative cover. The most intensive use should be for improved grazing, but measures must be applied to prevent overgrazing, which damages sod and promotes erosion. Capability unit VIe–2; woodland suitability group 3w3.

Chillum series

The Chillum series consists of well drained, level to moderately sloping soils on uplands. These soils are on ridgetops and the upper slopes of ridges. They formed in silty sediment over deposits of dense, compact gravelly material. The native vegetation is hardwoods, mainly oak, and Virginia pine.

In a representative profile the surface layer is about 8 inches thick. It is dark grayish brown loam in the thinner upper part and grayish brown loam in the lower part. The upper 15 inches of the subsoil is strong brown silt loam. Below that is about 7 inches of yellowish brown gravelly loam. The underlying material, between depths of 30 and 60 inches, is hard and compact gravelly sandy clay loam and gravelly sandy loam variegated with many colors.

Chillum soils are easy to work. They have a moderate available water capacity. They are moderately permeable in the silty upper mantle. In places permeability is moderately slow in the compact, gravelly lower part of the subsoil and in the substratum. Rooting depth is limited. Slope and the hazard of further erosion limit the soils for some uses. Chillum soils are suitable for most kinds of farming. The hard, compact underlying material is sometimes used as a source of gravel and roadfill. Chillum soils have only slight or moderate limitations for most nonfarm uses.

Representative profile of Chillum loam, 2 to 6 percent slopes, moderately eroded, in a wooded area 2 miles north of Morganza:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; very friable, slightly sticky; many roots; very strongly acid; clear smooth boundary.

A2—2 to 8 inches; grayish brown (10YR 5/2) loam; weak medium granular structure; friable, slightly sticky; many roots; strongly acid; clear smooth boundary.

B2t—8 to 23 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common roots; thin discontinuous clay films; very strongly acid; abrupt smooth boundary.

IIB3—23 to 30 inches; yellowish brown (10YR 5/6) gravelly loam; variegated with strong brown (7.5YR 5/6); moderate, medium angular blocky structure; firm, slightly sticky; few roots; thin clay films on ped faces; very strongly acid; clear wavy boundary.

IIC1—30 to 42 inches; strong brown (7.5YR 5/8) gravelly sandy clay loam, variegated with red (2.5YR 4/8) and yellowish red (5YR 5/8); massive; very firm in places, brittle; no roots; about 30 percent fine gravel; very strongly acid; clear smooth boundary.

IIC2—42 to 60 inches; strong brown (7.5YR 5/6) gravelly sandy loam; variegated with red (2.5YR 4/8) and yellowish red (5YR 5/8); massive; very firm, about 50 percent gravel; very strongly acid.

The solum ranges from about 20 to 34 inches in thickness. In the A horizon hue is 10YR, value is 3 to 5, and chroma is 2 to 4. In undisturbed A1 horizons less than 6 inches thick, value is 3.

In the B horizon hue is 10YR or 7.5YR, value is 4 or 5,

Figure 10.—**Unprotected spot of Caroline silt loam, 10 to 15 percent slopes, severely eroded, along Route 235, south of Lexington Park.**

and chroma is 4 or 6. The Bt horizon is silt loam or silty clay loam. Where present, the B3 horizon is heavy sandy loam or loam and is gravelly or sandy in some places.

In the IIC horizon color is variable, and this horizon commonly is variegated. It is hard, firm, and generally

trees. Tobacco yields are generally good, and the quality is medium. This soil is somewhat droughty in seasons of low or poorly distributed rainfall. The effective rooting depth is limited by the very firm substratum. Droughtiness is the most important management con-

rooting depth is limited by the very firm substratum. Droughtiness is the most important management concern. If measures are taken to conserve soil moisture, crops can be grown year after year. Practices that conserve soil moisture include planting on the contour, planting clean-tilled and close growing crops in nar-

or more, is stratified yellowish red and reddish yellow, very gravelly sandy loam.

Croom soils are not particularly difficult to work in places suitable for plowing. The gravel, however, is quite abrasive to farm implements. These soils are seldom used for farming. They have a shallow rooting depth. They have a low to moderate available water

with Sassafras soils, which are deeper and looser than Croom soils.

CrB2—Croom gravelly sandy loam, 2 to 5 percent slopes, moderately eroded. This gently sloping soil is in small areas on uplands. In places, much of the surface layer has washed away and in a few areas the subsoil is exposed or almost exposed.

The hazard of further erosion is moderate. This soil is somewhat droughty in seasons of low or poorly distributed rainfall.

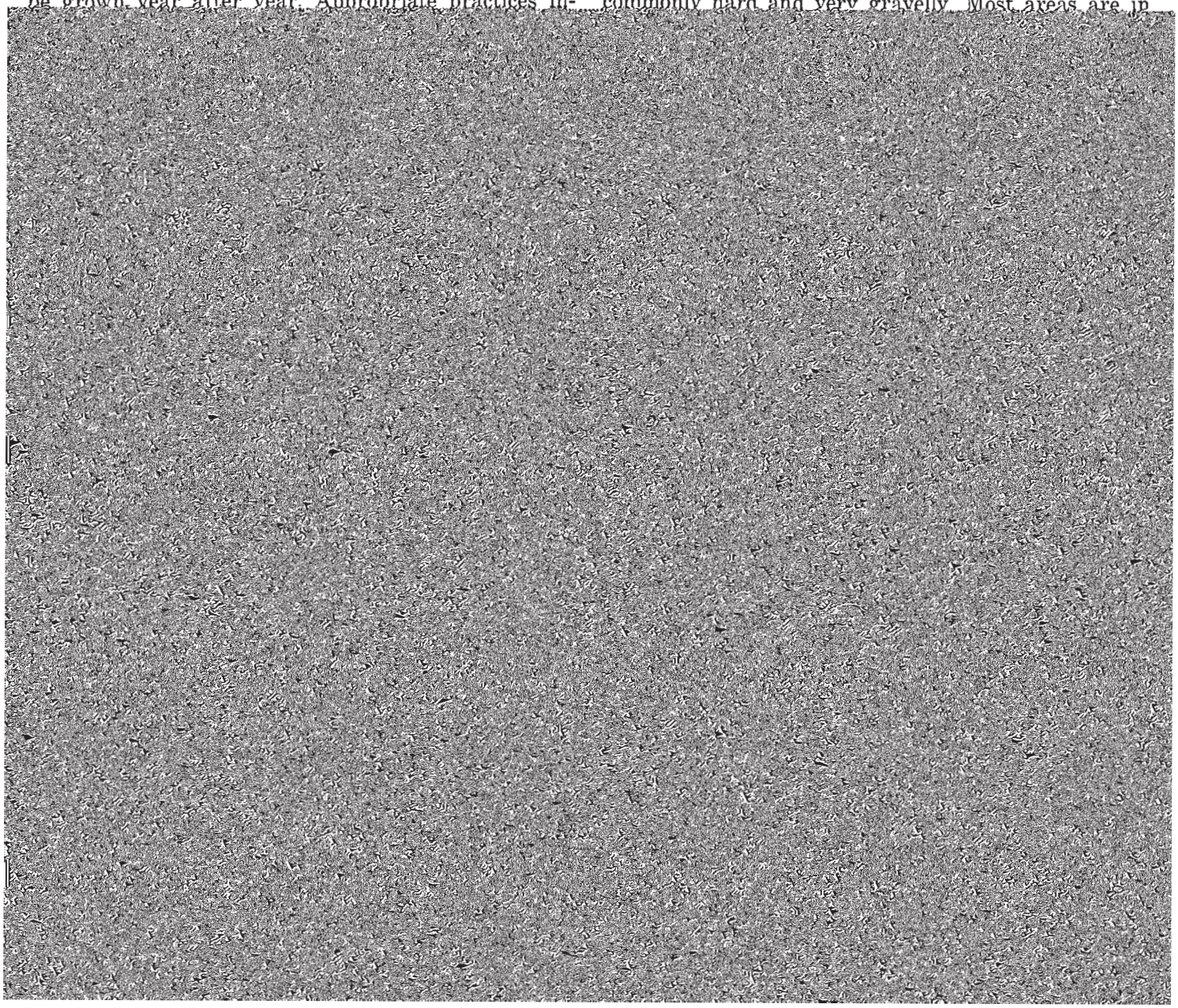
Included with this soil in mapping are areas of soils that have a loam surface layer. Also included are areas where the subsoil is redder than the range defined for the series.

This soil is suited to some crops and sown pasture. It is not suited to deep rooted crops. Tobacco yields range from poor to fair, and the quality is generally medium. Droughtiness is the major management concern. If measures are used to conserve soil moisture, crops can be grown year after year. Appropriate practices in-

dense than that described as typical for the series.

This soil is suited to a few crops and to some pasture. It is seldom used for tobacco. Tobacco yields and quality are generally low to medium. Further erosion is the major management concern. Practices which retard erosion include growing clean-tilled crops at long intervals in a cropping system that includes close growing crops or pasture plants, growing clean-tilled crops in narrow strips that are laid out on the contour, using minimum tillage, maintaining cover crops most of the year, and using all crop residue well. Even if erosion is controlled, this soil is best suited to hay, pasture, or woodland. Capability unit IVe–9; woodland suitability group 4d2.

CrD3—Croom gravelly sandy loam, 10 to 15 percent slopes, severely eroded. This strongly sloping to steep soil is on uplands. Most of the surface layer of this soil has been lost through erosion. The subsoil is exposed and in many places gullies are deep. The subsoil is commonly hard and very gravelly. Most areas are in



yellowish brown mottles. The lower part of the subsoil is about 26 inches of gray clay. Permeability in this part of the subsoil is slow to very slow. The underlying material, between depths of 48 and 60 inches, is light gray, mottled silty clay.

Elkton soils must be worked at just the right moisture content. When dry, they are rough and hard; when wet, they do not support heavy machinery. These

soils. In contrast to Bibb soils, the Elkton soils have a Bt horizon. This horizon has more clay and less silt than similar horizons in Leonardtown and Othello soils. Although Elkton and Keyport soils formed in similar clayey sediment, Elkton soils are poorly drained and Keyport soils are moderately well drained.

Ek—Elkton silt loam. This is the only Elkton soil mapped in the county. It is a nearly level soil and is

dium subangular blocky structure parting to single grained; very friable; very few roots; very strongly acid; gradual smooth boundary.

B6—25 to 30 inches, pale yellow (2.5Y 7/4) loamy

poorly distributed rainfall. Included with this soil in mapping are areas where the soil is reddish and somewhat finer textured than is typical for the series, and areas that are very gravelly.

This soil is very poorly suited to crops and pasture

soil and 40 percent Westphalia soil. It is cut by many deep, V-shaped ravines.

The hazard of erosion is moderate to severe. Included with these soils in mapping are small areas of Sassafras and Marr soils, and areas of soils that are gravelly.

This complex is not suited to cultivated crops because it is droughty and slopes are too steep. It is suited to woodland and some kinds of wildlife habitat. Most of the acreage is in woodland. Capability unit VIIs–1; woodland suitability group 3s1.

Faceville series

The Faceville series consists of well drained, nearly level to gently sloping, very deep soils. These soils are chiefly on very old alluvial terraces above the Wicomico River. They have a very red subsoil. Almost all areas have been cleared and used. The native vegetation was probably mixed hardwoods with some Virginia and loblolly pine in places.

In a representative profile the surface layer is yellowish brown silt loam about 9 inches thick. The upper 11 inches of the subsoil is brown clay loam. Below this, to a depth of 26 inches, is yellowish red clay. The lower part of the subsoil, between depths of 26 and 60 inches, is red sandy clay grading into sticky clay loam.

Faceville soils are not extensive in St. Marys County. They are easy to work except when wet. They have a high available water capacity and are moderately permeable. They are well suited to farming. Slope and the hazard of further erosion are the only important limitations to use of these soils. Faceville soils have few or no limitations for most nonfarm uses.

Representative profile of Faceville silt loam, 0 to 5 percent slopes, in a field about 1 mile northeast of Bushwood:

Ap—0 to 9 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; friable, slightly sticky and slightly plastic, many fine roots; strongly acid; abrupt smooth boundary.

B1—9 to 20 inches; brown (7.5YR 5/4) clay loam; weak medium granular structure; friable, slightly sticky and plastic; compacts to weak fine subangular blocky; firm, sticky and plastic; thin discontinuous clay films; strongly acid; clear smooth boundary.

In the A horizon hue is 10YR or 7.5YR, value is 4 or 5, and chroma is 2 to 4.

In the Bt horizon hue is 5YR and 2.5YR, value is 4 or 5, and chroma is 4 to 6. The Bt horizon is sandy clay, clay loam, or clay.

Faceville soils are somewhat similar to Croom soils in color. Croom soils are gravelly throughout.

FaB—Faceville silt loam, 0 to 5 percent slopes. This is the only Faceville soil mapped in the county. The hazard of erosion on this soil ranges from none to moderate. Included in mapping are areas where the surface layer is fine sandy loam. Also included are areas of soils where there is little or no erosion, some areas where slopes are more than 6 percent, and some severely eroded spots.

This soil is well suited to cultivated crops, pasture, and trees. It is among the most productive soils in the county. Under good management this soil is suited to intensive cultivation. The moderate hazard of erosion is the major management concern. Proper management includes using minimum tillage, cover crops, and cropping sequences; tilling on the contour where the landscape permits; keeping the plant nutrient supply high; and using all available crop residue well. Capability unit IIe–4; woodland suitability group 2o2.

Fallsington series

The Fallsington series consists of poorly drained, nearly level and gently sloping soils. These soils are on upland flats and on terraces above major streams. They formed in marine and old alluvial deposits of sandy material containing low to moderate amounts of silt and clay. The native vegetation is chiefly wetland oaks and maples, holly, sweetgum, and black gum. There is also some Virginia and loblolly pine.

In a representative profile the surface layer and subsurface layer, combined, are about 12 inches thick. They are sandy loam. The surface layer is very dark grayish brown and the subsurface layer is gray and has light gray and dark brown mottles. The subsoil

medium granular structure; friable, nonsticky, nonplastic; common roots; extremely acid; abrupt smooth boundary.

A2—3 to 12 inches; gray (5Y 6/1) sandy loam; common fine faint mottles of light gray (5Y 7/1) and common fine prominent mottles of dark brown (7.5YR 4/4); weak medium subangular blocky structure; friable, nonsticky, nonplastic; few roots; very strongly acid; clear smooth boundary.

B21t—12 to 22 inches; gray (5Y 6/1) sandy clay loam; common fine distinct mottles of brown (7.5YR 4/4) and many coarse faint mottles of light brownish gray (10YR 6/2); weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; very few roots; patchy clay films on large peds; 7 percent pebbles; very strongly acid; clear smooth boundary.

B22t—22 to 40 inches; dark gray (5Y 4/1) sandy clay loam; common medium distinct mottles of yellowish brown (10YR 5/6) and light gray (5Y 6/1) in pockets; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; very few roots; 10 percent pebbles; very strongly acid; gradual smooth boundary.

IIC—40 to 72 inches; light gray (5Y 7/1) loamy sand; many medium faint mottles of pale yellow (2.5Y 8/4) and common fine distinct mottles of yellowish brown (10YR 5/6); single grained; very friable, nonsticky, nonplastic; very strongly acid.

The solum ranges from about 24 to 40 inches in thickness. Smooth quartz pebbles about 1 inch in diameter are in the B horizon in places, and they make up 0 to 5 percent of the C horizon. The hue throughout the profile is 10YR through 5Y. Some subhorizons are neutral in color. In the A horizon value is 2 to 5 and chroma is 1 to 2; in the A1 horizon value is 2 and 3

where slope is more than 2 percent. Also included are some small areas where the subsoil is finer textured than is typical for the series.

If artificially drained, this soil is suited to some crops grown in the area. It is not well suited to tobacco. Most undrained areas are in woodland. Fallsington soils are easy to work and not difficult to drain. Tile lines are effective where adequate outlets can be provided. In addition to artificial drainage, good management includes minimum tillage and good use of all available crop residue. Capability unit IIIw–6; woodland suitability group 2w4.

Gravel pits

Gp—Gravel pits are excavations from which gravel and other materials have been or are being removed. These materials are used mainly for road fill or for other kinds of construction. Most pits are exploited for gravel; others yield both sand and gravel.

The total area of these pits is increasing. Possible land uses of these pits must be determined after onsite investigation. Although these areas are no longer suited to farming, some have been regraded and planted to trees (fig. 11). Capability unit VIIIs–4; woodland suitability group not assigned.

Kempsville series

The Kempsville series consists of well drained, level to strongly sloping, deep soils on uplands. These soils formed in old loamy deposits that have a relatively small amount of silt. The native vegetation is mixed upland hardwoods and Virginia pine.

In a representative profile the surface layer is about 15 inches thick. It is light brownish gray, pale brown,

and light yellowish brown fine sandy loam. The subsoil, between depths of 15 and 60 inches, is reddish brown and yellowish red and has mottles in the lower part. The upper 15 inches of the subsoil is friable loam. The next 16 inches is firm clay loam. The lower part, to a depth of 60 inches, is dominantly yellowish red sandy clay loam.

Kempsville soils are easy to work except in places where they are severely eroded. They have a high available water capacity and are moderately permeable. Slope and the hazard of further erosion are chief limitations for nonfarm uses.

