SOIL SURVEY

Talbot County, Maryland

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

Major fieldwork for this soil survey was done in the period 1959–65. Soil names and descriptions were approved in 1966. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1966.

This survey was made cooperatively by the Soil Conservation Service and the Maryland Agricultural Experiment Station. It is a part of the technical assistance furnished to the Talbot Soil Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, USDA, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY of Talbot County, Md., contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in judging the suitability of tracts of land for farming, industry, or recreation.

Locating Soils

All of the soils of Talbot County are shown on the detailed map at the back of this survey. This map consists of many sheets that are made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbol. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in the survey. This guide lists all of the soils in the county in alphabetic order by map symbol. It shows the page where each kind of soil is described, and also the page for the capability unit, woodland group, or any other group in which the soil has been placed.

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils in the soil descriptions and in the discussions of the capability units and woodland suitability groups.

Foresters and others can refer to the section "Use of Soils as Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the section "Use of Soils for Wildlife."

Community planners and others concerned with suburban development can read about the soil properties that affect the choice of homesites, industrial sites, schools, and parks in the section "Use of Soils for Community Development."

Engineers and builders will find under "Engineering Uses of Soils" tables that give engineering descriptions of the soils in the county and that name soil features affecting engineering practices and structures.

Scientists and others can read about how the soils were formed and how they are classified in the section "Formation and Classification of the Soils."

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

COVER PICTURE

View southwestward from above the town of Easton. The Mattapex-Matapeake soil association generally borders the tidal streams and is used for homesites. The Elkton-Othello-Barclay soil association is not well drained and much of it remains in woods.

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SOIL SURVEY OF TALBOT COUNTY, MARYLAND

SOILS SURVEYED AND PUBLICATION WRITTEN BY WILLIAM U. REYBOLD III, SOIL CONSERVATION SERVICE

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

TALBOT COUNTY lies in the heart of the Eastern Shore of Maryland. The county is on the west-central edge of the peninsula that extends between the Atlantic Ocean and the Chesapeake Bay (fig. 1). The area of the county is about 178,560 acres, or 279 square miles.

Talbot County is a part of the Coastal Plain. The soils of the county formed from marine sediments that were deposited during various geologic epochs. These sediments vary considerably, as do the soils that formed from them.

In 1964, the farms in Talbot County occupied 125,196 acres. The main type of farm is cash-grain, but poultry farms and dairy farms are numerous. Corn, soybeans, barley, and rye are the main crops, and a large acreage is in pasture.

The population of Talbot County was 21,578 in 1960. Easton, the county seat, had a population of 6,337 and is the largest of the five incorporated towns in the county.

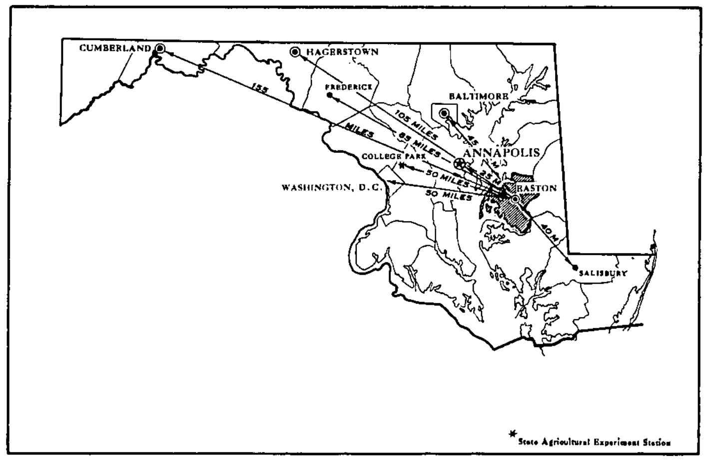

Figure 1.—**Location of Talbot County in Maryland.**

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Talbot County, where they are located, and how they can be used. The soil scientists went into the survey area knowing they likely would find many soils they had already seen and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rocks; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down 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 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 where a soil of that series was first observed and mapped. Sassafras and Elkton, for example, are the names of two soil series. All the soils in the United States having the same series names are essentially alike in those characteristics that go with their behavior in the natural landscape.

Soils of one series can differ somewhat in texture of the surface soil and in slope, stoniness, or some other characteristics that affect use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Sassafras sandy loam, 0 to 2 percent slopes, is one of several phases within the Sassafras series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodland, buildings, field borders, trees, and other details that greatly help in drawing soil boundaries accurately. The soil map in the back of this survey was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

In Talbot County there are places that are so marshy, so steep and severely eroded, or so disturbed by man that the soil material cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Tidal marsh and Made land are examples of two land types in Talbot County.

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

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, and then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Talbot County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and in other characteristics that affect management.

The six soil associations in Talbot County are described in the following pages.

1. Sassafras-Woodstown Association

Level to strongly sloping, well drained and moderately well drained soils that have a subsoil of sandy loam or sandy clay loam

This association occurs mostly in large tracts along U.S. Highway No. 50 and eastward to the Choptank River. Most of the association is open farmland consisting of level to moderately sloping soils. The association occupies 28 percent of the county.

The Sassafras soils make up about 70 percent of the association; the Woodstown soils, about 20 percent; and minor soils, the rest. Among the minor soils are the poorly drained Fallsington and Elkton soils.

The Sassafras and Woodstown soils are deep and have a sandy loam to sandy clay loam subsoil. They formed in marine deposits of sand, silt, and clay.

The Sassafras soils are well drained. Ground water is always below a depth of 5 feet. The Woodstown soils are moderately well drained. They have a fluctuating high water table during February and March. Sassafras soils are seriously eroded along strongly sloping narrow strips bordering intermittent streams.

The major soils in this association are well suited to farming. Cash grain is the main crop, but there is some dairy farming. Most of the truck crops grown in Talbot County, particularly peas, sweetcorn, and tomatoes, are grown on the soils of this association. A small acreage is wooded.

The soils of this association generally are suitable for community development, though the seasonal high water table restricts the use of Woodstown soils for septic tank filter fields. Most of the fill used for road subgrade in the county is from the soils in this association (fig. 2). The major soils are suitable as foundations for buildings.

2. Mattapex-Matapeake Association

Level to strongly sloping, moderately well drained and well drained soils that have a subsoil of loam to silty clay loam

This association occurs throughout the county. The largest areas are in the central part, bordering the tidal

***Figure 2.*—Excavating road fill of high quality from the Sassafras-Woodstown association.**

streams of Miles River Neck, Island Neck, and Oxford Neck. Most of the acreage is farmland consisting of level to gently sloping soils. This association occupies about 23 percent of the county. Figure 3 shows the relation of soil associations, 2, 4, and 6.

The Mattapex soils make up about 55 percent of the association; the Matapeake soils, about 40 percent; and minor soils the rest. Among the minor soils are the somewhat poorly drained Barclay soils and the well-drained Sassafras soils.

The Mattapex and Matapeake soils are deep. They developed in silty marine sediments underlain by sands containing a large amount of silt. The Mattapex soils are moderately well drained. Their subsoil is compact and tends to slow the movement of air and water through the soil. The Matapeake soils are well drained. They become compact when they are plowed or grazed when wet.

The major soils in this association are well suited to grain. These soils respond well to large additions of fertilizer. They retain moisture well and keep it readily avail-

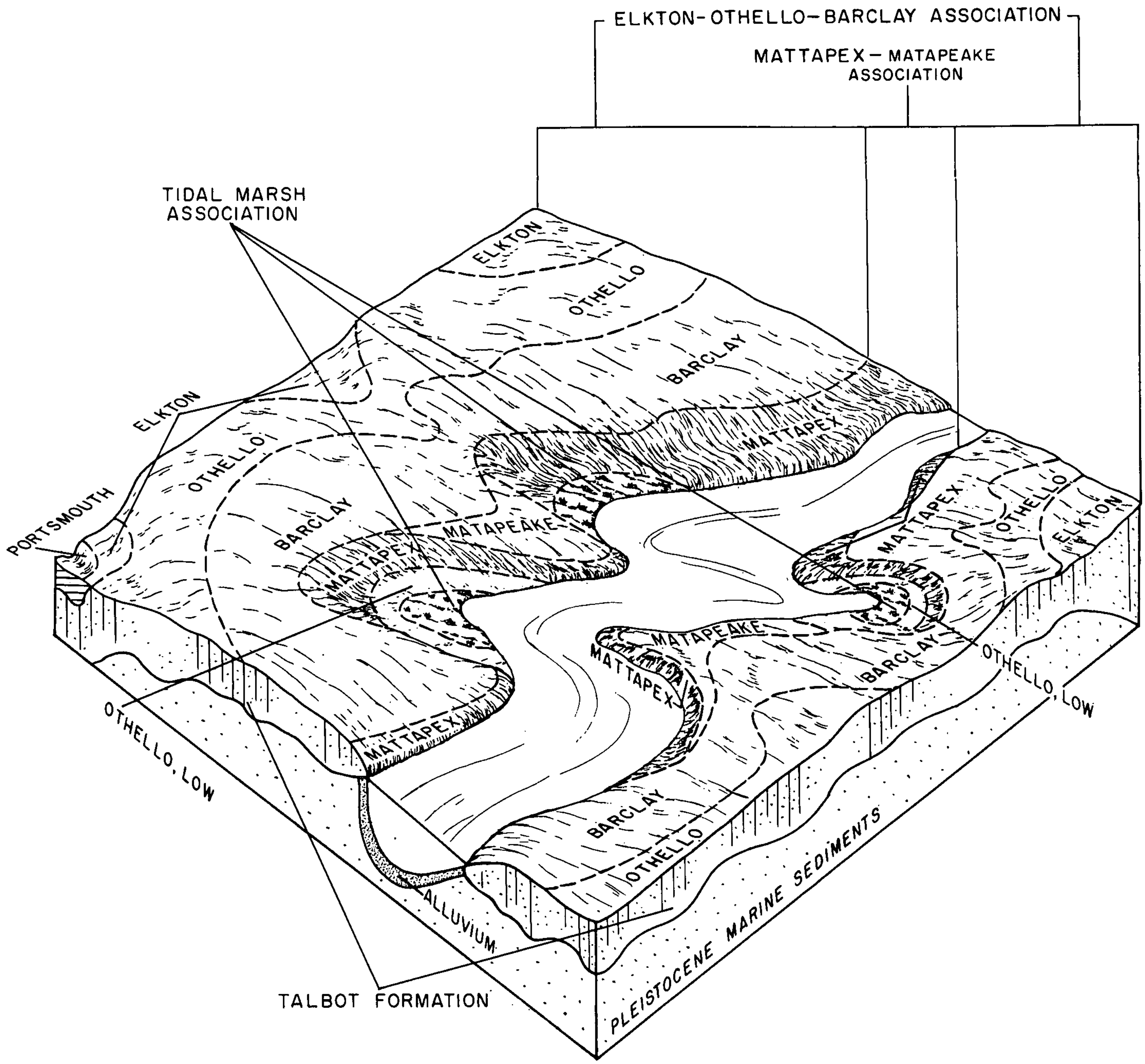

Figure 3.—Part of a neck showing the relation of the Mattapex-Matapeake, the Elkton-Othello-Barclay, and the Tidal marsh soil association.

able for plants. In most places the soils are level to gently sloping, occur in large areas, and are suitable for the use of large farm equipment. A small acreage is wooded.

The soils of this association generally are suitable for community uses such as homesites, golf courses, and parks.

3. Keyport-Mattapex Association

Level to gently sloping, moderately well drained soils that have a subsoil of silty clay loam or silt loam

This soil association occurs mainly in narrow areas that border tidal streams in the western part of Talbot County near St. Michaels, Bozman, Neavitt, and Royal Oak. The landscape is mostly level, except where it slopes to tidewater. This association makes up about 11 percent of the county.

The Keyport soils make up about 75 percent of this association, and the Mattapex soils, most of the rest, though there is a very small acreage of minor soils.

The Keyport and Mattapex soils are deep and formed from silt and silty clay marine deposits. The Keyport soils have a silty clay loam subsoil, and the Mattapex soils have a silt loam subsoil. Both of these subsoils restrict the movement of air and water, and especially in winter, water collects on the surface of the soils where they are nearly level. The subsoil of both kinds of soils is so hard and compact that it restricts the growth of roots during the dry summer months.

Grain, hay, and pasture crops grow well on the soils in this association where surface water is removed. Corn and soybeans are the main crops. Only a small part of this association is wooded.

Although the soils in this association have limitations if used for septic tank filter fields or for the foundations of buildings, many homes have been built on the soils. The surface water and the compact subsoil cause severe limitations for septic tank filter fields and moderate limitations for building foundations. The Keyport soils shrink and swell on alternate drying and wetting. Foundations of homes must be designed to take this into account.

4. Elkton-Othello-Barclay Association

Level and nearly level, poorly drained and somewhat poorly drained soils that have a subsoil of silty clay to silt loam

This soil association is in large areas in the western half of Talbot County, but smaller areas are scattered throughout. The soils occupy parts of or all of peninsulas, necks, and a few small islands throughout the tidewater area. The landscape is flat and is broken only by drainage ditches. Much of the acreage is wooded. This association occupies about 30 percent of the county.

The Elkton soils make up about 45 percent of this association; the Othello soils, about 40 percent; and the Barclay soils, about 15 percent.

The Elkton and Othello soils are deep and poorly drained. They formed in marine sediments of silt and silty clay texture. The Elkton soils are gray, and the Othello soils are grayish and brownish. The Barclay soils are deep and somewhat poorly drained. They are not so gray as the Elkton or Othello soils.

All the soils in this association have a fluctuating high water table during winter and spring. For much of these seasons the water table is at the surface, and in some places the water is ponded.

Artificial drainage is needed before the soils of this association can be farmed successfully. Farming is mainly of the cash-grain type, though the soils also are well suited to hay and pasture. In most places the fields are large, level, and suitable for the use of large farm equipment.

Much of this soil association has mixed cover of loblolly pine and oak. Loblolly pine grows well on these soils, but in winter and spring logging is difficult because of wetness.

Seasonal wetness also severely limits the use of these soils for community development. Roads are difficult to build and are expensive to maintain because of high water tables and susceptibility to frost heave.

5. Fallsington-Pocomoke Association

Level to depressional, poorly drained and very poorly drained soils that have a subsoil of sandy loam or sandy clay loam

This soil association occupies small areas near Trappe in the southern part of Talbot County and near Cordova in the northern part. The soils occupy depressions or low areas that generally are surrounded by the higher lying soils of the Sassafras-Woodstown association. The Fallsington-Pocomoke association occupies about 5 percent of the county.

Fallsington soils make up about 80 percent of this association, and the Pocomoke and minor soils make up the rest.

The Fallsington and Pocomoke soils are deep and dark colored. They formed in deposits of sand, silt, and clay. The Fallsington soils are gray and poorly drained. The Pocomoke soils are black and very poorly drained.

The soils of this association have a fluctuating high water table throughout much of the year. Several inches of ponded water generally cover the Pocomoke soils about 6 months each year.

Artificial drainage is needed to make soils of this association suitable for farming. These soils are used for many kinds of general farm crops.

Much of this association is woodland. Loblolly pine grows well. Because of wetness, logging is difficult throughout much of the year.

The soils of this association have severe or very severe limitations for community development. Because the water table is high throughout much of the year, limitations are severe for most engineering uses.

6. Tidal Marsh Association

Low-lying level areas that are subject to flooding by salt water

This soil association occupies large areas along the Choptank River and Tuckahoe Creek and smaller areas along most of the other tidal creeks in the county. These smaller areas generally are so small that they cannot be shown on the soil association map. In most places the landscape of this association is low-lying and flat, but in some places it is broken by hummocks, or by other slightly higher ground. The soils are not used for farming. This association occupies about 3 percent of the county.

Tidal marsh makes up about 95 percent of this association. The remaining 5 percent consists of small areas of

Coastal beaches, of the low Othello soils, and of the Plummer and Pocomoke soils.

This association is subject to flooding by salt water. Nearly all of the acreage is affected to some degree by tides, but some areas shown on the general soil map as Tidal marsh are much like fresh water swamp.

Except for some of the small areas of minor soils, this association is not used for woodland. The trees on the minor soils are water-tolerant hardwoods and loblolly pine, but generally these trees are not large enough to be sold.

Most of this association is used for a variety of wildlife purposes. In some areas muskrats are trapped and sold. Other areas serve as habitat for waterfowl. Many kinds of migratory birds find good resting places in the association.

This association is not suitable for community or commercial development.

Descriptions of the Soils

In this section the soil series and the mapping units in each series are described. The acreage and proportionate extent of each mapping unit are given in table 1.

The procedure is first to describe the soil series, and then the mapping units in that series. Thus, to get full information on any one mapping unit, it is necessary to read the description of that unit and also the description of the series to which it belongs. The description of a soil series mentions features that apply to all the soils in a series. Differences among the soils of one series are pointed out in the description of the individual soils or are indicated in the soil name. As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Tidal marsh, for example, is a miscellaneous land type that does not belong to a soil series. It is listed,

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Barclay silt loam, 0 to 2 percent slopes	8, 885	5. 0
Barclay silt loam, 2 to 5 percent slopes, moderately eroded	987	. 5
Borrow pits	388	. 2
Coastal beaches	116	(1)
Downer loamy sand, 0 to 2 percent slopes	441	. 2
Downer loamy sand, 2 to 5 percent slopes, moderately eroded	1, 923	1. 1
Downer loamy sand, 5 to 10 percent slopes, moderately eroded	326	. 2
Elkton loam	1, 928	1. 1
Elkton silt loam	23, 281	13. 0
Fallsington sandy loam	3, 919	2. 2
Fallsington fine sandy loam	503	. 3
Fallsington loam	5, 026	2. 8
Galestown loamy sand, 0 to 5 percent slopes	578	. 3
Galestown loamy sand, 5 to 15 percent slopes	125	(1)
Keyport loam, 0 to 2 percent slopes	930	. 5
Keyport loam, 2 to 5 percent slopes, moderately eroded	1, 005	. 6
Keyport loam, 5 to 10 percent slopes, moderately eroded	199	. 1
Keyport loam, 10 to 15 percent slopes	99	(1)
Keyport silt loam, 0 to 2 percent slopes	7, 090	4. 0
Keyport silt loam, 2 to 5 percent slopes, moderately eroded	3, 505	2. 0
Keyport silty clay loam, 5 to 10 percent slopes, severely eroded	532	. 3
Keyport silty clay loam, 10 to 15 percent slopes, severely eroded	118	(1)
Klej loamy sand	321	. 2
Made land	696	. 4
Matapeake loam, 0 to 2 percent slopes	2, 023	1. 1
Matapeake loam, 2 to 5 percent slopes, moderately eroded	5, 140	2. 9
Matapeake loam, 5 to 10 percent slopes, moderately eroded	468	. 3
Matapeake loam, 10 to 15 percent slopes	138	(1)
Matapeake silt loam, 0 to 2 percent slopes	1, 406	. 8
Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	2, 158	1. 2
Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	229	. 1
Matapeake silt loam, 5 to 10 percent slopes, severely eroded	1, 082	. 6
Matapeake silt loam, 10 to 15 percent slopes, severely eroded	149	(1)
Mattapex loam, 0 to 2 percent slopes	4, 178	2. 3
Mattapex loam, 2 to 5 percent slopes, moderately eroded	4, 051	2. 3
Mattapex silt loam, 0 to 2 percent slopes	6, 043	3. 4
Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	3, 761	2. 1
Mixed alluvial land	4, 893	2. 7
Othello silt loam	16, 307	9. 3
Othello silt loam, low	1, 470	. 8
Plummer loamy sand	99	(1)
Pocomoke sandy loam	187	. 1
Pocomoke loam	232	. 1
Portsmouth silt loam	358	. 2
Sassafras sandy loam, 0 to 2 percent slopes	6, 725	3. 8
Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	15, 927	8. 9
Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	1, 469	. 8
Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	3, 005	1. 7
Sassafras sandy loam, 10 to 15 percent slopes	1, 063	. 6
Sassafras sandy loam, 10 to 15 percent slopes, severely eroded	1, 026	. 6
Sassafras fine sandy loam, 0 to 2 percent slopes	303	. 2
Sassafras fine sandy loam, 2 to 5 percent slopes, moderately eroded	812	. 4
Sassafras loam, 0 to 2 percent slopes	2, 577	1. 4
Sassafras loam, 2 to 5 percent slopes, moderately eroded	4, 888	2. 7
Sassafras loam, 5 to 10 percent slopes, moderately eroded	469	. 3
Sassafras loam, 5 to 10 percent slopes, severely eroded	872	. 5
Steep land	2, 235	1. 2
Tidal marsh	6, 122	3. 4
Woodstown sandy loam, 0 to 2 percent slopes	6, 365	3. 6
Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded	2, 635	1. 5
Woodstown fine sandy loam, 0 to 2 percent slopes	688	. 4
Woodstown loam, 0 to 2 percent slopes	3, 435	1. 9
Woodstown loam, 2 to 5 percent slopes, moderately eroded	651	. 4
Total	178, 560	100. 0

[1] Less than 0.1 percent.

nevertheless, in alphabetic order along with the soil series.

Each series contains a short description of a typical soil profile and a much more detailed description of the same profile that scientists, engineers, and others can use in making highly technical interpretations. Some of the terms used to describe the soils are defined in the Glossary at the back of this soil survey. Others are defined in the "Soil Survey Manual" (*10*).[1]

Barclay Series

The Barclay series consists of deep, somewhat poorly drained soils that are nearly level to gently sloping. These soils occur in large areas in the western half of the county. They formed in marine sediments and have a silty surface layer and a silty subsoil in which little or no clay has accumulated.

In a typical profile in undisturbed areas, a loose layer of leaves, twigs, and decaying organic matter, about 4 inches thick, is on the surface. It is underlain by a mineral layer that is about 11 inches thick and consists of very strongly acid, very dark brown and yellowish-brown silt loam.

The subsoil, about 27 inches thick, is crumbly when moist, though it hardens when dry and is difficult to dig with a shovel. The upper part of the subsoil is extremely acid, yellowish-brown silt loam mottled with light brownish gray and strong brown. The middle part is extremely acid, light brownish-gray silt loam mottled with dark grayish brown and strong brown. The rest of the subsoil is very strongly acid, dark grayish-brown loam mottled with light olive brown.

The very strongly acid underlying material is loose and easily dug when moist. It is variegated dark-brown and brown sandy loam to a depth of 66 inches and is brown loamy fine sand below that depth.

The seasonal high water table of Barclay soils is about 6 inches from the surface during January, February, and March. In April the water table starts to drop, and by July it generally is below a depth of 4 feet.

Barclay soils are well suited to all general farm crops. These soils, however, are naturally acid and need additions of lime for good growth of crops. If fertilizer is added, large amounts of nutrients are retained for plant use because the fertilizer is not leached easily. To prevent delay in spring planting, surface water should be removed by ditches or other means. Even in drained areas tillage is delayed 2 or 3 days longer after wet weather than the delay on well-drained soils. If Barclay soils are compacted by several years of intensive cultivation, the growing of pasture or hay crops for several years lessens compaction. These soils are well suited to pasture.

The native vegetation on Barclay soils is primarily white and red oaks mixed with loblolly pine. Loblolly pine grows especially well on these soils and is widely used for reforesting them.

Barclay soils are limited for use as sites for industry or for densely populated communities. Septic systems fail because surface runoff is slow, because water moves moderately slowly through the soils, and because the water table is high for January through March. Basements are impractical because water seeps in during wet months. Maintenance of roads is costly unless drainage systems are installed.

Typical profile of Barclay silt loam, 0 to 2 percent slopes (on the east side of the Tunis Mills to Longwoods road, about 2.2 miles southwest of Longwoods on Miles River Neck):

O1&O2—4 inches to 0, a loose litter of leaves and twigs, underlain by decaying organic material.

A1—0 to 2 inches, very dark brown (10YR 2/2) silt loam; weak, fine, granular structure; friable, slightly sticky; fine fibrous and woody roots plentiful; very strongly acid; gradual, wavy boundary; horizon 1 to 4 inches thick.

A2—2 to 11 inches, yellowish-bown (10YR 5/6) silt loam that has few, fine, faint mottles of strong brown (7.5YR 5/8); weak, medium, subangular blocky structure; friable, slightly sticky but nonplastic; fine fibrous and woody roots plentiful; very strongly acid; diffuse boundary; horizon 6 to 9 inches thick.

B1—11 to 18 inches, yellowish-brown (10YR 5/6) silt loam that has many, coarse, distinct mottles of light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/8); weak to moderate, coarse, subangular blocky structure; friable to firm, slightly sticky but nonplastic; fine fibrous roots plentiful; extremely acid; gradual, wavy boundary; horizon 7 to 9 inches thick.

B2g—18 to 28 inches, light brownish-gray (2.5Y 6/2) heavy silt loam that has many, coarse, distinct mottles of dark grayish brown (2.5Y 4/2) and strong brown (7.5YR 5/8); weak, coarse, blocky structure; friable to firm, slightly sticky and slightly plastic; few roots; extremely acid; gradual, wavy boundary; horizon 8 to 12 inches thick.

B3g—28 to 38 inches, dark grayish-brown (2.5Y 4/2) loam, high in silt; few, fine, faint mottles of light olive brown (2.5Y 5/4); weak, coarse, blocky structure; firm, slightly sticky; few or no roots; very strongly acid; clear, wavy boundary; horizon 7 to 16 inches thick.

IIC1—38 to 66 inches, variegated dark-brown (7.5YR 4/4) and brown (10YR 4/3) sandy loam; massive (structureless); loose; no roots; very strongly acid; gradual, wavy boundary; horizon 15 to 30 inches thick.

IIC2—66 to 76 inches +, brown (10YR 4/3) loamy fine sand; single grain (structureless); loose; no roots; very strongly acid.

The solum ranges from 36 to nearly 50 inches in thickness. It generally is silt loam. Slight variations in texture are probably caused by stratification because there is little or no evidence that clay has moved or accumulated. Structure ranges from weak to moderate. The structure of the B3g horizon is weak and blocky, but it tends to be weak and platy in some places. Unless Barclay soils are limed, they are very strongly acid or extremely acid.

The Barclay soils normally occur between areas of Mattapex and Othello soils. Barclay soils are less poorly drained than the grayish Othello soils but are not so well drained as the Mattapex soils. The subsoil of the Barclay soils contains slightly less clay than that of the Othello and Mattapex soils, though typically the B2 horizon is heavy silt loam in all of these soils.

Barclay silt loam, 0 to 2 percent slopes (BaA).—This is the most extensive Barclay soil in the county. It has the profile described as typical for the series. In some areas the sandy underlying material begins at a depth of less than 36 inches. Water collects on the surface of this soil during winter, and if it is not removed by shallow plow furrows, spring plowing is delayed. In some areas, however, it is more economical to dig drains with a dragline. Surface water is not generally a concern during the growing season, though cultivation may be delayed after a heavy rain. Because this soil is nearly level and occurs in broad tracts, it is suitable for use of large farm equip-

[1] Italic numbers in parentheses refer to Literature Cited, p. 82.

ment. (Capability unit IIIw-1; woodland suitability group 3)

Barclay silt loam, 2 to 5 percent slopes, moderately eroded (BaB2).—This soil accumulates less surface water, has fewer poorly drained areas, and is more eroded than Barclay silt loam, 0 to 2 percent slopes, but is otherwise similar to that soil. In some areas this soil has lost as much as 75 percent of its original surface layer through sheet erosion. In some places the sandy underlying material occurs at a depth of only about 26 inches.

Included with this moderately eroded soil in mapping are a few severely eroded areas. These areas are rill eroded, and very small gullies have started to form.

Unless this soil is managed well, erosion continues. Practices that help to control further erosion and compaction are the disking and mulching of cornstalks or other crop residue and the rotation of pasture or hay crops. (Capability unit IIIw-1; woodland suitability group 3)

Borrow Pits

Borrow pits (Bp) are areas where all of the upper layers of soil material have been completely removed and the barren underlying material is exposed. Most of the Borrow pits in Talbot County generally are in areas of Sassafras soils. Almost all of the material taken from these pits is used for road subgrade or is treated to make macadam, a blacktop road surface. The depth of these pits normally is determined by the depth of material suitable for roads or depth to the water table.

Borrow pits are generally unsightly, are bare of vegetation, and have steep, eroding banks. Many of the pits have pools of shallow, stagnant water. In some places people illegally dump refuse in abandoned pits.

Although these areas cannot support farming, through special treatment and good management some vegetation could be established that would attract wildlife, as well as improve the esthetic value of the landscape. In some pits ponds might be established that would have value for wildlife or for recreation.

Nearly all trees common in Talbot County generally are hard to establish and have poor growth in these areas. Loblolly pine is adaptable, but its seedlings require special treatment. (Not assigned a capability unit; woodland suitability group 12)

Coastal Beaches

Coastal Beaches (Cb) consist of all grades of water-deposited sand. The sands normally shift and change through action of waves, currents, and winds. Coastal beaches occur in the western and southern parts of the county along tidal creeks, rivers, and bays. They are level or hummocky but do not have dunes. During hurricanes or spring tide the beaches are flooded by salt water.

On much of the coastal beaches native beach grasses have volunteered, among them saltmeadow cordgrass, coastal panicgrass, and American beachgrass. Loblolly and Virginia pine also have volunteered in several wide stabilized areas, but these trees grow very slowly and are of poor quality.

Coastal beaches are not suitable as building sites in Talbot County. They are, however, suitable as recreational areas or as habitat for some types of wildlife. (Capability unit VIIIs-2; woodland suitability group 12)

353-025—70——2

Downer Series

The Downer series consists of well-drained to somewhat excessively drained sandy soils. These level to strongly sloping soils formed in old sand deposits that contain some clay and silt. Downer soils have a thick, sandy surface layer underlain by a thin, somewhat finer textured, moderately developed subsoil. In Talbot County these soils occur on uplands in small areas near the upper reaches of the Choptank River and Tuckahoe Creek.

A typical profile in a cultivated area has a surface layer 16 inches thick. It is generally about 1 percent organic matter. The upper 12 inches is very strongly acid, dark-brown loamy sand through which water moves so easily that it never puddles on the surface, even after heavy rains. The lower part of the surface layer is strongly acid, dark yellowish-brown loamy sand.

The medium acid, yellowish-brown subsoil also is about 16 inches thick. The upper 7 inches is sandy loam that is slightly sticky when wet. It retains moisture for plants better than does the layer above. The rest of the subsoil is loamy sand that is not sticky.

The underlying material begins at a depth of 32 inches and in most places is yellowish-brown to strong-brown, loose sand that can be easily dug when dry or wet.

Downer soils do not have a fluctuating high water table; ground water remains below a depth of 5 feet during all seasons. Permeability is moderately rapid.

These soils warm early in the spring and become very hot during the summer. They are naturally acid, are low in fertility, generally do not retain moisture well for plant use, and are susceptible to soil blowing. In the top 2 feet, these soils can hold about 2.5 inches of moisture for use of plants. In areas irrigated by sprinklers, the maximum rate for water absorption is 0.9 inch per hour.

Downer soils are well suited to vegetables if lime and fertilizer are added and the soils are irrigated. Management practices are needed that supply organic matter, improve available moisture capacity, lessen soil blowing, and help reduce excessive heat in these soils in summer. If time and herbicides are applied, extra care is needed on these sandy soils to prevent damage to crops through burning. Downer soils generally are not well suited to pasture or hay crops, but alfalfa is deep rooted and may grow well on these soils.

The native vegetation is hardwoods and consists mainly of oaks, including blackjack and red oaks. Some of these trees are scrubby. In second-growth and cutover areas, Virginia pine is the dominant tree and seeds naturally. Loblolly pine grows in some of these areas, and where it is planted, it grows faster than does Virginia pine.

Downer soils are suitable as campsites. They also are suitable as sites for residential developments, though lawns may be difficult to establish and maintain. Septic systems give no trouble on these soils. Industries that discharge large quantities of water may find these soils especially well suited for their purpose. Downer soils generally are not suitable for ponds.

Typical profile of Downer loamy sand, 0 to 2 percent slopes, in a cultivated field (on the east side of State Route 328, about 2¼ miles east of Matthews):

Ap—0 to 12 inches, dark-brown (10YR 3/3) loamy sand; weak, medium, granular structure; very friable; fine fibrous roots abundant; very strongly acid; abrupt, smooth boundary; horizon 10 to 12 inches thick.

A2—12 to 16 inches, dark yellowish-brown (10YR 4/4) loamy sand; weak, medium, granular structure; very friable; fine fibrous roots abundant; strongly acid; diffuse boundary; horizon 3 to 6 inches thick.

B2t—16 to 23 inches, yellowish-brown (10YR 5/4 to 5/6) sandy loam; weak, medium, subangular blocky structure; friable; slightly sticky but nonplastic; fine roots abundant; clay bridges between sand grains; a few very faint clay films; medium acid; diffuse boundary; horizon 4 to 12 inches thick.

B3—23 to 32 inches, yellowish-brown (10YR 5/4) loamy sand; weak, medium, granular structure; very friable; fine roots abundant; medium acid; diffuse boundary; horizon 8 to 10 inches thick.

C1—32 to 39 inches, yellowish-brown (10YR 5/8) sand; single grain (structureless); loose; few roots; strongly acid; diffuse boundary; horizon 6 to 8 inches thick.

C2—39 to 52 inches +, strong-brown (7.5YR 5/8) sand; single grain (structureless); loose; no roots; strongly acid.

In some places a thin transitional B1 horizon occurs, and in some places the B3 horizon is lacking. Where present, the B1 and B3 horizons are loamy sand or light sandy loam. In places the B2t horizon has one or more thin strata of heavy sandy loam. The solum ranges from about 28 to 36 inches or more in thickness. The C horizon ranges from sand to light loamy sand and in many places has a lower chroma than in the profile described as typical for the series. The Downer soils are strongly acid or very strongly acid unless they have been limed.

The Downer soils are somewhat similar to Galestown soils, though the Galestown soils are loamy sand throughout the solum and typically have a strong brown Bt horizon. Downer soils also are somewhat similar to Sassafras soils but have a slightly thicker A horizon and a thinner B horizon and are not so fine textured.

Downer loamy sand, 0 to 2 percent slopes (DoA).—This soil has the profile described as typical for the series. Included with this soil in mapping are small areas of Galestown loamy sand and of Sassafras sandy loam.

This soil is well suited to vegetables, especially those planted early in the spring. Needed for maximum crop growth, however, are irrigation and large additions of fertilizer. Also needed are management practices that increase the amount of moisture held for plant use and that prevent damage from soil blowing. (Capability unit IIs-4; woodland suitability group 1)

Downer loamy sand, 2 to 5 percent slopes, moderately eroded (DoB2).—This soil has a thinner surface layer than that described as typical for the series. In most places about 75 percent of the original surface layer has been lost through erosion. Some areas are lighter and more yellowish than normal because plowing has turned up the subsoil. Soil eroded from the surface layer has accumulated at the base of slopes and in some slight depressions.

Included with this soil in mapping are areas of Sassafras sandy loam.

This Downer soil is suited to most vegetables if lime and fertilizer are added and the soil is irrigated. Most general farm crops lack enough moisture sometime during the growing season. The growth of hay and pasture crops is especially poor.

Management practices are needed that improve the ability of this soil to hold moisture for plant use and that lessen erosion.

This soil is poorly suited to trees, though Virginia pine generally seeds naturally. Where loblolly pine is planted, however, it grows faster than Virginia pine. (Capability unit IIs-4; woodland suitability group 1)

Downer loamy sand, 5 to 10 percent slopes, moderately eroded (DoC2).—In many places, much of the surface layer of this soil has been lost through erosion and the subsoil has been turned up by plowing. These areas generally are devoid of organic matter and can be recognized by their lighter, more yellow color.

Because this soil is droughty, most crops do not grow well. Hay and pasture crops are especially difficult to establish, and they grow poorly. Additions of lime and fertilizer are essential if crops are to be grown. Also needed are practices that control further erosion. (Capability unit IIIe-33; woodland suitability group 2)

Elkton Series

The Elkton series consists of deep, poorly drained, grayish soils that formed in marine sediments mostly of silty clay and silty clay loam texture. These nearly level soils occupy the central areas of peninsulas and necks in the western part of Talbot County. They also occur in the eastern part of the county in depressions not more than 2 acres in size.

In undisturbed areas a typical profile of Elkton soils has on the surface a loose layer of leaves, pine needles, twigs, and decaying organic matter about 2 inches thick. The mineral surface layer, about 5 inches thick, consists of sticky silt loam. It is very dark grayish-brown in the upper part and gray in the lower part. This layer feels like flour when it is crushed in the hand. When dug, however, the material does not crumble easily but tends to stick together. It is very strongly acid.

The subsoil, about 35 inches thick, is gray and light-gray silty clay in the upper part and dark-gray silty clay loam in the lower part. It is mottled with strong brown. When the subsoil is wet, it is similar to modeling clay and is very plastic. This dense clay subsoil is penetrated by roots, but they follow the weak cleavage lines. Water and air move slowly through the subsoil. Digging is difficult, especially during the dry summer. The clay is mostly kaolinite and does not greatly swell when wet or shrink when it dries. The subsoil is very strongly acid.

The underlying material begins at a depth of about 40 inches and is dark-gray sandy clay loam that is mottled with brown and yellowish brown. This material is moist or wet all year but, when wet, is only slightly plastic. It is strongly acid to neutral.

Elkton soils have a fluctuating high water table. It is at or near the surface during winter. In April the water table begins to drop gradually, and by midsummer, it is below a depth of 5 feet.

These soils compact easily, especially if worked or grazed when wet. The compaction further slows movement of water and air through these soils. Because they are wet and their light color reflects sunlight, Elkton soils warm slowly in spring. As a result, plowing and planting are delayed. If in drained areas these soils dry out in spring, they are difficult to work because large clods form that are difficult to break.

Elkton soils are suited to corn, soybeans, and small grains if lime and fertilizer are added and suitable drainage is provided. They are not suited to truck crops. Where late fall rains wet these soils, a late harvest of soybeans is difficult. Unless harvesting machinery is equipped with oversized tires, the harvesting may be delayed until the ground freezes. Frost heave is common during severe winters.

Deep outlets are needed for effective drainage. If outlets are established, shallow field drains, V-type ditches, or bedding can be used. Because water moves so slowly through these soils, tile drainage is effective only in lowering the high water table. Where suitable outlets are established, the tile should be placed in the coarse-textured underlying material.

These soils are well suited to white oak and loblolly pine, which cover much of the acreage. Other kinds of trees are hard to establish and grow slowly because Elkton soils are wet and their subsoil is dense. Logging is difficult during winter. After logging, soil compaction slows reestablishment of seedlings.

Elkton soils are suitable for constructing shallow ponds for wildlife. If the ground water is intercepted, these soils also provide suitable areas for constructing sewage lagoons. Other nonfarming uses are limited by the poor drainage. Septic systems fail because the water is high from January to April. When the water table is high, seepage makes basements impractical. Even where drainage is good, roads are difficult to maintain, particularly in severe winters where frost heave is serious.