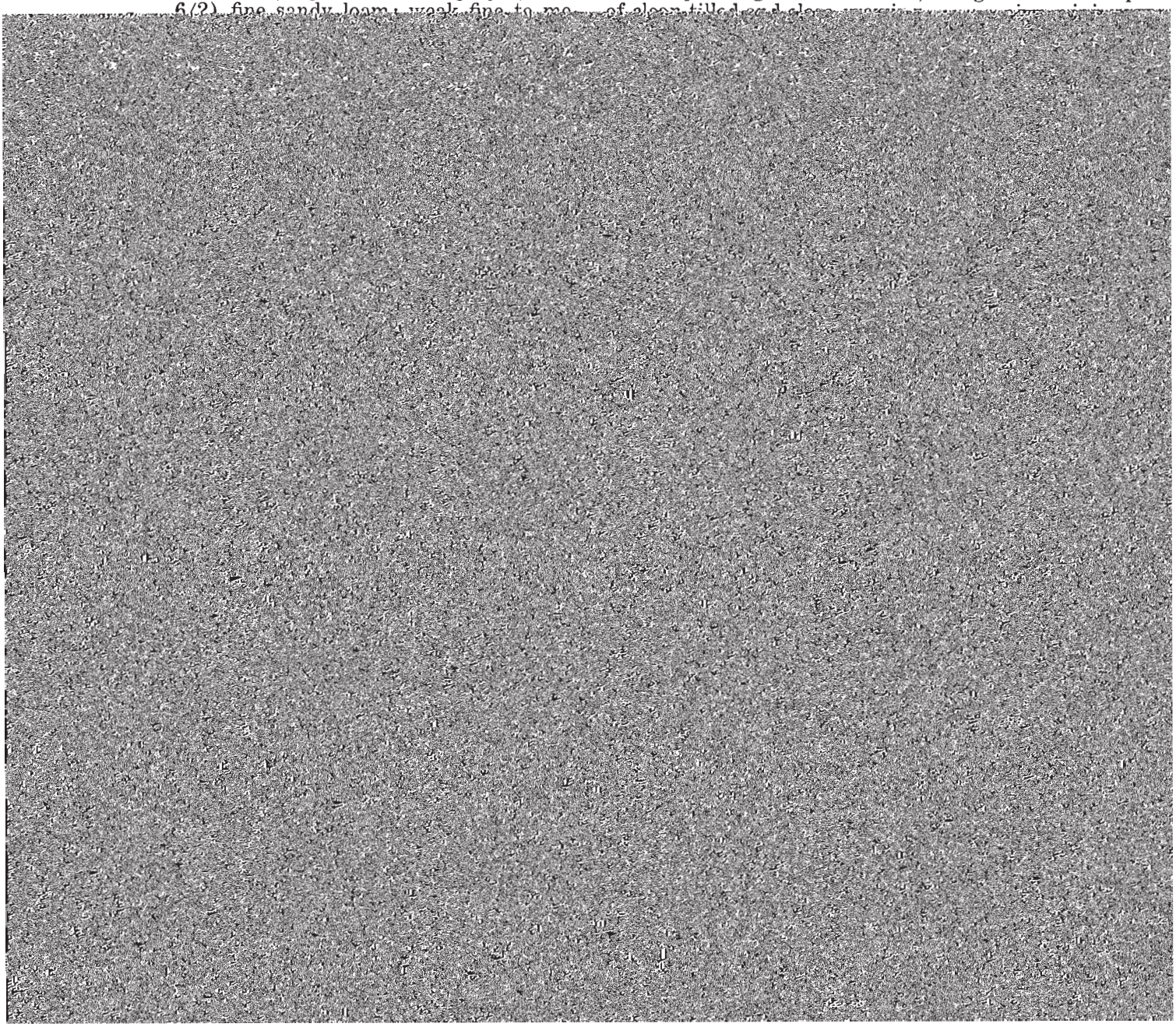
Representative profile of Kempsville fine sandy loam, 5 to 10 percent slopes, moderately eroded, in a wooded area about ½ mile north of Bushwood-Dynard Road in Bushwood:

A1—0 to 3 inches; light brownish gray (10YR 6/2) fine sandy loam; weak fine to me[illegible]

slopes, moderately eroded. This moderately sloping soil is on uplands. It has the profile described as representative of the series. Moderate amounts of surface soil have been lost through erosion. The hazard of further erosion is moderate to severe.

Included with this soil in mapping are some areas of soils that are nearly level, and a few severely eroded areas that are cut by shallow gullies.

This soil is well suited to cultivated crops, sown pasture, and trees. It is among the best soils in the county for tobacco. The yields and the quality are generally high to very high. This soil can be worked and planted earlier in spring than soils that are less sandy or less well drained. The hazard of further erosion is the major management concern, and simple, easily applied practices are needed. Practices which retard erosion include planting on the contour, using alternate strips of sloping tilled and [illegible]



using all available crop residue well. If erosion is controlled, this soil is better suited to hay, pasture, or woodland than to other uses. Capability unit IVe-5; woodland suitability group 2o2.

KeD3—Kempsville fine sandy loam, 10 to 15 percent slopes, severely eroded. This strongly sloping soil is on uplands. Most of the original surface soil has been lost through erosion. Gullies have formed in many areas. In spots, where farmed, the surface layer is sticky sandy clay loam and is difficult to work. The hazard of further erosion is severe.

Included with this soil in mapping are some areas of soils that have a surface layer of sandy clay loam or

6/4) silt loam; weak medium subangular blocky structure; friable, slightly sticky; few roots; very strongly acid; clear smooth boundary.

B1—8 to 14 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few roots; extremely acid; clear smooth boundary.

B21t—14 to 26 inches; yellowish brown (10YR 5/8) heavy silty clay loam; moderate fine and medium subangular blocky structure; friable to firm, slightly sticky,

Keyport silt loam. It is well suited to some crops, sown pasture, and woodland. It is not suited to crops that are subject to damage by frost heaving. Tobacco is grown on this soil in places, but the quality is medium and the quantity ranges from low to medium. Improving drainage is the major management concern. Drainage ditches are more suitable than tile lines. (The soil is slowly permeable, and clay prevents water from entering the tile.) In addition to artificial drainage, good management includes minimum tillage and good use of sodded waterways, minimum tillage, cover crops, and suitable cropping systems; and using and managing all available crop residue well. Capability unit IIe–13; woodland suitability group 3w3.

KrC2—Keyport silt loam, 5 to 10 percent slopes, moderately eroded. This moderately sloping soil is in areas mainly at lower elevations. In practically all cleared areas surface soil has been lost through erosion. Plowing exposes the subsoil in many places and gives the soil a spotty appearance. Shallow gullies are

ular structure; very friable, nonsticky and nonplastic; many roots; very strongly acid; abrupt smooth boundary.

B21—6 to 16 inches; light yellowish brown (2.5Y 6/4) loamy sand; weak fine granular

The native vegetation is wetland hardwoods, including oaks, holly, maples, and gums.

In a representative profile the surface layer and subsurface layer are silt loam. Combined, they are about 12 inches thick. The surface layer is olive gray and the subsurface layer is light olive gray. The upper 9 inches of the subsoil is gray light silty clay loam that has yellowish brown mottles. The lower 24 inches of the subsoil is light gray silt loam and silty clay loam that has yellowish brown mottles. It is a fragipan that is very firm, brittle, and very slowly permeable. The underlying material, between depths of 45 and 65 inches, is light gray heavy silt loam that has strong brown mottles.

Leonardtown soils have a moderate available water capacity and are slowly to very slowly permeable. Generally they are low in natural fertility. These soils have severe limitations for farming because natural drainage is poor, the water table is seasonally perched, and the rooting zone is limited by a fragipan. They also have severe limitations for most nonfarm uses. Leonardtown soils are poorly suited to residential and industrial development.

Representative profile of Leonardtown silt loam, in a level cleared area ½ mile east of Park Hall:

A1—0 to 2 inches; olive gray (5Y 5/2) silt loam mixed with black specks of organic leaf litter; weak coarse granular structure; very friable, slightly sticky; many fine roots; extremely acid; abrupt wavy boundary.

A2g—2 to 12 inches; light olive gray (5Y 6/2) silt loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak, fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; many roots; extremely acid; clear wavy boundary.

B2tg—12 to 21 inches; gray (5Y 5/1) light silty clay loam; common, medium prominent yellowish brown (10YR 5/6) mottles; weak, fine and medium subangular [illegible] and slightly plastic; very few roots only in polygon cracks; gray (N 5/0) clay films as much as ⅛ inch thick on vertical faces of prisms and yellowish brown clay films on some horizontal and vertical faces; extremely acid; gradual smooth boundary.

C—45 to 60 inches; light gray (5Y 6/1) heavy silt loam; common fine prominent mottles of strong brown (7.5YR 5/6); very weak thick platy structure; very hard, very firm, sticky and plastic; thin discontinuous yellowish brown clay films; very strongly acid.

The solum ranges from about 28 to 45 inches in thickness. Depth to the fragipan ranges from about 21 to 30 inches. In the profile hue is commonly 2.5Y or 5Y, but in some subhorizons it is neutral in places. All horizons contain mottles in places. Smooth pebbles are in the C horizon in places.

In the A horizon value is 3 to 6 and chroma is 0 to 2.

In the B and C horizon value generally is 5 or 6, or, in places, 4, and chroma is 1 or 2. The B horizon ranges from sandy loam to heavy silt loam.

Leonardtown soils are similar to Bibb, Elkton, Fallsington, and Othello soils in color and in natural drainage. Leonardtown soils are more poorly drained than the closely associated Beltsville soils. The well drained Chillum and Matapeake soils, the moderately well drained Beltsville soils, and the poorly drained Othello soils formed in the same kind of silty material as Leonardtown soils.

Le—Leonardtown silt loam. This is the only Leonardtown soil mapped in the county. This soil is in level areas and some depressions on uplands. It quickly becomes saturated when it rains or when snow melts, and it remains wet for long periods because runoff and permeability are very slow. The fragipan in the subsoil prevents the downward movement of water and restricts root growth below this layer. The water table is perched at or near the surface much of the year and in places is seasonally ponded. The hazard of

sediment containing moderate amounts of silt and clay. The sand particles in Marr soils are remarkably uniform in size. The native vegetation was probably mixed hardwoods and some Virginia pine.

In a representative profile, the surface layer is about 10 inches thick. It is yellowish brown fine sandy loam. The subsoil is strong brown fine sandy clay loam or

MaB2—Marr fine sandy loam, 2 to 6 percent slopes, moderately eroded. This soil has the profile described as representative of the series. In practically all cleared areas a significant amount of surface soil has been lost through erosion. The hazard of further erosion is moderate.

Included with this soil in mapping are areas where

ment. The native vegetation is mixed upland hardwoods, mainly oaks.

In a representative profile the surface layer is about 10 inches thick. It is dark brown silt loam. The subsoil is about 20 inches thick. It is brown heavy silt loam in the upper part grading into strong brown light silty clay loam in the lower part. The underlying material, between depths of 30 and 60 inches, is yellowish brown sandy loam grading into yellowish brown loamy sand.

Matapeake soils are easy to work at a favorable moisture content and they warm up readily in spring. They have a high available water capacity and are moderately permeable. They are among the most suitable soils for farming in the county. These soils are suited to practically all uses. Slope and the hazard of further erosion are the main factors that influence use; however, underlying some of these soils is an iron pan which forms an impermeable barrier. These pans have significance mainly because if septic tank disposal tile lines are installed, there is a hazard of pollution down slope.

Representative profile of Matapeake silt loam, 0 to 2 percent slopes, in a field 1¼ miles northeast of Hollywood:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; friable; many roots; slightly acid; abrupt smooth boundary.

B21t—10 to 18 inches; brown (7.5YR 5/4) heavy silt loam; moderate, fine and medium subangular blocky structure; friable, slightly sticky, plastic; common fine roots; thin continuous clay films; strongly acid; gradual smooth boundary.

B22t—18 to 30 inches; strong brown (7.5YR 5/6) light silty clay loam; moderate, medium subangular blocky structure; friable to firm, sticky and plastic; few fine roots; distinct continuous clay films; strongly acid; clear wavy boundary.

IIC1—30 to 44 inches; yellowish brown (10YR 5/6) sandy loam; massive; very friable, slightly sticky; very strongly acid; clear smooth boundary.

IIC2—44 to 60 inches; yellowish brown (10YR 5/8) loamy sand, single grained; loose to very friable; very strongly acid.

The solum generally ranges from 24 to 58 inches in thickness. Fine smooth pebbles are in the profile in tain much more silt and less sand in the solum than Marr and Sassafras soils. They formed in the same kind of material as the well drained Chillum soils, the moderately well drained Beltsville and Mattapex soils, and the poorly drained Leonardtown and Othello soils.

MmA—Matapeake fine sandy loam, 0 to 2 percent slopes. This nearly level soil is mainly along major rivers and on uplands. It has a profile similar to the one described as representative of the series, but the surface layer is fine sandy loam. The hazard of erosion is none to slight.

Included with this soil in mapping are areas of soils on uplands which are underlain by a discontinuous iron pan at a depth of about 48 to 60 inches. This iron pan serves as an impermeable barrier below septic disposal fields, which could cause pollution down slope.

This soil is well suited to all crops grown in the area, to pasture, and to trees. It is considered one of the best soils in producing both high quantity and high quality tobacco. This soil can be worked and planted earlier in the year than many other soils in the county. It does not require special conservation practices, and under proper management can be tilled year after year. Good management practices include using minimum tillage, keeping plant nutrients high, using cover crops and cropping sequences, and using all available crop residue well. Capability unit I–5; woodland suitability group 3o2.

MmB2—Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded. This gently sloping soil is along major rivers and on uplands. An appreciable amount of surface soil has been lost in most places. Deep plowing turns up some of the finer textured subsoil material. The hazard of further erosion is moderate.

Included with this soil in mapping are areas of soils on uplands which are underlain by a discontinuous iron pan at a depth of about 40 to 50 inches. This iron pan serves as an impermeable barrier below septic tank disposal fields, which could cause down slope pollution.

This soil is well suited to all crops grown in the area, to sown pasture, and to trees. It is especially suited to the production of tobacco and the quality is generally high to very high. Controlling further erosion is the major management concern. Practices which retard erosion include maintaining a cover crop as much of the time as possible; planting on the contour; using alternate strips of clean-tilled and close growing crops, minimum tillage, and suitable cropping systems; and

as high as on Matapeake fine sandy loam. These soils require no special conservation practices, and general crops respond well to good management. Good management includes using minimum tillage, keeping the plant nutrient supply high, planting cover crops, using [illegible]

Mattapex series

The Mattapex series consists of moderately well drained, level to moderately sloping, deep soils. These soils are chiefly in slightly elevated areas bordering major rivers of the county. They formed in silty de-

medium to high and the quality is generally low to medium. The hazard of further erosion is the major management concern. Practices which retard erosion include planting on the contour, planting clean-tilled and close growing crops in narrow alternate strips that are laid out on the contour, using minimum tillage, using a cropping system that includes close growing crops on each strip for half or more of the time, providing interceptors and diversions in sodded waterways, planting winter cover crops, and using all available crop residue well. Capability unit IIIe-16; woodland suitability group 3w3.

Othello series

The Othello series consists of poorly drained, nearly level, deep soils. These soils are on low terraces adjacent to some major rivers. They formed in silty deposits that are underlain by older sandy sediment. The native vegetation is wetland hardwoods, but some loblolly pine and pond pine also grow.

In a representative profile, the surface layer and subsurface layer are silt loam. Combined, they are about 13 inches thick. The surface layer is gray and the subsurface layer is light gray and has yellowish brown mottles in the lower part. The subsoil is about 13 inches thick. It is light gray heavy silt loam, that has yellowish brown mottles. The underlying material, between depths of 26 and 60 inches, is light gray fine sandy loam that has yellowish brown and strong brown mottles.

Othello soils are easy to work at a favorable moisture content. However, the seasonal water table is high and the soils are wet for long periods. These soils have a high available water capacity, and permeability is moderately slow. Artificial drainage is needed for most crops. Poor internal drainage and a high water table severely limit these soils for nonfarm uses.

Representative profile of Othello silt loam, in a level wooded area 3/4 mile south of Drayden:

A1—0 to 2 inches; gray (5Y 5/1) silt loam; very weak fine and medium granular structure; very friable, slightly plastic; many roots; extremely acid; abrupt wavy boundary.

A2g—2 to 13 inches; light gray (5Y 7/1) silt loam; few fine prominent mottles of yellowish brown (10YR 5/6); very weak coarse granular structure; very friable, slightly plastic; common roots; extremely acid; clear smooth boundary.

B2tg—13 to 26 inches; light gray (5Y 7/1) heavy [illegible] inent yellowish brown (10YR 5/8) mottles; massive; friable, slightly sticky and slightly plastic; no roots; extremely acid; gradual boundary.

IIC3—53 to 60 inches; light gray (5Y 6/1) fine sandy loam; many medium prominent strong brown (7.5YR 5/6) mottles; massive; very friable; very strongly acid.

The solum ranges from about 24 to 40 inches in thickness. In the A horizon hue is 10YR to 5Y, value is 4 to 7, and chroma is 0 to 2. Undisturbed A2 horizons are highest in value. The A horizon is fine sandy loam or silt loam.

In the B horizon hue is 10YR to 5Y, value is 5 to 7, and chroma is 0 to 1. Mottles have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 8. The B horizon is silt loam or silty clay loam.

In the C horizon color is similar to that of the B horizon. This horizon is fine sandy loam or coarser. Fine smooth pebbles are present in the C horizon in some profiles.

Othello soils are similar to Bibb, Elkton, Fallsington, and Leonardtown soils in color and natural drainage. They have a Bt horizon that is not present in the Bibb soils. Othello soils are not as clayey as Elkton soils and do not have a fragipan in the lower part of the B horizon as do the Leonardtown soils.

On—Othello fine sandy loam. This level soil is mainly in areas at lower elevations along the major rivers in the county. It has a profile similar to the one described as representative of the series, but the surface layer is fine sandy loam.