Typical profile of Elkton silt loam (about 25 feet from the south side of the Ferry Neck Road, 1 mile southwest of Bellevue, in a woods of mixed pine and deciduous trees):

O1—4 to 2 inches, litter of leaves, pine needles, and twigs.

O2—2 inches to 0, partly decomposed organic material.

A11—0 to ½ inch, very dark grayish-brown (2.5Y 3/2) silt loam; weak, fine, crumb structure; friable, sticky; plentiful fibrous roots; very strongly acid; clear, smooth boundary; horizon 0 to ½ inch thick.

A12—½ to 2 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, crumb structure; friable, sticky; few fine roots; very strongly acid; gradual, wavy boundary; horizon 1 to 2 inches thick.

A2g—2 to 5 inches, gray (5Y 5/1) silt loam; weak, fine, blocky structure; friable, sticky and plastic; few fine roots; very strongly acid; clear, wavy boundary; horizon 2 to 4 inches thick.

B21tg—5 to 13 inches, gray (5Y 5/1) silty clay; common, coarse, prominent mottles of yellowish brown (10YR 5/6) and few, fine, prominent mottles of strong brown (7.5YR 5/8); weak, medium, platy structure and moderate, coarse, blocky structure; firm, very sticky; few fine roots; very strongly acid; diffuse, wavy boundary; horizon 5 to 10 inches thick.

B22tg—13 to 19 inches, light-gray (5Y 6/1) silty clay; dark-gray clay coatings in old root channels; common, coarse, prominent mottles of strong brown (7.5YR 5/8); weak, thick, platy structure and moderate, coarse, blocky structure; firm, very plastic; few fine roots; very strongly acid; diffuse, wavy boundary; horizon 5 to 8 inches thick.

B3g—19 to 40 inches, dark-gray (N 4/0) silty clay loam that his common, coarse, prominent mottles of strong brown (7.5YR 5/6) and few, medium, distinct mottles of light gray (N 6/0); medium, coarse, blocky structure that breaks to weak, thick, platy structure; firm, very plastic; very few fine roots; thin clay coatings of dark gray lining old root channels and vertical ped faces; very strongly acid; clear, smooth boundary; horizon 19 to 23 inches thick.

IIC1g—40 to 55 inches, dark-gray (5Y 4/1) very fine sandy clay loam that has few, medium, distinct mottles of brown (10YR 5/3); moderate, coarse, blocky structure; firm, slightly plastic; few or no roots; strongly acid; clear, smooth boundary; horizon 14 to 16 inches thick.

IIC2g—55 to 66 inches, gray (5Y 6/1) very fine sandy clay loam that has many, medium, distinct mottles of yellowish brown (10YR 5/6); massive (structureless); firm, slightly plastic; no roots; neutral.

In Talbot County, the surface layer of Elkton soils is loam or silt loam. Where it is loam, there are plow layers as much as 18 inches thick because material eroded from higher elevations has accumulated. The layers in the B horizon commonly are about 40 percent clay, but the texture ranges from heavy silty clay loam and silty clay to clay. The solum ranges from about 32 to 46 inches in thickness. The IIC horizon is sandy clay, clay, very fine sandy clay loam, fine sandy clay, or sand that has clay lenses or is silty. Where these soils are dry, colors may be one or two units higher in value than where moist. Elkton soils range from very strongly acid to extremely acid unless they have been limed. In some places where the soils are a few feet above sea level, the substratum is neutral, but in most places it is extremely acid.

In the western part of the county, Elkton soils are adjacent to Othello or Keyport soils. Elkton soils are similar to Othello soils but contain more clay in the B horizon. They are more poorly drained and have a grayer B horizon than Keyport soils. In some places in the eastern part of the county, Elkton soils are surrounded by the sandier Fallsington soils and in other places are in deep depressions surrounded by the better drained Sassafras or Mattapex soils.

Elkton loam (Ek).—This soil is in depressions in the eastern part of Talbot County. Unlike the profile described as typical for the series, this loamy soil contains medium and coarse sand in its surface layer and subsoil.

Included with this soil in mapping are areas of Fallsington loam.

Elkton loam is suited to general farm crops if it is properly drained. Drainage, however, is difficult because outlets are not generally available and are expensive to establish. Where outlets are available, a tile well can be installed in the center of the depressions and surface water led to it. Tillage is delayed in spring because farm machinery is likely to mire. Pasture and hay crops do well on this soil if the plants are water tolerant. (Capability unit IIIw–9; woodland suitability group 5)

Elkton silt loam (Es).—This nearly level soil occurs in broad areas and is the most extensive soil in the county. It has the profile described as typical for the series. During January, February, and March, the broad, nearly level areas have 1 to 4 inches of water ponded in the deepest depressions.

Included with this soil in mapping are areas of Othello soils. Also included are a very few, very small areas that have a silty clay loam texture; these occupy the deepest depressions.

Only where Elkton silt loam is properly drained is it suited to general farm crops, though water-tolerant pasture and hay crops grow well in undrained areas. Large farm machinery can be used in the drained broad areas.

Land shaping is needed to increase surface runoff, and drainage systems are necessary if crops are to be grown. Tile drainage systems generally are not suitable. (Capability unit IIIw–9; woodland suitability group 5)

Fallsington Series

The Fallsington series consists of deep, poorly drained, mottled soils that formed in unconsolidated sandy marine sediments containing significant amounts of clay and silt.

These soils occupy depressional areas of 1 to 20 acres in the eastern half of Talbot County.

In undisturbed areas a typical profile has on the surface a loose layer of hardwood leaves over a 3-inch thick mat of decaying leaf mold. The top mineral layer, about 3 inches thick, is dark-gray sandy loam. The next layer is about 5 inches thick and consists of light brownish-gray sandy loam mottled with light yellowish brown. In these mineral layers, the soil material crumbles easily when dug.

The subsoil, about 25 inches thick, has prominent, yellowish-brown mottles as large as a nickel. It is light brownish-gray sandy loam in the upper part, olive-gray sandy clay loam in the middle, and olive-gray sandy loam in the lower part. The movement of air and water through the subsoil is moderate except when the water table is high.

The underlying material is loamy sand that is variegated with olive gray and strong brown. It is loose when dug and is not sticky or plastic.

Fallsington soils have a fluctuating water table that reaches the surface in January and remains there during February, March, and most of April and then begins to drop. By midsummer it generally is at a depth below 4 feet. Because of this seasonal high water table and slow run-off, drainage is needed if these soils are farmed.

Fallsington soils primarily are used for general farming and for farm woodlots. Growing truck crops is difficult.

These soils respond well to additions of fertilizer if they are properly limed. Fertilizer and lime, however, tend to be leached more readily from these soils than from the heavier silt loams in the county. Even in drained areas, use of machinery generally is delayed several days longer than on the surrounding, well-drained Sassafras soils. Also, the longer that harvest is delayed on Fallsington soils, the greater is the risk that machinery mires after the rains late in fall.

Fallsington soils can be drained effectively by digging deep ditches with a dragline, or by installing tile where outlets are available. In the more sloping areas that have seeps, interceptor tile should be placed across the slope.

The native vegetation probably was mixed hardwoods and loblolly pine, though all wooded areas have been cut over. These soils are among the most suitable in the county for loblolly pine. Logging, however, is difficult during wet periods.

Use of Fallsington soils as residential sites is very limited. Because of the fluctuating high water table, septic systems fail, no matter how well they are installed. Basements are impractical because of seepage through January to mid-April. Some areas of Fallsington soils are suitable for dug ponds, but the water recharge rate is not high enough to permit irrigation. Maintenance of roads is difficult unless proper drainage has been provided.

Typical profile of Fallsington sandy loam (in a wooded area 2 miles east of Matthews, on the east side of State Route 328):

O1—5 to 3 inches, a loose layer of leaves from mixed hardwoods.

O2—3 inches to 0, a mat of partly decayed leaf mold.

A1—0 to 3 inches, dark-gray (10YR4/1) sandy loam; weak, fine, granular structure; very friable; abundant, fine, fibrous and woody roots; very strongly acid; clear, wavy boundary; horizon 2 to 4 inches thick.

A2—3 to 8 inches, light brownish-gray (2.5Y 6/2) sandy loam that has few, fine, faint mottles of light yellowish brown (10YR 6/4); weak, medium, granular structure; very friable, slightly sticky; abundant, fine, fibrous roots and many woody roots; extremely acid; clear, wavy boundary; horizon 4 to 9 inches thick.

B1g—8 to 13 inches, light brownish-gray (2.5Y 6/2) heavy sandy loam that has common, medium, prominent mottles of yellowish brown (10YR 5/4); weak, medium, subangular blocky structure; friable, sticky; many fine fibrous roots; extremely acid; gradual, wavy boundary; horizon 4 to 7 inches thick.

B2tg—13 to 23 inches, olive-gray (5Y 5/2) light sandy clay loam that has many, fine to coarse, prominent mottles of yellowish brown (10YR 5/8); moderate, coarse, subangular blocky structure; friable, sticky and slightly plastic; many fine roots and few fibrous roots; some root channels lined with thin clay coatings of gray (10YR 5/1); extremely acid; gradual, wavy boundary; horizon 9 to 12 inches thick.

B3g—23 to 33 inches, olive-gray (5Y 5/2) sandy loam that has common, coarse, prominent mottles of yellowish brown (10YR 5/6); weak, very coarse, subangular blocky structure; very friable, slightly sticky; few fine roots; extremely acid; clear, wavy boundary; horizon 9 to 12 inches thick.

IICg—33 to 60 inches, horizontally variegated olive-gray (5Y 5/2) and strong-brown (7.5YR 5/8) loamy sand; single grain (structureless); loose; few or no roots; extremely acid.

In Talbot County the surface layer of Fallsington soils is fine sandy loam, loam, or sandy loam. Where deposits have accumulated in depressional areas, the Ap horizon is as much as 14 inches thick. The B2tg horizon ranges from heavy sandy loam to fine sandy clay loam. The solum ranges from about 28 to 36 inches in thickness. The substratum is sand, fine sand, or loamy sand, or it is sand containing many sandy clay lenses. In some places dry Fallsington soils have colors that are one or two units higher in value that moist Fallsington soils. Reaction in Fallsington soils is very strongly acid or extremely acid except where the soils have been limed.

The poorly drained Fallsington soils are lower lying than the surrounding well-drained Sassafras soils (fig. 4). In some places Fallsington soils are adjacent to the moderately well drained Woodstown and the poorly drained Elkton soils. The Fallsington soils are coarser textured than the Elkton and Othello soils but otherwise are similar in profile characteristics. In many of the lowest lying areas where there are no natural outlets for water, there is a concentric pattern of soils. Starting from the outer, higher lying soils the order is well drained Sassafras, moderately well drained Woodstown, poorly drained Fallsington and very poorly drained black Pocomoks soils. In the center of the depressions are the heavier textured, very poorly drained Portsmouth soils.

Fallsington sandy loam (Fa).—Slopes of this soil are not more than 2 percent in most areas, but in a few places they are as much as 5 percent. This soil has the profile described as typical for the Fallsington series. Except for the texture of the surface layer, this soil is similar to Fallsington loam, though it is more easily plowed throughout a wider range of moisture content. It does not, however, supply as much moisture to plants as Fallsington loam.

Fallsington sandy loam is one of the best soils in the county for growing loblolly pine. Sweetgum and oak grow naturally on this soil but not so well as on the finer textured loams and silt loams. (Capability unit IIIw-6; woodland suitability group 5)

Fallsington fine sandy loam (Ff).—The surface layer of this soil feels like scouring powder. Except that most of the sand is fine instead of medium or coarse, this soil has a profile similar to the one described as typical for the

Figure 4.—**Typical undrained depressional area of a Fallsington soil in needlegrass. Plowed, higher lying area of Sassafras soil is in the background.**

series. Slopes generally are not more than 2 percent but are as much as 5 percent in a few areas.

This soil is suited to general farm crops only if it is drained. In undrained areas water-tolerant pasture plants can be grown.

The recharge rate for irrigation ponds is not so great as that for ponds dug in Fallsington sandy loam. (Capability unit IIIw-6; woodland suitability group 5)

Fallsington loam (Fg).—Slopes of this soil are generally not more than 2 percent but in a few places are as much as 6 percent. Except that the surface layer of this soil is loam rather than sandy loam, its profile is similar to the one described as typical for the series. In many places water moves through this loam more slowly than through Fallsington sandy loam. As a result, Fallsington loam generally dries more slowly than the sandy loam and, during dry summers, has more moisture available for plant use.

Included with Fallsington loam in mapping are areas of Elkton loam.

Fallsington loam is well suited to pasture plants and, if properly drained, is suited to all general farm crops grown in the county. In some areas, Fallsington loam contains so much clay in the subsoil that tile drainage is impractical. (Capability unit IIIw-7; woodland suitability group 5)

Galestown Series

The Galestown series consists of somewhat excessively drained, level to strongly sloping, sandy, dark-brown soils. These soils border the Choptank River and Tuckahoe Creek in the eastern half of Talbot County.

In undisturbed areas a profile typical for the Galestown series has on the surface a loose layer of scattered pine needles and the leaves of mixed hardwoods. It is underlain by decaying leaf mold 1 inch thick. The top mineral layer is about 9 inches thick and consists of very strongly acid, dark-brown loamy sand that is easy to dig with a shovel. When held in the hand, this very loose material runs through the fingers. Less than 1 percent of this layer is organic matter.

The subsoil, about 17 inches thick, is strongly acid, strong-brown loamy sand through which water and air generally move rapidly. Although an abundance of fibrous roots has penetrated this layer, the sides of holes dug in the loose material cave in readily.

The underlying material begins at a depth of about 26 inches and is very strongly acid, yellowish-brown, loose sand that feels like the sand on ocean beaches.

Where Galestown soils are at low elevations near a river or creek, the water table is at a depth of about 5 feet; where elevations are higher, the water table is always well below that depth.

In the first 2 feet of soil, about 2 inches of water is held for plant use. Crops grown on these droughty soils are damaged yearly. In areas irrigated by sprinklers, the maximum rate of water absorportion is 1 inch per hour.

These soils are droughty, naturally acid, and low in fertility. Also, they are highly susceptible to soil blowing.

If the soils are effectively irrigated and are properly limed and fertilized, they are well suited to vegetable crops. They are not generally used for field crops. Pasture and hay crops are poorly suited to these soils.

Management practices are needed that supply organic matter, that increase available moisture capacity, and that lessen soil blowing. Additions of fertilizer should be in small, frequent applications over long periods so as to help offset the loss of nutrients through leaching. Lime or herbicides also should be applied frequently in small amounts because crops burn easily on these sandy soils if large amounts are used. Nitrogen is needed in side dressings.

The native vegetation on Galestown soils is generally Virginia pine mixed with blackjack oak and sassafras trees. Although Virginia pine seeds naturally on these soils, the planting of loblolly pine is economically more practical. On these soils, however, no tree has good growth and practices of forest improvement are not so rewarding as on other soils in the county. Pricklypear is a typical ground cover on Galestown soils.

Because Galestown soils are droughty, they are not well suited for development as wildlife habitat. Limitations for intensively used camping areas are severe because these soils are droughty and loose. Galestown soils, however, are suitable as building sites, though lawns are hard to establish and maintain. They also are suitable for disposal of industrial water. Their looseness limits use as road subgrade material. They are not suitable as sites for ponds.

Typical profile of Galestown loamy sand, 0 to 5 percent slopes (25 feet from the west bank of Tuckahoe Creek, approximately 2 miles northeast of Lewistown):

O1—2 inches to 1 inch, scattered pine needles and leaves of mixed hardwoods.

O2—1 inch to 0, partly decayed leaf mold.

A1—0 to 9 inches, dark-brown (7.5YR 4/2) loamy sand; single grain (structureless); loose; abundant fibrous roots; very strongly acid; clear, wavy boundary; horizon 5 to 9 inches thick.

B2t—9 to 26 inches, strong-brown (7.5YR 5/6) loamy sand; single grain (structureless); loose, very slightly sticky; plentiful fibrous roots and few woody roots; some clay bridges; strongly acid; diffuse boundary; horizon 17 to 36 inches thick.

C—26 to 60 inches, yellowish-brown (10YR 5/6) sand; single grain (structureless); loose; very few fine roots in upper part; very strongly acid.

The surface layer of Galestown soils is of weak structure in some places and in other places is structureless. The B2t horizon ranges from slightly sticky to very slightly sticky. The solum ranges from about 22 to 45 inches in thickness. In some areas a IIC horizon of sand containing a large amount of silt occurs that is finer textured than the overlying horizons. In many places where this horizon occurs, there is evidence of wetness.

Galestown soils generally occupy areas adjacent to the Sassafras and the Klej soils. The subsoil in the Galestown soils is coarser textured than the sandy clay loam subsoil in the Sassafras soils and has less available moisture capacity. The Galestown soils are similar to the Klej soils, except that the water table in Galestown soils is never above a depth of 5 feet, but the Klej soils have a seasonal, fluctuating high water table that is near the surface from January to May and is above a depth of 4 feet most of the year.

Galestown loamy sand, 0 to 5 percent slopes (GaB).—This soil has the profile described as typical for the Galestown series. Included in mapping are small areas of a soil that is paler and more yellow than the typically dark-brown Galestown soils. These included soils lack a sticky B2t horizon like the one in the profile described as typical for the series.

Galestown loamy sand, 0 to 5 percent slopes, is low in available moisture holding capacity, and it does not naturally retain enough nutrients for good growth of plants. It is well suited to truck crops, however, if it is effectively irrigated and additions of lime and fertilizer are properly applied. It warms early in the spring. This sandy soil is easy to work with light farm equipment.

All trees grow slowly on this Galestown soil. (Capability unit IVs–1; woodland suitability group 8)

Galestown loamy sand, 5 to 15 percent slopes (GaC).—This soil is similar to Galestown loamy sand, 0 to 5 percent slopes, except that it is more sloping and more susceptible to erosion. In some places some of the surface layer has been blown or washed away, but this erosion has had no effect on use or management.

This soil is too droughty and too strongly sloping to be suited to general farm crops or to hay and pasture.

It has limitations to good growth of trees. Although Virginia pine seeds naturally on this soil, the planting of loblolly pine is economically more practicable.

Limitations are severe for development of wildlife habitat. (Capability unit VIIs–1; woodland suitability group 8)

Keyport Series

The Keyport series consists of deep, moderately well drained soils that formed in silty clay marine sediments. Where these soils occur near the town of St. Michaels and on Tilghman Island, they are level to gently sloping. Where they occur in other parts of the county, they are level to strongly sloping.

In undisturbed areas a profile typical of the Keyport series has a 2-inch mat of decayed organic material on the surface. The surface mineral layer is very dark gray, light olive-brown, and yellowish-brown silt loam about 9 inches thick.

The subsoil, about 25 inches thick, is yellowish-brown silty clay loam to a depth of 19 inches and is light yellowish-brown mottled with grayish brown and strong brown below that depth. A few fine roots are in the upper part. The subsoil is so hard when it is dry that it must be dug with a pick. Water and air move through it with difficulty. When wet, the subsoil material is plastic and forms a ribbon if squeezed between the thumb and forefinger. The clay does not shrink and swell much upon alternate wetting and drying.

The underlying material of grayish-brown silty clay loam begins at a depth of 34 inches, and very few roots penetrate this horizon.

During February and March, Keyport soils have a water table within 20 inches of the surface. Subsurface drainage, however, is not practical.

These soils are low in natural fertility and very strongly acid or extremely acid. After adequate additions of lime on these soils, crops respond well to large amounts of fertilizer. Fertilizer and lime are not easily leached or washed from these soils.

Keyport soils are suited to grain crops and to hay and pasture crops. In many places, however, some form of surface drainage is needed for good growth of grain crops, though hay and pasture crops grow well without artificial drainage. Unless these soils are limed, they are not suited to most farm crops.

Compaction is a concern of management if these soils are worked or grazed when wet. Subsoiling, or the breaking up of the dense subsoil, is not a solution, but if pasture crops are grown for several years, compaction is reduced. Compaction is not an obstacle to the growth of trees, because fine roots penetrate to considerable depths through natural cracks in the subsoil.

The native vegetation of Keyport soils is mixed hardwoods. Cutover and second-growth areas are invaded by pines. Although some oaks still grow on these soils, loblolly pine is used almost exclusively for reforesting.

Keyport soils have limitations for use as sites for industrial or community developments. Septic tanks fail on Keyport soils because water moves slowly through them and because the water table rises to within 20 inches of the surface and remains there for about 2 months. Even in drained areas, maintenance of roads is difficult on these soils because of frost heave during the winter.

Typical profile of Keyport silt loam, 0 to 2 percent slopes, in a wooded area (about 2½ miles southeast of Easton):

O2—2 inches to 0, a mat of decomposed organic material.

A11—0 to 1 inch, very dark gray (10YR 3/1) silt loam; weak, medium, granular structure; friable, slightly sticky; plentiful roots; very strongly acid to extremely acid; clear, wavy boundary; horizon ½ to 1 inch thick.

A12—1 to 4 inches, light olive-brown (2.5Y 5/4) silt loam, variegated with yellowish brown (10YR 5/4); weak, medium, granular structure and fine subangular blocky structure; friable, slightly sticky; plentiful roots; very strongly acid to extremely acid; gradual, wavy boundary; horizon 3 to 5 inches thick.

A2—4 to 9 inches, yellowish-brown (10YR 5/4 to 5/6) heavy silt loam; weak, medium, granular structure and fine, subangular blocky structure; friable, sticky; few fine roots; very strongly acid to extremely acid; diffuse boundary; horizon 4 to 6 inches thick.

B21t—9 to 19 inches, yellowish-brown (10YR 5/6 to 5/8) heavy silty clay loam, somewhat variegated with brown (10YR 5/3) or yellowish brown (10YR 5/4); moderate to strong, medium, subangular blocky structure; very hard, firm, sticky and plastic; few fine roots; thin, discontinuous clay films; very strongly acid; gradual, wavy boundary; horizon 10 to 14 inches thick.

B22t—19 to 34 inches, light yellowish-brown (2.5Y 6/4) silty clay loam that has many, coarse, distinct mottles of grayish brown (2.5Y 5/2) and prominent mottles of strong brown (7.5YR 5/8); moderate, coarse, blocky structure that tends to be weak and platy; very hard, very firm, sticky and plastic; few fine roots in upper part; some coatings of dark gray (10YR 4/1) on peds; some prominent vertical cleavages, ¼ to ½ inch thick, irregularly spaced 6 to 15 inches apart, and filled with silt and organic matter; very strongly acid; diffuse boundary; horizon 12 to 18 inches thick.

Cg—34 to 56 inches +, grayish-brown (2.5Y 5/2) light silty clay loam that has many, coarse, distinct mottles of light yellowish brown (2.5Y 6/4) and prominent mottles of strong brown (7.5YR 5/8); massive (structureless), but has irregular spaced vertical cleavages; very hard, very firm, slightly sticky and slightly plastic; no roots; very strongly acid to extremely acid.

In Talbot County the texture of the surface layer of Keyport soils is loam, silt loam, or silty clay loam. In some areas the soils in this county have Bt horizons that contain somewhat less clay than the Bt horizons in the profile described as typical for the series. The Keyport series typically is centered around Bt horizons of silty clay that has an average content of clay well above 35 percent, but in this county Keyport soils have Bt horizons of heavy silty clay loam that has an average content of clay of only slightly more than 35 percent. Here these soils have a B22t horizon that characteristically is hard and firm, has relatively high bulk density, and appears to be very compact. The thickness of the solum ranges from about 34 to 48 inches. In some places the C horizon is underlain, or is replaced, at a depth of 40 inches or more, by a IIC horizon that ranges from fine sand to sandy loam. Where this IIC horizon replaces the C horizon, there may be a transitional IIB3 horizon of fine sandy clay loam that may be as much as 6 inches in thickness.

Keyport soils are similar to Woodstown and Mattapex soils in color and drainage but have a more clayey subsoil. Also, the subsoil in Keyport soils generally is more silty and less sandy than that in Woodstown soils. The Keyport soils are closely associated with the poorly drained Elkton soils and formed in the same kind of marine fine sediments.

Keyport loam, 0 to 2 percent slopes (KmA).—This soil occurs in shallow depressions where soil material that was sheet eroded from adjacent higher areas is deposited. It has a profile similar to the one described as typical for the series except that the surface layer and the subsoil in this soil contain more sand and the surface layer normally is thicker. In most places this soil is sandier and deeper than Keyport silty clay loam.

Included in mapping are areas of the sandier Woodstown soils.

This Keyport soil receives much runoff from adjacent, higher areas. This water lies on the surface late in winter and early in spring and delays early plowing. Where surface drainage is not installed, a heavy rainstorm during the growing season drowns out cultivated crops. In drained areas, however, this soil is suited to all general farm crops.

Tile drainage is not suitable for Keyport loam, 0 to 2 percent slopes, because its subsoil is slowly permeable. (Capability unit IIw-8; woodland suitability group 4)

Keyport loam, 2 to 5 percent slopes, moderately eroded (KmB2).—This soil is penetrated slowly by water, and runoff has eroded away about 75 percent of the surface layer. In most areas the more yellow and lighter colored subsoil has been mixed into the remaining surface layer. These areas contain far less organic matter than uneroded areas and tend to be more droughty. In most areas a good seedbed is difficult to prepare and seed germinates slowly. Except that this soil is eroded and that water does not collect on its surface, this loam soil is similar to Keyport loam, 0 to 2 percent slopes.

Management practices are needed that reduce the susceptibility of this soil to erosion. Also needed for good growth of crops are adequate additions of lime and fertilizer. (Capability unit IIe-13; woodland suitability group 4)

Keyport loam, 5 to 10 percent slopes, moderately eroded (KmC2).—This soil has lost about 7 inches of its surface layer through sheet erosion. This erosion occurred so slowly over so many years that it is not easily observable. In many places the subsoil has been mixed into the remaining surface layer, and the soil is lighter in color than the surrounding soil. In the more eroded areas the soil is devoid of organic matter, has poor structure, and crusts after a rain. During winter and spring seepage occurs at the base of slopes and delays tillage in spring for as much as a week.

Included in mapping are areas of Mattapex loam and of Mattapex silt loam.

This soil is suited to all general farm crops, but management practices are needed for controlling further erosion and for draining seepage areas. (Capability unit IIIe-13; woodland suitability group 7)

Keyport loam, 10 to 15 percent slopes (KmD).—This soil is mostly wooded. It is similar to Keyport loam, 5 to 10 percent slopes, moderately eroded, but is more sloping, is more susceptible to erosion if cleared and tilled, and has greater seepage for a longer period. This soil should remain wooded or should be developed as wildlife habitat. (Capability unit VIe-2; woodland suitability group 7)

Keyport silt loam, 0 to 2 percent slopes (KpA).—This soil is more extensive than any other Keyport soil in Talbot County. Its surface layer is less sandy than the surface layer in the Keyport loams and is less clayey than that layer in Keyport silty clay loams. This silt loam has the profile described as typical for the series.

Water collects on the surface of this soil during the winter and delays spring plowing unless this soil is drained. Although surface water generally is not a concern during the growing season, it may delay field operations after a heavy rain. Because this soil is level and occupies large areas, it is well suited to use of large farm machinery. The soil, however, compacts easily if worked or grazed when very wet.

In many areas where this soil borders tidal streams, erosion of the banks is very active. The banks are undercut when the sandier underlying material is washed away. Then large blocks of remaining soil break off and are eroded away by tidal action (fig. 5). (Capability unit IIw-8; woodland suitability group 4)

Keyport silt loam, 2 to 5 percent slopes, moderately eroded (KpB2).—This soil does not absorb so much surface water as Keyport silt loam, 0 to 2 percent slopes, and in places has lost as much as 75 percent of its surface layer. In these areas the subsoil has been mixed into the remaining surface layer by plowing and the present surface layer is lighter colored than in other places. Seed germinates slowly on the soil in the more eroded areas because it is low in organic matter.

Included in mapping are areas of a soil material that is underlain by fine sand or by sandy loam at a depth of 30 inches or more.

Although this soil is only moderately well drained, the growth of general farm crops ordinarily is not affected by drainage. Management practices are needed for controlling further erosion. (Capability unit IIe-13; woodland suitability group 4)

Keyport silty clay loam, 5 to 10 percent slopes, severely eroded (KsC3).—This soil has lost nearly all of its original surface layer through erosion. The existing surface layer, mainly material from the subsoil, is devoid of organic matter. It contains more clay and less sand than the surface layer in the Keyport silt loams or the Keyport loams. This soil erodes easily, is hard when dry, and is sticky when wet. It is wet into midsummer because of seepage at the base of slopes.

Included in mapping are small areas of severely eroded Mattapex loams and of Mattapex silt loams.

If this soil is used for cultivated crops, the crops grow poorly and erosion increases. Water-tolerant hay and pasture crops grown continuously help to control further erosion. Overgrazing of pasture should be avoided.

Although reforesting provides effective control of erosion, establishment of seedlings is difficult and growth of trees is slow. Areas of this soil, however, have good potential for wildlife habitat. (Capability unit VIe-2; woodland suitability group 7)

Keyport silty clay loam, 10 to 15 percent slopes, severely eroded (KsD3).—This soil has lost all of its original surface layer through erosion, and the existing surface layer, mainly subsoil material, is devoid of organic matter. Susceptibility to further erosion should be lessened by reforestation or by sprigging or seeding the soil to grasses and limiting grazing. The establishment of trees or grasses, however, is difficult because the soil is infertile, steep, and sticky when wet and hard when dry. (Capability unit VIIe-2; woodland suitability group 7)

Klej Series

The Klej series consists of moderately well drained, yellowish-brown, sandy soils. These level to gently sloping soils formed in sandy marine sediments. They occur near the towns of Trappe and Cordova and are slightly depressional or are near the base of gentle slopes.

In undisturbed areas a typical profile for Klej soils has an uneven layer of mixed hardwood leaves and pine needles that is underlain by a thin mat of decaying leaf mold. The mineral surface layer (A horizon) is loamy sand about 23 inches thick. It is dark grayish-brown in the upper part and yellowish-brown in the rest. This loamy sand is not sticky when moist and is easily dug with a shovel when wet or dry. Many roots have penetrated this layer.

The next layer is yellowish-brown and yellowish-red sand that is mottled with light brownish gray in the upper part. This material is loose and feels much like beach sand. Below a depth of 35 inches the sand is mottled with grayish brown and contains well-rounded quartz pebbles.

Klej soils have a fluctuating water table that remains 18 to 24 inches from the surface from January to May. The water table drops to a depth of 4 feet or more late in summer and the soils tend to be droughty.

Figure 5.—A Keyport silt loam that has been undercut by tidal action. Large compact blocks have broken off and are being eroded away.

These soils are very strongly acid throughout the profile, and water and air move rapidly through all layers.

Klej soils are not important for growing crops, because they occur in small areas that require drainage. These wet areas are a nuisance, for they commonly occur in large cultivated fields. Because Klej soils are droughty from summer to early in fall, hay and pasture crops do not grow well.

Klej soils require artificial drainage if they are used for most farm crops. Additions of lime and of fertilizer also are needed for good growth of crops because these soils are naturally acid and are low in fertility. Care must be taken in applying lime because the soils are easily overlimed and the crops burn. Also, since fertilizer leaches readily from Klej soils, it should be added frequently in side dressings.

Tile drains or open ditches dug by a dragline are well suited for controlling the water table. But ditches are difficult to establish because banks slough readily. Even where these sandy soils are properly drained, equipment sometimes mires during operations in spring.

Although Klej soils are suited to many kinds of trees, the native vegetation probably was mixed water-tolerant hardwoods. The native forests have been cut over, and the present woodland consists of hardwoods mixed with loblolly pine. Gum, oak, and yellow-popular grow well on these soils, but loblolly pine is preferred for reforesting.

Klej soils are not very suitable for use as sites for homes, because the fluctuating high water table causes seepage in basements and failure of septic systems. Lawns are difficult to maintain on these droughty soils during summer. Because these soils have only fair stability, roads built on them do not hold up well, even where subsurface drainage is installed.

Typical profile of Klej loamy sand (approximately 500 feet from the north side of Skipton-Cordova Road, 3 miles northeast of the town of Skipton, in a wooded area):

O1—4 to 2 inches, an uneven layer of mixed hardwood leaves and pine needles.

O2—2 inches to 0, a thin mat of partly decomposed leaf mold.

A11—0 to 7 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; many, fine, fibrous and woody roots; very strongly acid; clear, wavy boundary; horizon 6 to 10 inches thick.

A12—7 to 23 inches, yellowish-brown (10YR 5/4) loamy sand; weak, fine, granular structure; very friable; many, fine, fibrous roots; very strongly acid; gradual, wavy boundary; horizon 14 to 18 inches thick.

C1—23 to 35 inches, yellowish-brown (10YR 5/6) medium sand; common, medium, distinct mottles of light brownish gray (2.5Y 6/2); single grain (structureless); loose; few fine roots; very strongly acid; gradual, wavy boundary; horizon 8 to 12 inches thick.

C2—35 to 50 inches +, yellowish-red (5YR 4/6) medium to coarse sand and approximately 15 percent well-rounded quartz pebbles; common, coarse, prominent mottles of grayish brown (2.5Y 5/2); single grain (structureless); loose; few fine roots; very strongly acid.

Where Klej soils have been farmed, they have an Ap horizon about 10 inches thick. The color of the C horizons is grayish brown in some places. In places the C horizons do not contain quartz gravel. The color of dry Klej soils may be 1 or 2 units higher in value than that of moist Klej soils. Unless Klej soils have been limed, reaction ranges from strongly acid to extremely acid.

The Klej soils formed in the same kind of sandy marine sediments as did the Galestown and the Plummer soils. The Klej soils are not so poorly drained nor so grayish as the Plummer soils and do not have a high water table so near the surface. In contrast to Klej soils, the Galestown soils have a water table that is never within 5 feet of the surface. Klej soils are adjacent to the Sassafras and Woodstown soils but are sandier and contain less clay than the Sassafras or Woodstown soils and are wetter than the Sassafras.

Klej loamy sand (Ky).—This soil occurs in areas of 1 or 2 acres. Slopes are generally 1 or 2 percent but are as much as 5 percent in some places. The profile of this soil is the one described as typical for the Klej series.

Included with this soil in mapping are small areas of the less sandy Woodstown soils. Also included are areas of a Klej soil that has a sandy loam surface layer.

Klej loamy sand occurs in such small areas that it has little effect on the management of surrounding soils, though in spring these small areas are a nuisance unless they are drained. Drainage by tile is suitable if outlets are available. During the drier summer months, not so much moisture is supplied to plants by this soil as by surrounding soils and crops do not grow so well.

Klej loamy sand should remain forested. (Capability unit IIIw–10; woodland suitability group 3)

Made Land

Made land (Ma) consists of soils that have been so disturbed by man that they do not have a normal profile. Some areas occur near towns or villages where earthmoving equipment has rearranged the soil in preparation of sites for homes, parking lots, airports, or other developments.

Higher areas normally have been leveled and low areas filled with a mixture of varied soil materials. In areas along tidal waters, some filling has been done with material that has been dredged from the bottom of rivers or creeks so as to improve the channel or to make boat slips.

This land generally is very strongly acid to extremely acid and is not fertile. Where formed from dredge material, this land is so salty that common grasses do not grow on it until most of the salt has leached out. Leaching normally takes 2 to 4 years, but it can be hastened by adding gypsum.

Because this land is so variable, each site should be examined by a soil technician if it is to be used for farm or nonfarm purposes. (Woodland suitability group 12; not assigned a capability unit)

Matapeake Series

The Matapeake series consists of deep, well-drained soils that are level to strongly sloping. These soils developed in silty marine sediments throughout Talbot County.

In cultivated areas these soils typically have a dark-gray loam plow layer about 11 inches thick. This material breaks into crumblike pieces when dug with a spade. It retains moisture well, and this moisture is easily available for crop use. About 2 to 3 percent of the surface layer is organic matter. The plow layer is underlain by about 3 inches of yellowish-brown silt loam.

The subsoil, about 25 inches thick, is brown to strong-brown silty clay loam in the upper part and strong-brown loam in the lower part. Roots and air move through this layer easily, but large amounts of water and fertilizer elements are retained in the layer and are easily available for plants.

The underlying material is yellowish-brown, loose sand, grading in color to light gray with depth. Water and air pass through this material very readily, and it can be dug or excavated easily.

Matapeake soils do not have a high water table. Ground water is below a depth of 5 feet all year.

The topmost 18 inches of soil holds an average of 3 inches of moisture available for plants. If these soils are irrigated, application of water should not exceed 0.4 inch per hour. Permeability is moderate.

Uneroded areas of Matapeake soils make some of the best cropland in the county. Corn grows especially well in the less sloping areas. Where properly limed, these soils respond very well to large amounts of fertilizer. They retain moisture well and hold it easily available for plants.

Matapeake soils are easily managed. After a heavy rain, only 1 day is required for drying before field operations can be resumed. Plowpans may form, but they can be broken up by varying the depth of plowing each year or by seeding hay or pasture plants. Because Matapeake soils are mostly nearly level to gently sloping and are in large areas, heavy farm equipment easily can be used.

Nearly all of the acreage of Matapeake soils has been cleared of native vegetation, which probably was mixed hardwoods. These soils, however, are well suited to most kinds of trees adapted to this area. Loblolly pine is a good tree for reforesting. On these soils logging equipment can be used without difficulty during any season.

Matapeake soils are well suited as sites for industrial or community developments except in some areas with excessive slope.

Grass and shrubs grow well on these soils. Basements dug in Matapeake soils remain dry because the soils are moderately permeable and the underlying material is loose and sandy. Roads are easily maintained if adequate surface drainage has been provided.

Profile of Matapeake loam, 0 to 2 percent slopes (in a level cultivated field one-half mile south of Easton on the west side of U.S. Highway No. 50):

Ap—0 to 11 inches, dark-gray (10YR 4/2) loam; moderate, medium to fine, granular structure; very friable, sticky; very abundant fine roots; neutral (limed); abrupt, smooth boundary; horizon 10 to 11 inches thick.

A2—11 to 14 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, subangular blocky structure; firm, sticky; many fine roots; slightly acid; gradual, wavy boundary; horizon 0 to 3 inches thick.

B2t—14 to 29 inches, brown to strong-brown (7.5YR 5/4 to 5/6) light silty clay loam; weak, medium, subangular blocky structure; firm, sticky and slightly plastic; few fine roots in upper part; thin discontinuous clay coats in pores and old, dark yellowish-brown (10YR 4/4) root channels; slightly acid; gradual, wavy boundary; horizon 13 to 16 inches thick.