The water table is at or near the surface for long periods, and undrained areas are seasonally ponded. The hazard of erosion is none to slight.

If artificially drained, this soil is well suited to some crops, sown pasture, and trees. It is not well suited to tobacco or crops which need good soil aeration. A small amount of tobacco is grown on this soil. Wetness is the major management concern. This soil is not difficult to drain and can be drained by tile lines or ditches if good drainage outlets are available. Other than artificial drainage, good management includes cropping sequences, minimum tillage, and good use of all available crop residue. Capability unit IIIw-6; woodland suitability group 3w4.

Ot—Othello silt loam. This level soil is in sizeable areas, mainly at lower elevations bordering on the major rivers of the county. It has the profile described as representative of the series.

This soil is not as easy to drain or work as Othello

Rumford series

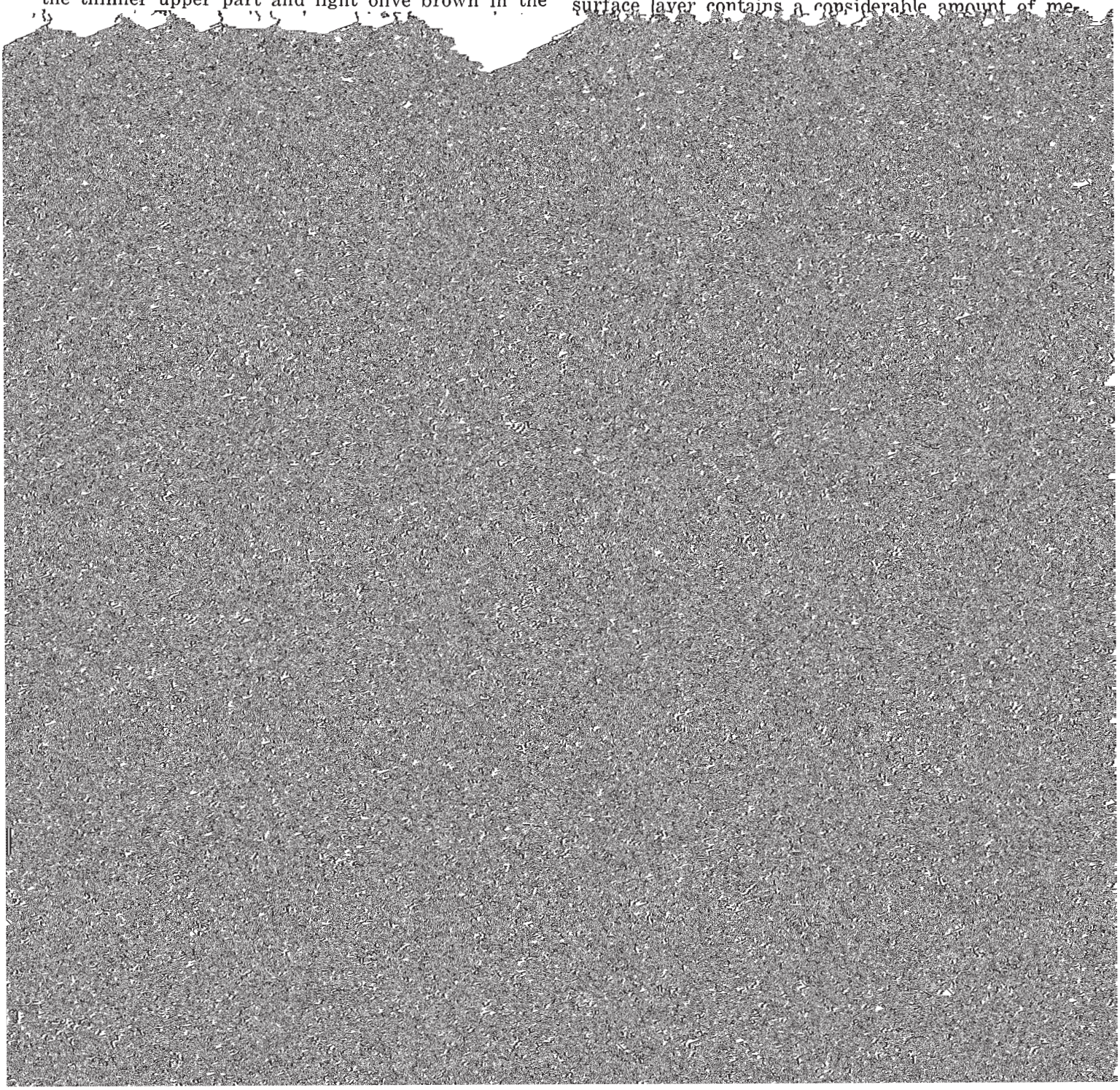
The Rumford series consists of somewhat excessively drained, level to moderately sloping, deep soils. These soils are on uplands. They formed in stratified sandy marine deposits containing small amounts of silt and clay and variable amounts of fine gravel. The native vegetation is chiefly mixed hardwoods and Virginia pine.

In a representative profile the surface layer is about 8 inches thick. It is loamy sand. It is grayish brown in the thinner upper part and light olive brown in the

The C horizon is variegated with colors and is commonly stratified. It is generally coarser than the B horizon.

Rumford soils are similar to Westphalia soils but the sands are not as uniform in size as the Westphalia soils. Rumford soils are coarser textured throughout their profile than Westphalia soils.

RuB—Rumford loamy sand, 0 to 5 percent slopes. This level to gently sloping soil is mainly on uplands and in a few areas at lower elevations. It has the profile described as representative of the series. The surface layer contains a considerable amount of me-



Sassafras series

The Sassafras series consists of well drained, nearly level to strongly sloping, deep soils. These soils are on uplands and on lower terraces bordering major rivers. They formed in loose deposits of loamy and sandy sediment of marine and alluvial origin. The native vegetation is mixed hardwoods, mainly oaks, but Virginia pine and loblolly pine grow in places.

In a representative profile the surface layer is brown sandy loam about 9 inches thick. The upper 12 inches of the subsoil is yellowish brown loam. The lower 19 inches is brown sandy clay loam grading into strong

by volume of smooth quartz pebbles in the A and B horizons and as much as 20 percent in the C horizon. In the A horizon hue is 10YR or 7.5YR, value is 3 to 5, and chroma is 1 to 4. The lowest chroma are confined to A1 horizons less than 4 inches thick. The A horizon is loam or sandy loam.

In the B horizon hue is 10YR, 7.5YR, or 5YR; value is 5 or 6; and chroma is 4 to 8. The Bt horizon is generally sandy clay loam but ranges to heavy sandy loam and heavy loam.

The C horizon is similar to the B horizon in color but it ranges from sandy loam to sand. In some profiles the C horizon is moderately hard and brittle when

of tobacco are generally high. The hazard of further erosion is the major management concern. Practices which retard erosion include planting on the contour; using alternate strips of clean-tilled and close growing crops; using minimum tillage, a suitable cropping system, and winter cover crops; and using all available crop residue well. Capability unit IIe–5; woodland suitability group 3o2.

SaC2—Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded. This moderately sloping soil is on uplands. It has lost part of the surface layer through erosion. Plowing exposes subsoil material in places, giving the surface a spotty appearance.

This soil warms up quickly in spring and can be worked and planted earlier than soils that are less sandy or less well drained. The hazard of further erosion is severe (fig. 13).

Included with this soil in mapping are small areas of soils which have a loam surface layer, and areas of soils which have a redder subsoil than is described for the series. Also included are small areas of Chillum loam which are either too intermixed or too small to map separately.

This soil is well suited to common crops, sown pasture, and trees. The yield and the quality of tobacco grown on this soil are generally high. The hazard of further erosion is the major management concern. Practices which retard erosion include planting clean-tilled and close growing crops in narrow alternate strips that are laid out on the contour, and which use a close growing crop on each strip for half or more of the time; using winter cover crops and minimum till

the soil is difficult to cultivate. Gullies have formed in many places. The hazard of further erosion is severe.

This soil is suited to some crops, sown pasture, and trees. It can be used only occasionally for cultivated crops. The hazard of further severe erosion is the major management concern. Practices which retard further erosion include growing clean-tilled crops at long intervals in narrow strips laid out on the contour, using a cropping system that includes close growing crops or pasture, using minimum tillage, and using all available crop residue well. Even if erosion is controlled, this soil is better suited to hay, pasture, or woodland. Capability unit IVe–5; woodland suitability group 3o2.

SaD2—Sassafras sandy loam, 10 to 15 percent slopes, moderately eroded. This strongly sloping soil is on uplands. Most of the acreage is in woodland. Where the land has been cleared, moderate amounts of surface soil have been lost through erosion. The hazard of further erosion is severe.

This soil is suited to a few cultivated crops, to pasture, or to trees. Tobacco, where grown, is generally of high quality, although the quantity may be medium. The severe hazard of erosion is the major management concern. Practices which retard erosion include growing clean-tilled crops at long intervals in narrow strips laid out on the contour, using a cropping system that includes close growing crops or pasture, using minimum tillage, and using all available crop residue well. This soil is better suited to hay, pasture, or woodland than to cultivated crops, even if erosion is controlled. Capability unit IVe–5; woodland suitability group 3o2.

described as representative of the series, but the surface layer is loam; the soil is also a little higher in silt and the subsoil is generally higher in clay. A moderate amount of surface soil has been lost through erosion.

The hazard of further erosion is moderate.

Included with this soil in mapping are areas of soils that are only slightly eroded and a few areas that are severely eroded. Also included on the uplands are small areas of a soil that is less permeable and has a somewhat compact gravelly or sandy subsoil.

This soil is well suited to cultivated crops, sown pasture, and trees. Yields of tobacco are generally high but the quality is generally not as high as on Sassafras sandy loam. The hazard of further erosion is the major management concern. Practices that retard erosion include contour cropping, minimum tillage, use of a suitable cropping system, winter cover crops, and good use of all available crop residue. Capability unit IIe–4; woodland suitability group 3o2.

SmC2—Sassafras–Chillum complex, 6 to 12 percent slopes, moderately eroded. The moderately sloping to strongly sloping soils in this complex are on uplands.

This complex consists of intricately mixed areas of Sassafras and Chillum soils. It is about 65 percent Sassafras soils and 35 percent Chillum soils. Most areas, especially on the steeper slopes, are very gravelly

sion is the major management concern. Practices which retard erosion include growing clean-tilled crops at long intervals in a cropping system that includes close growing crops or pasture plants, planting on the contour, using minimum tillage and winter cover crops, and using all available crop residue well. Even if erosion is controlled, these soils are beter suited to hay, pasture, or woodland. Capability unit IVe–5; woodland suitability group 3o2.

Tidal marsh

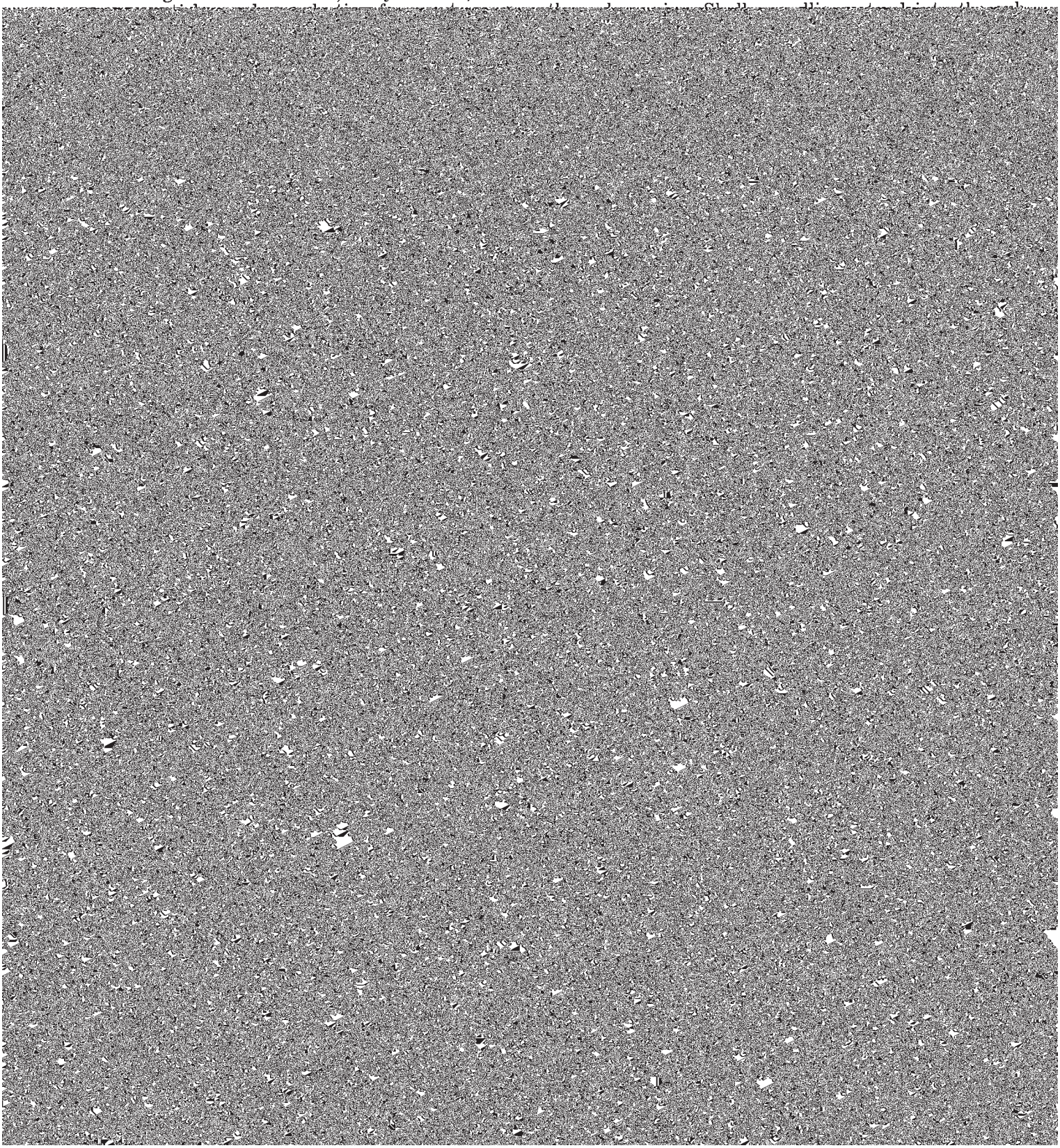
Tm—Tidal marsh consists of many small areas and a few fairly large, level areas that are periodically covered by tidal water. In St. Marys County most areas of Tidal marsh border the Chesapeake Bay, the Potomac River, and the St. Marys and Patuxent Rivers, and they are along the lower ends of streams. The water varies in salinity from almost fresh water to strongly brackish water. The soil material ranges from sand to clay, and in places it is peaty or mucky.

Tidal marsh commonly supports only marsh grasses and sedges and a few other salt tolerant herbs and low shrubs. It is not suited to crops, pasture, or trees. It is suitable for use as habitat for wetland wildlife and, in places where channels are deep enough, it is suitable

plastic; many roots; very strongly acid; abrupt smooth boundary.

A2—3 to 8 inches; yellowish brown (10YR 5/4) fine sandy loam; very weak medium granular structure; very friable, non-

WeC2—Westphalia fine sandy loam, 6 to 12 percent slopes, moderately eroded. This moderately sloping soil is on uplands, mainly in the northeastern part of the county. It has the profile described as representative of the series. Some surface soil has been lost



lying material, between depths of 40 and 60 inches, is light gray, mottled heavy sandy loam.

Woodstown soils are easy to work, but they have a seasonal water table that rises to within a depth of about 2 feet. Wetness generally prevents early plowing of the soil and early planting of crops. These soils have a moderate available water capacity. Permeability is moderate. Seasonal wetness limits this soil for some nonfarm uses.

Representative profile of Woodstown sandy loam, 0 to 2 percent slopes, in a wooded area, ¾ mile north of Avenue:

A1—0 to 7 inches; light olive brown (2.5Y 5/4) sandy loam; weak fine granular structure; friable; many roots; very strongly acid; clear wavy boundary.

A2—7 to 15 inches; light yellowish brown (2.5Y 6/4) sandy loam; weak medium granular structure; friable, slightly sticky; common roots; very strongly acid to extremely acid; clear smooth boundary.

B1—15 to 22 inches; light olive brown (2.5Y 5/6) sandy loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common roots; extremely acid; clear smooth boundary.

B2t—22 to 36 inches; light olive brown (2.5Y 5/6) light sandy clay loam; common medium distinct mottles of light gray (10YR 6/1) and a few medium distinct mottles of strong brown (7.5YR 5/8); weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few roots; extremely acid; clear smooth boundary.

B3—36 to 40 inches; light olive brown (2.5Y 5/6) sandy loam; common medium distinct mottles of grayish brown (10YR 5/2) and strong brown (7.5YR 5/8); very weak medium subangular blocky structure; friable; very few fine roots; abrupt smooth boundary.

Cg—40 to 60 inches; gray to light gray (5Y 6/1) heavy sandy loam; common fine prominant mottles of yellowish brown (10YR 5/4) and strong brown (7.5YR 5/8); massive; friable, slightly sticky and slightly plastic; about 15 percent rounded gravel; extremely acid.

The solum ranges from about 25 to 45 inches in thickness. Hue generally is 10YR or 2.5Y through the profile, but in places in the C horizon hue is 5Y.

In the A horizon value is 4 to 6 and chroma is 1 to 4. clay in the Bt horizon than the Keyport soils. The solum of the Woodstown soils is less silty and more sandy than that of the Mattapex soils.

WsA—Woodstown sandy loam, 0 to 2 percent slopes. This nearly level soil is on uplands and on lower terraces bordering major rivers. It has the profile described as representative of the series.