B3—29 to 39 inches, strong-brown (7.5YR 5/6) loam containing large percentage of silt; weak, medium, subangular blocky structure; hard, firm, slightly sticky; few or no roots; slightly acid; gradual, wavy boundary; horizon 8 to 12 inches thick.

IIC—39 to 60 inches, sand that is yellowish brown (10YR 5/8) grading to light gray (10YR 7/2) with depth; single grained (structureless); loose; slightly acid.

The Ap horizon is silt loam in some places. The B2t horizon is generally heavy silt loam or light silty clay loam, but in some places it is clay loam. In many places structure is moderate throughout the profile. The B3 horizon has fine faint mottles in places. Depth to material coarser than silt loam generally is about 32 inches, but this depth is as much as 40 inches in some places. The IIC horizon is sand, loamy sand, loamy fine sand, or sandy loam streaked with sand. When Matapeake soils are dry, value is one or two units higher than value in a moist profile. Except in limed areas, Matapeake soils are strongly acid to extremely acid.

The Matapeake soils generally occur next to Mattapex soils or next to Sassafras soils. Matapeake soils are similar to Sassafras soils but are less sandy and have a B2t horizon of light silty clay loam instead of sandy clay loam. Matapeake soils formed in silty material that is similar to the parent material of the Mattapex, Barclay, Othello, and Portsmouth soils. In contrast to the well-drained Matapeake soils, the Mattapex soils are moderately well drained, the Othello soils are poorly drained, and the Portsmouth soils are very poorly drained and have a black A1 horizon.

Matapeake loam, 0 to 2 percent slopes (MkA).—This soil is more shallow to sandy underlying material than is normal for the Matapeake loams in other counties. It is, however, representative of the Matapeake loams in this county, and it has the profile described as typical for the Matapeake series.

This soil contains more sand in the surface layer than does Matapeake silt loam, 0 to 2 percent slopes, and therefore is more easily worked, does not crust so readily, and dries more quickly.

This Matapeake loam occurs closely with the Sassafras soils, and small areas of Sassafras loams are included in mapping. Also included are small areas of moderately well drained Mattapex soils.

This Matapeake soil generally is excellent for crops, pasture, and forests. It retains moisture well, and this moisture is readily available for crops.

Additions of lime and fertilizer are needed, but practices to control erosion or to improve drainage generally are not. If management is good, and crop residue is mixed with the soil, compaction is not likely. (Capability unit I-4; woodland suitability group 1)

Matapeake loam, 2 to 5 percent slopes, moderately eroded (MkB2).—This is the most extensive Matapeake soil in the county. It has a profile similar to the one described as typical for the series except that in many places as much as 75 percent of its original surface layer has been lost through erosion. In these areas plowing mixes material from the subsoil into the surface layer. Surface crusting is likely after a rain, and the content of organic matter and nitrogen is low. Also, seed germinates poorly in these eroded areas.

Included with this soil in mapping are small, severely eroded areas in which very shallow gullies had started to form.

Because this soil is susceptible to erosion, management for reducing runoff is needed. Also needed are additions of lime and fertilizer for most crops. (Capability unit IIe-4; woodland suitability group 1)

Matapeake loam, 5 to 10 percent slopes, moderately eroded (MkC2).—In cultivated areas of this soil as much as 75 percent of the surface layer has been lost through sheet erosion. These areas can be identified by their lighter, more yellowish color. In these areas this soil does not retain moisture well, and it is low in content of organic matter and of nitrogen. The surface crusts easily after a rain. Seed germinates poorly in the eroded areas.

This soil is mostly cultivated but is partly wooded. It is suited to all crops grown in the county, but intensive management is needed for preventing further erosion. Additions of lime and fertilizer are needed for good growth of crops.

Growing on the woodland are excellent stands of yellow-poplar that has seeded naturally. (Capability unit IIIe-4; woodland suitability group 2)

Matapeake loam, 10 to 15 percent slopes (MkD).—This soil is more sloping than Matapeake loam, 5 to 10 percent slopes, moderately eroded, and has seepage water at the base of its slopes. Otherwise the two soils are similar. Because almost all of this soil is woodland, little erosion has occurred.

If this soil were cleared, it would be highly susceptible to erosion and a cover of pasture or long-term hay would be needed to help control erosion. This cover would increase the ability of the soil to hold moisture available for plants. The use of cultivated crops should be limited.

In many areas yellow-poplar grows in good stands. On this strongly sloping soil, however, use of logging equipment is more difficult than it is on more nearly level soils. (Capability unit IVe-3; woodland suitability group 2)

Matapeake silt loam, 0 to 2 percent slopes (MlA).—This soil has a profile similar to that described as typical for the series but has less sand in its surface layer. Because of having less sand, it tends to crust more easily after drying. If this silt loam is plowed when wet, it tends to compact and form clods that are not easily broken. Where there is no compaction, this soil retains more moisture for plant use than does the Matapeake loam. Also, the content of organic matter for the silt loam averages 2.5 percent and is generally higher than that in other soils in the area.

Included with this Matapeake silt loam in mapping are small areas of moderately well drained Mattapex silt loam. These included areas are so closely intermingled with this soil that mapping them separately is not practical.

This Matapeake silt loam is one of the most suitable soils in the county for farming; it is suited to all general farm crops grown in the area. Because this is a naturally acid soil, however, additions of lime are needed. Also, fertility is naturally low, but it can be increased by adding enough fertilizer for some of it to be carried over each year. The soil retains nutrients well and holds them readily available for plants. (Capability unit I-4) ; woodland suitability group 1)

Matapeake silt loam, 2 to 5 percent slopes, moderately eroded (MlB2).—In most places as much as 75 percent of the surface layer of this soil has been lost through sheet erosion. Except that it is more sloping and more eroded, this soil is similar to Matapeake silt loam, 0 to 2 percent slopes. The more eroded areas are lighter and more yellowish than other areas because plowing has mixed some of the lighter colored subsoil into the remaining surface layer. In these areas, this soil tends to be cloddy and it retains less moisture for plant use than do soils in uneroded areas. In the more eroded areas this soil is very low in content of organic matter and it crusts easily after a rain. Seed germinates poorly or during a dry spring generally not at all.

Included with this soil in mapping are areas of moderately well drained Mattapex soils.

This soil is well suited to all general farm crops if ordinary practices are used for reducing erosion and for increasing content of organic matter. The soil, however, is acid and generally low in natural fertility. Additions of lime and fertilizer are needed. If fertilizer is added, this soil holds large amounts of the nutrients readily available for plants. (Capability unit IIe-4 woodland suitability group 1)

Matapeake silt loam, 5 to 10 percent slopes, moderately eroded (MlC2).—Where this soil is cultivated, it has lost as much as 75 percent of its surface layer. In many places some of the lighter colored, more yellowish subsoil has been mixed into the remaining surface layer by plowing. In these places this soil is low in content of organic matter and of nitrogen and it does not retain moisture so well as soils in less eroded areas. This Matapeake silt loam is similar to Matapeake loam, 5 to 10 percent slopes, moderately eroded, except that the silt loam has less sand in its surface layer, that it does not dry so quickly, and that it tends to form clods more readily.

Some of this soil is woodland, but most of it is in cultivated crops. For good growth of crops, intensive liming and fertilization are needed. Also needed are practices that add organic matter, increase infiltration of water, and control erosion.

This soil is well suited to trees. The existing stands of hardwoods are of good quality. Yellow-poplar is generally a good tree for reforesting. (Capability unit IIIe-4; woodland suitability group 2)

Matapeake silt loam, 5 to 10 percent slopes, severely eroded (MlC3).—In most places severe erosion has taken away most of the original surface layer of this soil. The surface layer is strong brown because the subsoil is exposed. In some areas small gullies have started to form.

Organic matter is lacking or occurs only in small amounts, and moisture for plant use is not retained well. Germination of seed is not good. In many places seed, fertilizer, and lime wash down the slopes. Eroded soil material is at the base of some slopes.

This soil will continue to erode unless it is intensively managed. In some areas erosion is so severe that farming is no longer feasible. These areas should be reforested, though seedlings have difficulty in getting started and initial growth is normally slow. (Capability unit IVe-3; woodland suitability group 7)

Matapeake silt loam, 10 to 15 percent slopes, severely eroded (MlD3).—This soil is steeper and, if not protected, more susceptible to erosion than Matapeake silt loam, 5 to 10 percent slopes, severely eroded, but otherwise it is similar to that soil. Erosion is more rapid, and large gullies form in some places. This soil generally contains little lime and plant nutrients, especially nitrogen. It is low in content of organic matter, and it retains little moisture for plant use. Where it is plowed, clods form that are difficult to break.

Good uses for this soil are pasture, woodland, or wildlife habitat. Protection from overgrazing is needed on pasture. Loblolly pine generally is a good tree for reforesting, but seedlings are hard to establish and initial growth is slow. (Capability unit VIe-2; woodland suitability group 7)

Mattapex Series

The Mattapex series consists of deep, moderately well drained, dark-brown soils that are level to gently sloping. These soils developed in silty marine sediments. In Talbot County these soils occur primarily in the east-central and northwestern parts. They also occur in areas that border tidal streams on Miles River Neck, Island Neck, and Oxford Neck.

In cultivated areas a typical profile for Mattapex soils has a plow layer of brown loam that contains a large amount of silt and is about 10 inches thick. When moist or dry and pressed in the hand, this material feels like flour. An abundance of fine roots has penetrated this layer, which is 1 to 1.5 percent organic matter.

The subsoil, about 25 inches thick, is yellowish-brown silt loam that has a high content of silt to a depth of about 22 inches. Between depths of about 22 and 35 inches the soil material is distinctly mottled with grayish brown and strong brown. When the lower part of the subsoil is dry, it is hard and is difficult to dig with a spade.

The underlying material is variegated brown to yellowish-brown sandy loam. Very few roots penetrate this strongly acid to very strongly acid material.

In some areas bordering tidal streams, Mattapex soils have a seasonal high water table.

Mattapex soils are naturally acid, but they retain moisture well and hold it readily available to plants. Artificial drainage is not needed for growth of most crops common in the area. In some places, the subsoil of these soils is compact and roots, particularly in dry weather, penetrate it with difficulty.

Most areas of these soils are in cultivated crops. These soils are suited to all crops commonly grown in the area if lime is added in proper amounts.

Crops on these soils respond well to large amounts of added fertilizer, if the soils are adequately limed. If these soils are worked when wet or are cultivated year after year, compaction may increase or structure deteriorate.

Compaction can be lessened by growing grass for several years. Lessening compaction by subsoiling is not advisable, but subsoiling can be used to shatter a plowpan. These soils are suitable for the use of large farm machinery, but after a rain, farm operations are delayed 1 to 3 days longer on Mattapex soils than on the better drained Matapeake and Sassafras soils.

Some areas of Mattapex soils are wooded and have been cut over frequently. Although the native vegetation probably was mixed hardwoods, primarily oak, these soils are well suited to most trees grown locally. Because these soils are adaptable to use of most kinds of equipment, logging and reforesting are not difficult.

Particular attention should be given in choosing sites on these soils for housing developments. Use for community development is limited by the moderately slowly permeable subsoil and, in some areas, by a high water table. If these soils are used for road subgrade, some damage from frost heave can be expected in winter.

Typical profile of Mattapex loam, 0 to 2 percent slopes, in a cultivated field (on the north side of State Route 331, about 1.5 miles east of Easton):

Ap—0 to 10 inches, brown (10YR 4/3) loam, high in silt; weak, fine, granular structure; very friable, slightly sticky; abundant fine roots; slightly acid (limed); abrupt, smooth boundary; horizon 8 to 10 inches thick.

B21t—10 to 22 inches, yellowish-brown (10YR 5/4 to 5/6) heavy silt loam that contains a large amount of silt; moderate, fine and medium, subangular blocky structure; firm, sticky and slightly plastic; many fine roots; faint, dark yellowish-brown (10YR 4/4) coatings on some ped faces and in old root channels; slightly acid; gradual, wavy boundary; horizon 10 to 15 inches thick.

B22t—22 to 30 inches, yellowish-brown (10YR 5/6) heavy silt loam that has common, medium, distinct mottles of grayish brown (10YR 5/2) and a few, fine, distinct mottles of strong brown (7.5YR 5/8); moderate, medium, subangular blocky structure; firm, plastic and very sticky; common fine roots; distinct, dark yellowish-brown (10YR 4/4) coatings on some ped faces and in old root channels; slightly acid; gradual, wavy boundary; horizon 6 to 10 inches thick.

B3—30 to 35 inches, yellowish-brown (10YR 5/6) silt loam that has many, coarse, distinct mottles of grayish brown (10YR 5/2) and a few, fine, distinct mottles of strong brown (7.5YR 5/8); very weak, medium, subangular blocky structure; firm, sticky and slightly plastic; few roots; medium acid; gradual, wavy boundary; horizon 4 to 6 inches thick.

IIC—35 to 60 inches +, variegated brown to yellowish-brown (10YR 5/3 to 5/6) light sandy loam; single grain (structureless) to very weak, coarse, blocky structure; loose to very friable, slightly sticky; very few or no roots; strongly acid to very strongly acid.

In Talbot County the surface layer is loam or silt loam that contains much silt. The B2t horizons are heavy silt loam, light silty clay loam, or partly silty clay loam. In many places the lower part of the B horizon is very compact and very hard when dry. Depth to material coarser textured than silt loam is normally about 35 inches but, in some areas, is as much as 44 inches. In some places a silt loam C horizon overlies the IIC horizon, which ranges from loamy sand to fine sandy loam. In many places Mattapex soils have weak structure throughout the profile. Unless these soils have been limed, reaction is strongly acid or very strongly acid and, in some places, extremely acid.

Mattapex soils normally occur between areas of Matapeake and Barclay soils. The Mattapex soils are not so well drained as are the Matapeake soils but are better drained than the Barclay soils. The Mattapex soils are similar to Keyport and Woodstown soils in color and in drainage. The B2 horizons in the Mattapex soils, however, are not clayey nor so slowly permeable as are the B2 horizons in the Keyport soils, which are more than 35 percent clay. Also, these horizons in the Mattapex soils are more silty and less sandy than are the B2 horizons in Woodstown soils.

Mattapex loam, 0 to 2 percent slopes (MpA).—Where this soil is in small depressions, water ponds for short periods but does little or no damage to crops. This soil dries more quickly after a heavy rain than does Mattapex silt loam, 0 to 2 percent slopes, but does not crust so readily. This soil has the profile described as typical for the Mattapex series.

Included in mapping are areas of the sandier Woodstown soils.

Where fertilizer is added to this soil, large amounts are retained for good growth of crops. This soil also has excellent capacity for holding moisture for plant use. Compaction is not so much a concern on this loam as on the Mattapex silt loams.

Because this soil has a seasonal high water table in some places, care should be taken in selecting sites for any nonfarm use. (Capability unit IIw-1; woodland suitability group 4)

Mattapex loam, 2 to 5 percent slopes, moderately eroded (MpB2).—All of this soil has been cultivated. In most places as much as 6 inches of the surface layer has been lost through erosion. In most areas plowing has mixed subsoil material into the remaining surface layer so that the present surface layer is lighter and more yellow in color than in less eroded areas, and it crusts tightly after a rain. In these areas the content of organic matter and nitrogen are low and seed germinates poorly.

This soil is farmed intensively, primarily to cash grain. It responds well to applications of lime and fertilizer. Because of susceptibility to erosion, however, management practices that reduce runoff are needed. (Capability unit IIe-16; woodland suitability group 4)

Mattapex silt loam, 0 to 2 percent slopes (MxA).—This soil dries more slowly than do other Mattapex soils in the county, and field operations are delayed for 1 or 2 days longer after a rain. The profile of this soil is similar to the one described as typical for the series, except that it contains more silt and less sand. Some damage from frost heave can be expected on this soil during severe winters.

Included in mapping are small areas of the more clayey Keyport soils.

This Mattapex soil is easily farmed and is suitable for use of large farm equipment. It is not susceptible to erosion, and except for removal of surface water from depressions, management concerns are not serious. This silt loam, however, compacts more readily than do the Mattapex loams. Compaction can be overcome by growing hay or pasture crops and by neither working the soil nor grazing it when it is wet. (Capability unit IIw-1; woodland suitability group 4)

Mattapex silt loam, 2 to 5 percent slopes, moderately eroded (MxB2).—The profile of this soil is similar to that described as typical for the series, except that it contains more silt and less sand and is moderately eroded. In many of the eroded areas plowing has mixed material from the subsoil with the remaining surface layer. These areas do not retain moisture well for plant use. They contain little nitrogen and no organic matter, and their surface crusts readily after a rain. Seed generally germinates poorly in these areas.

Included in mapping are small areas of the more clayey Keyport soils. These included areas are so small that they do not affect use or management of this soil.

Almost all of this soil is cultivated. Sheet erosion, the most serious concern in management, is not easily visible as it progresses, but it eventually reduces growth of crops. Also, this silt loam does not dry so quickly as do the Mattapex loams, and it tends to compact if worked when wet or if continuously planted to intertilled crops. Management practices are needed for controlling sheet erosion and for preventing or alleviating compaction.

Although very little of this soil is wooded, it is well suited to all kinds of trees that grow in this county. Loblolly pine generally is suitable for reforesting.

This soil is well suited to development for habitat for quail, rabbits, and deer. (Capability unit IIe–16; woodland suitability group 4)

Mixed Alluvial Land

Mixed alluvial land (My) is a mixture of silt and sand washed from eroding uplands and deposited so recently that no soil horizons, or layers, have formed. This material is at the bottoms of ravines and along streams or intermittent streams that empty into tidal water. The texture and the drainage of this material vary greatly within short distances.

Where Mixed alluvial land occurs at heads of ravines or streams, it generally is somewhat poorly drained to poorly drained. If it occurs where intermittent streams start to broaden and make contact with the tidal water, Mixed alluvial land is very poorly drained and is similar to fresh water swamp. Because of the hazard of overflow, draining this land is not practical. Except in the wetter areas, some of the more valuable hardwoods grow well on this land. In the wetter areas the trees are of low quality and generally are not salable.

In many areas Mixed alluvial land is used as sites for ponds or for wildlife habitat (fig. 6). Where this land is selected as a site for any other nonfarm use, evaluation by a technician is needed because each site is different. (Capability unit VIw–1; woodland suitability group 11)

Othello Series

The Othello series consists of deep, nearly level, poorly drained, grayish soils that formed in silty marine sediments. These soils occupy the middle part of all necks and peninsulas in the tidewater areas of the county.

In undisturbed wooded areas a typical profile for Othello soils has a layer of organic material, 5 inches thick, on the surface. This layer consists of pine needles overlying a thin mat of decaying leaf mold. The mineral surface layer, about 13 inches thick, is very dark grayish-brown silt loam in the upper part and is grayish-brown, gleyed silt loam mottled with yellowish red below a depth of 3 inches.

The subsoil, about 20 inches thick, is light brownish-gray silty clay loam in the upper part, gray silt loam in the middle, and light brownish-gray loam in the lower part. The subsoil is gleyed and mottled with yellowish red throughout. It is sticky and slightly plastic when wet. The upper subsoil is difficult to dig, even with heavy earthmoving equipment.

The underlying material is light brownish-gray, loose sand that remains moist most of the year. It is easily dug.

Othello soils have a fluctuating high water table that is at or near the surface during January, February, and March. In April the water table begins to drop, and by the end of July, it is at a depth below 4 feet.

These soils are very strongly acid and have moderately slow permeability. The plow layer generally is 1 to 1.5 percent organic matter. Because this layer is light gray when dry, it reflects sunlight in summer and the soils warm slowly. In spring these soils are cold and wet, and field operations are delayed about 2 weeks.

Othello soils are well suited to water-tolerant hay and pasture crops. General farm crops also grow well on these wet, acid soils if suitable drainage systems are installed and lime is added. On these soils crops respond to large amounts of fertilizer because fertilizer does not leach readily from these soils.

If Othello soils are plowed when wet, they become very cloddy and seedbeds are difficult to establish. Also, these soils compact easily if worked or grazed when wet, or if they are planted to corn continuously for 5 or 6 years and good management is not followed. Winter cover crops, however, are difficult to establish, and frost heaving damages perennial plants in severe winters. If Othello soils are worked when dry, a heavy crust forms on the surface after a rain. Also, plowing when dry requires much more power than plowing when wet, and the wear on plowshares is excessive.

Deep outlet ditches generally are effective in draining these soils. Where outlets are established, shallow V-type ditches or bedding may be used to convey water to the outlets (fig. 7). Because permeability is moderately slow, tile lines normally are not effective in disposing of excess surface water. But tile placed in the sandy underlying material may help to lower the high water table.

In Talbot County Othello soils are as important to forestry as they are to farming. On these soils the native vegetation is pine mixed with red and white oaks. White oak and loblolly pine are well suited to Othello soils and are grown extensively. Loblolly pine trees have excellent growth and frequently grow to a height of 80 to 90 feet in 50 years. Logging is limited in winter because of wetness.

Use of Othello soils as building sites is limited because surface runoff is slow and the water table is seasonally high. Effective operation of septic systems is severely limited by the fluctuating water table and moderately slow permeability. Basements are not practical, because water continuously seeps into them. Even where good drainage is provided, roads are difficult to maintain on these soils. Frost heaving is evident during severe winters. Where ground water is intercepted and flooding is not a problem, Othello soils also are suitable for the construction of sewage lagoons. These soils are also suitable as sites for shallow impoundments for wildlife.

Typical profile of Othello silt loam in a level wooded area (about 1½ miles north of Unionville, at a point 25 feet from the west side of the Unionville-Longwoods road):

O1—5 to 2 inches, loose pine needles.

O2—2 inches to 0, matted partly decomposed leaf mold.

A1—0 to 3 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, subangular blocky structure; very friable; abundant, fine, fibrous and woody roots; very strongly acid; clear, wavy boundary; horizon 2 to 4 inches thick.

Figure 6.—**A typical area of Mixed alluvial land that has been flooded to provide habitat for wildlife.**

A2g—3 to 13 inches, grayish-brown (2.5Y 5/2) silt loam that has few, medium, distinct mottles of yellowish red (5YR 4/8) ; weak, medium, angular blocky structure; friable, slightly sticky; abundant, fine, fibrous and woody roots; very strongly acid; gradual, wavy boundary; horizon 8 to 11 inches thick.

B21tg—13 to 24 inches, light brownish-gray (2.5Y 6/2) light silty clay loam that has many, coarse, prominent mottles of yellowish red (5YR 4/8) ; weak, coarse, subangular blocky structure; firm, sticky and slightly plastic; plentiful, fine, fibrous roots; thin clay coats in root channels and thin, discontinuous clay coats on some vertical, dark grayish-brown (2.5Y 4/2) ped faces; very strongly acid; gradual, wavy boundary; horizon 10 to 14 inches thick.

B22tg—24 to 28 inches, gray (5Y 5/1) heavy silt loam that has common, medium, prominent mottles of yellowish red (5YR 4/8) ; weak, medium, subangular blocky structure; very friable, slightly sticky; few fine roots; thin, discontinuous clay coats on some vertical dark grayish-brown (2.5Y 4/2) ped faces; very strongly acid; gradual, wavy boundary; horizon 3 to 10 inches thick.

IIB3g—28 to 33 inches, light brownish-gray (2.5Y 6/2) loam; common, medium, prominent mottles of yellowish red (5YR 4/8) ; weak, coarse, subangular blocky structure; very friable, slightly sticky; few or no roots; very strongly acid; abrupt, smooth boundary; horizon 4 to 5 inches thick.

IIC—33 to 52 inches, light brownish-gray (2.5Y 6/2) sand; single grain (structureless) ; loose; very strongly acid.

In Talbot County the B2 horizons in Othello soils range from heavy silt loam to silty clay loam. Depth to material coarser than silt loam generally is about 30 inches but is as much as 40 inches in some places. In some places the lower part of the B horizon has weak platy structure. The substratum is loamy sand, sandy loam, sand with silt or silty clay lenses, or fine sandy loam. Colors in dry Othello soils may be 1 or 2 units higher in value than those in moist soils. Unless Othello soils have been limed, reaction ranges from strongly acid to extremely acid.

Othello soils generally occur adjacent to the somewhat poorly drained Barclay soils or the poorly drained Elkton soils. Where Othello and Elkton soils are adjacent, the Othello soils occupy the slight barely discernible rises. Othello soils contain less clay in the B horizon than Elkton soils and are more poorly drained than Barclay soils. Othello soils are similar to Fallsington soils in general characteristics of the profile, but the B2 horizons range from heavy silt loam to silty clay loam in the Othello soils and from sandy loam to sandy clay loam in Fallsington soils.

Othello silt loam (Oh).—This soil occurs in large areas in the western part of the county. In most places slopes do not exceed 2 percent, but in some places they are as much as 5 percent. This Othello soil generally is adjacent to the somewhat poorly drained Barclay soils. This soil has the

Figure 7.—**An outlet ditch dug by a dragline in the poorly drained Othello soils. The seepage at bottom of the ditch is from the high water table.**

profile described as typical for the Othello series.

Included in mapping were slightly depressional areas of Elkton soils.

Where Othello silt loam has been drained, it is well suited to all general farm crops. It especially is well suited to hay and pasture crops.

Because this soil is nearly level and generally occurs in large areas, it is suitable for use of large farm equipment. Care must be taken, however, to harvest crops before this soil becomes wet late in fall. If harvesting is delayed, and combines are not equipped with tires made for use in wet ricefields, harvesting will be further delayed until the ground freezes.

This soil is suitable for woodland and for development of wildlife habitat, especially for waterfowl. (Capability unit IIIw-7; woodland suitability group 6)

Othello silt loam, low (Ot).—This soil occurs in the western part of the county in small areas that border the heads of tidal creeks and areas of Tidal marsh. Except that in places the underlying material is less acid, the profile of this soil is similar to the one described as typical for the series.

Included with this soil in mapping are small areas of Keyport soils and of Elkton soils.

Unlike Othello silt loam, this soil periodically is flooded with salty sea water from unusually high tides, such as spring tides and hurricane tides. After the tides subside the salt leaches or washes out so slowly that the soil is suited only to extremely salt-tolerant grasses (fig. 8). Diking to prevent flooding is impractical because this poorly drained soil is naturally wet and is in small areas.

Loblolly pine grows very poorly on this soil. The older loblolly pine trees are stunted in the extremely salty areas. Normally, other kinds of trees do not grow on this soil.

Othello silt loam, low, is suitable for wildlife habitat. Because its surface is near sea level, use for most other

Figure 8.—**A typical area of Othello silt loam, low, showing an area devoid of vegetation because the soil contains salt brought in by high tides.**

nonfarm purposes is prohibited. (Capability unit Vw–1; woodland suitability group 10)

Plummer Series

The Plummer series consists of poorly drained, sandy, grayish soils that developed in sandy marine sediments. These soils are nearly level and occupy small areas adjacent to intermittent streams throughout the eastern part of Talbot County.

In formerly cultivated areas a typical profile for Plummer soils has a plow layer of very strongly acid, dark grayish-brown loamy sand about 8 inches thick. Water and air move rapidly through this sandy layer. The material is not sticky, and it crumbles easily when moist or dry. It overlies strongly acid, gray loamy sand that extends to a depth of 14 inches.

The next layer extends to a depth of 60 inches or more. This layer is grayish-brown loamy sand in the upper part, light grayish-brown sand distinctly mottled with strong brown in the middle, and dark-gray loamy coarse sand in the lower part. This material is saturated during most of the year. The sand is similar to that on ocean beaches and is so loose that it flows back into any hole dug in it.

Plummer soils have a high water table that is at or near the surface from January through May. In April the water table drops quickly to a depth of about 4 feet, which is its normal level during summer. After a rainy period during the summer, the water rises until dry weather, when it recedes to its normal level in summer.

Because these soils are poorly drained, are naturally acid, and are low in fertility, they must be drained and receive additions of lime and fertilizer if crops are to be grown. Crops, however, do not grow well on these soils, even where good management has been followed. Also, in spring Plummer soils are not so dry as the surrounding soils, and farm equipment readily becomes mired, even in small, drained areas of sandy Plummer soils.

If suitable outlets are available, tile lines are effective in draining Plummer soils. If no outlets are available, ditches dug by a dragline can be used, but the sloughing of ditch-banks can be expected. Lime and herbicides should be applied with care because crops burn easily on these sandy soils.

These soils are suited to most water-tolerant trees, but seedlings are difficult to establish. Also, logging is a concern because these soils are wet. Herbaceous plants compete strongly with the trees.

These soils have severe limitations for use as sites for commercial, industrial, or residential developments. Septic systems fail because the water table is near the surface in winter and after rains in summer. Because seepage is likely, basements are not suitable in these wet, sandy soils. Even where these soils are drained, they have poor stability for construction of roads.

Plummer soils are suitable as sites for woodland and wetland wildlife habitat. They also are suitable as sites for dug-out ponds, though side slopes may slough in some places. If ponds are used for irrigation, the recharge rate generally is good.

Typical profile of Plummer loamy sand (3½ miles northeast of Easton, just off the north side of the old Chapel Road in an abandoned field):

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand; very weak, fine, granular structure; very friable; many fine roots; very strongly acid; abrupt, smooth boundary; horizon 7 to 9 inches thick.

A1—8 to 14 inches, gray (10YR 5/1) loamy sand; single grain (structureless); loose; many fine roots; strongly acid; clear, wavy boundary; horizon 5 to 7 inches thick.

C1—14 to 21 inches, grayish-brown (10YR 5/2) loamy sand; single grain (structureless); loose; few fine roots; medium acid; clear, wavy boundary; horizon 6 to 9 inches thick.

C2—21 to 42 inches, light grayish-brown (10 YR 6/2) sand that has few, fine, distinct mottles of strong brown (7.5YR 5/8); single grain (structureless); loose; few or no roots; strongly acid; clear, wavy boundary; horizon 19 to 24 inches thick.

IIC3—42 to 60 inches, dark-gray (10YR 4/1) loamy coarse sand; single grain (structureless); loose; no roots; very strongly acid.

In some places mottles appear in Plummer soils above a depth of 21 inches, and in many places they are coarse and prominent. The C horizon is sand, loamy sand, or sandy loam. Colors in dry Plummer soils may be 1 or 2 units higher in value than those in moist Plummer soils. Plummer soils are very strongly acid throughout except where they have been limed.

Plummer soils generally occur adjacent to the moderately well drained Woodstown soils or the poorly drained Fallsington soils. Unlike the Woodstown and Fallsington soils, Plummer soils do not have a B horizon. Plummer soils are poorly drained and developed in the same kind of marine sediments as did the Galestown and Klej soils, but Galestown soils are somewhat excessively drained and Klej soils are moderately well drained.

Plummer loamy sand (Pe).—This soil occurs in areas of 1 or 2 acres in Talbot County. It has the profile described as typical for the series (fig. 9).

Included in mapping are a few areas of Fallsington sandy loam. Also included are very small areas of very poorly drained, black soils.

Because areas of Plummer loamy sand are so small and are generally surrounded by soils more suitable for farming, these small areas have little effect on the management of the better soils. Unless this soil is drained, however, it is a nuisance during tillage in spring. Drainage by tile is effective if outlets are available. But during the dry summer months after the water table has dropped, this soil is droughty and crops may be damaged. (Capability unit IVw-6; woodland suitability group 6)

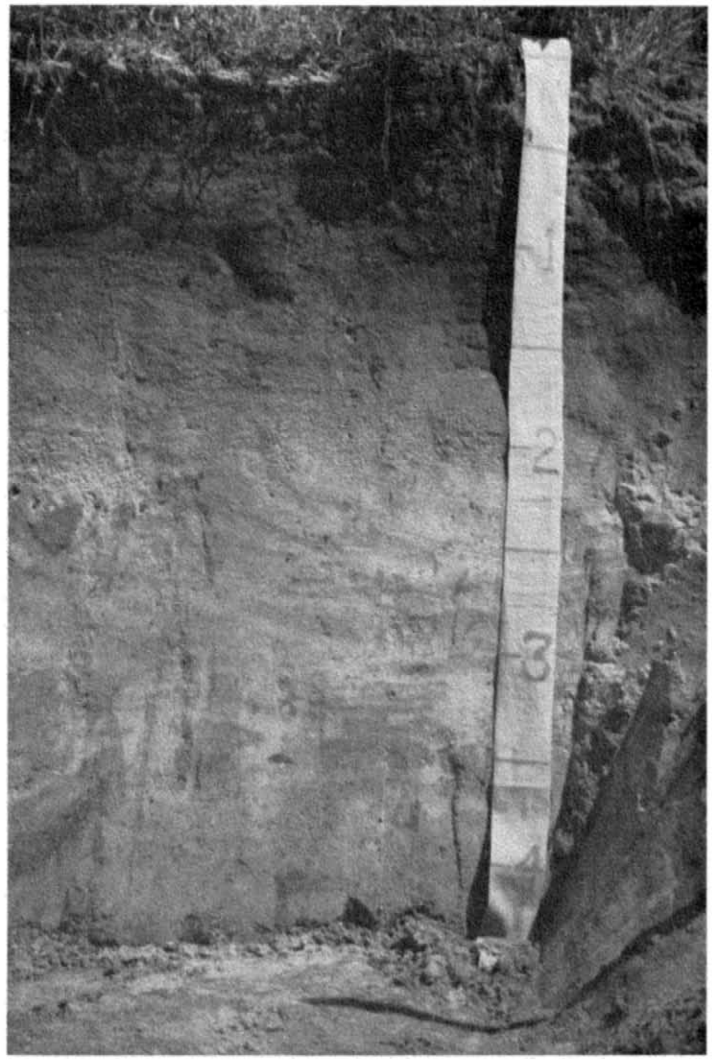

Figure 9.—**A typical profile of Plummer loamy sand.**

Pocomoke Series

The Pocomoke series consists of very poorly drained, black soils that formed in unconsolidated marine sediments that contain sand. These soils occupy small depressions that occur mainly in the east-central part of the county.

In undisturbed wooded areas a typical profile for Pocomoke soils has on the surface a layer of organic material that is hardwood leaves overlying a mat of partly decayed leaf mold. This layer is 5 inches thick. The surface mineral layer, about 13 inches thick, is black sandy loam that is about 15 percent organic matter. The organic matter makes the soil material feel greasy. The next layer, about 12 inches thick, is gray sandy loam.

The subsoil, about 9 inches thick, is gray sandy clay loam in the upper part and grayish-brown sandy loam in the lower part. The upper part of the subsoil is mottled with yellowish brown.

The underlying material of dark-gray sand extends to a depth of 52 inches or more. This material is not sticky or plastic.

Pocomoke soils have a high water table during most of the year. Water is at or ponded on the surface from December through May. During the rest of the year, the water table does not fall below a depth of 36 inches.

Pocomoke soils are moderately permeable. Where they are not limed, they are very strongly acid or extremely acid. The content of organic matter is high. Drainage is the main concern of management.

Where Pocomoke soils have been drained, they are suited to general farm crops. Because they absorb sunlight and warm earlier in spring than similar lighter colored soils, they are well suited to such specialty crops as bulbaceous flowers. They are also suited to water-tolerant grasses grown for hay or pasture.

Where outlets are available that are deep enough, tile drainage is feasible. In drained areas, however, tillage in spring may be delayed 4 or 5 days. Because the content of organic matter is high, large amounts of herbicide should be applied.

Native vegetation on Pocomoke soils probably was mixed water-tolerant hardwoods. Many areas are still wooded, and sweetgum and red maple generally are the dominant trees. Although loblolly pine grows well on these soils, seedlings are difficult to establish because plant competition is severe. Logging is difficult on these wet soils.

The wetness of Pocomoke soils prohibits use for most nonfarm purposes, including roadbuilding. These soils, however, are very suitable as sites for dug-out or ground water ponds.

Typical profile of Pocomoke sandy loam in a depressional wooded area (about three-fourths of a mile northwest of Hambleton on the Trappe Station-Hambleton Road):

O1—5 to 3 inches, leaves of mixed hardwoods.

O2—3 inches to 0, partly decayed leaf mold.

A1—0 to 13 inches, black (10YR 2/1) sandy loam; weak, fine, subangular blocky structure; friable, slightly sticky; abundant fibrous and woody roots; very strongly acid; clear, wavy boundary; horizon 10 to 18 inches thick.

A2—13 to 25 inches, gray (10YR 5/1) light sandy loam; weak, coarse, granular structure; very friable; abundant fibrous and woody roots; extremely acid; clear, wavy boundary; horizon 9 to 12 inches thick.

B2tg—25 to 31 inches, gray (10YR 5/1) sandy clay loam that has few, medium, prominent mottles of yellowish brown (10YR 5/6); moderate, fine, subangular blocky structure; firm, slightly sticky and slightly plastic; abundant, fine, fibrous roots; extremely acid; gradual, wavy boundary; horizon 6 to 8 inches thick.

B3g—31 to 34 inches, grayish-brown (2.5Y 5/2) sandy loam; weak, medium, granular structure; very friable, slightly sticky; abundant, fine, fibrous roots; very strongly acid; clear, wavy boundary; horizon 3 to 4 inches thick.

Cg—34 to 52 inches +, dark-gray (10YR 4/1) sand; single grain (structureless); loose; a few fine roots in upper part, none in lower part; very strongly acid.

In Talbot County the surface layer in Pocomoke soils is loam or sandy loam. Where these soils have been cultivated for long periods, the surface layer may be very dark gray instead of black. The A1 horizon is as much as 18 inches thick in areas of deposition. The B2t horizon, which has a content of clay of 18 percent or more, ranges from heavy sandy loam to heavy sandy clay loam. The C horizon is sand, sand with clay lenses, or sand containing gravel. Depth to the substratum ranges from 28 to 38 inches. The color of dry Pocomoke soils may be 1 or 2 units higher in value than colors of moist Pocomoke soils. Unless lime has been added, reaction is very strongly acid and extremely acid.

Pocomoke soils generally occur in shallow depressions that are surrounded by concentric rings of Fallsington, Woodstown, and Sassafras soils. In many places Pocomoke soils surround the Portsmouth soils, which are in the center of the depressions. Pocomoke soils are similar to Portsmouth soils except that, in most places, Pocomoke soils have a less clayey and more sandy B2t horizon. The Pocomoke soils are very poorly drained and are similar to the Fallsington, Woodstown, and Sassafras soils, but the Fallsington soils are poorly drained, the Woodstown soils are moderately well drained, and the Sassafras soils are well drained.

Pocomoke sandy loam (Pk).—The profile of this soil is the one described as typical for the series. This soil contains more sand than Pocomoke loam and can be drained more easily, dries more quickly, and can be worked sooner with farm equipment.

Included in mapping are areas of Fallsington soils.

If adequate drainage is provided and lime is added, this soil is suited to all general farm crops.