This soil is easy to work at the right moisture content. It has a seasonally high water table which delays planting in spring in some years. The hazard of erosion is none to slight.

Included with this soil in mapping are areas of soils that have a surface layer of loam.

This soil is well suited to most crops if drainage is provided. It is also well suited to sown pasture and trees. It is not suited to plants that are subject to damage by frost heaving. Tobacco yields are generally medium to high but the quality is generally only medium. Improving drainage is the major management concern. Good management practices include providing artificial drainage by tile lines or ditches, using minimum tillage and cover crops, and using all available crop residue well. Capability unit IIw–5; woodland suitability group 2w3.

WsB—Woodstown sandy loam, 2 to 5 percent slopes. This gently sloping soil is on uplands and on lower terraces along the major rivers.

This soil is easy to work at the right moisture content. It has a seasonally moderately high water table. The hazard of erosion is moderate.

Included with this soil in mapping are areas of soils that have a surface layer of loam. Also included are areas that are moderately eroded.

This soil is suited to most crops, to sown pasture, and to trees. It is not well suited to plants that are subject to damage by frost heaving. Tobacco yields are generally medium to high but the quality is generally only medium. Although drainage is needed for some crops, the hazard of erosion is the major management concern. Practices which retard erosion include constructing interceptors and diversions to reduce runoff from adjacent soils; using minimum tillage, a suitable cropping system, and winter cover crops; and using available crop residue well. Capability unit IIe–16; woodland suitability group 2w3.

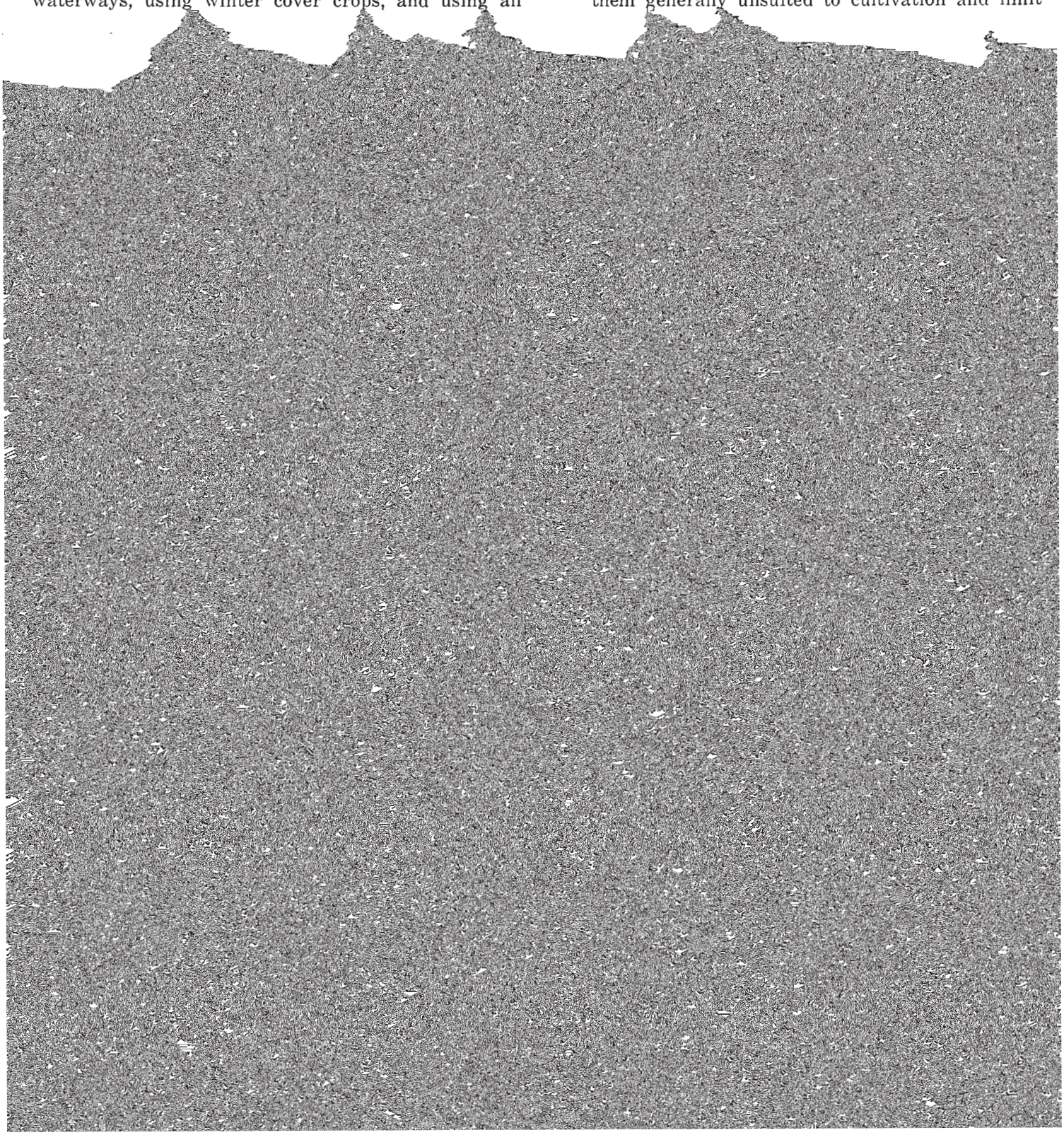
WsC2—Woodstown sandy loam, 5 to 10 percent slopes, moderately eroded. This moderately sloping soil is mainly at lower elevations and in some small areas on uplands. It has lost some of its original surface layer through erosion. In places shallow gullies have formed. In places plowing has exposed subsoil material giving freshly worked areas a spotted appearance.

The water table is seasonally moderately high, but

tard erosion include growing crops in narrow alternate strips that are laid out on the contour, using a cropping system that includes close growing crops on each strip for half or most of the time, using minimum tillage, providing interceptors and diversions and sodded waterways, using winter cover crops, and using all

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit



Unit IIe–4.—Deep, well drained, gently sloping, medium textured soils.

Unit IIe–5.—Deep, well drained, gently sloping, moderately coarse textured soils.

Unit IIe–13.—Moderately deep to deep, moderately well drained, gently sloping, medium textured soils that have a slowly permeable or very slowly permeable subsoil. Some have a fragipan in the lower part of the subsoil.

Unit IIe–16.—Deep, moderately well drained, gently sloping, medium textured soils.

Unit IIe–36.—Moderately deep to deep, moderately well drained, gently sloping, moderately coarse textured soils that have a slowly permeable to moderately slowly permeable subsoil. Some have a fragipan in the lower part of the subsoil.

Subclass IIw.—Soils moderately limited by excess water.

Unit IIw–1.—Level or nearly level, moderately well drained, medium textured soils that have a moderately permeable to moderately slowly permeable subsoil.

Unit IIw–5.—Level or nearly level, moderately well drained, moderately coarse textured soils that have a moderately permeable subsoil. Some have a fragipan in the lower part of the subsoil.

Unit IIw–7.—Deep, level or nearly level, moderately well drained, alluvial soils.

Unit IIw–8.—Deep, level or nearly level, moderately well drained, medium textured soils that have a slowly permeable to very slowly permeable subsoil.

Unit IIw–9.—Deep, moderately well drained, level or nearly level soils that have a slowly permeable subsoil.

Subclass IIs.—Soils moderately limited by slow permeability.

Unit IIs–4.—Deep, somewhat excessively drained, level to gently sloping, coarse textured soils.

Unit IIs–7.—Moderately deep to deep, well drained, medium textured soils that have a permeable subsoil. Some have a fragipan in the lower part of the subsoil.

Unit IIIe–16.—Deep, moderately well drained, moderately sloping, medium textured soils.

Unit IIIe–33.—Deep, somewhat excessively drained, moderately sloping, coarse textured soils.

Unit IIIe–36.—Deep, moderately well drained, moderately sloping, medium textured soils that have a moderately permeable to moderately slowly permeable subsoil.

Subclass IIIw.—Soils severely limited by excess water.

Unit IIIw–6.—Deep, poorly drained, nearly level, moderately coarse textured soils that have a moderately permeable or moderately slowly permeable subsoil.

Unit IIIw–7.—Deep, poorly drained, nearly level, medium textured soils that have a moderately permeable to moderately slowly permeable subsoil.

Unit IIIw–9.—Deep, poorly drained, nearly level, medium textured soils that have a slowly permeable subsoil.

Unit IIIw–10.—Deep, moderately well drained, nearly level, coarse textured soils.

Class IV. Soils having very severe limitations that reduce the choice of plants, require very careful management, or both.

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

Unit IVe–3.—Deep, well drained, moderately sloping, medium textured soils that are moderately permeable.

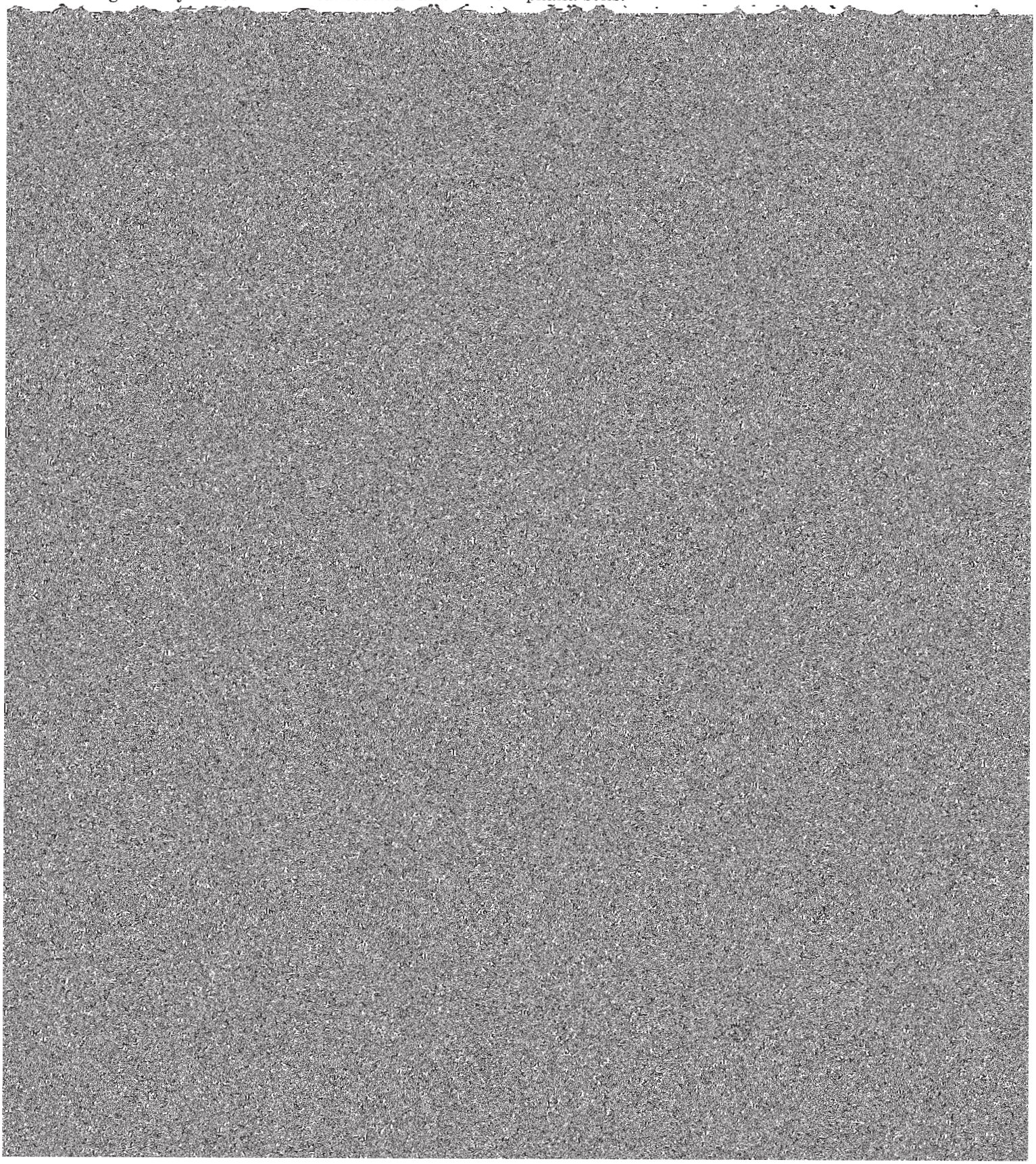
Unit IVe–5.—Deep, well drained, moderately sloping, severely eroded, moderately coarse textured soils and steep, moderately eroded, moderately coarse textured soils that are severely eroded.

Unit IVe–7.—Deep and moderately deep, well drained and moderately well drained, moderately sloping to strongly sloping, moderately coarse textured and medium textured soils that have a fragipan or hard compacted subsoil.

use largely to pasture or range, woodland, or wildlife. (None in St. Marys County.)

Class VI. Soils having severe limitations that make them generally unsuited to cultivation and limit

Soils that are not limited by drainage problems are Caroline, Chillum, Croom, Evesboro, Faceville, Kempsville, Marr, Matapeake, Rumford, Sassafras, and Westphalia soils.



come deficient in other elements, such as sulfur, boron, manganese, and zinc. Soil tests reveal such deficiencies and indicate the kinds and amounts of fertilizer and the frequency of application needed.

Cropping systems

Using a good cropping system helps to maintain organic matter in the soil and to control erosion. Level or nearly level soils do not need rotations to control erosion, but they benefit from green manure crops or cover crops grown between successive row crop seasons.

Generally, the length of the rotation should increase as the hazard of erosion increases. Gently sloping soils benefit from a 2 year rotation, steeper soils that are severely eroded may need a 4 year or a 5 year rotation for maximum protection. The Cooperative Extension Service or the St. Marys Soil Conservation District can help plan rotations for specific sites and soils.

In addition to replenishing organic matter and retarding erosion, a good cropping system helps to slow the rate at which some plant nutrients are depleted.

Tillage

Excessive tillage breaks down soil structure, causes loss of organic matter, and increases the hazard of

field helps check soil erosion. If the residue later is turned under, it supplies organic matter, improves soil structure, increases aeration, reduces runoff, and increases intake of water.

Estimated yields

Table 4 gives the estimates of the average yields of the principal crops grown in St. Marys County. Yields are given for each soil in the county that is used in farming. Yields are averages expected over a period of years in which there is a wide range of rainfall and other climatic conditions. Yields listed are those that are expected when the best current management practices are followed. These practices include:

1. Contour tillage, stripcropping, keeping tillage to a minimum, cropping systems, or similar measures to control erosion; the soils that need drainage are drained (those already artificially drained must have drainage systems that are well maintained); excess water is disposed of safely, and supplemental irrigation is given to soils that need it during periods of short moisture supply.
2. Winter cover crops are used as seasonal pro-

differences in yields on different kinds of soil should remain approximately the same.

Use of soils for woodland [6]

Approximately 157,200 acres, about 67 percent of the total land area in St. Marys County, is in woodland. [illegible] and esthetic effects are other important benefits that forest lands provide, but these are not readily apparent and are hard to measure.