Pocomoke sandy loam is well suited to water-tolerant hardwoods. Although loblolly pine is difficult to establish, it grows well on this soil. (Capability unit IIIw–6; woodland suitability group 5)

Pocomoke loam (Pm).—This soil has a profile similar to the one described as typical for the series except that the surface layer in this soil is not sandy and normally it is thicker.

Included in mapping are areas of finer textured Portsmouth loam.

Pocomoke loam must be drained if crops are to be grown. In adequately drained, limed areas, this soil is suited to general farm crops. Drainage is more difficult than on Pocomoke sandy loam because water is on the surface longer. If this soil is used for hay or pasture, water-tolerant grasses and clovers should be grown.

This soil is well suited to water-tolerant hardwoods. It also is well suited to loblolly pine, but this tree has difficulty reseeding naturally because plant competition is severe. Logging is difficult on this wet soil. (Capability unit IIIw–7; woodland suitability group 5)

Portsmouth Series

The Portsmouth series consists of deep, very poorly drained, black soils that formed in silty marine sediments. These soils are level or slightly depressional and occur primarily in the western part of Talbot County.

In undisturbed areas a typical profile for Portsmouth soils has a 3-inch layer consisting of loose, scattered leaves of mixed hardwoods and pine needles overlying a mat of partly decayed leaf mold. The mineral surface layer, about 11 inches thick, consists of black silt loam that feels greasy because it is about 10 to 15 percent organic matter.

The subsoil is about 31 inches thick. It is dark-gray silty clay loam mottled with yellowish brown in the upper part, gray silty clay loam mottled with strong brown in the middle, and dark-gray fine sandy loam mottled with olive brown in the lower part. A ribbon generally is formed when subsoil material is pressed between the thumb and forefinger. Because the subsoil is about 25 percent clay and has weak structure, permeability to air and water is slow.

The underlying material is variegated very dark gray and gray sand that is loose and very strongly acid. It is saturated most of the year.

Portsmouth soils have a fluctuating high water table. Water is at or ponded on the surface from January through May. In April the water table drops and remains at a depth of 3 or 4 feet for the rest of the year.

If these soils are drained and lime is added, they are suited to general farm crops. Drainage may be difficult because of the depressions. Because these soils contain a large amount of organic matter, are black, and absorb sunlight, they warm fairly early in spring and are well suited to such specialty crops as bulbaceous flowers.

The native vegetation on these soils probably was water-tolerant mixed hardwoods. These soils are well suited to most hardwoods grown in the area. Sweetgum grows well, though other plants compete strongly with it. Logging is difficult during most of the year because of wetness.

Portsmouth soils have severe limitations for use as sites for industrial or residential developments (fig. 10). Septic systems fail because surface runoff is very slow, because water moves slowly through the soils, and because the high water table is at or near the surface from January through May. Roads are difficult to build on these soils and are expensive to maintain.

Typical profile of Portsmouth silt loam (50 feet from the west side of Maryland Route 370, one-half mile south of Unionville on Miles River Neck) :

O1—3 to 2 inches, scattered leaves of mixed hardwoods and pine needles.

O2—2 inches to 0, mat of partly decayed leaf mold.

Figure 10.—**An area of very poorly drained Portsmouth silt loam used as a building site. Water stands in this yard most of the year.**

A1—0 to 11 inches, black (10YR 2/1) silt loam; weak, medium, granular structure; friable, sticky and very slightly plastic; many, fine, fibrous and woody roots; very strongly acid; clear, wavy boundary; horizon 9 to 12 inches thick.

B21tg—11 to 21 inches, dark-gray (10YR 4/1) light silty clay loam; few, medium, distinct mottles of yellowish brown (10YR 5/6); weak, medium, subangular blocky structure; firm, sticky and slightly plastic; few, faint, discontinuous coats of clay in root channels and on some vertical faces of peds; many, fine, fibrous roots; very strongly acid; gradual, wavy boundary; horizon 5 to 12 inches thick.

B22tg—21 to 34 inches, gray (10YR 5/1) silty clay loam that has many, coarse, prominent mottles of strong brown (7.5YR 5/8); many, distinct, dark-gray (N 4/1) clay coats on ped faces; weak, medium, subangular blocky structure; very firm, sticky and plastic; many, fine, fibrous roots; very strongly acid; gradual, wavy boundary; horizon 9 to 15 inches thick.

IIB3g—34 to 42 inches, dark-gray (2.5Y 4/0) fine sandy clay loam that has common, coarse, distinct mottles of olive brown (2.5Y 4/4); weak, medium, subangular blocky structure; firm, sticky and slightly plastic; many, fine, fibrous roots; very strongly acid; gradual, wavy boundary; horizon 7 to 12 inches thick.

IICg—42 to 52 inches +, gray (10YR 5/1) and very dark gray (10YR 3/1) variegated fine sand; single grain (structureless); loose; few or no roots; very strongly acid.

Where Portsmouth soils have been drained and cultivated for long periods, the surface layer may be very dark gray instead of black. Where there is a plow layer in the deeper depressions, the surface layer is as much as 16 inches thick. In some places the B22tg horizon is heavy silt loam. Parts of the B2tg horizons are of moderate structure in some places. The solum ranges from 30 to 48 inches in thickness. The substratum is fine sand, sandy loam, silty clay, or silty clay streaked with sand. The colors in dry Portsmouth soils may be 1 or 2 units higher in value than colors in moist Portsmouth soils. Unless Portsmouth soils have been limed, they are very strongly acid or extremely acid.

In broad level areas Portsmouth soils generally are surrounded by Elkton or Othello soils. The Portsmouth soils are black and very poorly drained, whereas the Elkton and Othello soils are gray and poorly drained. The subsoil in Portsmouth soils is less clayey than that in the Elkton. Where Portsmouth soils are in depressions, they are generally surrounded by Pocomoke and Fallsington soils in concentric rings. The black Portsmouth soils are similar to the black Pocomoke soils but are more clayey. Portsmouth soils, however, are not so clayey as the dark-gray Fallsington soils. Portsmouth soils formed in the same kind of marine sediments as the Matapeake and Mattapex soils, but Portsmouth soils are very wet, Mattapex soils are moderately wet, and Matapeake soils show no evidence of wetness. In contrast to Portsmouth soils, neither Matapeake nor Mattapex soils have a black surface layer.

Portsmouth silt loam (Pt).—This soil has the profile described as typical for the Portsmouth series. Where this soil is in deep depressions, it is surrounded by Pocomoke and Fallsington soils in concentric rings.

Included with this soil in mapping are many areas of these soils in rings that are too small to map separately. Also included are areas of clayey soils.

All general farm crops can be grown regularly on this soil if it is adequately drained and lime and fertilizer are added. Because water and air move slowly through the subsoil, drainage is difficult. Even where this soil is adequately drained, field operations are delayed in most places for 3 or 4 days in the spring and also after a heavy rain in summer.

Drainage by closely spaced open ditches generally is effective. Tile drainage is not feasible. (Capability unit IIIw-7; woodland suitability group 5)

Sassafras Series

The Sassafras series consists of deep, well-drained soils that are level to strongly sloping. These soils occur throughout the eastern part of Talbot County and in some areas of the western part. They developed in sandy marine sediment containing significant amounts of silt and clay.

In a typical profile in cultivated areas, the surface layer is mainly dark yellowish-brown sandy loam about 14 inches thick. This material crumbles very readily and is easy to dig and to cultivate. About 1 to 3 percent of the layer, by volume, is organic matter. The lower 3 inches of this layer contains less organic matter and is yellowish brown.

The subsoil, about 19 inches thick, is reddish-brown to yellowish-red sandy clay loam to a depth of about 24 inches and below this depth is strong-brown sandy loam. The upper part of the subsoil is very sticky when wet.

The underlying material is strong-brown sand to a depth of about 50 inches. It is easily penetrated by air and water.

Sassafras soils do not have a fluctuating high water table; ground water remains below a depth of 5 feet during all seasons. Permeability is moderate.

In most places Sassafras soils retain moisture well, and this moisture is easily available for plant use. These soils have the capacity to hold 3.7 to 4.0 inches of water available for plants. In areas irrigated by a sprinkler system, the maximum rate of water absorption is 0.4 to 0.6 of an inch per hour.

Sassafras soils are suited to all general crops and to most vegetable crops grown in the county. Because these soils are naturally acid, lime is needed for good growth of crops. Crops on these soils respond well to large amounts of fertilizer. These soils are easy to manage, and there is no concern with wetness and compaction. Generally Sassafras soils can be worked within one good drying day after a heavy summer rain, and they can be plowed in the spring before most other soils in the county. Plowpans may form, but they can be broken up by varying the depth of plowing each year or by seeding hay or a pasture crop. The largest areas of these soils are level to gently sloping and are suitable for use of larger farm equipment.

Only a few areas are woodland, but Sassafras soils generally are well suited to most kinds of trees that will grow in this region. Loblolly pine is a good tree for reforesting in most areas. Logging equipment can be used easily on Sassafras soils during any season.

Where slopes are not too steep, Sassafras soils have few limitations for commercial or residential development or for use as septic filter fields. Most of the fill used for road subgrades comes from areas of the Sassafras soils. Roads built on these soils are easily maintained. These soils can absorb large amounts of waste water.

Typical profile of Sassafras sandy loam, 0 to 2 percent slopes (0.6 of a mile north of Hambleton on the west side of U.S. Highway No. 50):

Ap—0 to 11 inches, dark yellowish-brown (10YR 4/4) sandy loam; weak, fine, crumb structure; very friable, slightly sticky; plentiful fine roots; slightly acid; clear, wavy boundary; horizon 8 to 11 inches thick.

A2—11 to 14 inches, yellowish-brown (10YR 5/6) sandy loam; moderate, fine, subangular blocky structure; friable, slightly sticky; plentiful fine roots; medium acid; gradual, irregular boundary; horizon 2 to 7 inches thick.

B2t—14 to 24 inches, reddish-brown to yellowish-red (5YR 5/4 to 5/6) sandy clay loam; moderate, coarse, blocky structure; friable, very sticky and plastic; plentiful fine roots; few, thin, discontinuous clay coats with some clay bridging between sand grains; strongly acid; clear, wavy boundary; horizon 8 to 12 inches thick.

B3—24 to 33 inches, strong-brown (7.5YR 5/8) sandy loam; moderate, coarse, blocky structure; very friable, slightly sticky; few roots; strongly acid; clear, wavy boundary; horizon 8 to 10 inches thick.

C—33 to 50 inches +, strong-brown (7.5YR 5/8) sand; single grain (structureless); loose; no roots; strongly acid.

In the Sassafras soils of Talbot County, the Ap horizon generally is sandy loam, but in some places it is fine sandy loam or loam. In some level areas where it is loam, this horizon is as much as 13 inches thick. Color of the Ap horizon ranges from dark yellowish brown (10YR 4/4) to dark brown (10YR 3/3). In some places, especially where it is fine sandy loam, the B horizon is of weak structure. The C horizon is a layer of sand, of loamy sand, of sandy loam, or of fine loamy sand, or it is stratified loamy sand and sandy loam. Depth to C horizon ranges from 30 to 40 inches. When these soils are dry, colors may be one or two units higher in value than the colors given for these soils when they are moist. Sassafras soils generally are very strongly acid, unless they have been limed.

The well drained Sassafras soils generally occur at higher elevations adjacent to the moderately well drained Woodstown soils and to the poorly drained Fallsington soils. The Sassafras soils are similar to the Matapeake soils, except that the B horizon in Sassafras soils typically is sandy clay loam and the B horizon in the Matapeake soils typically is silty clay loam or clay loam. Sassafras soils also are similar to Downer soils, though most layers in the Sassafras soils typically are less coarse textured than those in the Downer soils.

Sassafras sandy loam, 0 to 2 percent slopes (SaA).—This soil occurs in large areas in the eastern part of the county. It has the profile described as typical for the series.

The surface layer in this soil contains slightly less organic matter than the one in Sassafras loam, 0 to 2 percent slopes. Also, this sandy loam retains less moisture and plant nutrients than the loam.

Most vegetable crops common in the county are grown on this soil. Varieties of peas that must be planted early in spring are especially well suited. Because this soil tends to be droughty during dry spells, pasture and hay crops dry up, and the growth of other crops is retarded if the dry period is prolonged. This soil is well suited to irrigation where a supply of water is available. Irrigation water can be applied at rates of as much as 0.6 inch per hour.

This soil dries early in spring, and it can be plowed earlier than the other soils in Talbot County. It generally can be worked a day after a heavy rain. Because it occurs in such large areas, large farm machinery can be used, but not so much power is required for plowing as is required on finer textured soils.

Since plant nutrients are easily washed through this soil, side dressings of fertilizer, especially of nitrogen, are needed during the growing season. Liming is essential for good growth of crops. Because this soil contains much sand, extra care is needed in applying herbicides so as to prevent burning the crops. (Capability unit I–5; woodland suitability group 1)

Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded (SaB2).—This is the most extensive Sassafras soil in the county. In most places erosion is evident, because plowing has mixed material from lighter colored yellowish-brown subsoil with the surface layer. In some places, however, erosion can be detected only by close examination. Seed does not germinate readily in the more eroded areas, because crusting is likely, moisture-holding capacity is reduced, and the content of organic matter is low.

Additions of lime and fertilizer are essential for good growth of crops. Plowing should be across the slope where feasible. Practices that help in retarding erosion and in increasing moisture-holding capacity include growing winter cover crops, using plant residues, using minimum tillage and rotating crops. Care should be taken to prevent burning when applying herbicides to crops on this soil. (Capability unit IIe–5; woodland suitability group 1)

Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded (SaC2).—The surface layer of this soil has been thinned by erosion, and in many places some of the subsoil has been turned up by plowing. These areas are lighter colored and more yellow than the less eroded areas. In the more eroded areas, less moisture is retained and seeds germinate poorly. Also, these areas contain little organic matter, and they crust easily after a rain. Additions of lime and fertilizer are essential if crops are grown on this soil.

In some places this soil is covered by good stands of yellow-poplar, especially near the base of slopes. Loblolly pine is a good tree to plant in areas chosen for reforestation. (Capability unit IIIe–5; woodland suitability group 2)

Sassafras sandy loam, 5 to 10 percent slopes, severely eroded (SaC3).—This soil has lost almost all of its original surface layer through erosion. The subsoil is exposed in most places and is almost devoid of organic matter. This soil takes in and retains less moisture than uneroded Sassafras soils. Much water runs off and causes erosion. Gullies have started to form in some places. This soil is difficult to manage. When the soil is tilled, clods form that are difficult to break. Also, intensive management is needed to increase moisture-holding capacity and to retard erosion. Additions of lime and fertilizer are essential for good growth of plants on this soil. (Capability unit IVe–5; woodland suitability group 7)

Sassafras sandy loam, 10 to 15 percent slopes (SaD).—Most of this soil is woodland. During wet months water may seep around the base of the slopes. If this soil were cleared, it would erode easily unless it were adequately protected.

Cultivated crops should be limited because of the high susceptibility to erosion. Intensive conservation management is needed for good growth of crops. This soil, however, is better suited to hay or pasture grown for long periods than to cultivated crops.

Good stands of naturally seeded yellow-poplar grow in many areas. The soil is also well suited to loblolly pine, which is a good tree for reforestation. (Capability unit IVe–5; woodland suitability group 2)

Sassafras sandy loam, 10 to 15 percent slopes, severely eroded (SaD3).—This soil has had most of its surface layer and some of its subsoil removed through erosion. A few gullies have started to form. Little organic matter remains. The soil is acid, very low in fertility, and retains little moisture that plants can use.

This soil can be used for pasture, forest, or wildlife habitat. If it is used for pasture, intensive management that provides additions of lime and fertilizer is needed. Grazing must be limited. Even when managed well, pasture is poor during the dry summer months.

Loblolly pine normally is a good tree for reforesting areas of this soil, but seedlings have difficulty getting started, and their initial growth is slow. (Capability unit VIe–2; woodland suitability group 7)

Sassafras fine sandy loam, 0 to 2 percent slopes (SfA).—The profile of this soil is similar to the one described as typical for the series, except that it contains more fine sand and less medium and coarse sand. Also, the subsoil of this fine sandy loam is only weakly developed, and it contains less clay than does the subsoil of Sassafras sandy loams or loams. This soil dries more quickly than the Sassafras loams and is leached of plant nutrients more rapidly.

This fine sandy loam has few, if any, limitations to use for farming, if lime and fertilizer have been added. The soil is easily worked with light farm equipment. (Capability unit I–5; woodland suitability group 1)

Sassafras fine sandy loam, 2 to 5 percent slopes, moderately eroded (SfB2).—This soil has lost as much as 75 percent of its surface layer through erosion. In some places a little of the subsoil has been turned up by plowing. In these places seed germinates poorly, especially during a dry spring. Areas where the subsoil has been turned up are nearly devoid of organic matter and contain little nitrogen. Unless this soil is protected through intensive management, erosion will continue.

All locally grown, merchantable trees grow well on this soil. (Capability unit IIe–5; woodland suitability group 1)

Sassafras loam, 0 to 2 percent slopes (SmA).—Because this soil has less sand and more silt in its surface layer than does Sassafras sandy loam, 0 to 2 percent slopes, it retains moisture and plant nutrients better, contains slightly more organic matter, and does not show the effects of drought so quickly. This loam can be worked with machinery from 1 to 2 days after a heavy rain. Where it is worked, its surface layer tends to crust after a heavy rain, whereas the sandy loam does not.

Included with this soil in mapping are some areas of Matapeake loam, 0 to 2 percent slopes. In these included areas the subsoil contains less sand and more silt than does the subsoil of this Sassafras soil.

Sassafras loam, 0 to 2 percent slopes, is one of the best soils for farming in Talbot County. It is well suited to all crops commonly grown in this area and is well suited to alfalfa. Because this soil is naturally acid and is only moderately fertile, additions of lime and fertilizer are needed. Fertilizer is retained well for plant use.

This soil is well suited to timber. Loblolly pine and most hardwoods grow well. (Capability unit I–4; woodland suitability group 1)

Sassafras loam, 2 to 5 percent slopes, moderately eroded (SmB2).—This soil has lost as much as 75 percent of its original surface layer in many places. Eroded areas are difficult to recognize, except where erosion has been greatest and plowing has turned up some of the subsoil. In these places the surface is lighter colored or more yellow than it is in the less eroded areas. In the more eroded areas, moisture is not retained well and not enough is available in dry periods to meet the needs of crops. Also, these areas have little organic matter, and they tend to crust readily. Here seed germinates poorly.

This soil is suited to all crops grown in the county. Alfalfa and corn grow well under good management. The main management needs are additions of lime and fertilizer and practices that reduce erosion. (Capability unit IIe–4; woodland suitability group 1)

Sassafras loam, 5 to 10 percent slopes, moderately eroded (SmC2).—This soil has lost as much as 75 percent of its surface layer in many places where cropping has been intensive. Many of these places are not easy to recognize, but the more eroded areas are apparent because plowing has exposed the lighter colored, more yellowish subsoil. Seed germinates poorly in the more eroded areas because the soil lacks organic matter, does not retain moisture well, and tends to crust readily.

This soil is generally well drained. Excess water drains through it so quickly that this soil can be worked with heavy machinery within 1 or 2 days after a heavy rain. At the base of slopes, excess moisture is a concern.

Some of this soil is wooded, but most of it has been cultivated. It is suited to all general farm crops grown in the county, though intensive management is needed to prevent further erosion. Alfalfa grows particularly well and gives some protection against erosion. Additions of lime and fertilizer, however, are needed regularly. Applied fertilizer is retained well for plant use. Pastures should be managed so as to prevent overgrazing.

In some places good stands of yellow-poplar grow on this soil. Loblolly pine generally is a good tree for reforestation. (Capability unit IIIe–4; woodland suitability group 2)

Sassafras loam, 5 to 10 percent, severely eroded (SmC3).—Most of the surface layer of this soil is eroded away, and in places part of the subsoil. In some places small gullies have started to form. Small alluvial fans are at the base of slopes where eroded material is deposited. This soil is low in organic matter, and it does not well retain moisture that plants can use. Cultivation generally is difficult, partly because large clods form that cannot be broken easily. Fertilizer, lime, and seed are often washed downslope, and the seed that remains in place germinates poorly.

Where this soil is not intensively managed, erosion continues. If farming is to be successful, a good fertility plan is essential.

Areas of this soil so eroded that they cannot be cropped successfully can be planted to loblolly pine. But seedlings start growing only with difficulty, and initial growth is slow. (Capability unit IVe–3; woodland suitability group 7)

Steep Land

Steep land (St) consists of all areas in the county that have slopes of more than 15 percent. These slopes are irregular and generally short, none more than 200 feet long. Most of them appear to be very old erosion surfaces. The slopes are parts of ravines of watercourses that were cut back into the uplands during the last glacial stage when water levels were much lower than they are now. Most of the cutting or erosion probably took place before any vegetation was established.

In most places the soil material does not show evidence of the formation of horizons, or any other soil-forming processes, and it varies in texture within short distances.

The soil material is well drained at the top of the slopes, and in some places where it is very sandy, it is excessively drained. Toward the base of the slope, there generally is much seepage, especially during winter and spring. Free-running springs occur in some places at the base of the longer slopes.

Nearly all of Steep land is wooded. Generally, there is no sign of active erosion, except at the heads of some ravines where farmers have cleared close to the edge of the ravine or where concentration of water has been excessive.

This land is too steep and uneven to be used for cultivated crops or pasture, or for hay grown for a long period. The forest is primarily hardwoods. Yellow-poplar is the dominant commercial tree. Management that encourages its growth and reproduction is commercially advisable and also helps to prevent further erosion.

Steep land has severe limitations for most uses other than woodland. It is well adapted to habitat for some kinds of wildlife, and many animal burrows are found in the banks of this land. It is used primarily by foxes, groundhogs, and rabbits. Steep land also provides sheltered travel lanes for animals and, at the base of the slope, good drinking water. (Capability unit VIe-2; woodland suitability group 9)

Tidal Marsh

Tidal marsh (Tm) consists of land that is covered with brackish or salt water on each flood tide. It has a silt or very fine sand surface layer containing much partly decomposed organic matter. Below this is organic silt that has a few lenses of sand extending to a depth of more than 32 feet in some marshy areas bordering the Choptank River in the eastern part of the county. In other places Tidal marsh generally contains organic silt to a depth of 3 to 8 feet. This material is underlain by sand or beds of clay. The content of organic matter normally does not exceed 35 percent. In some areas, particularly along the Choptank River, this marsh gives off a strong odor of hydrogen sulfide when it is disturbed. Generally marsh that has this odor is only slightly acid until it dries. After it dries, it is extremely acid.

Tidal marsh generally occurs along the shoreline in Talbot County in areas of 1 to 10 acres, but areas are a hundred acres or more along the Choptank River in the eastern part of the county. This land does not support grazing animals and is suitable only for wetland wildlife and for a few kinds of recreation. Muskrat are trapped in some of the larger areas.

In some areas Tidal marsh supports herbaceous plants other than common marsh grasses. Among the plants that are common on this land are rose or swamp mallows, smooth cordgrass, arrow arum, common reedgrass, spikegrass, marsh elder, and common threesquare. Figure 11 shows a typical area of Tidal marsh.

Deer, especially during the hunting season, use the larger tracts of Tidal marsh as resting places. (Capability unit VIIIw-1; woodland suitability group 12)

Woodstown Series

The Woodstown series consists of level to moderately sloping, moderately well drained, brownish soils that formed in sandy marine sediments. These soils occur mainly in the eastern part of Talbot County.

In wooded areas a typical profile for Woodstown soils has, on the surface, a layer of mixed hardwood leaves and partly decayed leaf mold about 3 inches thick. The surface mineral layer, about 14 inches thick, is very dark brown, pale-brown, and light olive-brown sandy loam that is easily dug.

The subsoil is about 18 inches thick. It consists of yellowish-brown sandy clay loam to a depth of about 24 inches and of yellowish-brown sandy loam below that depth. The upper part of the subsoil is distinctly mottled with strong brown, and the lower part is distinctly mottled with yellowish red and grayish brown. The subsoil is very sticky when wet.

The underlying material is variegated light brownish-gray and yellowish-red sand. It is loose and easy to excavate.

Woodstown soils have a fluctuating water table that during January through March rises to a depth of 1½ feet. In May the water table begins to fall, and by the end of June, it has fallen to a depth between 4 and 6 feet, where it remains until the wet weather in November.

Unless limed, Woodstown soils are strongly acid. They are wet in small areas. Fertilizer and lime are leached more readily from these soils than from the silt loams in Talbot County. The plow layer of these soils generally is about 1 to 2 percent organic matter.

If Woodstown soils are limed, they are suited to the general farm crops commonly grown in the county. Except in small spots, artificial drainage is not needed in areas of field crops. If outlets are available, the small spots can be easily drained by tile (fig. 12) or by open drainage ditches. Tillage is delayed on these soils in spring and after a heavy rain. During plowing early in spring, equipment operators often have trouble because they cannot distinguish the moderately well drained Woodstown soils from the well drained Sassafras soils. In all areas where vegetables are grown, drainage is needed if these soils are to be worked early in spring.

Woodstown soils are suitable for most kinds of trees that grow in the county. Much loblolly pine is used for reforestation. The roots of trees easily penetrate these soils, and not many seedlings die because of competition from other plants.

A seasonally high water table moderately limits the use of these soils for industrial and residential sites. In winter the water table is high and water seeps into basements. If roads are drained by ditching, they are easy to maintain.

Typical profile of a Woodstown sandy loam (in a nearly level wooded area about 1½ miles northwest of Trappe and 100 feet north of the Trappe-Oxford road):

O1—3 inches to 1 inch, loose leaves of mixed hardwoods.

O2—1 inch to 0, partly decayed leaf mold.

A1—0 to 3 inches, very dark brown (10YR 2/2) sandy loam; weak, medium, crumb structure; friable, slightly sticky; abundant, fine, fibrous and woody roots; strongly acid; clear, wavy boundary; horizon 1 to 4 inches thick.

A2—3 to 4 inches, pale-brown (10YR 6/3) sandy loam that has few, fine, distinct mottles of strong brown (7.5YR 5/8); weak, medium, crumb structure; friable, slightly sticky; abundant, fine, fibrous and woody roots; very strongly acid; gradual, wavy boundary; horizon 0 to 1 inch thick.

Figure 11.—**A typical area of Tidal marsh.**

A3—4 to 14 inches, light olive-brown (2.5YR 5/4) heavy sandy loam; weak, fine, subangular blocky structure; friable, sticky; abundant, fine, fibrous and woody roots; very strongly acid; gradual, wavy boundary; horizon 8 to 12 inches thick.

B21t—14 to 24 inches, yellowish-brown (10YR 5/6) light sandy clay loam that has common, medium, distinct mottles of strong brown (7.5YR 5/8); moderate, medium, subangular blocky structure; friable, very sticky; plentiful fine roots and few fibrous and woody roots; few coats of brown (10YR 5/3) clay; very strongly acid; gradual, wavy boundary; horizon 9 to 13 inches thick.

B22t—24 to 32 inches, yellowish-brown (10YR 5/6) heavy sandy loam that has many, coarse to medium, distinct mottles of yellowish red (5YR 4/8) and grayish brown (2.5YR 5/2); weak, medium, subangular blocky structure; very friable, slightly sticky; plentiful fine roots and few woody and fibrous roots; some thin clay films in pores; strongly acid; gradual, wavy boundary; horizon 4 to 12 inches thick.

C—32 to 48 inches, variegated light brownish-gray (10YR 6/2) and yellowish-red (5YR 4/8) sand; single grain (structureless) loose; few fine roots; strongly acid.

The surface layer of Woodstown soils is fine sandy loam, loam, or sandy loam. The B2 horizons range from heavy sandy loam to heavy sandy clay loam. The C horizon is sand, sand having clay lenses, or sand and gravel. Where material has been deposited, the surface layer is as much as 18 inches thick. In areas of fine sandy loam, fine sand occurs throughout the profile. The depth to the substratum ranges from 26 to 38 inches. When these soils are dry, their colors are 1 or 2 units higher in value than when they are moist. Except where they are limed, the Woodstown soils are strongly to extremely acid.

Woodstown soils normally occur between areas of Sassafras and Fallsington soils. Woodstown soils are not so gray or so poorly drained as the Fallsington soils, which are at lower elevations. Slightly higher than Woodstown soils are the brownish Sassafras soils. The Woodstown soils are similar to the Keyport and Mattapex soils, but have a sandy loam to sandy clay loam B2 horizon, whereas the Mattapex and Keyport soils have a silty clay loam B2 horizon.

Woodstown sandy loam, 0 to 2 percent slopes (WdA).—This soil dries more quickly than Woodstown loam, 0 to 2 percent slopes, but does not retain plant nutrients so well.

Figure 12.—**Digging a ditch and laying tile with a machine.**

The profile of this sandy loam is the one described as typical for the Woodstown series.

Included with this soil in mapping are areas of Woodstown loam.

Woodstown sandy loam, 0 to 2 percent slopes, is suited to all general farm crops grown in the area. It is also suited to many kinds of vegetables.

The water table of this soil may delay planting for 3 or 4 days in spring. Farm machinery mires readily if the soil is worked when wet. If the wet areas are bothersome, they can be drained by tile or open ditches. The ditchbanks may cave in if ditches dug by a dragline are used. During the growing season, areas of this soil generally are not affected by too much moisture.

This soil can be worked with light farm equipment. Compaction is not a problem. Fertilizer, especially nitrogen, should be used as a side dressing because the fertilizer elements leach readily.

This soil is well suited to all kinds of trees grown in the area. Loblolly pine is commonly used for reforestation. (Capability unit IIw-5; woodland suitability group 3)

Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded (WdB2).—This soil is similar to Woodstown sandy loam, 0 to 2 percent slopes, except that less water accumulates on its surface and it is more susceptible to erosion. In most areas 75 percent of the surface layer has been lost through erosion. In these areas a small part of the subsoil has been mixed into the remaining surface layer by plowing. The content of organic matter is low in these areas.

This soil is suited to most general farm crops. Where the soil is intensively farmed and management is not good, further erosion occurs.

Much of this soil is wooded. It is well suited to all commercial trees grown in the area, but loblolly pine generally is used for reforesting. In some places, competition from herbaceous and woody plants is severe. (Capability unit IIe–36; woodland suitability group 3)

Woodstown fine sandy loam, 0 to 2 percent slopes (WfA).—This soil has a profile similar to the one described as typical for the series except that the sand throughout its profile is not coarse. Only a few of the sand grains are medium textured.

This soil is suited to general farm crops and to many kinds of vegetables.

Where this soil is troublesome because it is wet in spring, it can be effectively drained with tile. The soil is easily worked with light farm equipment. It retains moisture well and holds it readily available for plant use.

This soil is well suited to all commercial trees grown in the area. (Capability unit IIw–5; woodland suitability group 3)

Woodstown loam, 0 to 2 percent slopes (WoA).—This soil generally is in slight depressions. It has a profile similar to the one described as typical for the series except that the surface layer of this soil contains more silt and the subsoil normally contains more clay. Where there is a plow layer in the depressional areas, it is as much as 20 inches thick because silt washed in from the slightly higher surrounding soils. In many of these depressions, this soil is sandier at the outer edge and is more silty toward the center. Although it retains fertilizer elements better than Woodstown sandy loam, 0 to 2 percent slopes, this soil does not dry so quickly as the sandy loam.

This soil is suited to general farm crops. During dry periods crops grow better on this soil than on the surrounding well-drained soils. Surface drainage may be a concern at plowing time, but drainage generally is not practical. Except when rain is extremely intense for a short period, surface drainage is not a concern during the growing season. (Capability unit IIw–1; woodland suitability group 3)

Woodstown loam, 2 to 5 percent slopes, moderately eroded (WoB2).—This soil generally is in slightly depressional areas. Its surface layer contains more silt and its subsoil normally is more clayey than corresponding layers in the profile described as typical for the series. Also, the surface layer is as much as 20 inches thick because silt has washed in from slightly higher surrounding soils. In many depressions this soil is sandier at the outer edge and is more silty at the center. Although this soil retains fertilizer more readily than Woodstown loam, 0 to 2 percent slopes, it does not dry so quickly. During dry periods crops grow better on this soil than on the surrounding well-drained soils. (Capability unit IIe–16; woodland suitability group 3)

Use and Management of the Soils

This main section of the soil survey has several parts. The section first describes basic practices applicable to most of the soils in the county. It then explains the system of capability classification used by the Soil Conservation Service and describes each capability unit recognized in the county. Next are estimates of average yields of commonly grown crops. Other parts of this main section tell about the uses of soils as woodland, discuss the potential of the soils for development of wildlife habitats, describe engineering uses of soils, and discuss certain recreational and other nonfarm uses of the soils.

Use of Soils for Crops and Pasture

Discussed in the following pages are general management requirements on soils used for crops and pasture, the capability classification system used by the Soil Conservation Service, management of capability units, and estimated yields of crops and pasture commonly grown in Talbot County.

General management requirements

The prosperity of Talbot County largely depends on farming. The 1964 Census of Agriculture reports that farms in the county occupy 125,196 acres, or about 70 percent of the land area. Some of the management practices needed to obtain good growth of crops can be summarized for all the soils in the county. The practices used are determined mainly by natural drainage, erosion and susceptibility to erosion, and the ability of the soils to retain fertilizer and moisture for crop use.

DRAINAGE.—About 34 percent of Talbot County is made up of soils that are wet during much of the year. Fallsington and Pocomoke soils, for example, have slow runoff and a seasonal high water table that cause flooding, reduce aeration, and adversely affect growth of many crops. In Keyport, Elkton, and Othello soils, slow surface runoff and a subsoil that is slowly permeable or very slowly permeable have similar effects on crop growth.

Many areas of wet soils have been ditched to remove excess water. Soils that have the more slowly permeable subsoils, such as the Elkton and Othello, generally are drained by shallow V-type field ditches after suitable outlets have been constructed. The Fallsington, Pocomoke, and other sandy soils generally are drained by deep ditches dug by a dragline (fig. 13) or by tile lines, both of which help to lower the high water table.

The "Drainage Guide for Maryland" (*11*) gives more specific information on the kinds of drainage beneficial to specific soils, depth and spacing of drains, gradients of side slopes, and other related data.

EROSION.—In about 34 percent of Talbot County, the soils erode if they are not managed properly. This erosion is in two forms, gully erosion (fig. 14) and sheet erosion. Sheet erosion is the more common and is the greater hazard because it is not easily visible and the extent of soil damage and crop loss are difficult to evaluate.

Unprotected soils are sheet eroded by runoff water produced by heavy rains. This runoff water slowly moves soil particles, organic matter, and nutrients downhill. Also, the eroded material may cause damage by deposition in cropped fields below, by filling field and road ditches, by making streams unnavigable, and by other means.

Most erosion in the county can be controlled through proper management practices that include crop rotations, use of crop residue, growing cover crops, providing grasses and legumes in rotations, and minimum tillage. Where erosion is severe, field stripcropping, farming on the contour, or using diversion terraces are effective practices.

RETAINING FERTILIZER AND MOISTURE FOR PLANT USE.—Generally, the soils in Talbot County are low in natural fertility. Consequently, fertilizer must be added to these

Figure 13.—**A typical dragline ditch in the sandy Fallsington soils.**

soils if they are to be farmed successfully. The ability of soils to store fertilizer and available moisture and readily release them for plant use varies greatly. In the Galestown, Downer, and other sandy soils moisture and fertilizer are not easily stored. Fertilizer and lime are rapidly leached downward to underlying strata. In the silty soils, such as the Matapeake and Mattapex, large amounts of fertilizer are easily stored and readily released for plant growth throughout a long period. Also, these soils store more moisture for plant use than do the sandy soils.

Any fertility plan in Talbot County is affected by the acidity of the soils because all of them are naturally acid. Since some fertilizer elements are not readily released by soils that are more than slightly acid (pH of 6.0 or lower), additions of lime are needed if crops are to be grown.

Crop production can be maintained on the soils in this county only if a continuous program of liming and fertilizing is followed. Lime and fertilizer are needed in amounts determined by soils tests and by the needs of the specific crops.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forest trees or engineering.

In the capability system, all kinds of soils are grouped at three levels, the capability class, subclass, and unit. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

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

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 their use largely to pasture, woodland, or wildlife.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, woodland, wildlife.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements

Figure 14.—**A gully that has formed in an easily erodible Matapeake silt loam.**

about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-13. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass. In Talbot County the capability units are not in numerical order, because a statewide system is used in Maryland and all the capability units in the system are not in Talbot County.

In the following pages the capability units in Talbot County are described and suggestions for the use and management of the soils are given. The mention of the soil series in a description of a capability unit does not mean that all the soils in the series are in the unit. The soils that make up a capability unit can be identified by referring to the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT I-4

This unit consists of nearly level, deep, well-drained soils that have a loam or silt loam surface layer and are easily plowed and cultivated. These soils belong to the Matapeake and Sassafras series. They are among the best soils in the county for farming. They store moisture and fertilizer well and readily release these to plants. Water and air move through these soils moderately well. These soils are naturally acid. Lime is required if they are to be farmed successfully. The surface layer of these soils generally contains 2 to 3 percent organic matter.

The soils of this unit are suited to many kinds of crops. Under proper management, they are well suited to all general farm crops, including corn, small grains, and alfalfa. Ordinary practices of good farming are sufficient to maintain productivity, but in some intensively cultivated fields the subsoil has been compacted. This compaction restricts root growth and lessens moisture-holding capacity. A sod crop grown every few years reduces compaction and improves soil structure. Minimum tillage and use of crop residue also reduce soil compaction and increase moisture-holding capacity. Additions of fertilizer, besides increasing the growth of crops, improve soil structure and moisture-holding capacity by increasing root growth and the amount of crop residue.

CAPABILITY UNIT I-5

This unit consists of deep, well-drained soils that have a fine sandy loam or sandy loam surface layer. These soils belong to the Sassafras series. They are easily plowed and cultivated with light machinery. Although water and air move readily through these soils, the capacity to store moisture and readily release it to plants helps to prevent droughtiness. If prolonged droughty periods occur, they affect these soils earlier in summer than they affect the soils in capability unit I-4. These soils are naturally acid. Lime is required if they are to be farmed successfully. The surface layer of these soils contains 1 to 2 percent organic matter.

The soils in this unit are well suited to all general farm crops grown in the county. They are especially well suited to most vegetable crops, including peas, beans, tomatoes, cucumbers, and spinach. Also, alfalfa grows so well on these soils that 3 or 4 cuttings of good quality can be expected in one growing season.

Ordinary practices of good farming are sufficient to maintain crop growth, but use of winter cover and green-manure crops helps to control soil blowing and to maintain content of organic matter. Crops on the soils in this unit respond well to fertilizer, but smaller and more frequent applications are needed than are needed on the soils in capability unit I-4. Nitrogen should be applied as a side dressing on these soils. Care is needed in applying herbicides so as to prevent burning of crops. Also needed are practices that increase moisture-holding capacity and that help to maintain soil structure. Such practices include minimum tillage, following a fertility plan, and use of crop residue.