Woodland suitability groups

The soils of St. Marys County have been placed in woodland suitability groups to help owners plan the use of their soils for wood crops. Each group is made

TABLE 4.—*Estimated average acre yields of*

[Absence of a figure indicates crop is not suited to the soil specified or is not commonly grown. Alluvial land (Aa), Alluvial land, crops and pastures are not grown in these areas. The

Soil	Corn (grain)	Corn (silage)
	Bu	*Tons*
Beltsville silt loam, 0 to 2 percent slopes	95	19
Beltsville silt loam, 2 to 5 percent slopes, moderately eroded	95	19
Beltsville silt loam, 2 to 5 percent slopes, severely eroded	80	16
Beltsville silt loam, 5 to 10 percent slopes, moderately eroded	80	16
Beltsville silt loam, 5 to 10 percent slopes, severely eroded	70	14
Bibb silt loam	120	24
Bourne fine sandy loam, 2 to 5 percent slopes, moderately eroded	85	17
Bourne fine sandy loam, 5 to 10 percent slopes, severely eroded	80	16
Caroline silt loam, 2 to 5 percent slopes, moderately eroded	100	20
Caroline silt loam, 5 to 10 percent slopes, moderately eroded	90	18
Caroline silt loam, 5 to 10 percent slopes, severely eroded	70	14
Caroline silt loam, 10 to 15 percent slopes, moderately eroded	80	16
Caroline silt loam, 10 to 15 percent slopes, severely eroded		
Chillum loam, 0 to 2 percent slopes	130	26
Chillum loam, 2 to 6 percent slopes, moderately eroded	130	26
Chillum loam, 6 to 12 percent slopes, moderately eroded	120	24
Chillum loam, 6 to 12 percent slopes, severely eroded	100	20
Croom gravelly sandy loam, 2 to 5 percent slopes, moderately eroded	70	14
Croom gravelly sandy loam, 5 to 10 percent slopes, moderately eroded	65	13
Croom gravelly sandy loam, 10 to 15 percent slopes, moderately eroded		
Croom gravelly sandy loam, 10 to 15 percent slopes, severely eroded		
Elkton silt loam	105	21
[illegible]	60	12

principal crops under improved management

wet (Ad), Beaches (Be), Cut and fill land (Cu), Gravel pits (Gp), and Tidal marsh (Tm) are not included in this table because symbol < means less than; the symbol > means more than]

Wheat	Soybeans	Alfalfa grass hay	Clover grass hay	Tallgrass legume pasture	Yields of tobacco	Quality of tobacco
Bu	*Bu*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Lbs*	
45	35	----------	3.0	170	1,100–1,500	Low.
45	35	----------	3.0	170	1,100–1,500	Low.
40	30	----------	3.0	170	1,100–1,500	Low.
40	30	----------	3.0	170	1,110–1,500	Low.
35	----------	----------	3.0	170	1,100–1,500	Low.
----------	35	----------	3.0	170	----------	----------
40	30	----------	2.5	170	700–1,500	Medium.
35	30	----------	2.5	170	700–1,500	Medium.
40	35	4.0	3.0	230	1,100–1,500	Low.
35	30	----------	3.0	200	1,100–1,500	Low.
25	----------	----------	2.0	145	700–1,100	Low.
30	----------	----------	2.5	170	700–1,100	Low.
----------	----------	----------	----------	115	----------	----------
50	45	5.0	3.5	285	1,100–1,500	Medium.
50	45	5.0	3.5	285	1,100–1,500	Medium.
45	40	4.5	3.5	255	1,100–1,500	Medium.
40	----------	4.0	3.0	230	700–1,100	Medium.
35	25	----------	2.5	145	<700	Medium.
30	----------	----------	2.5	145	<700	Medium.
----------	----------	----------	----------	115	----------	----------
----------	----------	----------	----------	115	----------	----------
----------	40	----------	3.5	200	----------	----------
25	20	2.5	2.0	145	700–1,100	Very high.
----------	----------	----------	----------	115	----------	----------
30	----------	3.0	2.0	170	700–1,100	Very high.
45	40	4.5	3.0	255	1,100–1,500	Very high.
----------	----------	----------	----------	80	700–1,100	Very high.
40	----------	4.0	3.0	230	1,100–1,500	Very high.
----------	----------	----------	----------	80	----------	----------
----------	----------	----------	----------	200	----------	----------

TABLE 4.—*Estimated average acre yields of principal*

Soil	Corn (grain)	Corn (silage)
	Bu	*Tons*
Faceville silt loam, 0 to 5 percent slopes	140	28
Fallsington sandy loam	120	24
Kempsville fine sandy loam, 5 to 10 percent slopes, moderately eroded	110	22
Kempsville fine sandy loam, 5 to 10 percent slopes, severely eroded	90	18
Kempsville fine sandy loam, 10 to 15 percent slopes, moderately eroded	90	18
Kempsville fine sandy loam, 10 to 15 percent slopes, severely eroded		
Keyport fine sandy loam, 0 to 2 percent slopes	110	22
Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded	110	22
Keyport silt loam, 0 to 2 percent slopes	110	22
Keyport silt loam, 2 to 5 percent slopes, moderately eroded	110	22
Keyport silt loam, 5 to 10 percent slopes, moderately eroded	90	18
Klej loamy sand, 0 to 5 percent slopes	90	14
Leonardtown silt loam	70	14
Marr fine sandy loam, 2 to 6 percent slopes, moderately eroded	130	26
Marr fine sandy loam, 6 to 12 percent slopes, moderately eroded	120	24
Marr fine sandy loam, 6 to 12 percent slopes, severely eroded	100	20
Matapeake fine sandy loam, 0 to 2 percent slopes	140	28
Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	140	28
Matapeake silt loam, 0 to 2 percent slopes	140	28
Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	140	28
Matapeake silt loam, 5 to 10 percent slopes, severely eroded	110	22
Mattapex fine sandy loam, 0 to 2 percent slopes	135	27
Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded	135	27
Mattapex silt loam, 0 to 2 percent slopes	135	27
Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	135	27
Mattapex silt loam, 5 to 10 percent slopes, moderately eroded	130	26
Othello fine sandy loam	115	23
Othello silt loam	115	22

crops under improved management—Continued

Wheat	Soybeans	Alfalfa grass hay	Clover grass hay	Tallgrass legume pasture	Yields of tobacco	Quality of tobacco
Bu	*Bu*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Lbs*	
50	45	5.5	3.5	315	>1,500	Medium.
----------	35	----------	3.0	170	----------	----------
40	35	4.5	3.0	255	700–1,500	High.
40	----------	4.0	3.0	230	700–1,100	Medium.
40	----------	4.0	3.0	230	700–1,100	High.
----------	----------	----------	----------	200	----------	----------
40	40	----------	3.0	170	700–1,500	Medium.
40	40	----------	3.0	170	700–1,500	Medium.
40	40	----------	3.0	170	1,100–1,500	Low.
40	40	----------	3.0	170	1,100–1,500	Low.
35	30	----------	3.0	170	1,100–1,500	Low.
30	30	3.4	2.7	170	700–1,500	Medium.
----------	25	----------	2.5	145	----------	----------
50	45	5.5	3.5	315	1,100–1,500	High.
45	40	5.0	3.5	285	1,000–1,500	High.
40	----------	4.5	3.0	255	1,000–1,500	High.
50	45	5.5	3.5	315	1,100–1,500	High.

TABLE 4.—*Estimated average acre yields of principal*

Soil	Corn (grain)	Corn (silage)
	Bu	*Tons*
Sassafras sandy loam, 10 to 15 percent slopes, severely eroded	[illegible]	[illegible]

crops under improved management—Continued

Wheat	Soybeans	Alfalfa grass hay	Clover grass hay	Tallgrass legume pasture	Yields of tobacco	Quality of tobacco

TABLE 5.—*Factors affecting*

[Absence of an entry in a column means that information was not available. Beaches (Be), Cut and fill land (Cu), Gravel

Soil series and map symbols	Woodland suitability group	Limitations			
		Equipment limitations	Seedling mortality	Competition for	
				Conifers	Hardwood
Alluvial land: Aa	1w3	Moderate: water table; flood hazard.	Slight	Severe	Moderate
Alluvial land, wet: Ad	2w4	Severe: high water table; flooding.	Severe	Severe	Severe
Beltsville: BlA, BlB2, BlB3, BlC2, BlC3	3w3	Moderate: perched water table.	Moderate	Moderate	Slight
Bibb: Bm	2w4	Severe: high water table; flooding.	Severe	Severe	Severe
Bourne: BrB2, BrC3	3w3	Moderate: perched water table.	Moderate	Moderate	Slight
Caroline: CaB2, CaC2, CaC3, CaD2, CaD3	3w3	Moderate: seasonal perched water table.	Slight	Moderate	Moderate
Chillum: ChA, ChB2, ChC2, ChC3	3o2	Slight	Slight	Moderate to severe.	Slight to moderate.
Croom: CrB2, CrC2, CrD2, CrD3	4d2	Slight	Moderate	Moderate	Slight
Elkton: Ek	3w4	Severe: high water table; plastic subsoil.	Slight	Severe	Severe
Evesboro: EvB, EvC	3s1	Moderate to severe: slope	Moderate	Moderate	Slight
Evesboro-Westphalia complex: EwC2, EwD2, EwE2.	3s1	Moderate to severe: slope	Moderate	Moderate	Slight
Faceville: FaB	2o2	Slight	Slight	Severe	Moderate
Fallsington: Fs	2w4	Severe: high water table	Severe	Severe	Severe
Kempsville: KeC2, KeC3, KeD2, KeD3	2o2	Slight	Slight	Severe	Moderate
Keyport: KpA, KpB2, KrA, KrB2, KrC2	3w3	Moderate: seasonal water table; plastic subsoil.	Slight	Moderate	Moderate
Klej: Kz	3w6	Moderate: seasonal high water table.	Moderate	Moderate	Moderate

woodland management

pits (Gp), and Tidal marsh (Tm) are too variable to rate and are not suited to wood crops. The symbol > means more than]

Limitations—Continued		Site index				Preferred species		
Erosion hazard	Windthrow hazard	Mixed oaks	Loblolly pine	Yellow-poplar	Virginia pine	In existing stands	In planting	For Christmas trees
Slight	Slight	>85	>95	>95		Yellow-poplar	Loblolly pine	White pine, Scotch

TABLE 5.–*Factors affecting*

Limitations

Woodland management—Continued

annual increase per acre is about as follows: for mixed oaks, 200 board feet; for yellow-poplar, 350 board feet; for loblolly pine, 470 board feet or 1 cord of pulpwood; and for Virginia pine, 1.1 cords of pulpwood.

At the same age, the average yield per acre is about as follows: for mixed oaks, 9,750 board feet; for yellow-poplar, about 17,620 board feet; and for loblolly pine, 23,600 board feet. At 30 years, a fully stocked stand of Virginia pine yields about 33 cords of pulpwood per acre, and at 50 years it yields about 54 cords.

Woodland suitability group 3w3

This group is made up of soils of medium productivity of the Beltsville, Bourne, Caroline, Keyport, and Mattapex series.

In a normal stand of timber 50 years old, the average annual increase per acre is about as follows: for mixed oaks, 200 board feet; for loblolly pine, 470 board feet or 1 cord of pulpwood; and for Virginia pine, 1.1 cords of pulpwood.

At the same age, the average yield per acre is about as follows: for mixed oaks, 9,750 board feet; and for loblolly pine, 15,900 board feet or 51 cords of pulpwood. At 30 years, a fully stocked stand of Virginia pine yields about 33 cords of pulpwood per acre, and at 50 years, it yields about 54 cords.

Yellow-poplar is not well suited to most of these soils. Some areas have stands of sweetgum or red maple, but there are no reliable estimates of yields.

Woodland suitability group 3w4

This group consists of poorly drained, level to nearly level soils of the Leonardtown, Elkton, and Othello series. Potential productivity is good.

In a normal stand of timber 50 years old, the average annual increase per acre is about as follows: for loblolly pine, 470 board feet or 1 cord of pulpwood, and for sweet gum, 350 board feet. At the same age, the yield of loblolly timber per acre is about 23,600 board feet.

Some of these soils have sweetgum or red maple growing on them, but there are no reliable estimates of yields.

Woodland suitability group 3w6

The only soil in this group is in the Klej series. Potential productivity is good. This soil is moderately well drained, and has a slope of no more than about 5 percent.

In a normal stand of timber 50 years old, the average annual increase per acre is about as follows: for mixed oaks, 200 board feet; and for loblolly pine, 470 board feet or 1 cord of pulpwood. At the same age, the average yield per acre for mixed oaks is about 9,750 board feet, and for loblolly pine it is 23,600 board feet.

This soil is suited to white pine, but there is no reliable estimate of yields.

Woodland suitability group 3s1

This group is made up of soils of the Evesboro series and the Evesboro-Westphalia complex. Potential productivity is medium. These soils are excessively drained or well drained, and they have a slope that ranges to more than 40 percent.

In a normal stand of timber 50 years old, the average annual increase per acre is about as folows: for mixed oaks, 200 board feet; for loblolly pine, 470 board feet or 1 cord of pulpwood; and for Virginia pine, 1.1 cords of pulpwood.

At the same age, the average yield per acre is about as follows: for mixed oaks, 9,750 board feet; and for loblolly pine, 23,600 board feet or 50 cords of pulpwood. At 30 years, a fully stocked stand of Virginia pine yields about 33 cords of pulpwood per acre, and at 50 years it yields about 54 cords.

Woodland suitability group 4d2

This group is made up of soils of the Croom series. Woodland productivity is poor. These soils have a limited rooting zone over very hard, massive, gravelly subsoil. Roots appear to anchor well into the subsoil, but do not penetrate deeply enough to use most of the subsoil moisture. The soils are well drained, and they have a slope of no more than about 15 percent.

In a normal stand of timber 50 years old, the average annual increase per acre is about as follows: for mixed oaks, 125 board feet; and for Virginia pine, 0.6 cord of pulpwood. At the same age, the yield for mixed oaks is about 6,300 board feet. At 30 years, a fully stocked stand of Virginia pine yields about 19 cords of pulpwood per acre, and at 50 years it yields about 31 cords.

Use of soils for wildlife habitat

The production of a wildlife species depends largely on the amount and distribution of food, shelter, and water. If any of these elements is missing, inadequate, or inaccessible, the species is absent or scarce. The kinds of wildlife that live in a given area and the number of each kind are closely related to land use, to the resulting kinds and patterns of vegetation, and to the supply and distribution of water. These, in turn, are generally related to the kinds of soils.

Habitat for wildlife normally can be created or improved by planting suitable vegetation, by properly managing the existing plant cover, by fostering the natural establishment of desirable plants, or by using a combination of these measures.

This subsection rates the soils of St. Marys County according to their suitability for seven elements of wildlife habitat and for three general kinds of wildlife habitat. Then it explains the elements and the general kinds of wildlife habitat and explains the ratings.

Uses of suitability ratings

The suitability ratings in this subsection can be used as an aid in:

1. Planning the broad use of parks, refuges, nature-study areas, and other developments for wildlife.
2. Selecting the better soils for creating, improving, or maintaining specific kinds of wildlife habitat elements.
3. Determining the relative intensity of management needed for individual habitat elements.
4. Eliminating sites that would be difficult or not practical to manage for specific kinds of wildlife.

5. Determining areas that are suitable for acquisition for use as wildlife habitat.

Habitat elements

Each soil is rated in table 6 according to its suitability for various kinds of plants and other elements that make up wildlife habitat. The seven elements considered important are as follows:

Grain and seed crops.—These crops include such seed producing annuals as corn, sorghum, wheat, barthin but they may also be planted. The major soil properties that affect this habitat element are effective rooting depth, available water capacity, and natural drainage.

Wetland plants.—Making up this group are wild, herbaceous, annual, and perennial plants that grow on moist to wet sites, exclusive of submerged or floating aquatics. They produce food and cover extensively used mainly by wetland forms of wildlife. They include smartweed, wild millet, bulrush, sedges, barnyard

TABLE 6.—*Suitability of the soils for elements*

[Cut and fill land (Cu) and Gravel pits

Soil series and map symbols	Elements of wildlife habitat			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants
Alluvial land: Aa	Fair	Good	Good	Good
Alluvial land, wet: Ad	Poor	Fair	Fair	Good
Beaches: Be	Very poor	Poor	Poor	Very poor
Beltsville:				
BlA	Fair	Good	Good	Good
BlB2, BlB3, BlC2	Fair	Good	Good	Good
BlC3	Poor	Fair	Fair	Good
Bibb: Bm	Poor	Fair	Fair	Good
Bourne:				
BrB2	Fair	Good	Good	Good
BrC3	Poor	Fair	Fair	Good
Caroline:				
CaB2, CaC2, CaD2	Fair	Good	Good	Good
CaC3	Poor	Fair	Fair	Good
CaD3	Very poor	Poor	Fair	Good
Chillum:				
ChA, ChB2, ChC2	Fair	Good	Good	Good
ChC3	Poor	Fair	Good	Good
Croom:				
CrB2, CrC2, CrD2	Poor	Fair	Fair	Fair
CrD3	Very poor	Poor	Good	Good
Elkton: Ek	Poor	Fair	Fair	Good
Evesboro: EvB, EvC	Poor	Poor	Poor	Poor
Evesboro-Westphalia complex:				
EwC2	Poor	Poor	Poor	Poor
EwD2, EwE2	Very poor	Very poor	Poor	Poor
Faceville: FaB	Fair	Good	Good	Good
Fallsington: Fs	Poor	Fair	Fair	Good
Kempsville:				
KeC2	Fair	Good	Good	Good
KeC3, KeD2	Poor	Fair	Good	Good
KeD3	Very poor	Poor	Good	Good
Keyport:				
KpA, KrA	Fair	Good	Good	Good
KpB2, KrB2, KrC2	Poor	Fair	Fair	Good
Klej: Kz	Poor	Fair	Fair	Fair
Leonardtown: Le	Poor	Fair	Fair	Fair
Marr:				
MaB2, MaC2	Fair	Good	Good	Good
MaC3	Poor	Fair	Good	Good
Matapeake:				
MmA, MnA	Good	Good	Good	Good
MmB2, MnB2	Fair	Good	Good	Good
MnC3	Poor	Fair	Fair	Good
Mattapex:				
MtA, MuA	Fair	Good	Good	Good
MtB2, MuB2, MuC2	Fair	Good	Good	Good

of wildlife habitat and kinds of wildlife

(Gp) are too variable to be rated]

Elements of wildlife habitat—Continued				Kinds of wildlife		
Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Open land	Woodland	Wetland
Poor	Poor	Poor	Poor	Good	Good	Poor.
Fair	Good	Fair	Poor	Fair	Good	Fair.
Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor.
Poor	Poor	Poor	Poor	Good	Good	Poor.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Very poor	Fair	Good	Very poor.
Fair	Fair	Fair	Poor	Fair	Good	Fair.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Very poor	Fair	Good	Very poor.
Fair	Very poor	Very poor	Very poor	Good	Good	Very poor.
Fair	Very poor	Very poor	Very poor	Fair	Good	Very poor.
Fair	Very poor	Very poor	Very poor	Poor	Good	Very poor.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Very poor	Fair	Fair	Very poor.
Fair	Very poor	Very poor	Very poor	Fair	Fair	Very poor.
Poor	Very poor	Very poor	Very poor	Poor	Fair	Very poor.
Fair	Good	Good	Good	Fair	Good	Good.
Good	Very poor	Very poor	Very poor	Poor	Poor	Very poor.
Good	Very poor	Very poor	Very poor	Poor	Poor	Very poor.
Good	Very poor	Very poor	Very poor	Poor	Poor	Very poor.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.
Fair	Good	Good	Good	Fair	Good	Good.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.

TABLE 6.—*Suitability of the soils for elements*

Soil series and map symbols	Elements of wildlife habitat			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants
Othello: On, Ot	Poor	Fair	Fair	Good
Rumford: RuB, RuC2	Fair	Fair	Fair	Fair
Sassafras:				
SaA, SfA	Good	Good	Good	Good
SaB2, SaC2, SfB2	Fair	Good	Good	Good
SaC3, SaD2	Poor	Fair	Good	Good
SaD3	Very poor	Poor	Good	Good
Sassafras-Chillum complex:				
SmC2	Fair	Good	Good	Good
SmC3	Poor	Fair	Good	Good
Tidal marsh: Tm	Very poor	Very poor	Very poor	Very poor
Westphalia:				
WeB2, WeC2	Fair	Good	Good	Good
WeC3	Poor	Fair	Good	Good
Woodstown:				
WsA	Fair	Good	Good	Good
WsB, WsC2	Fair	Good	Good	Good

based on the ratings shown for wetland food and cover plants and shallow water areas.

On soils rated *Good,* habitat is generally easily created, improved, or maintained. There are few or no soil limitations in habitat management and satisfactory results are well assured.

On soils rated *Fair,* habitat generally can be created, improved or maintained, but the soils have moderate limitations that affect the creation, improvement, or maintenance of the habitat. A moderate intensity of management and fairly frequent attention may be required to assure satisfactory results.

On soils rated *Poor,* habitat can generally be created, improved, or maintained, but there are rather severe soil limitations. Habitat management may be difficult and expensive, and may require intensive effort. Satisfactory results are questionable.

On soils rated *Very Poor,* it is impractical to create, improve, or maintain habitat because of the very severe soil limitations. Unsatisfactory results are probable.

Not considered in the ratings are present land use, the location of a soil in relation to other soils, and the mobility of wildlife.

Engineering uses of the soils [8]

This section is useful to those who need information about soils used as structural material or as a foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to the water table, depth to bedrock, and soil slope. These properties, in various degrees and combinations, affect construction for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

[8] RICHARD R. NAGEL, assistant state conservation engineer, Soil Conservation Service, assisted in preparation of this section.

of wildlife habitat and kinds of wildlife—Continued

Elements of wildlife habitat—Continued						
Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Open land	Woodland	Wetland
Fair	Good	Good	Good	Fair	Good	Good.
Fair	Very poor	Very poor	Very poor	Fair	Fair	Very poor.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Very poor	Fair	Fair	Very poor.
Poor	Very poor	Very poor	Very poor	Poor	Fair	Very poor.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Very poor	Fair	Good	Very poor.
Very poor	Good	Poor	Very poor	Very poor	Very poor	Fair.
Poor	Very poor	Very poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Very poor	Fair	Good	Very poor.
Poor	Poor	Poor	Poor	Good	Good	Poor.
Poor	Very poor	Very poor	Very poor	Good	Good	[illegible]

TABLE 7.—*Estimated engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. follow carefully the instructions for referring to other series that appear in the first column of this table. Alluvial land (Aa), rate. The symbol > means more

Soil series and map symbols	Depth to high water table	Depth from surface [1]	Classification		
			USDA texture	Unified	AASHTO
	Ft	*In*			
Beltsville: BlA, BlB2, BlB3, BlC2, BlC3.	1½–2½	0–24	Silt loam	ML	A–4
		24–42	Loam, silt loam (fragipan)	ML, CL	A–4, A–6
		42–73	Loam, sandy loam, gravelly loam.	SM, ML	A–2, A–4
Bibb: Bm	0–1	0–28	Silt loam, sandy loam	ML, SM	A–4
		28–60	Sandy loam, sandy clay loam, fine sandy loam, silty clay loam (stratified).	SM, SC, CL	A–2, A–4, A–6
Bourne: BrB2, BrC3	1½–2½	0–25	Fine sandy loam, loam	SM, ML	A–2, A–4
		25–55	Fine sandy loam (fragipan)	SM, ML	A–2, A–4
		55–60	Sandy loam, sandy clay loam.	SM, ML, SC	A–2, A–4, A–6
Caroline: CaB2, CaC2, CaC3, CaD2, CaD3.	[3] 5	0–7	Silt loam	ML, CL	A–4, A–6
		7–60	[illegible]	CL, ML	[illegible]

properties of soils

The soils in each mapping unit may have different properties and different limitations, and for this reason it is necessary to

TABLE 7.—*Estimated engineering*

Soil series and map symbols	Depth to high water table	Depth from surface [1]	Classification		
			USDA texture	Unified	AASHTO
	Ft	*In*			
Klej: Kz	1–2½	0–30	Loamy sand, fine sand	SM, SP–SM	A–2, A–3
		30–60	Sand	SP, SP–SM	A–3
Leonardtown: Le	0–1	0–21	Silt loam, silty clay loam	ML, CL	A–4, A–6
		21–45	Silt loam, silty clay loam (fragipan).	ML, CL	A–4, A–6
		45–60	Silty clay	CL, CH	A–7
Marr: MaB2, MaC2, MaC3	>4	0–18	Fine sandy loam	SM, ML	A–4
		18–38	Sandy loam, fine sandy clay loam.	SC, CL	A–4, A–6
		38–60	Loamy fine sand, fine sandy loam.	SM, ML	A–2, A–4
Matapeake: MmA, MmB2, MnA, MnB2, MnC3.	>4	0–18	Fine sandy loam, silt loam	ML, CL	A–4, A–6
		18–30	Silty clay loam, silt loam	ML, CL	A–4, A–6, A–7
		30–60	Sandy clay loam, sandy loam, loamy sand.	SM, SC, CL	A–2, A–4, A–6
Mattapex: MtA, MtB2, MuA, MuB2, MuC2.	1½–2½	0–16	Silt loam, fine sandy loam	ML, CL	A–4
		16–28	Silt loam, silty clay loam	ML, CL	A–4, A–6
		28–60	Fine sandy loam	SM, ML	A–2, A–4
Othello: On, Ot	0	0–13	Silt loam, fine sandy loam	ML, CL	A–4, A–6
		13–26	Silt loam, silty clay loam	ML, CL	A–4, A–6
		26–60	Fine sandy loam, loamy sand	SM, SC	A–2, A–4
Rumford: RuB, RuC2	>4	0–8	Loamy sand	SM	A–2
		8–32	Sandy loam, sandy clay loam.	SM, SC	A–2, A–4
		32–60	Loamy sand to sandy loam	SM, SP–SM	A–2, A–4
*Sassafras: SaA, SaB2, SaC2, SaC3, SaD2, SaD3, SfA, SfB2, SmC2, SmC3. For Chillum part of SmC2 and SmC3, see Chillum series.	4	0–9	Sandy loam, loam	SM, ML	A–2, A–4
		9–40	Sandy clay loam, loam, sandy loam.	SM, SC, ML, CL	A–2, A–4, A–6
		40–70	Loamy sand to sandy loam	SM, SP–SM	A–2, A–4
Westphalia: WeB2, WeC2, WeC3	>5	0–16	Fine sandy loam	SM, ML, SC	A–2, A–4
		16–26	Heavy fine sandy loam	SM, SC	A–2, A–4, A–6
		26–60	Loamy fine sand, fine sand	SP–SM, SM, ML	A–2, A–3, A–4
Woodstown: WsA, WsB, WsC2	1½–2½	0–15	Sandy loam, loam	SM, ML	A–2, A–4
		15–36	Sandy clay loam, fine sandy loam, sandy loam.	SM, SC, ML, CL	A–2, A–4, A–6
		36–60	Loamy sand to sandy loam	SM, SP–SM	A–2, A–3, A–4

[1] Depths given are for the representative profile (see descriptions of the soils.) For any given layer, the figures are estimates of the range of the series within the county.

[2] Permeability classes are: <0.20, slow or very slow; 0.20–0.60, moderately slow; 0.60–2.0, moderate; 2.0–6.0, moderately

"clay," and some of the other terms used in the USDA textural classification are defined in the Glossary.

Estimated engineering properties

Several estimated soil properties significant in engineering are given in table 7. These estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engi-

and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the columns in table 7.

Depth to seasonal high water table is the distance from the surface of the soil to the highest level that ground water reaches in the soil in most years.

Soil texture is described in the standard terms used by the Department of Agriculture. These terms take

properties of soils—Continued

Percentage passing sieve—				Permeability range [2]	Available water capacity	Reaction (unlimed)	Shrink swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)				
				In per hr	*In per in of soil*	*pH*	
95–100	95–100	50–80	5–15	>6.0	0.06–0.08	4.0–6.5	Low.
45–100	95–100	50–80	5–15	>6.0	0.06–0.08	4.0–6.5	Low.
95–100	95–100	95–100	90–100	0.20–0.60	0.18–0.24	4.0–5.0	Low.
95–100	95–100	80–100	80–100	<0.20	0.18–0.24	4.0–5.0	Low.
90–100	85–100	70–95	50–85	0.20–0.60	0.12–0.24	4.0–5.0	Moderate.
95–100	95–100	70–95	40–65	2.0–6.0	0.14–0.20	4.5–5.0	Low.

TABLE 8.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. follow carefully the instructions for referring to other series that appear in the first column of this table. Alluvial land (Aa),

interpretations of soils

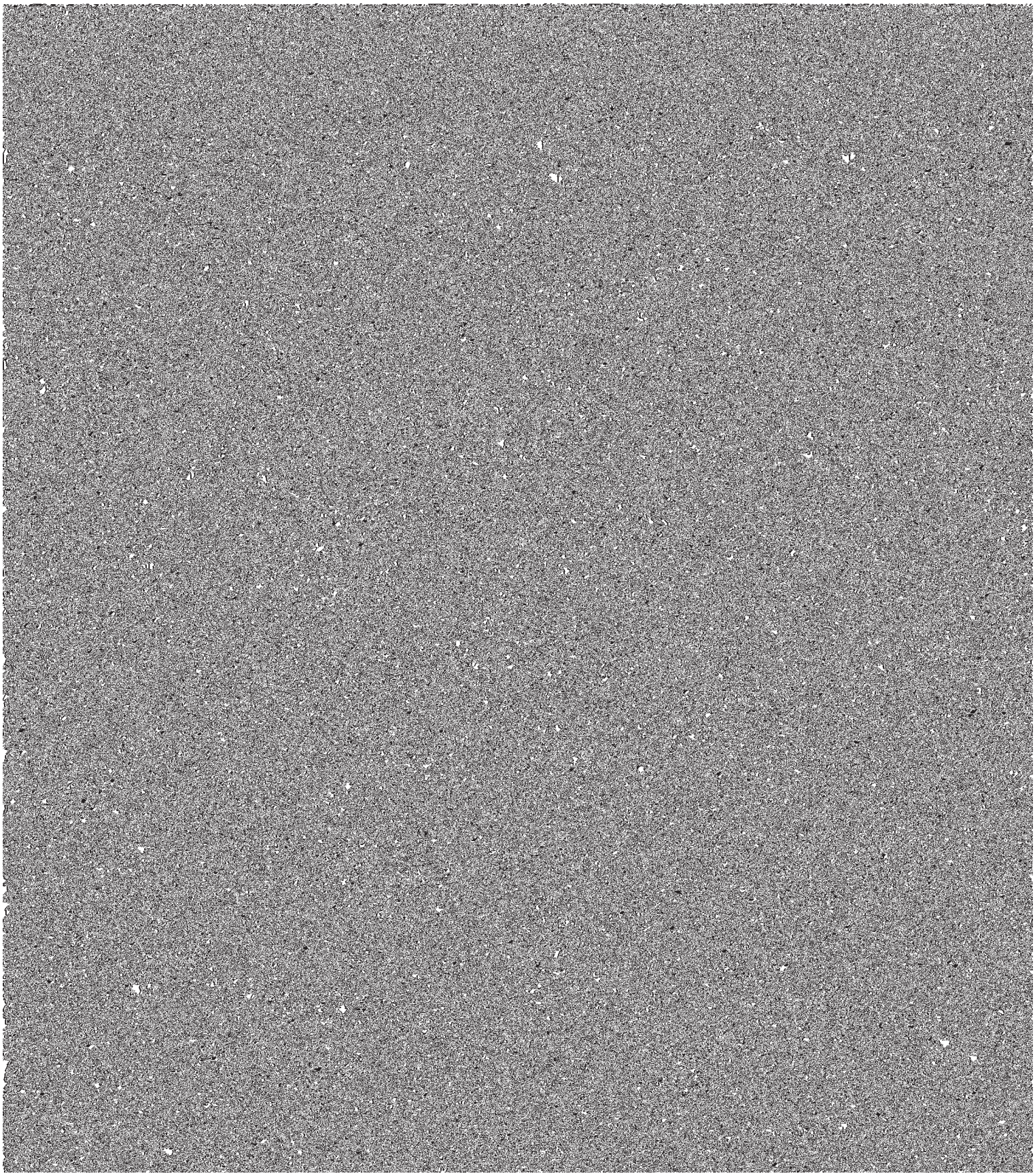


TABLE 8.—*Engineering interpretations*

Soil series and map symbols	Suitability as source of—			Soil features affecting—		
	Topsoil	Sand and gravel	Road fill	Highway and road location	Ponds	
					Reservoir areas	Embankments
*Evesboro: EvB, EvC, EwC2, EwD2, EwE2. For Westphalia part of EwC2, EwD2 and EwE2, see Westphalia series.	Poor: sandy; droughty.	Good for sand; fair for gravel.	Good with binder: A-1, A-2, A-3, A-4.	Loose; subject to blowing; cuts and fills needed; difficult to vegetate.	Excessive seepage.	Fair stability and compaction; porous; poor resistance to piping.
Faceville: FaB	Good to a depth of 16 inches.	Unsuitable	Fair to good: A-4, A-6, A-2.	Moderate potential frost action; cuts and fills needed.	Moderate seepage.	Good stability, compaction, and resistance to piping.
Fallsington: Fs	Fair to a depth of 10 inches.	Fair below a depth of 28 inches.	Good to fair: A-2, A-3, A-4.	Seasonal water table at surface; high potential frost action; local ponding.	Seasonal water table at surface; moderate seepage to high seepage in substratum.	Fair stability; good compaction; fair resistance to piping.
Kempsville: KeC2, KeC3, KeD2, KeD3.	Good to a depth of 9 inches.	Unsuitable	Good to fair; A-2, A-4, A-6, A-7.	Moderate potential frost action; cuts and fills needed.	Moderate seepage.	Good stability, compaction, and resistance to piping.
Keyport: KpA, KpB2, KrA, KrB2, KrC2.	Fair to a depth of 10 inches.	Unsuitable	Poor: A-7, A-6, A-4, A-2.	Seasonal water table at a depth of 1½ to 2½ feet; high potential frost action; plastic material; cuts and fills.	Seasonal water table at a depth of 1½ to 2½ feet; very slow seepage.	Poor to fair stability and compaction; moderate compressibility; good resistance to piping.
Klej: Kz	Poor	Fair for sand; unsuited for gravel.	Fair	Seasonal high water table at a depth of 1 to 2½ feet; fair stability; moderate frost action.	High seepage	Fair stability; medium maximum density.
Leonardtown: Le	Poor to fair to a depth of 10 inches.	Unsuitable	Poor to fair: A-6, A-4, A-7.	Perched water table at surface; high potential frost action; seepage problems in cuts.	Perched water table at surface; very slow seepage in subsoil, variable seepage in substratum.	Poor to fair stability, compaction, and resistance to piping.
Marr: MaB2, MaC2, MaC3.	Good to a depth of 16 inches.	Unsuitable	Fair to good: A-4, A-6,	Moderate potential frost	Moderate seepage to high	Fair to good stability and

of soils—Continued

Soil features affecting—Continued					
Drainage	Sprinkler irrigation	Terraces or diversions	Sodded waterways	Winter grading	Shallow excavations
Not needed; excessively drained.	Rapid intake and permeability; low available water capacity.	Loose: subject to blowing; low fertility; droughty.	Low available water capacity; low fertility.	No special problems.	Loose: trenches subject to caving.
Not needed; well drained.	Moderate intake; moderate permeability; high available water capacity.	Moderately erodible.	Moderately erodible.	Fair trafficability; some plastic materials.	No special problems.
Seasonal water table at surface; moderate permeability; flowage in substratum.	Drainage needed; moderate intake, permeability, and available water capacity.	Not needed; nearly level.	Not needed; nearly level.	Poor trafficability; seasonal water table at surface.	Seasonal water table at surface; trenches subject to caving; flowage in substratum.
Not needed; well drained.	Moderate intake and permeability; high available water capacity.	No special problems.	No special problems.	Good trafficability	No special problems.

TABLE 8.—*Engineering interpretations*

Soil series and map symbols	Suitability as source of—			Soil features affecting—		
	Topsoil	Sand and gravel	Road fill	Highway and road location	Ponds	
					Reservoir areas	Embankments
Matapeake: MmA, MmB2, MnA, MnB2, MnC3.	Good to a depth of 14 inches.	Locally fair for sand in substratum.	Fair: A–4, A–6, (rarely A–7), to A–2 in substratum.	Moderate potential frost action; cuts and fills needed.	Moderate seepage to high seepage in substratum.	Fair stability, compaction, and resistance to piping.
Mattapex: MtA, MtB2, MuA, MuB2, MuC2.	Good to a depth of 12 inches.	Unsuitable to locally fair in substratum.	Fair: A–2, A–4, A–6; good: A–2 in substratum.	Seasonal water table at a depth of 1½ to 2½ feet; high potential frost action.	Seasonal water table at a depth of 1½ to 2½ feet; moderate to moderately slow seepage to high seepage in substratum.	Fair stability and compaction; poor to fair resistance to piping.
Othello: On, Ot	Fair to a depth of 12 inches.	Locally fair for sand in substratum. Unsuitable for gravel.	Fair: A–4, A–6, A–2.	Seasonal water table at surface; high potential frost action.	Seasonal water table at surface; moderately slow seepage to rapid seepage in substratum.	Fair stability, compaction, and resistance to piping.
Rumford: RuB, RuC2	Fair to poor in gravelly phases.	Locally fair for sand and gravel.	Good to fair: A–2, A–4.	Cuts and fills needed.	Rapid seepage.	Fair stability; good compaction; poor resistance to piping.
*Sassafras: SaA, SaB2, SaC2, SaC3, SaD2, SaD3, SfA, SfB2, SmC2, SmC3. For Chillum part of SmC2 and SmC3, see Chillum series.	Good to a depth of 12 inches.	Locally fair in substratum.	Good: A–2, A–4, A–6.	Cuts and fills needed.	Moderate seepage in subsoil to rapid seepage in substratum.	Good stability and compaction; fair resistance to piping.
Westphalia: WeB2, WeC2, WeC3.	Good to a depth of 2 feet.	Poor to fair for sand; unsuitable for gravel.	Good to fair: A–2, A–3, A–4.	Cuts and fills needed.	Moderate seepage in subsoil to rapid seepage in substratum.	Fair stability and compaction; poor resistance to piping; highly erodible.
Woodstown: WsA, WsB, WsC2.	Good to a depth of 15 inches.	Locally fair for sand; unsuitable for gravel.	Good to fair: A–2, A–3, A–4, A–6.	Seasonal water table at a depth of 1½ to 2½ feet; high potential frost action.	Seasonal water table at a depth of 1½ to 2½ feet; moderate seepage to high seepage in substratum.	Good stability and compaction; fair resistance to piping.