CAPABILITY UNIT IIe-4

This unit consists of gently sloping, well-drained, deep loams and silt loams that, in most places, have lost as much as 75 percent of their surface layer through sheet erosion. These soils belong to the Matapeake and Sassafras series. They have good capacity to store moisture and readily release it for plant use, except in areas where the subsoil has been turned up by plowing. These areas generally lack organic matter and tend to crust and to compact easily. This crusting and compaction reduces aeration and moisture-holding capacity. Seed germinates slowly in areas where the subsoil is exposed.

Under good management that includes practices for controlling sheet erosion, the soils in this unit are well suited to all general crops grown in the county, including alfalfa, soybeans, and corn. Corn grows especially well on these soils.

Because these soils are gently sloping, they erode in intensively cultivated areas. Practices that help in controlling erosion, and in increasing moisture-holding capacity as well, include growing winter cover crops, minimum tillage, and use of plant residue and crop rotations. In some places where slopes are short and complex, farming on the contour is not practical, but field stripcropping may be used to advantage on some of these slopes. Crops on these soils respond well to additions of fertilizer because these soils hold fertilizer readily available for plant use.

CAPABILITY UNIT IIe-5

The soils in this unit are deep, gently sloping, well-drained fine sandy loams and sandy loams that belong to the Sassafras series. In most areas these soils have lost as much as 75 percent of their original surface layer through erosion. In these more eroded areas, the surface crusts readily, content of organic matter is low, and seed germinates poorly. During dry periods crops on these soils may be damaged because moisture is lacking. These naturally acid soils require additions of lime if crops are to be grown successfully.

Under good management, the soils in this unit are well suited to all general farm crops and to some vegetables. Pasture plants and long-term hay crops do not grow well on these soils, but deep-rooted alfalfa has excellent growth after it is established.

Additional erosion is likely in cultivated areas that are not protected. Practices that help to control erosion, to maintain content of organic matter, and to conserve moisture include use of cover crops, green-manure crops, crop residue, minimum tillage, and suitable crop rotations. These soils are not well suited to contour farming, though stripcropping may be a practical way to help control erosion and to insure good growth of crops. Crops on these soils respond well to large additions of fertilizer, but the applications should be slightly smaller and more frequent than those on the heavier silt loams and loams in capability unit IIe-4. Nitrogen should be applied as a side dressing. In applying herbicides, care is needed so as to prevent the burning of crops.

CAPABILITY UNIT IIe-13

This unit consists of moderately well drained, gently sloping, moderately eroded Keyport soils that have a loam or silt loam surface layer. In most places these soils have lost as much as 75 percent of their surface layer through sheet erosion. They are naturally acid. Lime is required if they are to be farmed successfully.

Runoff on these soils is so rapid that protecting them from erosion is more important than improving drainage. Upon drying, these soils become very compact. If these soils are plowed when too wet, clods form that are difficult to break.

Under good management, the soils in this unit are well suited to corn, soybeans, and hay and pasture.

Management is needed that reduces erosion and increases the content of organic matter. Suitable practices are use of plant residue, minimum tillage, stripcropping or contour farming where practical, growing cover crops, not tilling when the soils are wet, following a fertility plan, and using suitable crop rotations.

CAPABILITY UNIT IIe-16

This unit consists of gently sloping, moderately well drained, moderately permeable soils that have a loam or silt loam surface layer. These soils belong to the Mattapex and Woodstown series. They have been eroded so much that, in places, only 25 percent of their original surface soil remains. In these eroded areas, seed germinates poorly, the soil surface tends to crust easily, and the content of organic matter is very low. During dry periods, crops may be damaged by lack of moisture. These soils are naturally acid. Lime is required if farming is to be successful.

The soils in this unit are well suited to all general farm crops grown in the county. On drying during summer, the Mattapex soils tend to compact and the growth of roots and movement of air and water are retarded. Compaction is lessened by planting sod crops. Although these soils are only moderately well drained, artificial drainage is not essential for producing general farm crops. If these soils are cropped for long periods, management is needed that adds fertilizer, maintains organic matter and tilth, and conserves soil moisture.

Management practices suitable for these soils are use of plant residue, minimum tillage, planting cover crops, tilling only when the soil is not wet, and using a suitable rotation of adequately fertilized crops. Also advisable is using stripcropping or contour farming where practical.

CAPABILITY UNIT IIe-36

The only soil in this unit is Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded. This moderately well drained soil is easily penetrated by roots, water, and air. In many places sheet erosion has thinned the surface layer as much as 75 percent. The mottled subsoil indicates seepage or a seasonal high water table. This soil is naturally acid. Lime is required if farming is to be successful.

The soil in this unit is suited to most general farm crops grown in the county. Early in spring, however, plowing is often difficult because the water table is high. The water table could be lowered by artificial drainage, but this is not essential for growth of corn, small grains, soybeans, or hay. Crops on these soils respond well to additions of fertilizer and to practices that maintain the supply of organic matter. Among the practices suitable for this soil are use of plant residue, minimum tillage, stripcropping or contour farming where feasible, use of cover crops, not tilling when the soil is too wet, following a suitable fertility plan, and use of suitable crop rotations.

CAPABILITY UNIT IIw-1

This unit consists of nearly level, moderately well drained, deep soils that have a loam or silt loam surface layer. These soils belong to the Mattapex and Woodstown series. They have a mottled subsoil, which indicates a seasonal high water table or poor aeration.

The soils in this unit are suited to all general farm crops grown in the county. Although these soils are only moderately well drained, artificial drainage is not essential for producing general farm crops. Some wet, depressional areas of Woodstown loam may be a nuisance during spring operations, but these areas can be effectively drained with random ditches or tile, if a tile well is placed at the center of the depression.

When these soils dry in summer, they tend to compact. This compaction slows the growth of roots and the movement of air and water. Planting sod crops reduces compaction and improves soil structure. Other practices that help to maintain good growth of crops are use of cover crops and green-manure crops, use of plant residue, minimum tillage, and use of suitable rotations. Crops on these soils respond well to heavy applications of fertilizer.

CAPABILITY UNIT IIw-5

This unit consists of nearly level, moderately well drained, deep soils that have a fine sandy loam or sandy loam surface layer. These soils belong to the Woodstown series. They are penetrated easily by roots, water, and air, though the water table is seasonally high. Plowing and cultivating with light farm equipment are easy. These soils are naturally acid. Lime is required if farming is to be successful.

The soils in this unit are suited to all general farm crops grown in the county, and to many vegetable crops. Artificial drainage is needed if the soils are cropped to vegetables, and also in many places where general crops are grown. Deep tile lines or deep ditches dug by dragline lower the water table and prevent the drowning of crops and the miring of farm equipment. Ditches and tile also hasten the warming of the soils in spring. Cover crops help to control erosion. Large amounts of fertilizer are essential for good growth of crops, but frequent side dressing is needed throughout the growing period so as to reduce loss of fertilizer through leaching and to prevent the burning of the crops. Crop burning is also likely unless herbicides are applied with care.

CAPABILITY UNIT IIw-8

This unit consists of nearly level, moderately well drained Keyport soils that have a loam or silt loam surface layer and a clayey, slowly permeable subsoil. These soils are naturally acid. Lime is required if they are to be farmed successfully.

The soils in this unit are well suited to water-tolerant pasture and hay crops, but adequate drainage is needed if general farm crops are grown. Surface drainage, which generally is needed, can be achieved through use of V-type ditches dug with a bulldozer, plow furrows, bedding, and land smoothing, or a combination of these. Tile lines do not function properly, because the subsoil is dense. Deep ditches are needed as outlets for water from the surface drains or the plow furrows.

These dense soils are difficult to till. Because they compact tightly upon drying, the penetration of roots is restricted. Also causing compaction are use of heavy equipment and grazing on these soils when they are wet. Because fertilizer does not leach easily, large amounts are retained for plant use.

Management is needed that increases the movement of air and water, that helps to prevent or correct compaction, and that increases or maintains fertility and content of organic matter. Effective practices are use of plant residue, minimum and timely tillage, growing winter cover crops, and including sod crops in suitable crop rotations.

CAPABILITY UNIT IIs-4

This unit consists of nearly level to gently sloping, well-drained soils that have a thick loamy sand surface layer and a thin sandy loam subsoil. These soils are in the Downer series. They are naturally acid and contain little organic matter. They have poor capacity to hold moisture for plant use. These soils warm early in spring but become hot in summer. During winter they are susceptible to soil blowing.

The soils in this unit are well suited to vegetable crops, but additions of lime and fertilizer are needed. Irrigation insures maximum growth of vegetables. Because fertilizer leaches easily, losses should be replaced by small and frequent applications. Nitrogen, especially, should be applied in side dressings. Unless lime and herbicides are applied with care on these sandy soils, crops may be damaged by burning. Except for deep-rooted alfalfa, pasture and hay crops do not grow well.

Other practices of good management are needed on the soils in this unit so as to lessen soil blowing, to increase and maintain content of organic matter, to improve moisture-holding capacity, and to help control excessive heating in summer. These practices include growing well-fertilized cover crops, growing green-manure crops, and minimum and mulch tillage.

CAPABILITY UNIT IIIe-4

This unit consists of moderately sloping, well-drained, deep soils that have a loam or silt loam surface layer. These soils belong to the Matapeake and Sassafras series. In most places, they have lost as much as 75 percent of their surface layer through sheet erosion. These soils have good capacity to hold moisture and readily release it to plants. They require additions of lime if they are to be successfully farmed. In the more eroded areas, the surface crusts readily, content of organic matter is very low, and seed germinates poorly. During dry periods crops in these areas may be damaged from lack of moisture.

The soils in this unit are well suited to all general farm crops grown in the county if erosion is controlled. Alfalfa grows well and is suitable where there is a need for hay. Crops on these soils respond well to large additions of fertilizer.

Practices that help to control erosion on the soils in this unit are use of winter cover crops, plant residue, minimum tillage, field strips, and rotations that include a large percentage of close-growing crops. Because slopes are complex, contour farming generally is not practical on these soils, but diversions can be used to advantage in many places. In places where water concentrates, sod waterways are needed to prevent gullies from forming.

CAPABILITY UNIT IIIe-5

The only soil in this unit is Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded. This soil is deep and well drained. In most places it has lost as much as 75 percent of its surface layer through sheet erosion. It is moderately permeable to water and air and has only moderate capacity to hold moisture available for plant use. This soil is naturally acid and requires additions of lime if it is to be farmed successfully.

The soil in this unit is suited to all crops grown in the county if intensive practices are used for conserving soil and water. Practices that help to control erosion are growing winter cover crops, use of plant residue, minimum tillage, stripcropping, use of crop rotations, or a combination of these. Because slopes are complex, contour farming generally is not practical, but diversion terraces can be used in many places to divert concentrated water. Concentrated water may form gullies unless waterways are sodded. Fertilizer is essential, though applications should be extended over a long period so as to prevent leaching.

CAPABILITY UNIT IIIe-13

The only soil in this unit is Keyport loam, 5 to 10 percent slopes, moderately eroded. This moderately well drained, slowly permeable soil has a clayey subsoil through which water moves very slowly. This soil is naturally acid. Lime is required if farming is to be successful.

Where erosion is controlled, this soil is suited to most general farm crops grown in the county. Because the subsoil is very slowly permeable and runoff is rapid, control of erosion is needed. Suitable practices for this control are use of winter cover crops, use of plant residue, minimum tillage, stripcropping, and rotating crops. Alfalfa and other deep-rooted crops are not grown on this soil, because the subsoil is tight and the soil is wet from seepage. Interceptor tile is generally effective in draining this soil. Diversion terraces may be necessary in controlling erosion, but their use depends on the size of the area and the lay of the land. Sod crops increase permeability and improve soil structure. Additions of fertilizer are needed for maximum growth of crops.

CAPABILITY UNIT IIIe-33

The only soil in this unit is Downer loamy sand, 5 to 10 percent slopes, moderately eroded. This well-drained soil has a thick surface layer and a thin sandy loam subsoil. It has a low capacity for holding moisture that plants can use. In many places this soil has lost as much as 75 percent of its surface layer through soil blowing and sheet erosion. This soil is naturally acid. Lime is required if farming is to be successful.

Because this soil is droughty, it is not well suited to most farm crops grown in the county. It is suited to early truck crops, however, if management is intensive. Practices are needed that increase the content of organic matter and help to control erosion. Such practices include growing cover crops and green-manure crops, use of plant residue, minimum tillage and contour farming where practical, stripcropping if feasible, and use of diversion terraces to prevent concentrated water from forming gullies. Because fertilizer is leached easily, small amounts should be applied frequently. Supplemental irrigation is especially beneficial when the growing season is dry.

CAPABILITY UNIT IIIw-1

This unit consists of level to gently sloping, somewhat poorly drained, deep Barclay soils that have a silt loam surface layer. In a few places these soils have lost as much as 75 percent of the surface layer through sheet erosion. Excess water caused by slow surface runoff is the primary concern of management. These soils are naturally acid. Lime is required if farming is to be successful.

The soils in this unit are well suited to all general farm crops grown in the county. Successful farming in nearly level areas, however, requires removal of excess surface water by use of shallow V-type ditches, bedding, plow furrows, land smoothing, or by a combination of these. In many places deep outlet ditches are needed to remove water from the shallow field drains. Where these soils are gently sloping, sheet erosion can be controlled by working across the slopes. Because these soils compact when they dry during summer, in some places root growth is limited and the movement of air and water through the soils is slowed. Management practices that maintain tilth and soil structure also help to lessen compaction. These practices include growing cover crops, minimum tillage, use of crop residue, and especially use of sod crops in the rotations. These soils also are well suited to hay and pasture, but grazing must be prohibited when the soils are wet. Crops on the soils in this unit respond well to large additions of fertilizer.

CAPABILITY UNIT IIIw-6

This unit consists of nearly level, poorly drained to very poorly drained, moderately permeable soils that have a fine sandy loam or sandy loam surface layer. These soils are in the Fallsington and Pocomoke series. They have a high water table through much of the year. In some areas crop growth has been increased by artificial drainage.

If properly drained, these soils are suited to all general farm crops grown in the county. Tile lines or deep ditches dug with a dragline are needed to lower the high water table and to carry away excess water. Because ditchbanks may cave in, sod should be established on them as soon as possible after the ditches are dug.

The Pocomoke soil contains a large amount of organic matter. Because this soil is black, it absorbs much sunlight and warms fairly early in spring. After it is drained, it is well suited to specialized crops, such as bulbous spring flowers.

Because the soils in this unit are wet, working them early in spring is difficult. After they are drained, however, these soils are easily tilled with light farm equipment. Winter cover crops improve soil tilth and generally allow plowing earlier in spring. Crops on these soils respond to fertilizer, but side dressing is needed during the growing period so as to replace losses of fertilizer through leaching. Because these soils are strongly acid or extremely acid, heavy applications of lime are needed to improve crop growth.

CAPABILITY UNIT IIIw-7

This unit consists of nearly level, poorly drained to very poorly drained soils that have a loam or silt loam surface layer. These soils belong to the Fallsington, Othello, Pocomoke, and Portsmouth series. They have a seasonal high water table and poor surface drainage. Except for the Pocomoke and Portsmouth soils, these soils warm very slowly. They are naturally acid. Lime is required if they are to be farmed successfully.

If properly drained, these soils are suited to the general farm crops grown in the county. Surface drainage can be improved by V-type ditches, bedding, plow furrows, and land smoothing, or by a combination of these. Deeper ditches dug by a dragline are needed as outlets for the shallow ditches, and also to help lower the water table in spring or in other periods of excessive wetness. If crop residue is on these soils during spring, it retards drying. Rough plowing in fall is undesirable, because it leaves many pockets that water stands in and delays spring planting. The soils in this unit also are well suited to water-tolerant hay and pasture crops. Crops on these soils respond well to additions of fertilizer.

CAPABILITY UNIT IIIw-9

This unit consists of nearly level, poorly drained, very slowly permeable soils that have a loam or silt loam surface layer. These soils belong to the Elkton series. The subsoil normally is so dense that it is penetrated by moisture, air, and roots with difficulty. These soils are strongly acid. Lime is required if they are to be farmed successfully.

If properly drained, the soils in this unit are suited to the general farm crops grown in the county. Water-tolerant pasture and hay plants grow especially well.

Surface drainage is a major concern in management because these soils are nearly level and very slowly permeable. Surface drainage, however, can be improved by digging V-type ditches with a bulldozer, land smoothing (fig. 15), plowing furrows, or by a combination of these. In many places deep ditches dug with a dragline are needed to serve as outlets for the shallow drains. Tile lines do not function properly on these soils. Grazing on these soils or working them with farm machinery when they are wet intensifies the drainage problem.

If these soils are worked when wet, hard clods form. Also, these soils are compacted when they dry, but cloddiness and compactness can be lessened by planting sod crops so as to improve structure and tilth. By planting winter cover crops, the farmer can plow earlier in spring because these crops take in much moisture from the soil and give it off into the air. But these soils warm slowly because they are light colored and reflect much heat from the sun. Use of crop residue may delay spring plowing because the residue slows evaporation of excess moisture. Plowing in fall delays spring plowing by leaving pockets in which water collects. Crops grow well if fertilizer is added, and most of the added fertilizer is used by the crops because little of it leaches.

CAPABILITY UNIT IIIw-10

The only soil in this unit is Klej loamy sand. This soil is nearly level, moderately well drained, and rapidly permeable. It has a high water table during winter and spring. It is naturally acid and lime is required for good growth of most crops.

Crops generally do not grow well on this soil. If crops are grown, drainage is needed. Tile lines and open ditches dug by a dragline are suitable for drainage because water and air pass easily through this soil. Any management practice that increases content of organic matter is of benefit. Additions of fertilizer also are necessary if crops are to have satisfactory growth. Because fertilizer leaches rapidly, however, small amounts applied in frequent side dressings are needed throughout the growing season. In spring machinery is difficult to use on this soil because miring is likely.

CAPABILITY UNIT IVe-3

This unit consists of deep to moderately deep, moderately sloping or strongly sloping soils that have a loam or silt loam surface layer. In some places all of the surface layer and part of the subsoil have been removed through sheet erosion. These soils belong to the Matapeake and Sassafras series. They are naturally acid. Lime is required if crops are to grow well.

Because of their slopes and susceptibility to erosion, the soils in this unit are better suited to pasture, hay, and trees than to cultivated crops. If these soils are cultivated intensive management is needed. This management should provide diversion terraces, sod waterways, contour farming, stripcropping, use of crop residue, and a long-term rotation that is made up entirely of close-growing crops. Additions of fertilizer are needed for good growth of crops, though some of the fertilizer is carried downslope by runoff water if intensive management is not practiced.

353-025—70——4

Figure 15.—**Land smoothing to provide surface drainage on poorly drained Elkton soils. These soils are in capability unit IIIw-9.**

CAPABILITY UNIT IVe-5

This unit consists of deep, moderately sloping and strongly sloping Sassafras soils that have a sandy loam surface layer. In many areas all of the surface layer of these soils and as much as 75 percent of the subsoil have been removed through erosion. These soils are naturally acid. Lime is required if crops are to have satisfactory growth.

The soils in this unit are better suited to hay and pasture than to cultivated crops. Because they are subject to erosion, these soils should be cultivated as little as possible. If a cultivated crop is grown, it should be followed by winter grain and that by hay grown for several years. Other erosion control practices needed are the use of crop residue and of cover crops and contour farming where practical. In many places diversion terraces are needed to carry away concentrated water safely. Before the diversion terraces are built, outlets and waterways should be shaped and well sodded. In the more severely eroded areas, these soils tend to be droughty. During dry weather in spring, seed germinates poorly. Some applied fertilizer can be expected to wash downslope where surface runoff is not controlled.

CAPABILITY UNIT IVw-6

The only soil in this unit is Plummer loamy sand, a nearly level, poorly drained, rapidly permeable soil. This soil is hard to manage because it is kept wet by a high water table much of the year. It is very strongly acid. Lime is required if crops are grown.

Under good management that includes drainage and additions of fertilizer, this soil can be used for most general crops common in the county, but these crops do not grow very well. If suitable outlets are available, drainage can be by tile lines or by open ditches dug by a dragline. The banks of the ditches are likely to cave. After this soil is drained, it tends to be droughty. Fertilizer should be applied in small amounts throughout the growing season so that not so much of it is leached from this soil.

CAPABILITY UNIT IVs-1

The only soil in this unit is Galestown loamy sand, 0 to 5 percent slopes. This soil is excessively drained and rapidly permeable. It does not hold moisture well for plant use. It is naturally acid, and additions of lime are required if crops are to be grown.

This soil is not well suited to cultivated crops, because it is droughty. Some vegetables can be grown if this soil is irrigated and fertilizer is added. By growing cover crops and green-manure crops, soil blowing is controlled and the content of organic matter is increased. Also beneficial are use of plant residue and mulch tillage. Fertilizer should be applied in split applications because it is easily leached from this soil. Nitrogen is especially needed. This soil warms and can be worked early in spring, but it may become excessively hot in summer. Light farm equipment is suitable on this soil, and disking generally can take the place of plowing.

CAPABILITY UNIT Vw-1

The only soil in this unit is Othello silt loam, low. It is a nearly level, poorly drained soil that is flooded by salt water when tides are unusually high.

This soil is intermittently salty and supports only salt-tolerant vegetation. The salt leaches out only during periods of rainfall. In some places low dikes are constructed to prevent flooding, but such construction is expensive and not feasible. Drainage also is not feasible, because the elevation of this soil is about that of sea level and removing excess water may require the building of tide gates to prevent salt water from backing into the drainage ditches. Adapted grasses can be grown on this soil, but grazing should be limited.

CAPABILITY UNIT VIe-2

The soils in this unit are mostly strongly sloping or severely eroded, or both. They are in the Keyport, Matapeake, and Sassafras series. Steep land is also included in this unit. These soils are well drained in most places, but in some areas, especially at the lower parts of slopes, seepage spots occur. These soils are naturally acid. Additions of lime are required if sod crops are to have good growth. In many places these soils have lost all of the surface layer and much of the subsoil through sheet and rill erosion.

Because these soils are strongly sloping or steep and are susceptible to erosion, they are not suited to cultivated crops. They are suited to hay and pasture, as woodland, and as wildlife habitat.

On the severely eroded soils, further damage can be prevented by building diversion terraces around the head of gullies. Before the diversion terraces are built, safe outlets for the water should be completed. In preparing pasture for reseeding, disking on the contour is needed. Good growth of pasture plants is insured by applying fertilizer. Pasture on these soils can be grazed early in spring, but overgrazing must be prevented. Operation of farm machinery is hazardous because of the slopes.

CAPABILITY UNIT VIw-1

Only Mixed alluvial land is in this unit. This land is level and somewhat poorly drained to very poorly drained. It is frequently flooded by nearby streams. The water table is at or near the surface of this land most of the year.

Mixed alluvial land is not suitable for cultivation, because it is flooded frequently and the water table is high. Some cleared areas that are less wet than other areas can be improved by planting water-tolerant grasses. These areas can be grazed during dry periods. This land is better suited as woodland or as wildlife habitat than as pasture.

CAPABILITY UNIT VIIe-2

The only soil in this unit is Keyport silty clay loam, 10 to 15 percent slopes, severely eroded. The runoff on this soil is very rapid and carries away much of the surface layer where it is not protected by ground cover. Because slopes are moderately steep and erosion is likely, a protective cover of trees is needed on this soil. If properly managed, this soil produces timber of good quality.

CAPABILITY UNIT VIIs-1

The only soil in this unit is Galestown loamy sand, 5 to 15 percent slopes. This soil is rapidly permeable and droughty. It is naturally acid and infertile.

This soil is so droughty and steep that it is not suited to cultivated crops, hay, or pasture. It should remain wooded or be planted to trees.

CAPABILITY UNIT VIIIw-1

Only Tidal marsh is in this unit. This marsh is not suitable for farming, because it is too wet and salty. It generally cannot be used for grazing, because it is too soft to support the weight of cattle. Most areas do not produce marsh hay. Tidal marsh generally is excellent as wildlife habitat for water-loving animals and fowl.

CAPABILITY UNIT VIIIs-2

Only Coastal beaches are in this unit. These beaches border tidal creeks, rivers, and bays. Coastal beaches are not suitable for farming, because they are extremely droughty and are flooded by salt water during high tides. They are suited as recreational areas and as habitat for some forms of wildlife.

Estimated yields

Table 2 shows estimated average yields of the principal crops grown on the tillable soils in Talbot County under two levels of management. Not suitable for crops and pasture and not included in table 2 are Borrow pits, Coastal beaches, Made land, Mixed alluvial land, Steep land, and Tidal marsh. Listed in columns A are estimated average yields of specified crops under management commonly practiced in the county. The yields listed in columns B are those expected under improved management.

Common management is that practiced by most farmers in the county. Under common management the farmer is likely to follow one or more of these bad practices. The soils are not properly limed, fertilizer is not applied in amounts needed for maximum yields, wet areas are not properly drained, and erosion control is inadequate. Many farmers do not use improved varieties of certified seed. Weeds, insects, and disease are not adequately controlled. Moisture-holding capacity and aeration are reduced because the soil is compacted. On some fields tillage is not timely. The listed yields are averages obtained through a period of years in which there were wide ranges in climate, particularly in rainfall.

TABLE 2.—*Estimated average acre yields of specified crops under two levels of management*

[Yields in columns A are averages obtained under management commonly practiced in the county; those in columns B are averages under improved management. Absence of a yield figure indicates that the crop is not commonly grown on the soil, that the soil is not suitable for the crop, or that no information is available upon which to base an estimate]

Soil	Corn		Soybeans		Barley		Rye		Tall grass pasture	
	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Barclay silt loam, 0 to 2 percent slopes	55	105	19	36	25	47	17	32	80	145
Barclay silt loam, 2 to 5 percent slopes, moderately eroded	55	115	20	38	25	47	18	34	80	150
Downer loamy sand, 0 to 2 percent slopes	45	115	17	40	22	57	15	36	60	150
Downer loamy sand, 2 to 5 percent slopes, moderately eroded	45	110	16	40	21	54	14	36	60	145
Downer loamy sand, 5 to 10 percent slopes, moderately eroded	40	100	15	38	19	48	13	34	50	135
Elkton loam	50	95	16	25	23	40	15	27	70	125
Elkton silt loam	50	95	16	25	23	40	15	27	70	125
Fallsington sandy loam	50	95	18	34	24	45	16	31	70	135
Fallsington fine sandy loam	50	95	18	34	24	45	16	31	70	135
Fallsington loam	50	95	18	34	24	45	16	31	70	135
Galestown loamy sand, 0 to 5 percent slopes	35	90	14	25	18	40	13	25	40	120
Galestown loamy sand, 5 to 15 percent slopes	30	85	13	23	17	36	12	23	30	115
Keyport loam, 0 to 2 percent slopes	55	110	20	38	26	49	18	34	75	145
Keyport loam, 2 to 5 percent slopes, moderately eroded	55	115	20	38	25	48	18	34	75	155
Keyport loam, 5 to 10 percent slopes, moderately eroded	55	115	20	38	25	48	18	34	75	155
Keyport loam, 10 to 15 percent slopes									70	130
Keyport silt loam, 0 to 2 percent slopes	55	110	20	38	26	49	18	34	75	145
Keyport silt loam, 2 to 5 percent slopes, moderately eroded	55	115	20	38	25	48	18	34	75	155
Keyport silty clay loam, 5 to 10 percent slopes, severely eroded									65	135
Keyport silty clay loam, 10 to 15 percent slopes, severely eroded									50	115
Klej loamy sand	35	90	14	37	19	48	13	33	55	135
Matapeake loam, 0 to 2 percent slopes	70	135	25	40	33	62	22	36	90	170
Matapeake loam, 2 to 5 percent slopes, moderately eroded	65	130	24	40	31	60	22	36	85	165
Matapeake loam, 5 to 10 percent slopes, moderately eroded	60	120	23	40	30	58	21	36	80	160
Matapeake loam, 10 to 15 percent slopes	60	120	23	40	30	58	21	36	75	150
Matapeake silt loam, 0 to 2 percent slopes	70	135	25	40	33	62	22	36	90	170
Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	65	130	24	40	31	60	22	36	85	165
Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	60	120	23	40	30	58	21	36	80	160
Matapeake silt loam, 5 to 10 percent slopes, severely eroded	55	115	20	40	26	53	18	36	75	150
Matapeake silt loam, 10 to 15 percent slopes, severely eroded									80	145
Mattapex loam, 0 to 2 percent slopes	60	120	23	40	29	56	21	36	85	160
Mattapex loam, 2 to 5 percent slopes, moderately eroded	60	125	23	40	28	55	21	36	85	170
Mattapex silt loam, 0 to 2 percent slopes	60	120	23	40	29	56	21	36	85	170
Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	60	125	23	40	28	55	21	36	85	170
Othello silt loam	55	105	19	36	25	47	17	32	80	145
Othello silt loam, low									85	180
Plummer loamy sand		50		22						85
Pocomoke sandy loam	50	95	18	34	24	45	16	31	70	135
Pocomoke loam	50	95	18	34	24	45	16	31	70	135
Portsmouth silt loam	55	105	19	36	25	47	17	32	80	145
Sassafras sandy loam, 0 to 2 percent slopes	65	125	24	40	32	60	22	36	85	160
Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	60	120	23	40	30	58	21	36	80	155
Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	60	115	22	40	28	55	20	36	80	150
Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	55	110	20	38	26	49	18	34	75	140
Sassafras sandy loam, 10 to 15 percent slopes	60	110	21	39	27	51	19	35	80	145
Sassafras sandy loam, 10 to 15 percent slopes, severely eroded									70	130
Sassafras fine sandy loam, 0 to 2 percent slopes	65	130	25	40	33	62	22	36	85	165
Sassafras fine sandy loam, 2 to 5 percent slopes, moderately eroded	60	125	24	40	31	60	21	36	80	160
Sassafras loam, 0 to 2 percent slopes	65	130	25	40	33	62	22	36	85	165
Sassafras loam, 2 to 5 percent slopes, moderately eroded	60	125	24	40	31	60	21	36	80	160
Sassafras loam, 5 to 10 percent slopes, moderately eroded	60	120	23	40	29	57	20	36	80	155
Sassafras loam, 5 to 10 percent slopes, severely eroded	55	115	21	38	27	51	18	34	75	145
Woodstown sandy loam, 0 to 2 percent slopes	55	110	22	40	29	54	20	36	80	150
Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded	60	115	23	40	30	57	21	36	85	160
Woodstown fine sandy loam, 0 to 2 percent slopes	55	110	22	40	29	54	20	36	80	150
Woodstown loam, 0 to 2 percent slopes	55	110	22	40	29	54	20	36	85	150
Woodstown loam, 2 to 5 percent slopes, moderately eroded	60	115	23	40	30	57	21	36	85	160

[1] Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of animal units carried per acre multiplied by the number of days the pasture is grazed during a grazing season without injury to the sod. An acre of pasture that provides 30 days of grazing for two cows has a carrying capacity of 60 cow-acre-days.

In improved management, or that expected to produce the yields listed in columns B, these practices are followed—

1. Fertilizer and lime are applied according to the needs indicated by soil tests.
2. Weeds, insects, and disease are controlled by the most practical means.
3. Certified seed of proven varieties that has been treated for fungus and disease is seeded at rates suited to the crops and the soil.
4. Suitable methods of plowing, preparing the seedbed, and cultivating are used, but tillage is kept to a minimum.
5. Rotations of adequate length and cover crops are used that help control weeds, that improve tilth and moisture-holding capacity, and that help control disease, reduce erosion, and maintain content of organic matter.
6. Use of contour tillage, stripcropping, diversion terraces, grassed waterways, or similar practices that help control erosion, that lessen runoff of usable water, and that increase moisture retention of the soil.
7. Adequate drainage is installed on wet soils so as to prevent flooding of crops, to improve aeration, and to lower the water table.

The yields in columns B were jointly estimated by agronomists of the University of Maryland and soil scientists of the Soil Conservation Service. Yields of corn were estimated on the basis of data from a corn-soil yield study made during the period 1960–64 in Talbot County. Other basic data used in making the estimates in table 12 were market records and miscellaneous publications issued by the Department of Agricultural Economics, University of Maryland, Agricultural Experiment Station.

The estimated yields shown in columns B are not presumed to be the maximum attainable. They are goals that are practical for most farmers to reach through a number of years of cropping under varying conditions and better than average management. Many soils in the county can produce more than 150 bushels of corn per acre. Yields of more than 200 bushels per acre have been recorded for the Matapeake soils. Yields vary from year to year, depending on management, weather, insects, disease, and the like.

Use of Soils as Woodland [2]

Practically all of Talbot County, except marshland, originally was forested, but no virgin forests and few original trees remain. The soils were cleared early so that they could be farmed. The trees were burned, or they were sold for lumber, to make charcoal, or to be used as fuel.

According to the U.S. Forest Service, about 48,700 acres, or about 27 percent of the county, remained wooded in 1964. Except for small State and Federal holdings, this woodland is owned privately. The largest part of it is covered by mixed loblolly pine and white oak.

[2] Prepared with the assistance of ADNA R. BOND, chief of forest management, Maryland Department of Forests and Parks, and SILAS LITTLE, research forester, Northeastern Forest Experiment Station, U.S. Forest Service.

Loblolly pine is the most important tree in the county, because it grows rapidly and can be readily sold for use as poles, piling, and pulpwood, and for use in building construction and in making baskets and crates. In the rest of the woodland in the county, the trees are mixed hardwoods, consisting of oaks, tulip-poplar, sweetgum, blackgum, red maples, hickory, beech, ash, and sycamore. Of these trees, the logs of tulip-poplar, sweetgum, and of some red maple, sycamore, and beech trees are in demand for making baskets and crates. Also, a small quantity of these trees is sold for use in general construction. Furniture is made from some of the better grades of tulip-poplar. Red oak and white oak are used for furniture, flooring, paneling, and for boat and construction timber. Some of the well-formed white oak trees are used for piling. Loblolly pine and some of the hardwoods are chipped at sawmills in the county to be made into paper pulp. Sawdust, shavings, bark, and other byproducts of sawmills are used for the bedding of poultry.

Woodland suitability groups

Just as soils were placed in capability units according to their suitability for crops and pasture, they are grouped according to suitability for woodland. Each woodland suitability group is made up of soils that produce similar kinds of wood crops, that require similar practices to conserve soil and moisture, and that have similar potential productivity for trees.

In this subsection the woodland suitability groups of Talbot County are described. The description of each group names the soil series represented in the group, but this does not mean that all the soils in the series mapped in the county are in the group. The woodland group classification of any given soil in the county can be found by referring to the "Guide to Mapping Units" at the back of this soil survey. Terms used in the descriptions of these groups require explanation.

The potential productivity of soils for trees is measured by site index. The site index is the average height, in feet, of dominant trees in a stand 50 years of age. If the site index of loblolly pine, for example, is said to be 70 on a given soil, the statement means that the dominant trees in the stand of loblolly pine on the given soil have an average height of 70 feet when the trees are 50 years of age. Because loblolly pine is the most important species grown on the Eastern Shore of Maryland, the site index of this tree has been determined by taking measurements at a fairly large number of sites on some soils.

The site indexes for loblolly pine given in this soil survey were taken from results of studies made at sites along the Coastal Plain of Maryland, Delaware, and Virginia. These sites are in many counties, including Talbot. On some soils trees were measured on a fairly large number of sites, but on other soils only a few suitable sites were available where the stand of loblolly pine was fully stocked. Measurements were not taken on some soils, but the site index was estimated as about that of soils having similar characteristics.

Data on site index not so complete as data collected for loblolly pine have been collected for various kinds of hardwoods that grow on the soils of Maryland and on similar soils in surrounding States.

Species priority indicates for each woodland group the kinds of trees that should be favored in management and is given in order of priority of the trees. This information is important in planning methods of thinning, weeding, and planting. Species priority is based on the site indexes of individual species, though species adaptation and the expected commercial value also are considered.

Seedling mortality refers to the percentage of naturally occurring or planted tree seedlings that die because of adverse characteristics of the soils. Assumed for planted seedlings are use of healthy stock, site preparation, and proper planting, and for naturally occurring seedlings, an adequate supply of seed. A normal environment is assumed for both natural and planted seedlings. Seedling mortality is rated *slight* if the losses expected are not more than 25 percent of the planted stock and restocking from initial planting is satisfactory. Ordinarily, some natural regeneration takes place. Mortality is rated *moderate* if expected losses from the influences of the soil are between 25 and 50 percent. Natural regeneration cannot be relied upon for adequate and immediate restocking. Seedling mortality is *severe* where expected losses from the influences of the soil are more than 50 percent of planted stock and natural regeneration cannot be relied on. To insure adequate and immediate restocking in formerly cultivated fields and in woodland, seedbeds must be specially prepared and superior methods of planting used. Also, considerable replanting is expected.

Plant competition refers to the degree that undesirable species invade woodland and thus compete with desirable trees. Each woodland group is rated on the basis of encroachment from brush, transition to less desirable species, and other undesirable plant competition. Plant competition is *slight* if invasion by undesirable species does not impede natural regeneration and growth of desired trees. Competition is *moderate* if it does not prevent establishment of an adequate stand of the desired species, though initial growth of the trees may be slowed. Site preparation is not essential. Plant competition is *severe* where natural regeneration cannot be relied upon to provide adequate restocking of the desired species. In these places special management and special site preparation are necessary, as is management that provides controlled burning, spraying with chemicals, girdling, disking, or similar practices.

Equipment limitation is a hazard that results from soil characteristics and topographic features, such as drainage and slope, that restrict or prohibit the use of equipment commonly used in harvesting trees. The limitation may be seasonal or year long. Limitation is *slight* if the soil or topography is such that the type of equipment and the time of year the equipment is used are not restricted. Slopes are less than 10 percent. Equipment limitation is *moderate* if the kinds of soil are such that the type of equipment is only moderately limited. Wetness may limit use of equipment seasonably. Where slopes limit use of equipment, they generally range from 10 to 15 percent. Some damage to tree roots is expected. Where limitation is *severe*, the kinds of soil are such that the type of suitable equipment is limited. Also, because of excess water, the use of this equipment is restricted for a period of more than 3 months. Use of equipment causes serious damage to tree roots and to soil structure and stability. Steep slopes limit use of equipment in places.

Erosion hazard is the susceptibility of a soil to erosion. This hazard is rated *slight* if the kind of soil and the slope are such that little or no erosion occurs in areas having little cover, or during periods of intense rainfall. The hazard is *moderate* if some erosion occurs during periods of intense rainfall in areas not adequately covered by vegetation. Erosion hazard is *severe*, if the loss of soil is severe during periods of intense rainfall and if there is some loss when rainfall is moderate.