TABLE 9.—*Engineering*

[Tests made by Soil Consultants, Incorporated, in accordance with standard procedures of

Soil name and location	SCS report no.	Depth	Mechanical analysis [1]			
			Percentage passing sieve—			
			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (.42 mm.)	No. 200 (.074 mm.)
		In				
Bourne fine sandy loam:	72MD-19-1-2	9–19	----------	100	98	42

test data

the American Association of State Highway and Transportation Officials (AASHTO)]

Mechanical analysis [1]—Continued				Liquid limit	Plasticity index	Classification	
Percentage smaller than—						AASHTO	Unified [2]
0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
41	33	19	12	[3]NP	NP	A-4 (1)	SM
51	30	22	16	NP	NP	A-4 (5)	ML
34	34	33	31	32	10	A-2-4 (0)	SM-SC
15	14	11	9	33	16	A-2-6 (0)	GC
9	8	8	7	30	13	A-2-6 (0)	SC
89	82	69	55	49	21	A-7-6 (14)	ML-CL
83	79	68	54	48	20	A-7-6 (14)	ML-CL
67	64	58	50	42	18	A-7-6 (10)	ML-CL
54	54	53	46	39	15	A-6 (6)	ML-CL

[2] The Soil Conservation Service and the Bureau of Public Roads have agreed that all soils having plasticity indexes within 2 points of the A-line are to be given a borderline classification.
[3] NP means nonplastic.
[4] 100 percent of this sample passed the 2 inch sieve.
[5] 100 percent of this sample passed the 1½ inch sieve.
[6] 100 percent of this sample passed the ⅜ inch sieve.

Road fill is soil material used in embankments for roads. The suitability ratings reflect the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage, and the relative ease of excavating the material at borrow areas.

Soil properties that most affect *highway and road location* are load supporting capacity and stability of the subgrade and the workability and quantity of cut and fill material available. The AASHTO and Unified classifications of the soil material and also the shrink-swell potential indicate traffic supporting capacity. Wetness and flooding affect stability of the material. Slope, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach an even grade.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to permeable material. Dug-out ponds are dependent mainly on the height of the water table, so seepage into and out of the pond is important.

Embankments and dikes require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones or organic material in a soil are among factors that are unfavorable.

Drainage of cropland and pasture is affected by such soil properties as permeability, texture, and structure, slope, stability in ditchbanks; susceptibility to stream overflow; and availability of outlets for drainage.

Irrigation of a soil is affected by such features as slope; susceptibility to stream overflow, water erosion, soil texture; content of stones; depth of root zone; rate of water intake at the surface; permeability of soil layers below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; and need for drainage or depth to water table.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff and seepage so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to unfavorable material; presence of stones; permeability; and resistance to water erosion and soil slipping. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

Sodded waterways are affected by such soil properties as texture, depth, and erodibility of the soil material; presence of stones; and the steepness of slopes. Other factors affecting waterways are seepage, natural soil drainage, available water capacity, susceptibility to siltation, and the ease of establishing and maintaining vegetation.

Winter grading is affected chiefly by soil features that are relevant to moving, mixing, and compacting

Shallow excavations for pipelines, sewer lines, phone and power transmission lines, basements, open ditches, and cemeteries are those that generally require digging or trenching to a depth of less than 6 feet. Desirable soil properties are good workability, moderate resistance to sloughing, gentle slopes, and freedom from flooding or a high water table.

Engineering test data

Listed in table 9 are the results of tests made on certain soils of St. Marys County to determine their

greatest limitations, but more than one kind of limitation can be listed. For example, a soil can have a moderate limitation for sewage lagoons because of permeability, but a steeper soil of the same series can have a severe limitation because of slope.

A rating of *slight* means soil properties are generally favorable for the rated use, or in other words, limitations that are minor and easily overcome.

A rating of *moderate* means that some soil properties are unfavorable but can be overcome or modified by special planning and design.

TABLE 10.—*Limitations of soils for town and country planning*

[Alluvial land (Aa), Cut and fill land (Cu), and Gravel pits (Gp) are too variable for interpretation or are not used for the purpose listed]

TABLE 10.—*Limitations of soils for town and country planning*—Continued

Soil series and map symbols	Sewage disposal		Homesites (three stories or less)		Streets and parking lots	Home gardens
	Filter fields	Lagoons	With basements	Without basements		
ChB2	Slight to moderate: moderate to moderately slow permeability.	Moderate: moderate to moderately slow permeability; slope.	Slight	Slight	Moderate: slope.	Moderate: slope:
ChC2, ChC3	Slight to moderate: moderate to moderately slow permeability.	Severe: slope; moderate to moderately slow permeability.	Slight to moderate: slope.	Slight to moderate: slope.	Severe: slope	Severe: slope.
Croom:						
CrB2	Severe: moderately slow	Moderate to severe:	Slight	Slight	Moderate to severe:	Moderate: slope; limited

TABLE 10.—*Limitations of soils for town and country planning*—Continued

Soil series and	Sewage Disposal	Homesites (three stories or less)	Streets and	Home gardens

TABLE 10.—*Limitations of soils for town and country planning*—Continued

Soil series and map symbols	Sewage disposal		Homesites (three stories or less)		Streets and parking lots	Home gardens
	Filter fields	Lagoons	With basements	Without basements		
MmB2, MnB2	Slight to moderate: moderate permeability.	Moderate: moderate permeability; slope.	Slight	Slight	Moderate: slope.	Moderate: slope.
MnC3	Slight to moderate: moderate permeability.	Severe: slope; moderate permeability.	Slight	Slight	Severe: slope	Severe: slope; unit MnC3 severely eroded.
Mattapex:						
MtA, MuA	Severe: moderately slow permeability; moderately high water table.	Slight	Moderate: moderately high water table.	Slight	Moderate: moderately high water table.	Moderate: moderately high water table.
MtB2, MuB2	Severe: mod-	Moderate:	Moderate:	Slight	Moderate:	Moderate:

TABLE 10.—*Limitations of soils for town and country planning*—Continued

Soil series and map symbols	Sewage disposal		Homesites (three stories or less)		Streets and parking lots	Home gardens
	Filter fields	Lagoons	With basements	Without basements		
Sassafras-Chillum complex: SmC2, SmC3.	Slight to moderate: moderate to moderately slow permeability.	Severe: slope	Slight to moderate: slope.	Slight to moderate: slope.	Severe: slope	Severe: slope; unit SmC3 severely eroded.
Tidal marsh: Tm	Severe: tidal high water table.[1]	Severe: tidal high water table; instability.[1]	Severe: tidal high water table; instability.	Severe: tidal high water table; instability.	Severe: tidal high water table; instability.	Severe: tidal high water table; salinity.
Westphalia:						
WeB2	Slight	Moderate to severe: moderate to moderately rapid permeability; slope.	Slight	Slight	Moderate: slope.	Moderate: slope.
WeC2, WeC3	Slight to moderate: slope.	Severe: slope	Slight to moderate: slope.	Slight to moderate: slope.	Severe: slope	Severe: slope; unit WeC3 severely eroded.
Woodstown:						
WsA	Moderate: moderately high water table.	Moderate: moderate permeability.	Moderate: moderately high water table.	Slight	Moderate: moderately high water table.	Moderate: moderately high water table.
WsB	Moderate: moderately high water table.	Moderate: moderate permeability; slope.	Moderate: moderately high water table.	Slight	Moderate: moderately high water table; slope.	Moderate: slope; moderately high water table.
WsC2	Moderate: moderately high water table.	Severe: slope; moderate permeability.	Moderate: moderately high water table.	Slight	Severe: slope	Severe: slope.

[1] Strong possibility of polluting nearby springs, wells, ponds, streams, or other surface or underground water resources.

areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, freedom from flooding during periods of heavy use, and a surface that is firm after rains but not dusty when dry.

Picnic areas are attractive natural or landscaped tracts used mainly for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry, are free of flooding during the season of use, and do not have slopes or stoniness that greatly increases cost of leveling sites or of building access roads.

Paths and trails are used for local and cross country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Service buildings are needed for use with some recreational facilities. Inasmuch as these buildings generally are not large and do not have basements, the limitations of the soils for this purpose are approximately the same as those for homesites without basements (table 10).

Genesis, morphology, and classification of soils

Genesis and morphology

Soil is the product of several processes acting simultaneously upon the earth's surface. Using an analogy, soil is the "rust" or "weathering rind" on the earth's skin. The morphological characteristics of the soil

[9] By DRS. F. P. MILLER and J. E. FOSS, Department of Agronomy, University of Maryland.

TABLE 11.—*Degree and kind of limitations for specified recreational uses*

[Alluvial land (Aa), Cut and fill land (Cu), Gravel Pits (Gp), and Tidal marsh (Tm) are not rated because they are too variable or are not used for the purposes listed]

Soil series and map symbols	Playgrounds	Camp areas	Picnic areas	Paths and trails
Alluvial land, wet: Ad	Severe: mostly poor natural drainage; flood hazard.	Severe: mostly poor natural drainage; flood hazard.	Severe: mostly poor natural drainage; flood hazard.	Severe: mostly poor natural drainage; flood hazard.
Beaches: Be	Severe: loose sand; subject to blowing.	Severe: loose sand; subject to blowing.	Severe: loose sand; subject to blowing.	Severe: loose sand.
Beltsville:				
B1A	Moderate: moderately high seasonally perched water table;[1] slow permeability.	Moderate: moderately high seasonally perched water table;[1] slow permeability.	Moderate: moderately high seasonally perched water table;[1] slow permeability.	Slight.
B1B2, B1B3	Moderate: moderately high seasonally perched water table;[1] slow permeability; slope.	Moderate: moderately high seasonally perched water table;[1] slow permeability.	Moderate: moderately high seasonally perched water table;[1] slow permeability.	Slight.
B1C2, B1C3	Severe: slope; moderately high seasonally perched water table.	Moderate: moderately high seasonally perched water table;[1] slow permeability.	Moderate: moderately high water table.	Slight.
Bibb: Bm	Severe: poor natural drainage; high water table; flood hazard.	Severe: poor natural drainage; high water table; flood hazard.	Severe: poor natural drainage; high water table; flood hazard.	Severe: poor natural drainage; high water table; flood hazard.
Bourne:				
BrB2	Moderate: moderately high seasonally perched water table;[1]	Moderate: moderately high seasonally perched water table;[1]	Moderate: moderately high seasonally perched water table	Slight.

TABLE 11.—*Degree and kind of limitations for specified recreational uses*—Continued

Soil series and map symbols	Playgrounds	Camp areas	Picnic areas	Paths and trails
Croom:				
CrB2	Severe: coarse fragments on surface.	Moderate: coarse fragments on surface; moderately slow permeability.	Moderate: coarse fragments on surface.	Moderate: coarse fragments on surface.
CrC2	Severe: coarse fragments on surface; slope.	Moderate: coarse fragments on surface; moderately slow permeability.	Moderate: coarse fragments on surface; slope.	Moderate: coarse fragments on surface.
CrD2, CrD3	Severe: slope; coarse fragments on surface.	Severe: slope; coarse fragments on surface.	Severe: slope; coarse fragments on surface.	Moderate: coarse fragments on surface.
Elkton: Ek	Severe: poor natural drainage; high water table; slow permeability.	Severe: poor natural drainage; high water table; slow permeability.	Severe: poor natural drainage; high water table.	Severe: poor natural drainage; high water table.
Evesboro:				
EvB	Severe: loamy sand, subject to blowing.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.
EvC	Severe: loamy sand, subject to blowing; slope.	Moderate: loamy sand surface layer; slope.	Moderate: loamy sand surface layer; slope.	Moderate: loamy sand surface layer; slope.
Evesboro-Westphalia complex:				
EwC2	Severe: slope; loose loamy sand in	Moderate: slope; loose loamy sand in	Moderate: slope; loose loamy sand in	Slight to moderate: loose loamy sand in

TABLE 11.—*Degree and kind of limitations for specified recreational uses*—Continued

Soil series and map symbols	Playgrounds	Camp areas	Picnic areas	Paths and trails
Klej: Kz	Moderate: high water table; deep loose loamy sand.	Moderate: high water table; deep loose loamy sand.	Moderate: deep loose loamy sand.	Moderate: deep loose loamy sand.
Leonardtown: Le	Severe: poor natural drainage; high water table; slow permeability.	Severe: poor natural drainage; high water table; slow permeability.	Severe: poor natural drainage; high water table.	Severe: poor natural drainage; high water table.
Marr:				
MaB2	Moderate: slope	Slight	Slight	Slight.
MaC2, MaC3	Severe: slope	Slight to moderate: slope.	Slight to moderate: slope.	Slight.
Matapeake:				
MmA, MnA	Slight	Slight	Slight	Slight

TABLE 11.—*Degree and kind of limitations for specified recreational uses*—Continued

Soil series and map symbols	Playgrounds	Camp areas	Picnic areas	Paths and trails
WsB	Moderate: moderately high water table; slope.	Moderate: moderately high water table.	Moderate: moderately high water table.	Slight.
WsC2	Severe: slope	Moderate: moderately high water table.	Moderate: moderately high water table.	Slight.

[1] While soils of the Beltsville, Bourne, and Keyport series are slowly permeable, they are generally dry enough for long periods during the seasons of most use, so they are rated as only moderately limited for playgrounds and camp areas because of permeability.

series mapped in St. Marys County have developed through a unique set of processes acting upon geologic materials. Simonson (*5*) outlined four basic changes in the soil system during pedogenesis (soil formation). These changes are the result of additions, removals, transfers, and transformations. For example, organic matter, fertilizer, dust and other materials are added to soils, while soluble salts and basic ions released in the weathering of certain minerals are removed to varying degrees. Clay particles and iron are transferred within the soil profile. Soil minerals such as feldspars and mica are transformed to clay minerals.

The intensity and magnitude of changes are determined by five factors of soil formation. These soil-forming factors—parent material, climate, living organisms, relief, and time—are important in determining the nature and properties of soils. They do not act independently but overlap, and each factor modifies the effects of the other. Climate and living organisms are the active forces in soil formation. Their effect on the parent material is modified by topography and time. Each of these soil-forming factors, as it applies to the distribution and morphology of soils in St. Marys County, is discussed in the following paragraphs.

Parent material

Soils inherit some of their characteristics from the parent material. The various types of geologic sediment are altered by physical and chemical processes. The unconsolidated residue that results from this action is the parent material from which soils form by weathering and subsequent modification by the other factors of soil formation.

Parent material provides the mineral skeleton of the soils and influences the texture and mineralogy of the resulting soil profile. Studies by Fanning (*3*) have shown that most soils of the Coastal Plain are fairly uniform in clay mineralogy. The clay fraction of the soil contains about equal amounts of the minerals chlorite, mica, and kaolinite or intergradient chlorite. This reflects the importance of parent material in clay mineralogy. Soils that formed in Coastal Plain sediment containing mostly quartz and kaolinite clay will most likely contain a predominance of these minerals. Likewise, soils formed from sandy or gravelly sediment will probably retain this characteristic throughout their genesis. Soils that formed from clayey sediment tend to be fine textured. These inherited characteristics, however, are frequently modified and sometimes masked by the influence of other factors.

The parent material of all soils in St. Marys County is unconsolidated sediment of the Coastal Plain. The texture of this material varies greatly, and the geologic age ranges from early Cretaceous to Holocene (Recent). The older sediment is dominantly sandy or gravelly. Croom, Evesboro, Marr, Sassafras, Westphalia, and Woodstown soils commonly formed in this sediment. Where the older sediment has a silty deposit over it, Beltsville, Chillum, and Leonardtown soils, and some of the Matapeake, Mattapex, and Othello soils, formed.

In places soils that formed in old sediment are very deeply developed, commonly to depths of 10 to 15 feet. These are called paleosols and are best represented by soils of the Caroline series.

In later sediment of various textures, mostly on old alluvial terraces above major streams, the soils are chiefly of the Elkton, Fallsington, Keyport, Faceville, Klej, and Kempsville series. Some of the Matapeake, Mattapex, and Othello soils are also on these terraces.

The parent material of the youngest soils in the county consists of recent alluvium transported by streams and deposited on flood plains. These soils are of the Bibb series, Alluvial land, and Alluvial land, wet.

Climate

Climate strongly influences the weathering process and the vegetation which in turn further modifies the soil forming process. Under the humid climate typical of the mid-Atlantic region, the soils of St. Marys County reflect the impact of the weathering process as shown by the well developed soil profiles. Climatic data for the county are recorded in the section "General nature of the county."

Rainfall influences soil formation through erosion, solution losses caused by leaching, and chemical reaction (where water is a necessary component). The effects of erosion are particularly noticeable on soils that have steep slopes. Many of these soils are thin and have weakly developed profiles, in contrast to their more level counterparts in areas where geological erosion is in equilibrium with the soil-forming processes. Accelerated erosion resulting from man's influence also contributes to the loss of horizons at the surface in soils on sloping landscapes.

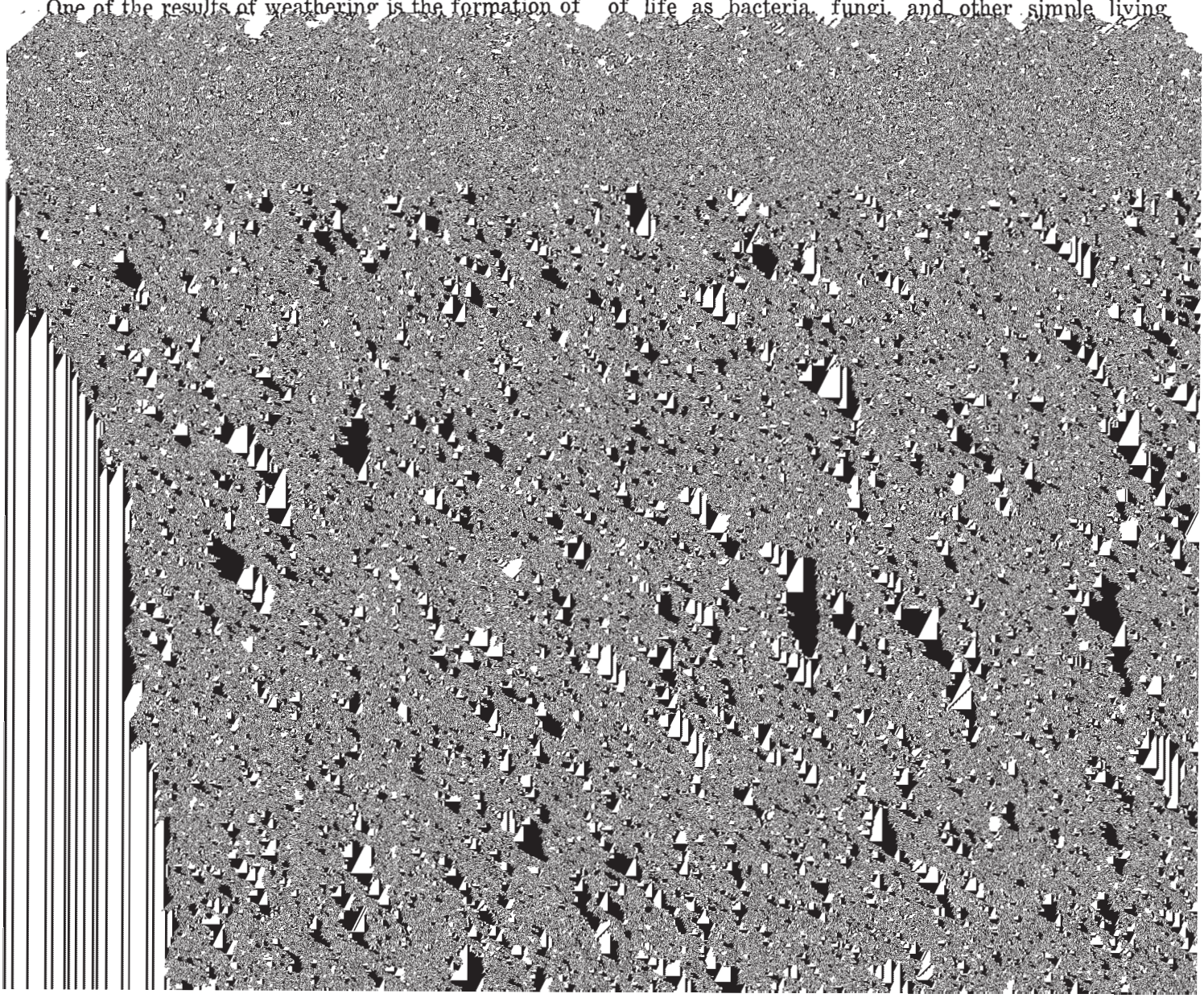
Many constituents are removed from the soils by leaching. For example, the soluble salts and basic ions (Ca^{++}, Mg^{++}, K^{+}, and Na^{+}) released in weathering of certain minerals are removed in varying degrees. Water percolating through soils may remove, in the course of year via solution, several tons of minerals per square mile. As a result of this leaching, the soils of St. Marys County are naturally acid to extremely acid. The exchange sites on clay and organic matter are dominated by hydrogen or aluminum ions rather than by basic ions. Variations in percentage of bases on the exchange sites are dependent on the amount of basic elements in the parent material, the duration and intensity of weathering, or on possible additions of basic ions. The low content of bases in the parent materials of soils of St. Marys accounts for much of the natural acidity in these soils. The addition of lime or limestone during farming operations has decreased the acidity of some soils, particularly in the Ap horison, or plow layer.

One of the results of weathering is the formation of in leaching and translocation; wetting and drying results in expansion and contraction, which subsequently forms soil structure; and the continuous process of mineral weathering eventually produces a soil in dynamic equilibrium with its environment. The soils in St. Marys County are thus directly related to the climate in which they formed and in which they exist today.

Plant and animal life

One of the features that distinguishes soil from its parent material (purely mineral) is the organic constituent of living plants and animals and their decayed or decaying remains. When climate begins to act on parent material, soil begins to form. Plant and animal life soon follow and hasten the weathering process. The resulting soil is a product of these inorganic and living factors as modified by climate, relief, and time.

Early in the formation of soil such primitive forms of life as bacteria, fungi, and other simple living



in turn, produce a shift in equilibrium of soils with their environment. Such a shift will be a very slow process in most cases. Soils that have been cultivated for centuries in Europe, however, are easily distinguished in morphology and other properties from their virgin associates. This emphasizes the concept that man must be considered significant in the soil-forming processes.

Relief

The shape of the landscape, as well as its elevation, orientation, and gradient influences soil formation. Even in places where parent materials are uniform, soils formed on steeper gradients generally are thinner development. These soils are in the Bibb series. Their parent materials, which are on flood plains, have not been in place long enough for profiles to be significantly differentiated and expressed. Some features associated with wetness or natural drainage, however, can be observed. The Caroline and Faceville soils, on the other hand, have very well developed profiles. This indicates that their landscapes have been rather stable and have been exposed to soil-forming processes for a considerable length of time.

Interrelationships of soils

In table 12 relationships in position, parent material, and drainage of soils in St. Marys County are

TABLE 12.—*Soil series relationships in terms of position, parent material, and drainage*

Parent material	Soils of uplands and terraces			
	Excessively or somewhat excessively drained	Well drained	Moderately well drained	Poorly drained
Sands and loamy sands	Evesboro (excessively drained).		Klej	
Sands containing moderate clay and silt		Sassafras, Kempsville.	Woodstown	Fallsington.
Sands with little clay and silt	Rumford (somewhat excessively drained).			
Fine sand, silts, and silty clays over sands		Matapeake	Mattapex	Othello.
Miocene fine sand with little clay and silt		Westphalia, Marr		

TABLE 13.—*Soil series classified according to the current system*

Series	Family	Subgroup	Order
Alluvial land		Udifluvents	Entisols.
Alluvial land, wet		Fluvaquents	Entisols.
Beltsville	Fine-loamy, mixed, mesic	Typic Fragiudults	Ultisols.
Bibb	Coarse-loamy, siliceous, acid, thermic.	Typic Fluvaquents	Entisols.
Bourne	Fine-loamy, mixed, thermic	Typic Fragiudults	Ultisols.
Caroline	Clayey, mixed, thermic	Typic Paleudults	Ultisols.
Chillum	Fine-silty, mixed, mesic	Typic Hapludults	Ultisols.
Croom	Loamy-skeletal, mixed, mesic	Typic Hapludults	Ultisols.
Cut and fill land		Typic Udorthents	Entisols.
Elkton	Clayey, mixed, mesic	Typic Ochraquults	Ultisols.
Evesboro	Mesic, coated	Typic Quartzipsamments	Entisols.
Faceville	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Fallsington	Fine-loamy, siliceous, mesic	Typic Ochraquults	Ultisols.
Kempsville	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Keyport	Clayey, mixed, mesic	Aquic Hapludults	Ultisols.
Klej [1]	Mesic, coated	Aquic Quartzipsamments	Entisols.
Leonardtown	Fine-silty, mixed, mesic	Typic Fragiaquults	Ultisols.
Marr	Fine-loamy, siliceous, mesic	Typic Hapludults	Ultisols.
Matapeake	Fine-silty, mixed, mesic	Typic Hapludults	Ultisols.
Mattapex	Fine-silty, mixed, mesic	Aquic Hapludults	Ultisols.
Othello	Fine-silty, mixed, mesic	Typic Ochraquults	Ultisols.
Rumford	Coarse-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Sassafras	Fine-loamy, siliceous, mesic	Typic Hapludults	Ultisols.
Tidal marsh		Hydraquents and Sulfaquents	Entisols.
Westphalia	Coarse-loamy, siliceous, mesic	Ochreptic Hapludults	Ultisols.
Woodstown	Fine-loamy, siliceous, mesic	Aquic Hapludults	Ultisols.

[1] Taxadjuncts—Klej series—taxadjunct is dominantly medium and slightly acid in lower part of the B horizon and C horizon rather than very strongly or extremely acid throughout as is defined for the Klej series.

when used for engineering. Among the properties considered are texture, mineralogy, reactions, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on, that are used as family differentiae (table 13). An example is the coarse-loamy, siliceous, acid, thermic family of

(6) Simonson, Roy W. 1962. Soil classification in the United States. Sci. 137: 1027–1034.
(7) Thorp, James and Guy D. Smith. 1949. Higher categories of soil classification: order, suborder, and great soil groups. Soil Sci. 67: 117–126.
(8) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173–188 issued May 1962]
(9) United States Department of Agriculture. 1960. Soil classi-

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidy. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well [illegible] are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic mater and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gravelly soil material. Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, maily a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying [illegible] to the underlying C horizon. [illegible]

Leaching. The removal of soluble material from soil or other material by percolating water.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

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

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—few, common, and many; size—fine, medium, and coarse; and contrast—faint, distinct, and prominent. The size measurements are of the diameter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three single variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are very slow (less than 0.06 inch), slow (0.06 to 0.20 inch), moderately slow (0.2 to 0.6 inch), moderate (0.6 to 2.0 inches), moderately rapid (2.0 to 6.0 inches), rapid (6.0 to 20 inches), and very rapid (more than 20 inches).

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Poorly graded. Refers to soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second botom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Topography. See "Relief."

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. The capability classification system is described on pages 43 to 45. In referring to a woodland group, read the introduction to the section it is in for general information about its management.

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group	
			Symbol	Symbol	Page
Aa	Alluvial land	11	IIw-7	1w3	53
Ad	Alluvial land, wet	11	VIw-1	2w4	53
Be	Beaches	13	VIIIs-2	---	--
B1A	Beltsville silt loam, 0 to 2 percent slopes	14	IIw-8	3w3	58
B1B2	Beltsville silt loam, 2 to 5 percent slopes, moderately eroded	15	IIe-13	3w3	58
B1B3	Beltsville silt loam, 2 to 5 percent slopes, severely eroded	15	IIIe-13	3w3	58
B1C2	Beltsville silt loam, 5 to 10 percent slopes, moderately eroded	15	IIIe-13	3w3	58
B1C3	Beltsville silt loam, 5 to 10 percent slopes, severely eroded	15	IVe-9	3w3	58
Bm	Bibb silt loam	16	IIIw-7	2w4	53
BrB2	Bourne fine sandy loam, 2 to 5 percent slopes, moderately eroded	17	IIe-36	3w3	58
BrC3	Bourne fine sandy loam, 5 to 10 percent slopes, severely eroded	17	IVe-7	3w3	58
CaB2	Caroline silt loam, 2 to 5 percent slopes, moderately eroded	18	IIe-13	3w3	58
CaC2	Caroline silt loam, 5 to 10 percent slopes, moderately eroded	18	IIIe-13	3w3	58
CaC3	Caroline silt loam, 5 to 10 percent slopes, severely eroded	19	IVe-9	3w3	58
CaD2	Caroline silt loam, 10 to 15 percent slopes, moderately eroded	19	IVe-9	3w3	58
CaD3	Caroline silt loam, 10 to 15 percent slopes, severely eroded	19	VIe-2	3w3	58
ChA	Chillum loam, 0 to 2 percent slopes	20	IIs-7	3o2	56
ChB2	Chillum loam, 2 to 6 percent slopes, moderately eroded	20	IIs-7	3o2	56
ChC2	Chillum loam, 6 to 12 percent slopes, moderately eroded	21	IIIe-7	3o2	56
ChC3	Chillum loam, 6 to 12 percent slopes, severely eroded	21	IVe-7	3o2	56
CrB2	Croom gravelly sandy loam, 2 to 5 percent slopes, moderately eroded	22	IIs-7	4d2	58
CrC2	Croom gravelly sandy loam, 5 to 10 percent slopes, moderately eroded	22	IIIe-9	4d2	58
CrD2	Croom gravelly sandy loam, 10 to 15 percent slopes, moderately eroded	22	IVe-9	4d2	58
CrD3	Croom gravelly sandy loam, 10 to 15 percent slopes, severely eroded	22	VIe-2	4d2	58
Cu	Cut and fill land	22	-------	---	--
Ek	Elkton silt loam	23	IIIw-9	3w4	58
EvB	Evesboro loamy sand, 0 to 8 percent slopes	24	IVs-1	3s1	58
EvC	Evesboro loamy sand, 8 to 15 percent slopes	24	VIIs-1	3s1	58

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group	
			Symbol	Symbol	Page
KeC2	Kempsville fine sandy loam, 5 to 10 percent slopes, moderately eroded	27	IIIe-5	2o2	53
KeC3	Kempsville fine sandy loam, 5 to 10 percent slopes, severely eroded	27	IVe-5	2o2	53
KeD2	Kempsville fine sandy loam, 10 to 15 percent slopes, moderately eroded	27	IVe-5	2o2	53
KeD3	Kempsville fine sandy loam, 10 to 15 percent slopes, severely eroded	28	VIe-2	2o2	53
KpA	Keyport fine sandy loam, 0 to 2 percent slopes	28	IIw-9	3w3	58
KpB2	Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded	29	IIe-36	3w3	58
KrA	Keyport silt loam, 0 to 2 percent slopes	29	IIw-8	3w3	58
KrB2	Keyport silt loam, 2 to 5 percent slopes, moderately eroded	29	IIe-13	3w3	58
KrC2	Keyport silt loam, 5 to 10 percent slopes, moderately eroded	29	IIIe-13	3w3	58
	Kitchen Middens	29	-------	---	--
Kz	Klej loamy sand, 0 to 5 percent slopes	30	IIIw-10	3w6	58
Le	Leonardtown silt loam	31	IVw-3	3w4	58
MaB2	Marr fine sandy loam, 2 to 6 percent slopes, moderately eroded	32	IIe-4	3o2	56
MaC2	Marr fine sandy loam, 6 to 12 percent slopes, moderately eroded	32	IIIe-5	3o2	56
MaC3	Marr fine sandy loam, 6 to 12 percent slopes, severely eroded	32	IVe-5	3o2	56
MmA	Matapeake fine sandy loam, 0 to 2 percent slopes	33	I-5	3o2	56
MmB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	33	IIe-5	3o2	56
MnA	Matapeake silt loam, 0 to 2 percent slopes	33	I-4	3o2	56
MnB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	34	IIe-5	3o2	56
MnC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded	34	IVe-3	3o2	56
MtA	Mattapex fine sandy loam, 0 to 2 percent slopes	35	IIw-5	3w3	58
MtB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded	35	IIe-36	3w3	58
MuA	Mattapex silt loam, 0 to 2 percent slopes	35	IIw-1	3w3	58
MuB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	35	IIe-16	3w3	58
MuC2	Mattapex silt loam, 5 to 10 percent slopes, moderately eroded	35	IIIe-16	3w3	58
On	Othello fine sandy loam	36	IIIw-6	3w4	58
Ot	Othello silt loam	36	IIIw-7	3w4	58
RuB	Rumford loamy sand, 0 to 5 percent slopes	37	IIs-4	3o2	56
RuC2	Rumford loamy sand, 5 to 10 percent slopes, moderately eroded	37	IIIe-33	3o2	56
SaA	Sassafras sandy loam, 0 to 2 percent slopes	38	I-5	3o2	56
SaB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	38	IIe-5	3o2	56
SaC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	39	IIIe-5	3o2	56
SaC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	39	IVe-5	3o2	56
SaD2	Sassafras sandy loam, 10 to 15 percent slopes, moderately eroded	39	IVe-5	3o2	56
SaD3	Sassafras sandy loam, 10 to 15 percent slopes, severely eroded	39	VIe-2	3o2	56
SfA	Sassafras loam, 0 to 2 percent slopes	39	I-4	3o2	56
SfB2	Sassafras loam, 2 to 5 percent slopes, moderately eroded	39	IIe-4	3o2	56

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group	
			Symbol	Symbol	Page
SmC2	Sassafras-Chillum complex, 6 to 12 percent slopes, moderately eroded	40	IIIe-4	3o2	56
SmC3	Sassafras-Chillum complex, 6 to 12 percent slopes, severely eroded	40	IVe-5	3o2	56

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.