Windthrow hazard is rated according to soil characteristics that influence the development of tree roots, as this development affects the resistance of trees to uprooting by wind. Information on this hazard is provided by observing the damage to stands that, on different kinds of soil, is caused by wind of varying velocities. This rating is important in determining a suitable density of stands that can be obtained by thinnings, release cuttings, regeneration, and harvest cuttings. Windthrow hazard is *slight* on soils in which root development of the desired species is sufficient to prevent windthrow of trees exposed to normal wind. Individual trees are expected to remain standing where surrounding trees are harvested on all sides. The hazard is *moderate* where root development of the desired species provides adequate stability, except during periods when wetness is excessive and wind velocity is greatest. The rating is *severe* for soils in which rooting is not deep enough to anchor the trees adequately, and individual trees are blown over if surrounding ones are harvested. The water table or a dense, restrictive layer may limit the depth of rooting.

Assistance in the management of woodland can be obtained, without cost, from the assistant district forester, Maryland Department of Forests and Parks, at Cambridge. He may be reached directly or through the Talbot Soil Conservation District or the county agent.

WOODLAND SUITABILITY GROUP 1

This group consists of deep, well-drained, level to gently sloping silt loams, loams, sandy loams, and loamy sands that are moderately permeable. These soils are in the Downer, Matapeake, and Sassafras series. Most of them retain moisture well and readily release it to trees.

The soils in this group occupy about 44,323 acres, or 24.7 percent of the county.

Except for the Downer soils, the soils in this group have about the same suitability for pine or hardwood trees. The Downer soils are not so well suited to hardwoods, especially yellow-poplar, as are the Sassafras and Matapeake soils, because the Downer soils do not retain moisture as well. The Sassafras loams and the Matapeake soils are excellent for establishing black walnut, a tree of high value.

The following trees and their site indexes are listed in order of species priority: Loblolly pine, 75–84; mixed oaks, 65–80; and tulip-poplar, 75–90. Shortleaf pine and Virginia pine also are suitable trees for the soils of this group.

These soils have few or no limitations to woodland management, except that plant competition may be moderate, particularly in young stands of conifers where treetops have not closed over enough to shade out competing plants and shrubs. Seedling mortality, equipment limitations, erosion, and windthrow are only slight hazards.

WOODLAND SUITABILITY GROUP 2

This group consists of deep, well-drained soils that have a silt loam, loam, loamy sand, or sandy loam surface layer and are moderately permeable. These soils are in the Downer, Matapeake, and Sassafras series. They normally occur on each side of tidewater and intermittent streams. Slopes range from 5 to 15 percent. Much moisture is generally available to trees because water seeps in from higher surrounding areas.

The soils in this group occupy about 4,162 acres, or 2.3 percent of the county.

The Downer soils of this group have a loose loamy sand surface layer and a thin sandy loam subsoil that is more droughty and dries more quickly than the subsoil of the other soils in this group. Consequently, loblolly pine should be favored at the top of the slope and hardwoods at the base. The hardwoods need the additional moisture that seeps in at the base of the slopes.

The following trees and their site indexes are listed in order of species priority: Yellow-poplar, 80–100; loblolly pine, 75–84; and mixed oaks, 70–85.

Because the moisture content is generally good, the soils of this group are well suited to yellow-poplar, to other hardwoods, and to loblolly pine. The soils in this group produce an average of about 11,500 board feet per acre of loblolly pine in 50 years. The Matapeake and Sassafras soils of this group are well suited to black walnut.

Because slopes are strong in places, use of some logging equipment is moderately limited. This limitation is not severe, because the slopes are so short. The stronger slopes also account for a moderate to severe seedling mortality, especially on slopes facing the south. Here the soils dry much quicker than soils on slopes facing north and are subject to more freezing and thawing that uproot seedlings. In other places seedling mortality is slight. In the older well-established stands, erosion is of little concern. Erosion, however, is a moderate hazard on washed-out logging roads, and gullying may be severe in young stands or where woodland is cut over. Other plants compete moderately with conifers but only slightly with hardwoods. Equipment limitations and the hazard of windthrow are slight.

WOODLAND SUITABILITY GROUP 3

This group consists of moderately well drained to somewhat poorly drained soils that have a loamy sand, sandy loam, fine sandy loam, loam, or silt loam surface layer and a moderately permeable subsoil. These soils are in the Barclay, Klej, and Woodstown series. Most of them are level to nearly level, and the rest are gently sloping. Also, most of these soils have a high water table. If dug when wet, the soils in this group crumble easily.

This group of soils occupies about 23,967 acres, or 13.5 percent of the county.

These soils are well suited to loblolly pine (fig. 16). Studies made in New Jersey (*5*) show that yellow-poplar grows better on the finer textured silt loams than on the coarser textured soils. The Klej soil, however, is sandy, is

Figure 16.—**A young stand of loblolly pine on a Barclay silt loam. The trees are expected to reach an average height of about 85 feet at 50 years of age.**

poorly suited to most hardwoods, and should be used for pines.

Site indexes are listed for the following trees in order of species priority: Loblolly pine, 80–90; sweetgum, 75–90; yellow-poplar, 80–105; and mixed oaks, 75–90. Virginia pine also is a suitable tree for the soils in this group.

Plant competition generally is only moderate on these soils because moisture is readily available to trees. After trees are harvested, however, competition may increase because sunlight can then get through to the competing plants. Plant competition with conifers is particularly severe in young stands where treetops have not closed over enough to shade out competing plants. Equipment limitations are severe because during winter and spring the water is high and water stands in the woods. Planking, or matting, the logging roads is advisable for preventing the miring of logging equipment and the cutting of deep ruts. Seedling mortality, erosion, and windthrow are only slight hazards on these soils.

WOODLAND SUITABILITY GROUP 4

This group consists of moderately well drained to somewhat poorly drained loams and silt loams that are in the Keyport and Mattapex series. These soils, especially the Keyport, have a compact, slowly permeable subsoil, through which water, air, and the larger roots of trees penetrate with difficulty. These soils have slopes of 0 to 5 percent.

The soils in this group occupy about 30,563 acres, or 17.2 percent of the county.

Because the subsoil in Keyport soils is compact, loblolly pine grows slowly on these soils. Keyport soils produce about 9,000 board feet per acre of this tree in 50 years. Large roots generally cannot penetrate Keyport soils below a depth of about 18 inches, though some fine roots grow through natural cracks and reach deeper into the soil (fig. 17). The Mattapex soils in this group produce good stands of loblolly pine and are well suited to some kinds of hardwoods, mainly mixed oak and sweetgum. The soils in this group that border tidal waters, however, are not well suited to most trees, because high winds are damaging and salt water floods these soils during unusually high tides.

Site indexes are listed for the following trees in order of species priority: Loblolly pine, 75–84; mixed oaks, 60–80; and sweetgum, 60–80.

Equipment limitations generally are moderate hazards on the soils in this group. Windthrow hazard is slight. Plant competition is moderate except in young stands of conifers where it may be severe. Use of logging equipment is difficult only during the wettest parts of winter and spring. Seedling mortality and erosion are only slight hazards on the soils in this group.

WOODLAND SUITABILITY GROUP 5

This group consists of poorly drained and very poorly drained soils that have a sandy loam, fine sandy loam, loam, or silt loam surface layer. These soils are in the Elkton, Fallsington, Pocomoke, and Portsmouth series. Their subsoil is clayey and slowly permeable or is sandy and moderately permeable. These soils occupy large areas and have slopes that are not more than 2 percent.

The soils in this group occupy about 35,434 acres, or 19.8 percent of the county.

Figure 17.—**Stubby roots of a loblolly pine have had difficulty penetrating the compact subsoil of a Keyport silt loam.**

The soils in this group have about the same suitability for pine or hardwood trees, except for the Elkton soils on which hardwoods grow poorly. In 50 years most soils of this group produce about 14,000 board feet of loblolly pine per acre. The Elkton soils may produce less. A study made in New Jersey (*6*) shows that sweetgum grows poorly on Fallsington soils and reaches only a height of 58–64 feet in 50 years.

Site indexes are listed for the following trees in order of species priority: Loblolly pine, 85–95; mixed oaks, 60–85; and sweetgum, 55–85.

Equipment limitation on these soils is severe, especially during winter and spring when the seasonal water table is high. During these wet periods, equipment mires easily, but logging roads can be planked to prevent the miring of equipment and the rutting of roads. Woody shrubs and low-value hardwoods compete severely with the seedlings of loblolly pine. Plant competition is moderate for hardwoods but is severe for conifers. Seedling mortality, erosion, and windthrow are slight hazards on the soils in this group.

WOODLAND SUITABILITY GROUP 6

The only soils in this group are Othello silt loam and Plummer loamy sand. These soils are poorly drained. The subsoil in the Othello soil contains more silt and clay than the comparable layer in the Plummer soil and is moderately permeable. The Plummer soil is rapidly permeable. Both soils occur in small depressions throughout the eastern part of the county and on broad level areas in the western part.

The soils in this group occupy about 16,406 acres, or 9.3 percent of the county.

These soils have a high water table and are excessively wet during most of the year. They are well suited to loblolly pine, but seedlings have difficulty establishing themselves because of wetness. In 50 years these soils produce about 11,500 board feet of loblolly pine per acre. Hardwoods grow poorly on the soils in this group.

Site indexes are listed for the following trees in order of species priority: Loblolly pine, 75–84; mixed oaks, 60–75; and sweetgum, 60–75.

Because of the high water table and excessive wetness during most of the year, use of equipment is severely limited. During the wet periods, equipment mires easily, but logging roads can be planked to prevent the miring of equipment and the rutting of roads (fig. 18). Undesirable plants compete severely with young conifers. Competition against hardwoods is only moderate. Seedling mortality, erosion, and windthrow are only slight hazards.

WOODLAND SUITABILITY GROUP 7

This group consist of moderately well drained or well drained, moderately sloping to strongly sloping soils that generally are moderately permeable. Most of these soils are severely eroded and have a sandy clay loam or silty

***Figure 18.*—A temporary plank, or mat, logging road constructed on poorly drained Othello silt loam so as to prevent the miring of equipment and rutting of the surface.**

clay loam subsoil. Slopes are short and range from 5 to 15 percent. These soils are in the Keyport, Matapeake, and Sassafras series.

The soils in this group occupy 7,082 acres, or 3.8 percent of the county. Little of this acreage is wooded, but planting trees is advisable because crops grow poorly on the soils in this group.

These soils produce an average of about 6,500 board feet per acre of salable loblolly in 50 years. Virginia pine also can be grown on these soils. Trees grow more slowly on the Keyport soils than on the other soils in this group because Keyport soils are more slowly permeable, are very compact, and are only moderately well drained.

On the soils in this group erosion is a severe hazard until the trees have grown large enough to provide adequate protection. Equipment limitations are moderate but increase as slope increases. Windthrow and seedling mortality generally are moderate, but seedling mortality is somewhat higher on the Keyport soils than on the other soils in this group. Because nearly all native plants grow slowly on the soils in this group, plant competition is only a slight hazard.

WOODLAND SUITABILITY GROUP 8

This group consists of excessively drained, loose loamy sands underlain by strata of sand. These soils are in the Galestown series. They do not hold moisture well for plant use. Slopes range from 0 to 15 percent.

The soils in this group occupy about 703 acres, or 0.4 percent of the county

Although the soils in this group are droughty, they are well suited to loblolly pine. In 50 years an average of about 11,500 board feet per acre of this tree is produced. These soils also are suited to shortleaf pine and Virginia pine but are very poorly suited to hardwoods.

Seedling mortality is moderate because these soils are dry and, when exposed to the sun, hot. Dryness also causes poor seed germination. Equipment limitations generally are moderate because these soils are loose. Little erosion occurs, however, as a result of logging operations on cutover or newly planted woods. Plant competition and windthrow are only slight hazards on the soils in this group.

WOODLAND SUITABILITY GROUP 9

Only Steep land is in this group. Its slopes are steep to very steep and relatively short. At the top of the slope the soil material is generally well drained, but seepage occurs downslope and increases as slope increases. Near the base of a slope the soil material is moderately well drained to somewhat poorly drained.

Steep land occupies about 2,235 acres, or 1.2 percent of the acreage of the county.

Nearly all of the land in this group is forested. Many areas have stands of yellow-poplar and other hardwoods of good quality. At the top of slopes where the soil material is driest, it is feasible to plant shortleaf pine or Virginia pine, but on the lower slopes hardwoods grow better and become more salable timber.

Site indexes are listed for the following trees in order of species priority: Yellow-poplar, 80–90; loblolly pine, 75–84; and mixed oaks 70–80. Shortleaf pine and Virginia pine also are suitable on Steep land.

Limitations for use of equipment on the land in this group are severe because slopes are steep or very steep. Erosion, also a severe hazard, is most severe where logging or skidding exposes soil material, but erosion can be lessened by felling most trees upslope. Windthrow and plant competition are moderate hazards for conifers. Seedling mortality and plant competition with hardwoods are only slight hazards.

WOODLAND SUITABILITY GROUP 10

The only soil in this group is Othello silt loam, low. This level, poorly drained soil occurs in low areas that border marshes, creeks, and rivers. It is flooded by salt water during unusually high tides.

This soil occupies about 1,470 acres, or 0.8 percent of Talbot County.

This soil is very poorly suited to trees because large amounts of salt are deposited by unusually high tides. This soil produces less than 4,000 board feet per acre of loblolly pine in 50 years.

On this soil seedling mortality is severe because of the flooding. Equipment limitations also are severe during the wet winter and spring and after the high tides. Plant competition generally is slight but is moderate where the trees are so far apart that competing plants are not shaded. Competing plants are mainly greenbrier, poison ivy, and high tide bush. Windthrow is only a slight hazard on this soil. There is no hazard of erosion.

WOODLAND SUITABILITY GROUP 11

This group consists only of Mixed alluvial land. This land is made up of silt, sand, and fine sand that were eroded from surrounding higher ground and recently deposited along perennial and intermittent streams. These streams overflow during heavy rains and flood this land. Moisture content of the soil material varies greatly.

Mixed alluvial land occupies about 4,893 acres, or 2.7 percent of the county. About two-thirds of this acreage is well suited to salable hardwoods, but the rest is not suited to salable trees of any kind.

At the upper ends of watersheds, Mixed alluvial land is least wet and is well suited to sweetgum, tulip-poplar, and other salable hardwoods. Farther down the watershed, however, this land is similar to fresh-water swamp and supports red maple, sweetbay, willow oak, ash, willow, and other water-tolerant trees that are of little commercial value.

Site indexes are listed for the following trees in order of species priority: Sweetgum, 75–90; tulip-poplar, 75–100; and loblolly pine, 80–95.

Plant competition is severe against conifers and moderate against hardwoods. Because of excess water, equipment limitations also are severe. Seedling mortality generally is moderate. The hazards of windthrow and erosion are slight. Mixed alluvial land is subject to scouring during floods.

WOODLAND SUITABILITY GROUP 12

This group consists of Borrow pits, Coastal beaches, Made land, and Tidal marsh. These land types are not suited to salable trees, but trees may be planted for protective cover.

In Talbot County this group covers 7,322 acres, or about 4.0 percent of the county.

Loblolly pine is better suited to these land types than are other trees. It may reach a height of as much as 50 feet in some places, but its height varies greatly. Tidal marsh is too salty for trees to grow.

Use of Soils for Wildlife

Wildlife in Talbot County is abundant and is of three major kinds—open-land wildlife, woodland wildlife, and wetland wildlife. About 57 percent of the land area of the county is potentially well suited to open-land wildlife. Open-land wildlife includes rabbits, some deer, and quail and other upland game birds. Nearly 90 percent of the land is potentially well suited to woodland wildlife. Woodland wildlife includes deer, squirrel, and woodcock and other birds. About 30 percent of the land is potentially well suited to wetland wildlife, which includes raccoon, muskrat, and rails, ducks, geese, and other waterfowl. The migratory Canada geese are especially important.

In addition to the land area, the county has about 495 miles of shoreline along the rivers of the county and the Chesapeake Bay that are also important to wildlife (*4*). The shoreline of Talbot County is longer than that of any county in Maryland. This shoreline is generally narrow but continuous; it consists of the areas between normal high tide and normal low tide. Generally these areas have very little or no vegetation, but growing abundantly in a few areas are such plants as widgeongrass, sago pondweed, claspingleaf pondweed, and pygmy spikerush.

When the tide is low, shores are important feeding grounds for some kinds of waterfowl and shore birds and for mammals, especially raccoons. Any kind of pollution, such as that caused by insecticides and herbicides, damages these feeding grounds. Damage also is caused by shore erosion and by deposition of soil material washed from the uplands. Material washed from the uplands, however, and from the marshes as well, supplies food for many kinds of aquatic life. Fish and crabs are plentiful in the Chesapeake Bay, in estuaries, and in the larger rivers of the county. These waters provide recreation for many sport fishermen and hunters.

Table 3 lists the soils of the county and rates their suitability for eight elements of wildlife habitat and for three classes, or kinds, of wildlife. In that table the soils are rated *good*, or above average; *fair*, or average; *poor*, or below average, or *not suited.*

Elements of Wildlife Habitat.—The elements of wildlife habitat are discussed in the following paragraphs.

Grain and seed crops include corn, sorghum, millet, soybeans, buckwheat, cowpeas, wheat, oats, rye, barley, and other crops that produce grain or grainlike seeds used by wildlife.

Grasses and legumes include lespedezas, alfalfa, alsike clover, Ladino clover, red clover, tall fescue, bromegrass, bluegrass, and timothy. All of these are commonly planted for forage but also are valuable for wildlife.

Wild herbaceous upland plants consist of native annual or other herbaceous plants that commonly grow in upland areas. Included are panicgrass and other native grasses, partridgepea, beggartick, lespedezas, and other native herbs that wildlife use for food and cover.

Hardwood woody plants are trees and shrubs that grow vigorously and produce heavy crops of seed or fruit. They are established naturally or are planted. Among these plants are sumac, dogwood, persimmon, sassafras, hazelnut, lespedezas, multiflora rose, autumn-olive, wild cherry, various kinds of oak and hickory, bayberry, blueberry, huckleberry, highbush cranberry, blackshaw, sweetgum, and holly.

Coniferous woody plants are coniferous trees and shrubs that are native or are planted. Examples are Virginia, loblolly, shortleaf, red, Scotch, and pond pines, Norway spruce, redcedar, and Atlantic white-cedar. The rating is based on whether young trees grow slowly and develop dense foliage, not on the size of mature plants.

Wetland food and cover plants are plants that provide food and cover for waterfowl and furbearing animals. They include smartweed, wildrice, barnyardgrass, wild millet, bulrush, pondweed, duckweed, arrow-arum, pickerelweed, waterwillow, cattail, and various sedges.

Shallow water developments are impoundments in which shallow water can be maintained at a desired level. The water level is generally maintained by surface runoff, by use of reservoir ponds at a higher elevation, or by controlling tidewater.

Excavated ponds are dug-out ponds that depend on ground water, not runoff. The water level in these ponds normally fluctuates with the level of ground water.

Farm ponds of the impounded type are not included in table 4, but can be important for producing fish. If fish are to be produced, at least one-fifth of the pond should be 6 feet deep or more. Table 7 in the subsection "Engineering Uses of Soils" gives features of each soil in the county that affect the selection of sites for ponds.

Suitability of Soils for Kinds of Wildlife.—In table 3 the soils are rated according to their suitability for three general kinds of wildlife. The ratings are based on the suitability of the soils for habitat elements essential to the birds and mammals that make up each kind of wildlife. Elkton silt loam, for example, is rated good for wetland wildlife (fig. 19).

Suitability of Tidal Marsh for Wildlife.—Tidal marsh in Talbot County produces wetland plants that provide good food and cover for a few kinds of wildlife, mainly waterfowl, muskrat, and raccoon. It is also fairly good for shallow water developments, almost all of which are tidal. Tidal marsh has almost no habitat potential for other kinds of wildlife.

The marshes of Maryland have been classified into marsh types according to the dominant vegetation. The vegetation is influenced strongly by the range in tidal fluctuations and by the degree of salinity of the tidal waters (*4*). Three of these marsh types occur in Talbot County and are I, the cattail type; II, the transitional type; and V, the needlerush-saltmeadow type.

In table 4 these three marsh types are rated according to their suitabilities for muskrat, raccoon, rail, nesting ducks, Wilson's snipe, migratory ducks, and geese.

Type I marsh is called the cattail type, but growing in this marsh in addition to cattail are pickerelweed, wildrice, arrow-arum, spatterdock, rice cutgrass, American three-square, spikerush, sedges, wild millet, and a smartweed. Type I marsh occupies about 9 percent of the marshland of the county and occurs only in the upper reaches of tidal streams. Tidal action is slight, and the water is nearly fresh or is only slightly saline. In type I marsh muskrats are numerous and various kinds of rails are usually abundant. Areas of this marsh are excellent for migratory and

TABLE 3.—*Suitability of soils for elements of*

Soil series and map symbols [1]	Elements of wildlife habitat			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants
Barclay:				
BaA	Fair	Good	Good	Good
BaB2	Fair	Good	Good	Good
Downer:				
DoA	Good	Good	Good	Good
DoB2, DoC2	Fair	Good	Good	Good
Elkton: Ek, Es	Poor	Fair	Fair	Good
Fallsington: Fa, Ff, Fg	Poor	Fair	Fair	Good
Galestown: GaB, GaC	Poor	Poor	Poor	Poor
Keyport:				
KmA, KpA	Fair	Good	Good	Good
KmB2, KpB2, KmC2	Fair	Good	Good	Good
KmD, KsC3, KsD3	Poor	Fair	Good	Good
Klej: Ky	Poor	Fair	Fair	Poor
Matapeake:				
MkA, MlA	Good	Good	Good	Good
MkB2, MkC2, MlB2, MlC2	Fair	Good	Good	Good
MkD, MlC3	Poor	Fair	Good	Good
MlD3	Not suited	Poor	Good	Good
Mattapex:				
MpA, MxA	Fair	Good	Good	Good
MpB2, MxB2	Fair	Good	Good	Good
Mixed alluvial land: My	Poor	Poor	Poor	Good
Othello:				
Oh	Poor	Fair	Fair	Good
Ot	Not suited	Poor	Poor	Not suited
Plummer: Pe	Not suited	Poor	Poor	Good
Pocomoke: Pk, Pm	Not suited	Poor	Poor	Good
Portsmouth: Pt	Not suited	Poor	Poor	Good
Sassafras:				
SaA, SfA, SmA	Good	Good	Good	Good
SfB2, SmB2, SaC2, SmC2, SaB2	Fair	Good	Good	Good
SmC3, SaC3, SaD	Poor	Fair	Good	Good
SaD3	Not suited	Poor	Good	Good
Steep land: St	Not suited	Poor	Good	Good
Tidal marsh: Tm	Not suited	Not suited	Not suited	Not suited
Woodstown:				
WdA, WfA, WoA	Fair	Good	Good	Good
WdB2, WoB2	Fair	Good	Good	Good

[1] Borrow pits (Bp) and Made land (Ma) are not included in this table, because these units are too variable for even general

wildlife habitat and kinds of wildlife

Elements of wildlife habitat—Continued				Kinds of wildlife		
Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Open-land wildlife	Woodland wildlife	Wetland wildlife
Poor	Fair	Fair	Fair	Good	Good	Fair.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Fair	Good	Good	Good	Fair	Good	Good.
Fair	Good	Good	Good	Fair	Good	Good.
Good	Not suited	Not suited	Not suited	Poor	Poor	Not suited.
Poor	Poor	Poor	Poor	Good	Good	Poor.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Poor	Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Good	Poor	Poor	Poor	Fair	Poor	Poor.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Poor	Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Poor	Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Poor	Poor	Poor	Poor	Good	Good	Poor.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Good	Good	Poor	Not suited	Poor	Good	Fair.
Fair	Good	Good	Good	Fair	Good	Good.
Not suited	Good	Fair	Not suited	Not suited	Not suited	Fair.
Good	Good	Good	Good	Poor	Good	Good.
Good	Good	Good	Good	Fair	Good	Good.
Good	Good	Good	Good	Fair	Good	Good.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.
Poor	Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Poor	Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Poor	Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Not suited	Good	Poor	Not suited	Not suited	Not suited	Fair.
Poor	Poor	Poor	Poor	Good	Good	Poor.
Poor	Not suited	Not suited	Not suited	Good	Good	Not suited.

interpretation. Coastal beaches (Cb) are not included, because they are unsuited as habitat for any kinds of wildlife listed.

Figure 19.—Shooting geese on an area of Elkton silt loam that is a good habitat for wetland wildlife.

wintering waterfowl because food of high quality is plentiful. Nesting areas are few, however, except along the wooded fringes where wood ducks sometimes build their nests.

Type II marsh makes up about 43 percent of the marshland of the county. Growing in areas of this marsh are most of the plants that are in type I, and also many other species that have a greater tolerance for salt than the plants of type I. In addition to the plants listed for type I are mainly Olney's three-square, saltmarsh bulrush, big cordgrass, smooth cordgrass, and marshy cordgrass. Muskrats are generally numerous, and Wilson's snipe, also called jacksnipe, is commonly abundant during migrations in spring and fall. Several kinds of rail also use type II marsh. Many kinds of waterfowl spend the winter in this marsh, and some black ducks and blue-winged teal nest in it.

TABLE 4.—*Suitability of marsh types for kinds of wildlife*

Species	Type I (Cattail)	Type II (Transitional)	Type V (Needlerush-saltmeadow cordgrass)
Muskrat	Excellent food and cover.	Excellent food and cover.	Poor food and cover.
Raccoon	Excellent food and cover.	Excellent food and cover.	Poor food and cover.
Rail	Excellent	Excellent	Poor.
Nesting ducks	Excellent for wood ducks.	Good	Good for black ducks.
Wilson's snipe	Not rated	Excellent	Not rated.
Migratory ducks.	Excellent	Excellent	Good.
Geese	Good	Good	Poor.

Type V marsh makes up about 48 percent of the total marshland. Areas of this marsh are fairly high and are not often flooded. Needlerush and saltmeadow cordgrass are the most common plants, but high-tide bush, groundsel bush, and switchgrass are common in some of the higher areas. Large numbers of black ducks and small songbirds may build their nests in this marsh. Migratory and wintering waterfowl are usually less numerous than they are in other types of marsh. Muskrats are not abundant, and other mammals are relatively few.

Some areas of marsh should not be drained, because they are made up of material called cat clay. This material, which must be identified on the site, contains large amounts of sulfur compounds. If excess water is removed, oxidation of these compounds results in the formation of sulfuric acid that kills vegetation and makes affected areas practically worthless.

Engineering Uses of Soils

This subsection is a guide to the properties of soils and to the influence of those properties on engineering problems. Soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, foundations for buildings, facilities for water storage, structures for erosion control, drainage systems, and sewage disposal systems. Among the properties most important to the engineer are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell potential, grain size, plasticity, and reaction (pH). Depth to bedrock and topography are also important.

With the use of the soil map for identification, the engineering interpretations in this subsection can be useful for many purposes. It should be emphasized, however, that they may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads or where the excavations are deeper than the depth of the layers given in this soil survey. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

The information in this and other parts of this soil survey can be used by engineers to—

1. Make studies of soil and land use that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils in planning drainage and irrigation systems, diversion terraces, farm ponds and reservoirs, and structures for soil and water conservation or for other purposes.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, airport, pipelines, and cables, and in planning detailed investigation at the selected locations.
4. Locate probable sources of sand and gravel for use in construction.
5. Correlate performance of engineering structures with kinds of soil and thus develop information that will be useful in designing and maintaining engineering structures and installations.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other sources so that it can be readily used by engineers.
8. Develop other preliminary estimates for design and construction purposes pertinent to a particular area.

Much of the information in this subsection is in tables 5, 6, and 7. Table 5 lists engineering data that were obtained when selected soils in the county were tested. In table 6 are estimated engineering properties of the soils in the county, and in table 7 are engineering interpretations of the soils.

Some terms used by soil scientists may be unfamiliar to engineers, and some words may have a special meaning in soil science. Many of these terms are defined in the Glossary at the back of this publication.

Engineering classification systems

Most highway engineers classify soil material in accordance with the system approved by the American Association of State Highway Officials. In this system soil materials are classified into seven principal groups. The groups range from A–1, which consists of gravelly soils of high bearing capacity, to A–7, which consists of clay soils having low strength when wet. Within each group, the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 for the best material to 20 for the poorest. The group index number is shown in parentheses, following the soil group symbol in table 5.

Some engineers prefer to use the Unified soil classification system. In this system soil materials are identified as coarse grained (8 classes), fine grained (6 classes), and highly organic.

Engineering test data

Samples that represent five soil series were taken from 15 locations in Talbot County and were tested by the Bureau of Public Roads (BPR) according to standard procedures of the American Association of State Highway Officials (AASHO) (*1*). The data obtained from these tests are given in table 5.

Table 5 also gives two systems of engineering classification for each soil sample—the AASHO system and the Unified system (*13*). These classifications are based on the data obtained by mechanical analyses and by tests made to determine the liquid limit and the plastic limit.

The tests for liquid limit and plastic limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which a soil passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition. Some silty and sandy soils are nonplastic; that is, they do not become plastic at any moisture content.

Estimated engineering properties of the soils

Table 6 shows some estimated soil properties that are important in engineering, and it gives estimated AASHO and Unified classifications for the soils. The textural terms used to describe the soil material in the main horizons are those used by the U.S. Department of Agriculture. Color has been omitted from the table, but it is given in the section "Descriptions of the Soils."

The information given in table 6 applies to the soils that are only slightly eroded. Also, the thickness of the soil horizons varies somewhat from place to place, but the thickness and other properties described in the table are those that actually exist in a specific profile of the soil described; they are not averages obtained from a number of profiles.

Depth to a seasonal high water table refers to the highest level at which the ground water stands for a significant period of time.

The permeability of a soil horizon is the rate at which water moves through the undisturbed soil material. It depends largely on the texture and structure of the soil.

Available water capacity indicates the amount of water that the soil holds in a form that is available to plants. It is the amount of moisture held in the soil between field capacity, or about one-third atmosphere of tension, and the wilting point, or about 15 atmospheres of tension.

In table 6, the range in reaction is given in pH values, which indicate the degree of acidity or alkalinity of the soil material. Higher values indicate alkaline material and lower values acid material, as shown in the Glossary.

TABLE 5.—*Engineering*

[Tests performed by Bureau of Public Roads (BPR) in accordance with standard

Soil series and location	BPR report number	Depth	Mechanical analyses [1]		
			Percentage passing sieve—		
			¾ in.	No. 4 (4.74 mm.)	No. 10 (2.0 mm.)
		Inches			
Barclay:					
2.2 miles southwest of Longwoods on Miles River Neck. (Modal profile)	S-43420	2-11	----------	----------	100
	S-43421	18-28	----------	----------	----------
	S-43422	38-66	100	98	96
1 mile southwest of Easton on State Route 333. (More silty than modal profile).	S-43423	14-21	----------	----------	100
	S-43424	21-34	----------	----------	100
	S-43425	39-54	----------	----------	100
1 mile southeast of Claiborne. (Modal profile)	S-43426	8-14	----------	----------	100
	S-42427	14-23	----------	----------	100
	S-43428	28-66	----------	----------	100
Elkton:					
1 mile southwest of Bellevue on Ferry Neck Road. (Modal profile)	S-43429	5-13	----------	----------	----------
	S-43430	19-40	----------	----------	----------
	S-43431	55-66	----------	----------	----------
1 mile southeast of Oxford. (Finer textured than modal)	S-43432	½-9	----------	----------	----------
	S-43433	12-22	----------	----------	----------
	S-43434	22-31	----------	----------	----------
	S-43435	31-60	100	95	92
2.2 miles east of Trappe. (Modal profile)	S-43436	14-26	----------	----------	100
	S-43437	26-37	----------	----------	----------
	S-43438	46-58	100	99	98
Keyport:					
1.5 miles southwest of Neavitt at the tip of Nelson Point. (Modal profile).	S-43439	0-12	----------	----------	----------
	S-43440	19-34	----------	----------	----------
	S-43441	47-62	----------	----------	----------
2.2 miles southeast of Easton in the Seth Demonstration Forest. (Modal profile).	S-43442	4-9	----------	----------	100
	S-43443	13-19	----------	----------	100
	S-43444	24-34	----------	----------	100
	S-43445	56-72	----------	----------	100
1.5 miles southwest of St. Michaels on Hopkins Point. (Modal profile)	S-43446	20-33	----------	----------	----------
	S-43447	33-40	----------	----------	----------
	S-43448	48-60	----------	----------	----------
Mattapex:					
1.5 miles east of Easton. (Modal profile)	S-43449	10-17	----------	----------	100
	S-43450	22-30	----------	----------	100
	S-43451	45-60	----------	----------	100
1.5 miles south of Easton. (More silty than modal profile)	S-43452	17-25	----------	----------	100
	S-43453	25-45	----------	----------	100
	S-43454	45-55	----------	100	99
4 miles south of Barber on Goose Point. (Modal profile)	S-43455	18-24	----------	----------	100
	S-43456	24-32	----------	----------	100
	S-43457	38-49	----------	----------	100

See footnotes at end of table.

test data

procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analyses [1]—Continued						Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Continued		Percentage smaller than—						AASHO	Unified [2]
No. 40 (0.042 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
99	94	92	66	29	20	26	4	A-4(8)	ML-CL
100	97	96	69	34	27	36	13	A-6(9)	ML-CL
87	18	15	12	10	9	[3] NP	[3] NP	A-2-4(0)	SM
96	88	86	57	24	16	27	8	A-4(8)	CL
96	86	84	50	18	13	26	6	A-4(8)	ML-CL
64	40	40	35	25	20	36	19	A-6(3)	SC
99	79	77	54	25	16	22	4	A-4(8)	ML-CL
99	76	72	50	26	20	29	12	A-6(9)	CL
97	17	12	8	6	6	NP	NP	A-2-4(0)	SM
100	99	99	87	53	43	35	12	A-6(9)	ML-CL
100	99	98	73	38	29	31	11	A-6(8)	CL
100	76	69	49	29	21	22	5	A-4(8)	ML-CL
100	98	98	80	37	27	29	6	A-4(8)	ML-CL
100	99	99	85	54	47	43	21	A-7-6(13)	CL
100	99	98	77	39	31	32	11	A-6(8)	CL
88	29	27	22	16	11	NP	NP	A-2-4(0)	SM
98	86	84	70	47	41	48	27	A-7-6(16)	CL
100	99	98	71	38	32	34	13	A-6(9)	CL
92	62	62	56	39	31	27	11	A-6(6)	CL
100	97	96	68	30	18	31	5	A-4(8)	ML
100	98	96	72	38	31	38	15	A-6(10)	ML-CL
100	92	84	54	33	27	30	9	A-4(8)	ML-CL
99	94	92	72	35	24	27	6	A-4(8)	ML-CL
99	96	94	72	38	30	36	13	A-6(9)	ML-CL
99	96	94	68	34	27	36	14	A-6(10)	CL
91	57	56	42	22	15	20	6	A-4(4)	ML-CL
100	84	81	64	42	32	35	16	A-6(10)	CL
100	72	67	48	32	26	25	7	A-4(7)	ML-CL
100	30	25	14	9	6	NP	NP	A-2-4(0)	SM
99	94	92	66	33	23	28	7	A-4(8)	ML-CL
99	96	94	70	38	31	36	14	A-6(10)	CL
91	59	56	40	24	18	22	8	A-4(5)	CL
98	88	86	60	30	23	29	8	A-4(8)	ML-CL
93	74	72	49	23	17	26	7	A-4(8)	ML-CL
96	64	63	52	38	29	28	12	A-6(7)	CL
99	92	90	68	34	27	33	12	A-6(9)	CL
99	93	91	67	34	28	30	9	A-4(8)	ML-CL
95	34	32	29	24	19	18	2	A-2-4(0)	SM

TABLE 5.—*Engineering*

Soil series and location	BPR report number	Depth	Mechanical analyses [1] Percentage passing sieve— ¾ in.	No. 4 (4.74 mm.)	No. 10 (2.0 mm.)
		Inches			
Sassafras:					
0.6 mile north of Hambleton on U.S. Highway No. 50. (Modal profile)	S-43458	14-24	100	99	99
	S-43459	24-33			100
	S-43460	33-72			100
0.5 mile south of Longwoods. (Coarser textured than modal profile)	S-43461	17-25			100
	S-43462	31-38			100
	S-43463	38-72			100
2 miles northeast of Easton on Old Chapel Road. (Modal profile)	S-43464	16-26			100
	S-43465	26-34			100
	S-43466	34-60			100

[1] Mechanical analyses according to the AASHO Designation T 88 (*1*). Results by this procedure frequently differ from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes of soil.

TABLE 6.—*Estimated engineering*

Soil series and map symbols [1]	Depth to seasonal high water table	Depth from surface	Classification: USDA texture	Unified	AASHO
	Feet	*Inches*			
Barclay (BaA, BaB2)	0.5	0-28	Silt loam	ML-CL or CL	A-4 or A-6
		28-38	Loam	ML-CL or CL	A-6 or A-4
		38-76	Sandy loam to loamy fine sand.	SM or SC	A-2 or A-6
Coastal beaches (Cb)	[3]	0-60	Sand	SP	A-1 or A-3
Downer (DoA, DoB2, DoC2)	5+	0-16	Loamy sand	SP-SM or SM	A-2 or A-3
		16-23	Sandy loam	SM or SC	A-2, A-4
		23-32	Loamy sand	SM	A-2
		32-52	Sand	SP or SM	A-3 or A-2
Elkton (Ek, Es)	0	0-5	Silt loam or loam	ML-CL	A-4
		5-19	Silty clay	CL, ML-CL, or CH.	A-6 or A-7
		19-40	Silty clay loam	CL or CH	A-6 or A-7
		40-66	Fine sandy clay loam	ML, CL, or SM	A-6, A-2, or A-4.
Fallsington (Fa, Ff, Fg)	0	0-13	Fine sandy loam, loam, or sandy loam.	SM or ML	A-2 or A-4
		13-23	Sandy clay loam	SC, SM, or ML-CL	A-2 or A-4
		23-33	Sandy loam	SM or SP-SM	A-2
		33-60	Loamy sand	SM or SP-SM	A-2 or A-3

See footnotes at end of table.

test data—Continued

Mechanical analyses [1]—Continued						Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Continued		Percentage smaller than—						AASHO	Unified [2]
No. 40 (0.042 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
94	68	66	56	34	27	29	12	A-6(7)	CL
95	45	44	38	26	22	24	8	A-4(2)	SC
96	22	21	17	13	10	NP	NP	A-2-4(0)	SM
86	61	59	47	29	24	30	12	A-6(6)	CL
74	34	32	26	19	16	20	7	A-2-4(0)	SM-SC
64	17	16	14	11	10	NP	NP	A-2-4(0)	SM
94	69	68	58	35	27	29	13	A-6(8)	CL
90	47	46	39	23	18	22	7	A-4(2)	SM-SC
85	25	24	20	16	13	NP	NP	A-2-4(0)	SM

[2] Based on the Unified Classification System (*13*). SCS and BPR have agreed to consider that all soils having plasticity indexes within two points from the A-line are to be given a borderline classification. Examples of borderline classification obtained by this use are ML-CL and SM-SC.

[3] NP=Nonplastic.

properties of the soils

Percentage passing sieve—			Range in permeability	Available water capacity	Range in reaction [2]	Corrosion potential		Shrink-swell potential	Optimum moisture	Maximum dry density
No. 4	No. 10	No. 200				Untreated steel pipes	Concrete pipes			
			Inches per hour	*Inches per inch of depth*	*pH*				*Percent*	*Lbs. per cubic foot*
100	100	75-100	0. 20-0. 63	0. 17	4. 0-5. 0	High	High	Low	18	101-110
95-100	95-100	60-75	0. 20-0. 63	. 15	4. 0-5. 0	High	High	Low	15	111-120
90-100	90-100	15-40	0. 63-6. 3	. 10	4. 0-5. 0	High	High	Low	12	101-120
95-100	90-100	0-5	>6. 3	. 07	----------	High	High	Low	9-15	100-115
100	100	5-30	>6. 3	. 08	4. 0-5. 0	Low	High	Low	----------	----------
100	100	15-40	2. 00-6. 3	. 12	4. 0-5. 0	Low	High	Low	14	111-120
100	100	10-20	>6. 3	. 06	4. 0-5. 0	Low	High	Low	10	101-110
100	100	0-25	>6. 3	. 04	4. 0-5. 0	Low	High	Low	10	91-100
100	100	60-90	0. 06-0. 20	. 21	4. 0-5. 0	High	High	Moderate	----------	----------
100	100	60-100	<0. 06	. 18	4. 0-5. 0	High	High	Moderate	18	101-110
100	100	85-100	<0. 06	. 18	4. 0-5. 0	High	High	Moderate	15	101-110
100	100	30-80	0. 20-0. 63	. 18	4. 0-7. 3	High	High	Moderate	12	111-120
100	100	30-55	2. 0 -6. 3	18	4. 0-5. 0	High	High	Low	----------	----------
100	100	30-55	0. 63-2. 0	. 18	4. 0-5. 0	High	High	Low	14	111-120+
100	100	10-25	0. 63-6. 3	. 15	4. 0-5. 0	High	High	Low	12	101-120
100	100	10-15	2. 0 -6. 3	. 08	4. 0-5. 0	High	High	Low	10	101-110

TABLE 6.—*Estimated engineering*

Soil series and map symbols [1]	Depth to seasonal high water table	Depth from surface	Classification		
			USDA texture	Unified	AASHO
	Feet	*Inches*			
Galestown (GaB, GaC)	5+	0–26	Loamy sand	SM or SP–SM	A–2 or A–3
		26–60	Sand	SP or SP–SM	A–3
Keyport [4] (KmA, KmB2, KmC2, KmD, KpA, KpB2, KsC3, KsD3).	2	0–9	Silt loam or loam	ML–CL or ML	A–4
		9–34	Silty clay loam	CL or ML–CL	A–6
		34–56	Silty clay loam	ML–CL or SM	A–4 or A–2
Klej (Ky)	2	0–23	Loamy sand	SM–SP or SM	A–2 or A–3
		23–50	Sand	SP or SM–SP	A–3
Matapeake (MkA, MkB2, MkC2, MkD, MlA, MlB2, MlC2, MlC3, MlD3).	5+	0–14	Silt loam or loam	ML or ML–CL	A–4
		14–29	Silty clay loam	ML or CL	A–6 or A–4
		29–39	Loam	SM or ML	A–4
		39–60	Sand	SP, SM, or SP–SM	A–3 or A–2
Mattapex (MpA, MpB2, MxA, MxB2)	2	0–10	Silt loam or loam	ML–CL	A–4
		10–35	Silt loam	CL	A–6
		35–60	Sandy loam	SM	A–2
Othello (Oh, Ot)	0	0–13	Silt loam	ML or ML–CL	A–4
		13–28	Silty clay loam	ML or CL	A–4 or A–6
		28–33	Loam	ML	A–4
		33–52	Sand	SP, SP–SM, or SM	A–3 or A–2
Plummer (Pe)	0	0–21	Loamy sand	SM or SP–SM	A–2 or A–3
		21–42	Sand	SP or SM–SP	A–3 or A–1
		42–60	Loamy coarse sand	SP–SM or SP	A–3 or A–2
Pocomoke (Pk, Pm)	0	0–25	Sandy loam or loam	SM or ML	A–2 or A–4
		25–34	Sandy clay loam to sandy loam.	SC, SM, or CL	A–2 or A–4
		34–52	Sand	SP, SP–SM, or SM	A–3 or A–2
Portsmouth (Pt)	0	0–11	Silt loam	ML or ML–CL	A–4 or A–7
		11–34	Silty clay loam	CL or ML–CL	A–6
		34–42	Fine sandy clay loam	SC, SM, or CL	A–6
		42–52	Fine sand	SP, SM, or SC	A–3 or A–2
Sassafras (SaA, SaB2, SaC2, SaC3, SaD, SaD3, SfA, SfB2, SmA, SmB2, SmC2, SmC3).	5+	0–14	Fine sandy loam, loam, or sandy loam.	SM or ML	A–2 or A–4
		14–24	Sandy clay loam	SC or CL	A–6
		24–33	Sandy loam	SC or SM	A–2 or A–4
		33–50	Sand	SP–SM or SM	A–2
Woodstown (WdA, WdB2, WfA, WoA, WoB2).	1½–2	0–14	Fine sandy loam, loam, or sandy loam.	SM or ML	A–2 or A–4
		14–24	Sandy clay loam	SC, ML–CL, SM–SC, or CL.	A–4 or A–6
		24–32	Sandy loam or sandy clay loam.	SM, ML–CL, ML, or SC.	A–4
		32–48	Sand	SP–SM, SM, or SM–SC.	A–2 or A–4

[1] Properties are not shown in this table for Borrow pits (Bp), Made land (Ma), Mixed alluvial land (My), Steep land (St), and Tidal marsh (Tm).
[2] For unlimed soils.

properties of the soils—Continued

Percentage passing sieve—			Range in permeability	Available water capacity	Range in reaction [2]	Corrosion potential		Shrink-swell potential	Optimum moisture	Maximum dry density
No. 4	No. 10	No. 200				Untreated steel pipes	Concrete pipes			
			Inches per hour	*Inches per inch of depth*	*pH*				*Percent*	*Lbs. per cubic foot*
100	100	10–15	>6. 3	. 06	4. 0–5. 0	Very low	High	Low	10	101–110
100	100	0–5	>6. 3	. 04	4. 0–5. 0	Very low	High	Low	10	91–110
100	100	65–95	0. 20–2. 0	. 21	4. 0–5. 0	High	High	Low	----------	----------
100	100	80–95	<0. 20	. 18	4. 0–5. 0	High	High	Moderate	17	101–110
100	100	30–90	0. 20–0. 63	. 18	4. 0–5. 0	High	High	Moderate	14	101–120
100	100	10–20	>6. 3	. 08	4. 0–5. 0	Low	High	Low	10	101–110
100	100	0–5	>6. 3	. 04	4. 0–5. 0	Low	High	Low	10	91–110
100	100	60–95	0. 63–2. 0	. 21	4. 5–5. 0	Low	Moderate	Low	----------	----------
100	100	60–95	0. 63–2. 0	. 18	4. 5–5. 0	Moderate	Moderate	Moderate	15	101–110
100	100	40–75	0. 63–2. 0	. 18	4. 5–5. 0	Low	High	Low	12	111–120
100	100	0–20	>6. 3	. 04	4. 5–5. 0	Low	High	Low	10	91–110
100	100	60–75	0. 63–2. 0	. 21	4. 5–5. 5	Moderate	Moderate	Low	----------	----------
100	100	60–90	0. 20–0. 63	. 18	4. 5–5. 5	High	High	Moderate	18	101–110
100	95–100	20–35	2. 0 –6. 3	. 15	4. 0–5. 0	High	High	Low	15	111–120
100	100	85–95	0. 20–0. 63	. 20	4. 5–5. 0	High	High	Low	----------	----------
100	100	85–95	0. 20–0. 63	. 20	4. 5–5. 0	High	High	Moderate	15	101–110
100	100	50–60	0. 63–2. 0	. 18	4. 5–5. 0	High	High	Low	12	111–120
100	100	10–30	>6. 3	. 06	4. 0–5. 0	High	High	Low	10	91–110
100	100	10–20	>6. 3	. 08	4. 0–5. 0	High	High	Low	10	101–110
100	100	0–10	>6. 3	. 04	4. 0–5. 0	High	High	Low	10	91–110
100	100	5–15	>6. 3	. 06	3. 5–4. 5	High	High	Low	10	101–110
100	100	25–55	0. 63–2. 0	. 18	4. 0–5. 0	High	High	Low	----------	----------
100	95–100	30–60	0. 63–2. 0	. 18	4. 0–5. 0	High	High	Low	14	111–120+
100	100	0–20	>6. 3	. 04	4. 0–5. 0	High	High	Low	10	91–110
100	100	60–95	0. 20–0. 63	. 21	4. 0–5. 0	High	High	Low	----------	----------
100	100	80–95	<0. 20	. 18	4. 0–5. 0	High	High	Moderate	15	101–110
100	95–100	35–60	<0. 20	. 18	4. 0–5. 0	High	High	Low	14	111–120+
100	100	0–35	>6. 3	. 04	4. 0–5. 0	High	High	Low	10	91–100
95–100	90–100	30–55	2. 0–6. 3	. 15	4. 0–5. 0	Low	High	Low	----------	----------
95–100	95–100	40–70	0. 63–2. 0	. 18	4. 0–5. 0	Low	High	Low	14	111–120+
100	100	15–50	2. 0–6. 3	. 15	4. 0–5. 0	Low	High	Low	12	111–120+
100	100	10–25	>6. 3	. 04	4. 0–5. 0	Low	High	Low	10	91–110
100	100	30–65	0. 63–2. 0	. 17	4. 0–5. 0	Low	High	Low	----------	----------
100	100	40–75	0. 20–2. 0	. 18	4. 0–5. 0	Moderate	High	Low	14	111–120+
100	100	35–75	0. 63–2. 0	. 15	4. 0–5. 0	Moderate	High	Low	12	111–120+
100	100	10–40	>6. 3	. 04	4. 0–5. 0	Moderate	High	Low	10	91–110

[3] Water table fluctuates with tides.
[4] Severely eroded soils in this series lack all or most of the silt loam or loam surface layer.

TABLE 7.—*Engineering*

Soil series and map symbols [1]	Suitability for earthwork when soil is—		Susceptibility to frost action	Suitability as source of—			Soil features that affect—
	Wet	Frozen		Topsoil [2]	Sand [3]	Road fill	Pipeline construction and maintenance
Barclay (BaA, BaB2)	Poor	Unsuitable	Severe	Good	Fair	Poor to fair.	High fluctuating water table; poor stability.
Coastal beaches [5] (Cb)	Good	Good	None	Unsuitable	Good	Fair	Fluctuating saline water table; loose material; poor stability.
Downer (DoA, DoB2, DoC2).	Good	Fair	Slight	Fair	Fair to good	Good to fair.	More than 5 feet to water table; fair stability.
Elkton (Ek, Es)	Poor	Unsuitable	Severe	Poor	Unsuitable	Poor to fair.	High fluctuating water table; poor stability.
Fallsington (Fa, Ff, Fg)	Fair	Poor	Severe	Fair	Poor	Fair	High fluctuating water table; fair to good stability.
Galestown (GaB, GaC)	Good	Good	Slight	Fair	Fair to good	Fair	More than 5 feet to water table; fair stability.
Keyport (KmA, KmB2, KmC2, KmD, KpA, KpB2, KsC3, KsD3).	Very poor	Unsuitable	Severe	Fair	Unsuitable	Poor	Moderately high fluctuating water table; fair stability.
Klej (Ky)	Fair to good.	Fair	Moderate	Fair	Fair above depth of 24 inches and good below.	Fair	Moderately high fluctuating water table; fair stability.

See footnotes at end of table.

interpretations

Soil features that affect—Continued						
Road or highway location	Sites for ponds and reservoirs	Dikes, levees, and other embankments	Drainage systems	Irrigation	Terraces or diversions	Waterways [4]
Seasonal high water table; poor stability; severe frost action.	Low seepage through subsoil; moderate seepage in substratum; seasonal high water table.	Poor stability; highly erodible.	Moderately slow permeability; highly erodible.	High moisture capacity; slow infiltration; somewhat poor drainage.	High erodibility; poor stability.	High available moisture capacity; moderate fertility; erodible.
High water table; tidal hazard; loose material; poor stability.	Excessive seepage; subject to tidal action.	Poor stability; highly porous; susceptible to soil blowing.	Not needed	Extremely low moisture capacity; extremely rapid infiltration; saline ground water.	Not applicable.	Not applicable.
Fair stability; slight frost action.	Moderate seepage through subsoil; excessive seepage in substratum.	Susceptible to erosion; moderate permeability; fair stability.	Not needed	Low moisture capacity; rapid infiltration.	Fair stability; erodible.	Low available moisture capacity and fertility; erodible.
Seasonal high water table; poor stability; severe frost action.	Seasonal high water table; low to very low seepage.	Poor stability; highly erodible.	Very slow permeability; highly erodible; outlets may be a problem.	High moisture capacity; slow infiltration; poor drainage.	High erodibility; poor stability.	High available moisture capacity; low fertility; erodible.
Seasonal high water table; fair to good stability; severe frost action.	Seasonal high water table; moderate seepage through subsoil; high seepage in substratum.	Fair to good stability; moderately erodible.	Moderate permeability; moderately erodible; outlets may be a problem.	Moderate moisture capacity; moderate infiltration; poor drainage.	Not applicable.	Moderate available moisture capacity; low fertility.
Fair stability; no or slight frost action.	High to excessive seepage.	Fair stability; susceptible to soil blowing; loose material.	Not needed	Very low available moisture capacity; rapid infiltration.	Susceptible to soil blowing; fair stability.	Very low available moisture capacity and fertility.
Seasonal high water table; fair stability; severe frost action.	Seasonal high water table; low to very low seepage.	Fair stability; highly erodible.	Slow permeability; highly erodible.	High available moisture capacity; slow infiltration; impeded drainage.	High erodibility; fair stability.	High available moisture capacity; low fertility.
Seasonal high water table; fair stability; moderate frost action.	Seasonal high water table; high seepage.	Fair stability	Rapid permeability.	Low available moisture capacity; rapid infiltration; impeded drainage.	Fair stability	Low available moisture capacity and fertility.

TABLE 7.—*Engineering*

Soil series and map symbols [1]	Suitability for earthwork when soil is—		Susceptibility to frost action	Suitability as source of—			Soil features that affect—
	Wet	Frozen		Topsoil [2]	Sand [3]	Road fill	Pipeline construction and maintenance
Matapeake (MkA, MkB2, MkC2, MkD, MlA, MlB2, MlC2, MlC3, MlD3).	Poor	Poor	Moderate	Good	Good below depth of 40 inches.	Fair	More than 5 feet to water table; fair stability.
Mattapex (MpA, MpB2, MxA, MxB2).	Poor	Very poor	Severe	Good	Fair to poor	Fair	Moderately high fluctuating water table; fair stability.
Othello (Oh, Ot)	Very poor	Very poor	Severe	Fair	Fair below depth of 33 inches.	Fair to poor	High fluctuating water table; poor stability.
Plummer (Pe)	Good	Fair	Severe	Poor	Fair	Poor to fair	High fluctuating water table; poor stability.
Pocomoke (Pk, Pm)	Poor	Unsuitable	Severe	Good [6]	Good below depth of 34 inches.	Good to fair	High fluctuating water table; poor stability; may be ponded.
Portsmouth (Pt)	Very poor	Unsuitable	Severe	Good [6]	Fair below depth of 42 inches.	Poor	High fluctuating water table; poor stability; may be ponded.
Sassafras (SaA, SaB2, SaC2, SaC3, SaD, SaD3, SfA, SfB2, SmA, SmB2, SmC2, SmC3.	Fair	Fair	Moderate	Good	Good to fair below depth of 33 inches.	Good	More than 5 feet to water table; good stability.
Woodstown (WdA, WdB2, WfA, WoA, WoB2).	Fair	Poor	Severe	Good	Good to fair below depth of 32 inches.	Good to fair.	Moderately high fluctuating water table; good stability.

[1] Interpretations are not given in this table for Borrows pits (Bp), Made land (Ma), Mixed alluvial land (My), Steep land (St), and Tidal marsh (Tm).

[2] Rating for topsoil is for the first, or surface, layer only, or to an average depth of 10 inches, whichever is less. Also, all severely eroded soils are unsuitable as a source of topsoil.

[3] None of the soils in Talbot County are suitable as sources of gravel, though some gravel may occur in small, isolated spots.

interpretations—Continued

Soil features that affect—Continued						
Road or highway location	Sites for ponds and reservoirs	Dikes, levees, and other embankments	Drainage systems	Irrigation	Terraces or diversions	Waterways [4]
Fair stability; moderate frost action.	Moderate seepage	Fair stability; moderately erodible.	Not needed	High available moisture capacity; moderate infiltration.	Moderate erodibility; fair stability.	High available moisture capacity; moderate fertility.
Seasonal high water table; fair stability; severe frost action.	Moderate seepage through subsoil; high seepage in substratum.	Fair stability; highly erodible.	Moderately slow permeability; highly erodible.	High available moisture capacity; moderate infiltration; impeded drainage.	High erodibility; fair stability.	High available moisture capacity; moderate fertility.
Seasonal high water table; poor stability; severe frost action.	Seasonal high water table; low seepage through subsoil; high seepage in substratum.	Poor stability; moderately erodible.	Slow permeability; moderately erodible.	High available moisture capacity; moderate infiltration; poor drainage.	Moderate erodibility; poor stability.	High available moisture capacity; moderate fertility.
High water table; poor stability; severe frost action.	High to very high seepage; high water table.	Moderate permeability; poor stability.	Rapid permeability; outlets may be a problem.	Very low available moisture capacity; rapid infiltration; poor drainage.	Not applicable	Very low available moisture capacity and fertility.
High water table; fair stability; severe frost action.	High water table; moderate seepage through subsoil; high seepage in substratum.	Fair stability; moderately erodible.	Moderate permeability; moderately erodible; outlets may be a problem.	Moderate available moisture capacity; moderate infiltration; poor drainage.	Not applicable	Not applicable.
High water table; poor stability; severe frost action.	High water table; low seepage through subsoil; high seepage in substratum.	Poor stability; moderately erodible.	Slow permeability; moderately erodible; outlets may be a problem.	Moderate available moisture capacity; slow infiltration; poor drainage.	Not applicable	Not applicable.
Good stability; moderate frost action.	Moderate seepage through subsoil; high seepage in substratum.	Good stability; moderately erodible.	Not needed	Moderate available moisture capacity; moderate infiltration.	Moderate erodibility; good stability.	Moderate available moisture capacity and fertility.
Seasonable high water table; good stability; severe frost action.	Seasonal high water table; moderate seepage through subsoil; high seepage in substratum.	Good stability; moderately erodible.	Moderate permeability; moderately erodible.	Moderate available moisture capacity; moderate infiltration.	Moderate erodibility; good stability.	Moderate available moisture capacity and fertility.

[4] Features are for surface layer only.
[5] The engineering properties of Coastal beaches vary so much that onsite investigation is necessary before any engineering structures can be built or practices applied.
[6] The surface layer contains large to very large amounts of organic matter, and rating is for only those places where topsoil rich in organic matter is desirable.

Corrosion potential refers to the deterioration of concrete or untreated steel pipelines as a result of exposure to oxygen and moisture and to chemical and electrolytic reactions.

Shrink-swell potential indicates the volume change that can be expected with changes in moisture content. It depends largely on the kind and amount of clay in a horizon.

Optimum moisture is the moisture content at which the soil can be compacted to maximum dry density. The estimated percentages in table 6 are averages, and for each soil horizon, can be expected to vary a little.

Maximum dry density is the greatest amount of dry soil, by weight, that can be compacted into a given unit of volume, under controlled conditions and by standard procedures. In table 6 it is expressed in pounds of soil per cubic foot.

Engineering interpretations

Table 7 rates the soils in Talbot County according to their suitability for earthwork, both when the soils are wet and when they are frozen. It also rates the soils according to their susceptibility to frost action and their suitability as sources of topsoil, sand, and road fill.

In addition, table 7 lists soil features that affect different kinds of engineering work. The features shown are those that affect the construction and maintenance of pipelines; the location of roads and highways; sites for ponds and reservoirs; use of soil material for dikes, levees, and other embankments; drainage systems; irrigation practices; and the construction of terraces, diversions, and waterways. The interpretations are based on information shown in tables 5 and 6 and on the experience of engineers in the county.

Table 7 indicates both the good and the undesirable features of a soil that may require special consideration before a structure is planned, designed, or constructed. Heavy silty clay loam, such as that in the lower part of the subsoil in the Elkton soils, has characteristics that make it poor for an earthen embankment or dam. The material in such a subsoil is unstable and highly erodible, and it cannot be compacted to favorable dry density. Because the subsoil material is very slowly permeable, however, it may be suitable as the core of a dam, which is used to reduce seepage. Fine texture and slow permeability in a subsoil increase the difficulty of providing adequate drainage for such soils, and they limit the suitability of the soils for irrigation.

The choice of a soil suitable for laying a pipeline is determined primarily by the natural stability of the soil and by the height and seasonal fluctuation of the water table. If the water table is high, laying a line for sewage, water, or gas in wet soils is difficult and frustrating because ditchbanks are likely to collapse. In some soils the banks are unstable even where the water table is not high.

The choice of a soil on which to locate a road or highway is affected primarily by the height and the fluctuation of the water table; by the hazard of flooding; by the stability of the soil materials, particularly under heavy load or pressure; and by the expected severity of frost action.

The choice of a soil for a pond or reservoir depends largely on the amount or rate of seepage that can be expected, particularly at the bottom of the reservoir. The amount of seepage depends on whether the reservoir floor consists of subsoil material or substratum material, for these layers may differ greatly in seepage characteristics. A constant and reliable source of water is desirable. Such a source is especially necessary if seepage or other losses are rapid.

Stability, erodibility, and the probable maximum density of soil material strongly affect the choice of a soil for building dikes, levees, dams, and other embankments. The maximum density to which soil material can be compacted affects the strength and permeability of the structure. All earth dams allow some seepage, but it is desirable to keep such water loss to a minimum. Soils in which the maximum density can be obtained by ordinary methods of compacting are those having a well-graded mixture of particles sizes and sufficient fine material to fill all voids between the particles when compacted.

The ease or difficulty with which a soil can be drained artificially is determined mainly by the least permeable layer or layers, by the height and fluctuation of the water table, by the erodibility of the bottom and banks of drainage ditches, and by the adequacy of outlets.

Soil features that affect the kind and design of an irrigation system are the rate that applied water can infiltrate the soil, the capacity of the soil to retain moisture, and the degree of natural drainage. Soils having seasonal high water tables need to be artificially drained before the irrigation system is installed.

In planning and designing terraces and diversions, the stability and erodibility of the surface soil are of special concern. These features, as well as the water-holding capacity and the natural fertility of the soil, strongly influence the design of waterways through fields and the kinds of grasses or other vegetation needed for sodding or stabilizing the waterways.

The interpretations in table 7 are not a substitute for onsite investigation.

Use of Soils for Community Development

In Talbot County the trend is toward community development and the expansion of towns. The residential and commercial uses of land have increased in recent years. Probably, the present trend will continue. Accompanying the spread of residential and commercial development is a growing need for information about soil properties that affect nonfarm and residential uses.

Much of the information in this subsection is in tables 8 and 9. Table 8 gives limitations of the soils in the county for selected nonfarm uses. In table 9 are soil limitations that affect specified recreational uses. In both tables the limitations of the soils are rated slight, moderate, or severe. If the limitations are rated moderate or severe, the chief limitation or limitations for the use specified are listed. A rating of *slight* indicates that the soil has few or no limitations and is considered desirable for the use named. A rating of *moderate* shows that a moderate problem is recognized but can be overcome or corrected. A rating of *severe* indicates that use of the soils is seriously limited by a hazard or restriction that is difficult to overcome. A rating of severe for a particular use does not mean that a soil so rated cannot be put to that use.

Any given property may not restrict all types of nonfarm uses or recreational uses equally. For example, slow permeability and impeded drainage that are only moderate limitations for many uses can severely limit the use of a soil in the disposal of sewage effluent from septic tanks (fig. 20).

Following are the properties that limit the soils of the county in their suitability for each nonfarm use specified in table 8:

Filter fields for sewage disposal: Permeability of the soil, depth to a seasonal high water table, natural drainage, depth to an impervious layer, slope, and hazard of flooding. Many septic tank filter fields have failed because the percolation tests were made during the dry season when the water table was low.

Sewage lagoons: Soil permeability, depth to an impervious layer, slope, hazard of flooding, and organic-matter content.

Building foundations (for buildings of two stories or less): Depth to water table, natural drainage, slope, and hazard of flooding. (The suitability of a soil for foundations for buildings for special uses and those of more than two stories should be investigated on the site.)

Landscaping: Texture of the soil, especially the surface layer; natural drainage; susceptibility to frost action; and stability of the subsoil. (It is assumed that the area of soil will be used for grass, shrubs, and trees without adding topsoil.)

Streets and parking lots: Depth to water table, natural drainage, slope, soil stability, hazard of frost action, high content of clay, and hazard of flooding.

Sanitary land fills (trench method): Depth to water table, natural drainage, depth to a hard layer, soil permeability, and hazard of flooding.

***Figure 20.*—Water-tolerant weeds that grew up over a septic tank in an area of lawn. The area is continually wet because of poor percolation through Elkton loam.**

TABLE 8.—*Soil limitations for*

Soil series and map symbols [1]	Sewage disposal		Homes with basements (two stories or less)	Landscaping
	Septic tanks	Lagoons		Trees and shrubs
Barclay:				
(BaA)	Severe: high water table; moderately slow permeability.	Slight	Severe: high water table; somewhat poor drainage.	Slight
(BaB2)	Severe: high water table; moderately slow permeability.	Moderate: 2 to 5 percent slopes.	Severe: high water table; somewhat poor drainage.	Slight
Coastal beaches (Cb)	Severe: tidal flooding	Severe: tidal flooding; rapid permeability.	Severe: loose material; little stability.	Severe: flooding; salt damage.
Downer:				
(DoA, DoB2)	Slight	Severe: very permeable	Slight	Slight
(DoC2)	Slight	Severe: very permeable; slopes more than 5 percent.	Slight	Slight
Elkton (Ek, Es)	Severe: high water table; slow permeability.	Slight	Severe: high water table; poor drainage.	Moderate: heavy subsoil.
Fallsington (Fa, Ff, Fg)	Severe: high water table.	Severe: high water table; moderate permeability.	Severe: high water table; poor drainage.	Moderate: high water table.
Galestown:				
(GaB)	Slight: danger of polluting nearby wells.	Severe: rapid permeability.	Slight	Severe: droughty; low fertility.
(GaC)	Slight: danger of polluting nearby wells.	Severe: rapid permeability.	Slight	Severe: droughty; low fertility.
Keyport:				
(KmA, KpA)	Severe: seasonal high water table; slow permeability.	Slight	Moderate: seasonal high water table.	Slight
(KmB2, KpB2)	Severe: seasonal high water table; slow permeability.	Moderate: 2 to 5 percent slopes.	Moderate: seasonal high water table.	Slight
(KmC2, KmD, KsC3, KsD3).	Severe: seasonal high water table; slow permeability.	Severe: 5 to 15 percent slopes.	Moderate: seasonal high water table.	Slight: trees may be hard to establish in eroded areas.
Klej (Ky)	Moderate: seasonal high water table.	Severe: rapid permeability.	Moderate: seasonal high water table.	Slight
Matapeake:				
(MkA, MlA)	Slight to moderate: moderate permeability.	Moderate: compaction necessary.	Slight	Slight
(MkB2, MlB2)	Slight to moderate: moderate permeability.	Moderate: 2 to 5 percent slopes; compaction necessary.	Slight	Slight
(MkC2, MlC2, MlC3).	Slight to moderate: moderate permeability.	Severe: 5 to 10 percent slopes.	Slight	Slight, except where severely eroded.
(MkD, MlD3)	Moderate: 10 to 15 percent slopes.	Severe: 10 to 15 percent slopes.	Moderate: 10 to 15 percent slopes.	Slight, except where severely eroded.
Mattapex:				
(MpA, MxA)	Severe: seasonal high water table; moderately slow permeability.	Slight if compacted	Moderate: seasonal high water table.	Slight
(MpB2, MxB2)	Severe: seasonal high water table; moderately slow permeability.	Moderate: 2 to 5 percent slopes.	Moderate: seasonal high water table.	Slight

See footnote at end of table.

selected nonfarm uses

Landscaping—Continued: Lawns	Streets and parking lots	Sanitary land fills (trench method)	Cemeteries	Disposal of industrial water
Moderate: some surface drainage necessary.	Severe: high water table; somewhat poor drainage.	Moderate: sticky; some cracking.	Severe: high water table; somewhat poor drainage.	Severe: seasonal high water table.
Slight	Severe: high water table; somewhat poor drainage.	Moderate: sticky; some cracking.	Severe: high water table; somewhat poor drainage.	Severe: seasonal high water table.
Severe: flooding; salt damage.	Severe: tidal flooding	Severe: tidal flooding	Severe: tidal flooding; rapid permeability.	Severe: flooding.
Slight: may be droughty	Slight	Slight	Slight	Slight.
Slight: may be droughty	Moderate: 5 to 10 percent slopes.	Slight	Slight	Slight: control of erosion necessary.
Severe: poor drainage	Severe: high water table; poor drainage.	Severe: sticky; some cracking; poor drainage; high water table.	Severe: high water table; poor drainage.	Severe: high water table; slow permeability.
Severe: poor drainage; high water table.	Severe: high water table; poor drainage.	Slight	Severe: high water table.	Severe: high water table.
Severe: low fertility; droughty.	Slight: loose material; difficult to compact.	Slight: loose material; difficult to compact.	Moderate: some caving of excavation; droughty.	Slight.
Severe: low fertility; droughty.	Moderate: 5 to 10 percent slopes; loose material.	Slight: loose material; difficult to compact.	Moderate: some caving of excavation; droughty.	Slight.
Moderate: seasonal wetness.	Moderate: seasonal wetness; much clay.	Severe: sticky; cracking likely; seasonal wetness.	Severe: seasonal high water table; sticky.	Severe: slow permeability; seasonal high water table.
Moderate: seasonal wetness.	Moderate: seasonal wetness.	Severe: sticky; seasonal wetness.	Severe: seasonal high water table; sticky.	Severe: slow permeability; seasonal high water table.
Severe: eroded; heavy subsoil.	Severe: seasonal wetness; 5 to 15 percent slopes.	Severe: very sticky; wet.	Severe: seasonal high water table; too sticky.	Severe: slow permeability; subject to erosion.
Moderate: may be droughty in dry seasons.	Moderate: loose material; seasonal high water table.	Moderate: seasonal high water table; loose material; difficult to compact.	Moderate: seasonal high water table.	Severe: seasonal high water table.
Slight	Slight	Slight	Slight	Moderate: moderate permeability.
Slight	Slight	Slight	Slight	Moderate: moderate permeability.
Slight, except where severely eroded.	Moderate: 5 to 10 percent slopes.	Slight	Slight	Severe: erosion hazard; excessive runoff.
Moderate, except where severely eroded.	Severe: 10 to 15 percent slopes.	Moderate: 10 to 15 percent slopes.	Moderate: 10 to 15 percent slopes.	Severe: erosion hazard; excessive runoff.
Slight	Moderate: seasonal wetness	Moderate: seasonal wetness	Moderate: seasonal high water table.	Severe: seasonal high water table; moderately slow permeability.
Slight	Moderate: seasonal wetness	Moderate: seasonal wetness	Moderate: seasonal high water table.	Severe: seasonal high water table; moderately slow permeability.

TABLE 8.—*Soil limitations for*

Soil series and map symbols [1]	Sewage disposal		Homes with basements (two stories or less)	Landscaping
	Septic tanks	Lagoons		Trees and shrubs
Mixed alluvial land (My).	Severe: high water table; flooding.	Severe: flooding	Severe: high water table; flooding.	Severe: flooding
Othello:				
(Oh)	Severe: high water table; moderately slow permeability.	Slight	Severe: high water table; poor drainage.	Moderate: poor drainage.
(Ot)	Severe: flooding; high water table; moderately slow permeability.	Severe: flooding	Severe: flooding	Severe: flooding; excessive salt.
Plummer (Pe)	Severe: high water table.	Severe: rapid permeability.	Severe: high water table; poor drainage.	Severe: high ground water; low fertility.
Pocomoke (Pk, Pm)	Severe: high water table.	Severe: content of organic matter high.	Severe: high water table; very poor drainage.	Moderate: high water table.
Portsmouth (Pt)	Severe: high water water table; slow permeability.	Severe: content of organic matter high.	Severe: high water table; very poor drainage.	Moderate: high water table.
Sassafras:				
(SaA, SfA, SmA)	Slight	Moderate: moderate permeability.	Slight	Slight
(SaB2, SfB2, SmB2)	Slight	Moderate: moderate permeability; 2 to 5 percent slopes.	Slight	Slight
(SaC2, SaC3, SmC2, SmC3).	Slight	Severe: 5 to 10 percent slopes; moderate permeability.	Slight	Slight, except where severely eroded.
(SaD, SaD3)	Moderate: 10 to 15 percent slopes.	Severe: 10 to 15 percent slopes; moderate permeability.	Moderate: 10 to 15 percent slopes.	Slight, except where severely eroded.
Steep land (St)	Severe: slopes of more than 15 percent.	Severe: slopes of more than 15 percent.	Moderate: slopes of more than 15 percent.	Severe: slopes of more than 15 percent.
Tidal marsh (Tm)	Severe: tidal flooding	Severe: tidal flooding	Severe: tidal flooding	Severe: tidal flooding
Woodstown:				
(WdA, WfA, WoA)	Moderate: seasonal high water table.	Moderate: moderate permeability.	Moderate: seasonal high water table.	Slight
(WdB2, WoB2)	Moderate: seasonal high water table.	Moderate: moderate permeability; 2 to 5 percent slopes.	Moderate: seasonal high water table.	Slight

[1] Properties of Made land (Ma) and Borrow pits (Bp) are so variable that estimates of their limitations were not made.

selected nonfarm uses—Continued

Landscaping—Continued: Lawns	Streets and parking lots	Sanitary land fills (trench method)	Cemeteries	Disposal of industrial water
Severe: flooding	Severe: high water table; flooding.	Severe: flooding; cracking; high water table.	Severe: high water table; flooding.	Severe: flooding; high water table.
Severe: poor drainage	Severe: high water table; poor drainage.	Severe: high water table.	Severe: high water table; poor drainage.	Severe: high water table.
Severe: flooding; excessive salt.	Severe: flooding	Severe: flooding; sticky.	Severe: flooding	Severe: flooding.
Severe: high water table; low fertility.	Severe: high water table; poor drainage.	Severe: high water table; loose material; difficult to compact.	Severe: high water table; poor drainage.	Severe: high water table.
Severe: high water table.	Severe: high water table; very poor drainage.	Severe: content of organic matter high; high water table.	Severe: high water table; very poor drainage.	Severe: high water table.
Severe: high water table	Severe: high water table; very poor drainage.	Severe: content of organic matter high; high water table.	Severe: high water table; very poor drainage.	Severe: high water table.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight	Slight.
Slight, except where severely eroded.	Moderate: 5 to 10 percent slopes.	Slight	Slight	Moderate: erosion hazard.
Moderate, except where severely eroded.	Severe: 10 to 15 percent slopes.	Moderate: 10 to 15 percent slopes.	Moderate: 10 to 15 percent slopes.	Severe: excessive surface runoff; erosion hazard.
Severe: slopes of more than 15 percent.	Severe: slopes of more than 15 percent.	Severe: slopes of more than 15 percent.	Severe: slopes of more than 15 percent.	Severe: surface runoff; erosion hazard.
Severe: tidal flooding	Severe: tidal flooding	Severe: tidal flooding; variable material.	Severe: tidal flooding	Severe: tidal flooding.
Slight	Moderate: seasonal wetness.	Moderate: seasonal wetness.	Moderate: seasonal high water table.	Severe: seasonal high water table.
Slight	Moderate: seasonal wetness.	Moderate: seasonal wetness.	Moderate: seasonal high water table.	Severe: seasonal high water table.

Cemeteries: Depth to water table, natural drainage, depth to a hard layer, soil permeability, hazard of flooding, texture of the surface layer, and plasticity and stability of the layers underlying the surface layer.

Disposal of industrial water: Seasonal high water table, flooding, hazard of erosion, and soil permeability. Soil permeability is especially important where industrial water is disposed of by spraying it onto soils. Disposal of this kind is effective on permeable soils and meets most public health requirements.

Another group of uses closely related to community development are those for outdoor recreation. Table 9 rates the soils in the county according to their limitations for various facilities of outdoor recreation that depend a great deal on soil properties.

Following are the recreational areas rated in table 9 and the properties that limit the soils of the county in their suitability for each kind of area listed in table 9:

Paths and trails: Natural drainage, flooding, soil texture, soil permeability and stability, and slope.

Athletic fields and other intensive play areas: Natural drainage, soil permeability and stability, depth to seasonal high water table, soil texture, and slope. (It is assumed that topsoil and fill will not be brought in.)

Parks, other extensive play areas, and picnic areas: Depth to seasonal high water table, slope, soil texture and permeability, soil stability, and flooding. (More traffic is expected in picnic areas than in parks and other extensive play areas. Sewage disposal is not considered in rating picnic areas.)

Campsites (tents and trailers): Natural drainage; depth to seasonal high water table, soil permeability and texture, and slope. (Campsites where trailers are parked are more affected by slope than are campsites where tents are pitched. Sewage disposal from toilet facilities is not considered in the ratings.)

Golf fairways: Depth to seasonal high water table, slope, soil texture, and flooding. (It is assumed that topsoil will not be added where the fairway is sodded.)

Not rated in table 9 is the suitability of the soils for service buildings and as filter fields for septic tanks. Soil features that limit use of soils as sites for washrooms, bathhouses, picnic shelters, and other service buildings, as well as for seasonal and year-round cottages, are about the same as those that limit use for homesites. (See table 8.) Wetness is less limiting, however, if service building or cottage does not have a basement.

Formation and Classification of the Soils

This section tells how soils and their horizons were formed and describes the main kinds of horizons in the soils of Talbot County. The section also discusses the five factors of soil formation and the effects of these factors on the formation of soils in the county. In addition, the categories in the current system of classification are briefly defined, and the soil series represented in the county are placed in some of these categories.

How the Soils of Talbot County Were Formed

Soils are natural bodies that have formed a crust on the surface of the earth. They are three dimensional and have depth, length, and width. An individual body of soil may

TABLE 9.—*Soil limitations for specified recreational uses* [1]

Soil series and map symbols	Paths and trails	Athletic fields and other intensive play areas [2]	Parks, extensive play areas, and picnic areas	Campsites (tents and trailers)	Golf fairways
Barclay (BaA, BaB2)	Moderate: somewhat poorly drained; silty.	Severe: somewhat poorly drained; silty; moderately slow permeability.	Moderate for parks and intensive play areas; somewhat poorly drained. Severe for picnic areas: somewhat poorly drained.	Severe: somewhat poorly drained; moderately slow permeability.	Moderate: somewhat poorly drained.
Coastal beaches (Cb)	Severe: tidal flooding; loose sand.	Severe: tidal flooding; loose sand; very difficult to sod.	Severe: tidal flooding; loose sand.	Severe: tidal flooding; loose sand.	Severe: tidal flooding; loose sand; very difficult to sod.
Downer:					
(DoA, DoB2)	Slight	Slight, but soil may be droughty.	Slight	Slight	Slight, but soil may be droughty.
(DoC2)	Slight	Moderate: 5 to 15 percent slopes; soil may be droughty.	Slight for parks and extensive play areas. Moderate for picnic areas: slopes.	Slight for tents. Moderate for trailers: 5 to 10 percent slopes.	Slight, but soil may be droughty.
Elkton (Ek, Es)	Severe: poorly drained.	Severe: poorly drained; very slow permeability.	Severe: high water table; poorly drained.	Severe: poorly drained; very slow permeability.	Severe: poorly drained; high water table.

See footnotes at end of table.

TABLE 9.—*Soil limitations for specified recreational uses*[1]—Continued

Soil series and map symbols	Paths and trails	Athletic fields and other intensive play areas [2]	Parks, extensive play areas, and picnic areas	Campsites (tents and trailers)	Golf fairways
Fallsington (Fa, Ff, Fg)	Severe: poorly drained.	Severe: poorly drained.	Severe: high water table; poorly drained.	Severe: poorly drained.	Severe: poorly drained; high water table.
Galestown:					
(GaB)	Moderate: loose footing.	Severe: droughty; low fertility.	Severe: droughty; difficult to sod.	Severe: loamy sand; loose; droughty.	Severe: droughty; low fertility.
(GaC)	Moderate: loose footing.	Severe: droughty; low fertility.	Severe: droughty; difficult to sod.	Severe: loamy sand; loose; droughty; slopes.	Severe: droughty; low fertility.
Keyport:					
(KmA, KmB2, KpA, KpB2).	Slight	Severe: seasonal high water table; slow permeability.	Slight for parks and extensive play areas. Severe for picnic areas: seasonal high water table; slow permeability.	Severe: slow permeability; seasonal high water table.	Moderate: seasonal high water table.
(KmC2)	Slight	Severe: slow permeability; seasonal high water table.	Slight for parks and extensive play areas. Severe for picnic areas: seasonal high water table.	Severe: slow permeability; seasonal high water table; slopes.	Moderate: seasonal high water table.
(KmD, KsC3, KsD3)	Moderate: erosion hazard.	Severe: seasonal wetness; slopes.	Slight for parks and extensive play areas. Severe for picnic areas: seasonal wetness; slopes.	Severe: slow permeability; seasonal wetness; slopes.	Severe: erosion hazard; difficult to maintain sod.
Klej (Ky)	Moderate: loose footing.	Moderate: seasonal high water table.	Moderate: seasonal wetness; seasonal high water table.	Moderate: seasonal high water table.	Moderate: soil may be droughty during summer.
Matapeake:					
(MkA, MkB2, MlA, MlB2).	Slight	Slight	Slight	Slight	Slight.
MkC2, MlC2, MlC3).	Slight	Moderate: 5 to 10 percent slopes.	Slight for parks and extensive play areas. Moderate for picnic areas: 5 to 10 percent slopes.	Slight for tents. Moderate for trailers: 5 to 10 percent slopes.	Slight, except where severely eroded.
(MkD, MlD3)	Moderate: erosion hazard.	Severe: 10 to 15 percent slopes.	Moderate for parks and extensive play areas: 10 to 15 percent slopes. Severe for picnic areas: 10 to 15 percent slopes.	Moderate for tents: 10 to 15 percent slopes. Severe for trailers: 10 to 15 percent slopes.	Moderate, except where severely eroded.
Mattapex (MpA, MpB2, MxA, MxB2).	Slight	Moderate: moderately slow permeability; seasonal wetness.	Slight for parks and extensive play areas. Moderate for picnic areas: seasonal wetness.	Moderate: moderately slow permeability; seasonal wetness.	Slight.
Mixed alluvial land (My).	Severe: high water table; subject to flooding.	Severe: high water table; subject to flooding.	Severe: high water table; subject to flooding.	Severe: high water table; subject to flooding.	Severe: high water table; subject to flooding.
Othello (Oh, Ot)	Severe: poorly drained.	Severe: poorly drained; high water table.	Severe: high water table; poorly drained.	Severe: poorly drained; high water table.	Severe: poorly drained; high water table.
Plummer (Pe)	Severe: poorly drained; loose.	Severe: poorly drained; loose; high water table.	Severe: high water table; poorly drained; loose.	Severe: poorly drained; loose; high water table.	Severe: poorly drained; high water table.

See footnotes at end of table.

TABLE 9.—*Soil limitations for specified recreational uses* [1]—Continued

Soil series and map symbols	Paths and trails	Athletic fields and other intensive play areas [2]	Parks, extensive play areas, and picnic areas	Campsites (tents and trailers)	Golf fairways
Pocomoke (Pk, Pm)	Severe: very poorly drained.	Severe: very poorly drained; high water table.	Severe: high water table; very poorly drained.	Severe: very poorly drained; high water table.	Severe: very poorly drained; high water table.
Portsmouth (Pt)	Severe: very poorly drained.	Severe: very poorly drained; high water table.	Severe: high water table; very poorly drained.	Severe: very poorly drained; high water table.	Severe: very poorly drained; high water table.
Sassafras:					
(SaA, SaB2, SfA, SfB2, SmA, SmB2).	Slight	Slight	Slight	Slight	Slight.
(SaC2, SmC2, SaC3, SmC3).	Slight	Moderate: 5 to 10 percent slopes.	Slight for parks and extensive play areas. Moderate for picnic areas: 5 to 10 percent slopes.	Slight for tents. Moderate for trailers: 5 to 10 percent slopes.	Slight, except where severely eroded.
(SaD, SaD3)	Moderate: erosion hazard.	Severe: 10 to 15 percent slopes.	Moderate for parks and extensive play areas: 10 to 15 percent slopes. Severe for picnic areas: 10 to 15 percent slopes.	Moderate for tents: 10 to 15 percent slopes. Severe for trailers: 10 to 15 percent slopes.	Moderate, except where severely eroded.
Steep land (St)	Severe: slopes of more than 15 percent.	Severe: slopes of more than 15 percent.	Moderate for parks and extensive play areas: slopes of more than 15 percent. Severe for picnic areas: slopes of more than 15 percent.	Severe: slopes of more than 15 percent.	Severe: slopes of more than 15 percent.
Tidal marsh (Tm)	Severe: tidal flooding.	Severe: tidal flooding.	Severe: tidal flooding.	Severe: tidal flooding.	Severe: tidal flooding.
Woodstown (WdA, WdB2, WfA, WoA, WoB2).	Slight	Moderate: seasonal wetness.	Slight for parks and extensive play areas. Moderate for picnic areas: seasonal wetness.	Moderate: seasonal wetness.	Slight, but is seasonally wet.

[1] Borrow pits (Bp) and Made land (Ma) are so variable that they are not included in this table.
[2] Includes playgrounds and athletic fields for baseball, football, volley ball, and other organized games. Foot traffic is likely to be intense.

occupy only a few cubic yards, whereas another soil body may occupy millions of cubic yards. The exact dimensions are difficult to measure because different kinds of soils merge gradually and normally do not end or begin abruptly. For example, as the Woodstown soils grade toward the Fallsington soils in Talbot County, an area of transition is progressively more mottled and more gray as the Fallsington soils are approached.

Because soils are natural bodies, they may be studied somewhat like archeological ruins are studied so that facts relating to their history can be determined. A study of the Pocomoke soils in Talbot County has indicated that for many decades water stood on these soils for long periods of the year and reduced the rate of oxidation of leaves and other organic material. A thick black surface layer formed on these soils.

Digging down through many soils exposes a succession of layers, called horizons. From a study of kind, number, and thickness of these horizons, we may learn a great deal about the past history of the soil. Also they indicate how the soil may react to future uses. A series of horizons is called a soil profile. By their considerable difference in appearance and properties, three main horizons generally can be distinguished in most soils. These horizons are the A, B, and C. Some soils, such as the Klej, are relatively young and do not have a B horizon. In other soils, most of the A horizon has been washed away by erosion.

The A horizon, or surface layer, may be divided into subhorizons by adding the letter p or the numerals 1, 2, or 3. An Ap horizon is the plow layer. This horizon generally contains more organic matter than other horizons, except the A1, and this organic matter imparts a darker color. Also, the Ap horizon supports great biological activity. In Talbot County an Ap horizon can be found in cultivated fields where erosion has not been excessive.

In an A1 horizon organic matter has accumulated and has imparted a dark, or even a black, color. In Talbot County, most soils have a very thin A1 horizon and occur in wooded areas. Average thickness of this horizon is about half an inch, but the very poorly drained Pocomoke and Portsmouth soils are exceptions. They have a thick black A1 horizon because excessive water has prevented the oxidation of organic material.

A thick A1 horizon has a strong effect on soil management. The wetness that contributed to the accumulation of organic matter makes the soil unsuited to crops unless it is artifically drained. After drainage and liming, the organic matter holds large amounts of nutrients and of moisture that are readily available for growing plants. Because of its black color, a thick A1 horizon absorbs heat and may warm early in spring if it is not too wet.

An A2 horizon is a layer that has lost large amounts of clay, iron, manganese, aluminum, and other readily soluble elements. Remaining in the layer, in sand and silt sizes, are particles of quartz or other of the more resistant minerals. The minerals and soil particles removed from the A2 horizon have been washed downward by rainwater or have been dissolved in the water and carried downward or outward. Because iron and manganese, the minerals that are responsible for the color of the soil, have been removed, the A2 horizon becomes lighter in color. When this process is carried to the extreme, a white horizon develops and consists primarily of grains of clean quartz sand. Because more iron and managanese have been lost, the A2 horizon in Pocomoke soils is lighter colored than that horizon in Downer soils.

In addition to the iron and manganese, nearly all of the clay particles have been washed from the A2 horizon of Downer soils, and the horizon is thick. Because of this loss of clay particles, moisture and fertilizer elements move quickly through the A2 horizon. In dry periods this thick A2 horizon does not hold enough moisture to supply shallow-rooted crops. Also, nutrients added to the soil in the form of fertilizer are more rapidly leached than from soils that contain considerable clay. Other soils in Talbot County generally do not have such a prominent A2 horizon, and in many places the thin A2 horizon has been obliterated in plowing. An A2 horizon typical for the county is at the northern end of the borrow pit in Sassafras soil, on the west side of U.S. Highway No. 50, 1 mile north of Hambleton.

An A3 horizon is transitional. It is somewhat like the B horizon but has more characteristics of the A2 horizon. It is relatively unimportant and has not been formed in the profiles of most soils of Talbot County.

The B horizon, commonly called the subsoil, may be made up of B1, B2, and B3 horizons. The B1 and B3 horizons are transitional and relatively unimportant. In some places they are not present in the soils of Talbot County.

For the soils of Talbot County, nearly all B2 horizon designations are followed by the small letter t. A B2t horizon is the layer into which the particles of clay size and the iron and aluminum, generally from the A2 horizon, have accumulated. Some minerals that were in solution have precipitated from the solution into the B2t horizon. In a well-drained soil, an accumulation of iron gives the B2t horizon a conspicuously brighter color than other layers.

The properties of a B2 horizon affect the management of a soil, probably more than those of any other horizon. The amount of accumulated clay, the compactness of the soil material, and the thickness of the horizon determine the ability of a soil to retain moisture and nutrient elements and to allow the penetration of plant roots. In Galestown soils the B2t horizon contains little clay, and growth of crops may be slowed at times during the growing season because sufficient moisture is not available. In contrast, the Matapeake soils contain much more clay, and crop growth is slowed only during periods of extreme drought. The Galestown soils, because of their rapidly permeable B2t horizon, are well suited to use for percolation of septic effluent, whereas the B2t horizon of the Matapeake soils has less than optimum permeability for the percolation of septic effluent.

Immediately below the B horizon is the third main recognizable layer, the C horizon. It consists of material from which the horizons above are assumed to have formed. In Talbot County this material consists of marine sediments. The C horizon is relatively sterile; it contains little or no organic matter and has little or no biological activity. The C horizon is easily identified in the Sassafras soils. It is the light-colored layer that begins at a depth of about 33 inches.

Although the C horizon is described as part of the soil profile, only the A and B horizons are considered to be true soil. This part of the profile, from the surface of the A horizon to the bottom of the B, is called the solum. It has formed under the influence of the various soil-forming processes. The C horizon is material similar to that from which soil may have formed, but it has not been altered to the point that it is true soil. Its physical, chemical, and especially biological development has not been great enough.

The horizons of many soils in Talbot County are designated by the small letter g. This letter stands for strong gleying, or the reduction of iron that takes place when water remains in a soil for prolonged periods. Gleying is easily recognized by the dominantly gray coloring or gray mottling. The mottling, or gray, yellow, reddish speckled appearance, is easily seen in the Fallsington soils. Gleying is important because, where it occurs in the upper subsoil, the soil generally is too wet for growing crops well unless it is artificially drained. Gleying also affects many nonfarm uses of a soil. The effects of gleying can readily be seen in the Fallsington and Woodstown profiles along the ditchbank on the north side of the road between Barber and Jamaica Point, one-half mile southeast of Barber.

The kinds of horizons described are the most important in soils of Talbot County and are the most easily recognized and identified. They are not, however, the only horizons in a soil profile. Descriptions of other kinds of horizons are generally of interest only to soil scientists.

It is important to remember that the soils of Talbot County and their various horizons are changing constantly, though the changes are generally so subtle and so slow that they cannot be recognized.

Factors of Soil Formation

Soils are the products of soil-forming processes acting upon materials altered or deposited by geologic forces. The five major factors in the formation of soils are climate, plant and animal life, relief, parent material, and time. Climate and plant and animal life, particularly vegetation, are the active forces in soil formation. Their effect on parent material is modified by topography and by the length of time the parent material has been in place. The relative importance of each factor varies from place to place. In some places one factor is dominant and fixes most of the properties of the soil. Normally, however, the interaction of all five factors determines the kind of soil that develops in any given place.

Climate

Climate has been a uniform factor in the formation of soils in Talbot County because there have been no abrupt changes in the climate while the soils were forming, or from one place to another in the county. Possible changes in temperature have been moderated by the many tidal streams and larger bodies of water nearby.

During much of the time when soils were forming in Talbot County, the climate was temperate and annual rainfall averaged 43 inches, as it has in recent years. Climate of this type is conducive to the formation of soils that are strongly weathered, leached, acid, and low in fertility. Most of the soils in Talbot County are of this kind. Bases and free carbonates have been washed or leached from the soils. Where the soil material is not strongly weathered, it formed from quartz or other resistant rock. More information on the climate of Talbot County is in the section "General Nature of the Area."

Plant and animal life

Vegetation is probably the most important of the living organisms that affected the formation of soils in Talbot County. For a long period soils formed under forests of mixed oak and pine. During the summer when trees were taking in water from the soil, not much water was left to leach the soil of its plant nutrients. In seasons when the trees were practically dormant, however, large amounts of rainwater percolated through the soils and leached them.

Litter from the native pine trees is extremely acid and tends to disperse clay particles so that they are rapidly moved downward, with organic matter, to form a clearly expressed B2, or subsoil, horizon. Except where the subsoil and surface layer have been mixed, the Sassafras, Matapeake, or Elkton soils have a well-developed B2 horizon. In some areas horizons have been destroyed or the surface layer and subsoil have been mixed where wind has uprooted trees.

Soil microflora, especially the fungi under pine forests, also play an important part in the formation of soils. These fungi form organic acids that help in the development of soils having a leached A horizon, as is evident in Downer and other soils in this county. Other forms of microflora, such as bacteria and algae, are extremely important in breaking down organic matter and in forming simple compounds that affect both chemical and physical properties of a soil.

Burrowing animals, such as rodents, foxes, and groundhogs, mix soil materials and disrupt normal development of the profile to some extent, though foxes and groundhogs have only recently come into Talbot County. Worms, though important elsewhere, have had little part in soil formation in this county, mainly because the soil is naturally acid and aeration is poor. Termites and other insects have played some part by breaking down organic matter and mixing it in the soil. Ants contribute to the mixing of horizons by bringing particles from the subsoil into the surface layer.

Microfauna, such as protozoa, occur in the soil in great numbers and probably affect soil formation only indirectly by controlling the population of various bacteria. Nematodes may be important in some areas, though only as they affect vegetation.

Since man has started to farm the soils of Talbot County, changes have occurred in their formation. An obvious change is accelerated erosion, though man has caused other changes that may not be noticeable for hundreds of years. Where soil management has been good, nitrogen, organic matter, and exchangeable potassium and calcium may have been increased and acidity reduced. Draining the wetlands also changes the formation of soils, mainly by reducing the content of organic matter in such soils as the Portsmouth and the Pocomoke. Many years after drainage, the Portsmouth soils will have a profile similar to that of the Othello soils, and the Pocomoke soils similar to that of the Fallsington soils.

Relief

Relief, or topography, plays an important part in the formation of soils in Talbot County. The level to sloping and depressional relief is especially important where the water table affects soil development. In this county the Sassafras soils are higher lying than are the Woodstown soils and do not have a high water table, but development of the Woodstown soils is slightly affected by a fluctuating high water table. The Fallsington or Pocomoke soils occur below the Woodstown soils. Figure 21 shows the relationship of relief to the water table in the Sassafras, Fallsington, Pocomoke, and Woodstown soils. Those soils are a drainage sequence. Each kind of soil developed from the same kind of material but differs in degree of wetness and topography. Drainage sequences of the soils in Talbot County are given in table 10.

In well-drained soils where water percolates throughout the year, leaching is generally deeper than it is in the same general area that has wetter soils with a seasonal high water table. This is because the water table prevents the water from moving downward. Generally more water percolates through level soils than through steep ones that have excessive runoff. These contrasting effects have not topography. Drainage sequences of the soils in Talbot County are given in table 10.

On gently rolling soils that have been cultivated for long periods, eroded soil material has accumulated in shallow depressions and has thickened the Ap horizon.

Because many of the soils in the western part of the county have low relief and are nearly level, their surface runoff is slow. The soils are poorly drained to somewhat poorly drained and are poorly aerated. The Elkton, Othello, and Barclay soils are this kind.

On the steep soils of the county, erosion is accelerated, southern slopes generally are drier and warmer than northern ones, and the content of organic matter normally is low. These conditions have affected soil formation, but the effects are difficult to isolate.

To a limited extent, tidal water has wet or flooded some of the soils in Talbot County. Evidence of drainage ditches,

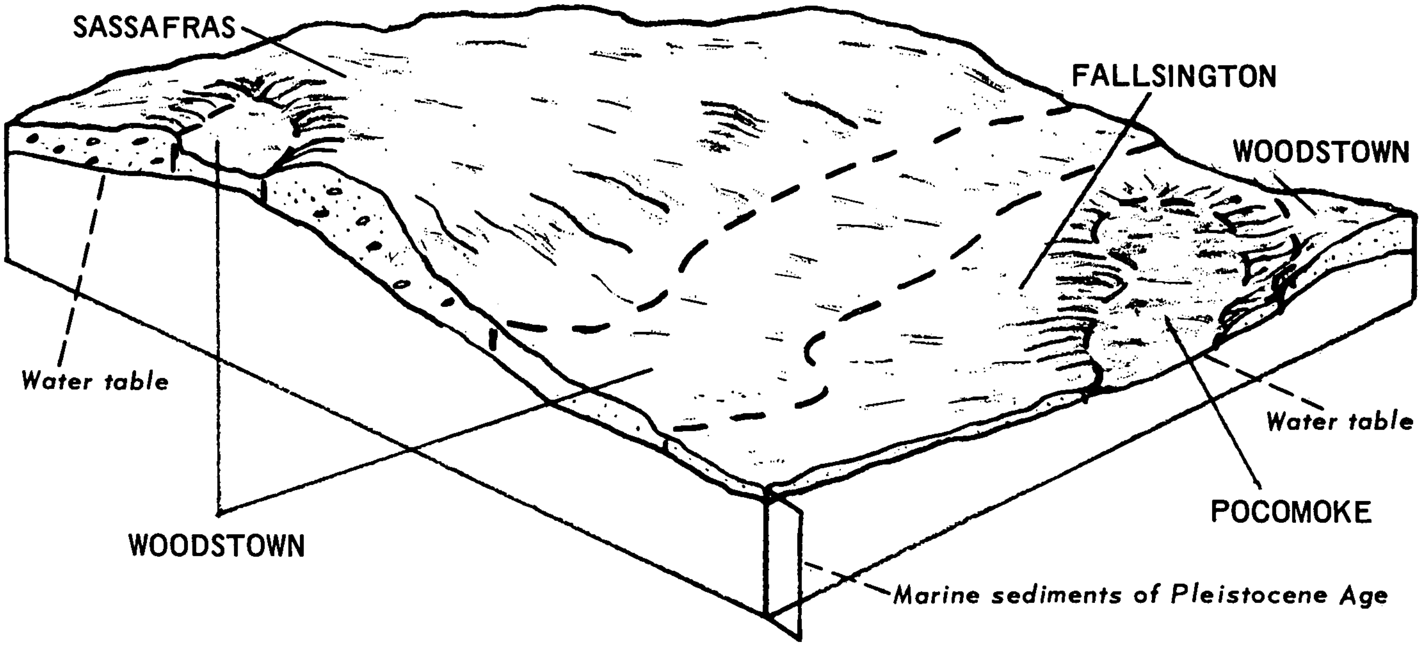

Figure 21.—**Relationship of soils to topography and water table on the Wicomico formation in Talbot County.**

field boundaries, and foundations for homes may still be seen in areas that are now Tidal marsh in neighboring Dorchester County. If water elevations continue to rise, soil mapped as Othello silt loam, low, will be Tidal marsh in another 50 to 75 years.

Parent material

Except for local differences, the parent material in Talbot County has not had so much effect in the formation of different kinds of soils as have climate and vegetation.

In this county all soils formed from sediment that was transported by water, probably from watersheds of the Susquehanna, Potomac, Delaware, or other large rivers. This sediment was deposited primarily during two stages of the Pleistocene epoch. In Talbot County these stages are represented by the Wicomico Terrace and the Talbot Terrace, both shown in figure 22. These terraces are thought to have formed after glacial ice melted, and the meltwater transported the sediment and deposited it in marine or estuarine waters. Similar deposition, though on a much smaller scale, now occurs at the mouth of the Susquehanna, Potomac, and Delaware Rivers.

During periods when the glacial ice advanced, the sea level was lowered and the deposited soil material was exposed. In these periods, there were stream cutting, erosion, beach building, and other geologic action. These processes, which occurred alternately and at varying periods, produced a complicated series of strata. The soils of Talbot County developed in these strata and inherited a wide range of characteristics from them.

The Wicomico is the older of the two terraces in Talbot County. Generally, soils on this terrace are sandy and have distinct horizons. The dominant soils on the Wicomico Terrace are the Sassafras, the Woodstown, and the Fallsington.

The soils on the younger Talbot Terrace are characterized by their finer textured silts and clays, and by less distinct horizons that in many places are difficult to see. The

TABLE 10.—*Soil series arranged to show drainage, parent material, and degree of horizonation*

Parent material	Excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
SOILS THAT HAVE WEAKLY EXPRESSED HORIZONS						
Sand and loamy sand	Galestown		Klej		Plummer	
Silts over silty sands				Barclay	Othello	Portsmouth.
Silty clays and clays			Keyport	Keyport	Elkton	
SOILS THAT HAVE MORE STRONGLY DEVELOPED HORIZONS						
Sand, silt, and clay		Sassafras Downer	Woodstown		Fallsington	Pocomoke.
Silts over silty sands		Matapeake	Mattapex			

Figure 22.—The Wicomico and Talbot Terraces are of Pleistocene age. The Wicomico, shown by diagonal lines, is the older of the two.

Elkton, Othello, Keyport, and Barclay soils are dominant on this terrace.

In many places the soil material of the two terraces contains stones and boulders that indicate they were transported to the terraces by large pieces of glacial ice.

The mixed alluvial material that occurs in Talbot County generally was deposited recently. This material was eroded and washed down from surrounding uplands after the land was cleared.

In some places, the uniform silty material from which the Othello and Barclay soils formed closely resembles loess, or material transported by wind. It is doubtful, however, that this silt is loess, though the material probably was reworked by wind before vegetation was established. These deposits could be better understood if their mineralogy were studied.

Time

The formation of a soil ranges from fairly rapid to very slow and depends on the kind of parent material and the place where the soil forms. A soil is considered mature, or old, if its profile is fully developed, if its parent material is no longer evident as such, and if the soil changes little with time and is in equilibrium with the environment. Where little development can be seen in the profile a soil is considered immature, or young. If two soils are of the same age in years, the one having the more fully developed profile is considered the older, or more mature. In Talbot County the Sassafras soils generally are examples of mature soils; the Othello soils, of immature soils; and the Plummer soils, of even younger, more immature soils.

In areas of old soils where erosion has been accelerated by cultivation, forest fires, or other disturbances, the changing environment changes the formation of soils. Soils of this kind may be called post mature, and in Talbot County they are exemplified by the eroded phases of the Sassafras and Matapeake soils.

As stated in the subsection "Parent Material," the soils that occupy Talbot Terrace are chronologically younger than those that occupy Wicomico Terrace. It is estimated that the actual time in years for the formation of the soils in Talbot County is in the tens of thousands. Table 11 shows the relative age of the soils in Talbot County.

Classification of Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationships to one another and to the whole environment, and to develop principles that help us in understanding their behavior and their response to manipulation. First through classification and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Thus in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and used in managing farms, fields, and woodland; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and later revised (*9*). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965. The current system is under continual study. Therefore, readers interested in developments of the current system should search the latest literature available (*12*, *7*).

In table 11 the soil series of Talbot County are placed in some categories of the current system and in the great soil groups of the older system. Placement of some soil series in the current system of classification may change as more precise information becomes available.

The current system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system soil properties that are observable and measurable were used as a basis for classification. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped together. The classes that make up the current system are briefly defined in the following paragraphs.

ORDER: Each order has a three- or four-syllable name that ends in *sol* (Ent-i-sol). The ten orders are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings to soils. Two exceptions, Entisols and Histosols, occur in many different kinds of climate.

Table 11 shows the three soil orders in Talbot County—Entisols, Inceptisols, and Ultisols.

Entisols are recent mineral soils that are slightly modified from the geologic material in which they formed or are, in some places, just beginning to form. In Talbot County the principal modifications are a weakly developed A1 horizon and, in some places, minor changes in color because of wetness. Examples of Entisols in this county are the Klej soils.

Inceptisols (from the Latin *inceptum*, for beginning) are mineral soils in which horizons have started to develop. These soils generally occur on young but not recent land surfaces. In Talbot County, for example, Inceptisols are soils in which the B horizon is distinctively colored but otherwise is not differentiated. The Barclay soils are the only Inceptisols in this county.

Ultisols (from the Latin *ultimus*, for last) are mineral soils that still contain weatherable minerals and have a clay-enriched B horizon in which base saturation normally is low, generally less than 35 percent. In Talbot County the Ultisols are the most common order of soils. Examples are the Sassafras and the Elkton soils.

Ultisols range from well drained to very poorly drained. They generally have reached a highly weathered and almost static stage of development. In Talbot County, the materials in which Ultisols developed were highly weathered before they were deposited.

SUBORDER: Each order is divided into suborders, primarily on the basis of those soil characteristics that seem to produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the order. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging or of soil differences resulting from climate or vegetation. Suborders have names of two syllables. The last syllable indicates the order. An example is Aquepts (*Aqu*,

TABLE 11.—*Soil series classified according to the current and 1938 classification*

Series	Current classification: Family	Current classification: Subgroup	Current classification: Order	1938 classification (with later revision): Great soil group
Barclay [1]	Coarse-silty, mixed, thermic	Aquic Dystrochrepts	Inceptisols	Low-Humic Gley soils intergrading to Red-Yellow Podzolic soils.
Downer	Coarse-loamy, siliceous, mesic	Typic Hapludults	Ultisols	Gray-Brown Podzolic soils intergrading to Red-Yellow Podzolic soils.
Elkton	Clayey, mixed, mesic	Typic Ochraquults	Ultisols	Low-Humic Gley soils.
Fallsington	Fine-loamy, mixed, mesic	Typic Ochraquults	Ultisols	Low-Humic Gley soils.
Galestown	Sandy, siliceous, mesic	Psammentic Hapludults	Ultisols	Sol Brun Acides.
Keyport	Clayey, mixed, mesic	Aquic Hapludults	Ultisols	Red-Yellow Podzolic soils intergrading to Gray-Brown Podzolic soils.
Klej	Mesic, coated	Aquic Quarzipsamments	Entisols	Regosols.
Matapeake	Fine-silty, mixed, mesic	Typic Hapludults	Ultisols	Gray-Brown Podzolic soils intergrading to Red-Yellow Podzolic soils.
Mattapex	Fine-silty, mixed, mesic	Aquic Hapludults	Ultisols	Gray-Brown Podzolic soils intergrading to Red-Yellow Podzolic soils.
Othello	Fine-silty, mixed, mesic	Typic Ochraquults	Ultisols	Low-Humic Gley soils.
Plummer [1]	Loamy, siliceous, thermic	Grossarenic Ochraquults	Ultisols	Regosols.
Pocomoke [1]	Coarse-loamy, siliceous, thermic	Typic Umbraquults	Ultisols	Humic Gley soils.
Portsmouth [1]	Fine-loamy, siliceous, thermic	Typic Umbraquults	Ultisols	Humic Gley soils.
Sassafras	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols	Gray-Brown Podzolic soils intergrading to Red-Yellow Podzolic soils.
Woodstown	Fine-loamy, mixed, mesic	Aquic Hapludults	Ultisols	Gray-Brown Podzolic soils intergrading to Red-Yellow Podzolic soils.

[1] This group of soils is a taxadjunct in Talbot County because soil temperatures are a few degrees cooler than defined for the series. A taxadjunct is a group of soils named for the series it strongly resembles. It differs from that series in ways too small to be of consequence in interpreting usefulness or behavior.

meaning water or wet, and *ept*, from Inceptisol). The suborder is not shown in table 11.

GREAT GROUP: Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which, iron or humus has accumulated or those horizons that have pans interfering with growth of roots or movement of water. The features used are the self-mulching properties of clay, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like.

The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Humaquept (*Hum*, for the presence of humus, *aqu*, for wetness or water, and *ept*, from Inceptisol). The great group is not shown separately in table 11, because the names of the great groups are the last word in the name of the subgroups that are shown in table 11.

SUBGROUP: Great groups are divided into subgroups, one representing the central (typic) segment of the group; and others, called intergrades that have properties of one great group and also one or more properties of another great group, subgroup, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, or subgroup, or order. The names of subgroups are derived from placing one or more adjectives before the name of the great group. An example is *Typic* Humaquept (a typical Humaquept).

FAMILY: Families are separated within a subgroup primarily on the basis of properties of soils important to the growth of plants or to the behavior of the soils where they are used for engineering purposes. Among the properties considered are texture, mineralogy, reaction, soil temperature, and thickness of horizons. An example is the Typic Humaquept that belongs to the family of *sandy* (texture), *siliceous* (mineralogic), *thermic* (soil temperature) *soils* that, typically, contain humus, are moist or very poorly drained, and have a distinctively colored B horizon that otherwise is not differentiated.

General Nature of the Area

This section describes the climate; geology, relief, and drainage; and the water supply of Talbot County. Also included are brief descriptions of history and population, industry and transportation, and farming.

Climate of Talbot County [3]

Talbot County has a humid, continental type of climate that is modified by nearness to large bodies of water. The general flow of atmospheric air is from west to east, but

[3] By W. J. MOYER, State climatologist for Maryland and Delaware.

alternating high and low pressure systems dominate or control the climate during the colder half of the year. High pressure systems normally bring westerly or northwesterly winds, cooler temperatures, and clearing weather. Low pressure systems bring southerly and easterly winds, warmer temperatures, cloudiness, and rain or snow according to the season and the temperature. This pattern tends to break down in the summer, however, as warm moist air spreads northward from the south and southwest and remains over the area much of the time.

The Atlantic Ocean and Chesapeake Bay modify masses of air that pass over them before reaching the county. In winter the temperature rises when easterly winds, associated with a low pressure system, move northward along the eastern coast of the United States, bringing air from the ocean. In summer, winds from the east and air flowing inland from the bay lower the temperature and lessen extreme day-to-day ranges in areas immediately adjacent to the bay.

Talbot County is on the Coastal Plain of Maryland where the relief is level to gently rolling. The elevation is mainly about 40 feet above sea level. Hence the variation in climate resulting from topography is fairly small, though there is some difference between climate in the tideland area and that in the somewhat higher areas of the eastern half of the county. The data given for Easton in table 12, therefore, are representative for the county. Some of the more important exceptions are noted.

The average annual temperature is about 56° F. The warmest period of the year is the last half of July when the maximum temperature in the afternoon averages near 89°. Extremes of more than 100° occur infrequently. Only 33 days have had such high temperatures at Easton in 72 years, and four of these occurred in one year, 1930. The highest temperature recorded at Easton is 104° on July 21, 1930, and August 10, 1936. The coldest period of the year is the latter part of January and the early part of February, when the minimum temperature early in the morning averages near 25°. During an average winter, a freezing temperature of 32° or lower can be expected on an average of 89 days. A temperature of 0° or lower is rare; there were only 12 days with such temperatures in the 30-year period, 1931–1960. The lowest temperature recorded at Easton is —15°, on February 11, 1899.

Table 13 shows the probability of freezing temperatures at Easton on or after given dates in spring and on or before given dates in fall. The average growing season or frost-free period in the central part of the county is 198 days; it extends from the middle of April to the end of October. In other parts of the county the average growing season differs somewhat. It is 210 to 220 days in the tideland areas near the Chesapeake Bay and is 185 to 195 days in some of the eastern and northeastern parts of the county.

The annual precipitation at Easton averages 44.65 inches, but extremes range from 22.04 inches in 1930 to 57.33 inches in 1935. Generally, the distribution of precipitation over the county is much more uniform in winter because, during the colder half of the year, most precipitation is the result of low pressure storms that cover large areas and that may last for several days. In summer the distribution of precipitation varies because heavy rain in thunderstorms or hurricanes may fall on only one area of the county and may miss other areas entirely. Heavy precipitation may occur in any month of the year, but it is most likely to occur during summer. As a result of this uneven distribution of precipitation, the amount of moisture stored in the soil in summer commonly varies markedly within short distances.

Any time of year may be droughty, but serious drought affecting farm crops is most likely in summer. Generally, the rainfall and the moisture stored in the soil are adequate for the favorable growth of crops. At times, however, showers are unevenly distributed in summer, dry spells occur at critical stages of plant growth, and the rate of evaporation is high during the growing season. Annual snowfall at Easton averages about 15.2 inches, but it varies greatly from year to year. It ranges from as little as 0.5 inch in the winter of 1918–19 to as much as 66.2 inches in 1898–99.

Thunderstorms occur on an average of about 30 days per year, and two-thirds of these storms are in June, July, and August. Occasionally thunderstorms are so severe that lightning, wind, hail, or floods damage crops and property and bring injury and death. Hail falls during these storms only once or twice a year, usually in the period from May through August.

Tornadoes are rare and have caused litle damage. An average of one or two tornadoes per year has been reported in Maryland. The effects of tropical storms or hurricanes are felt in the county about once a year, usually in August or September. Most of these storms cause only minor damage in Talbot County, and the rainfall that accompanies them is beneficial to farming.

Prevailing winds are from the west or northwest except in summer, when the prevailing wind is southerly. The average wind velocity is 8 to 10 miles per hour, but winds of 50 to 60 miles per hour, or even higher, sometimes accompany hurricanes, severe thunderstorms in summer, or general storms in winter.

The relative humidity generally is lowest in February, March, and April and is highest in July, August, and September. The humidity varies during the day and generally decreases with increasing temperature. On a normal day, the highest relative humidity occurs about sunrise, when it is about 80 to 85 percent late in summer and early in fall and is about 70 to 75 percent late in winter and early in spring. In the afternoon humidity generally ranges from 50 to 55 percent in summer and is about 60 percent in winter.

Geology, Relief, and Drainage

Talbot County lies between the Atlantic Ocean and the Piedmont Plateau in the physiographic province called the Atlantic Coastal Plain. Almost 90 percent of the boundaries of the county is tidal water. Much of the county is indented by creeks, rivers, and bays. Nearly half the county, mostly the western half, is less than 25 feet above sea level and almost flat. In the eastern half, elevations are as high as 75 feet and relief is stronger than in the western half.

Talbot County generally has good surface drainage. Enough streams dissect the uplands to provide suitable drainage outlets for most all areas of poorly and very poorly drained soils. In the more nearly level areas, surface water runs off where ditches are provided, but runoff normally is very slow. The major drainage systems of the

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TABLE 12.—*Temperature and*

[Coordinates: 38° 45′ N.; 76°

Month	Temperature									Precipitation	
	Average			Extremes				Two years in 10 will have at least 4 days with [2]—		Average	Greatest any 1 day
	Daily Maximum	Daily Minimum	Monthly	Highest on record	Year	Lowest on record	Year	Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		
	°F.	°F.	°F.	°F.		°F.		°F.	°F.	Inches	Inches
January	44. 9	28. 2	36. 6	76	1950 [3]	−10	1935	58	14	3. 47	2. 84
February	46. 4	27. 9	37. 2	78	1930	−15	1899	60	15	2. 95	3. 06
March	54. 3	34. 3	44. 3	89	1907	2	1960	74	22	3. 95	2. 65
April	65. 7	43. 5	54. 6	93	1896	16	1923	80	33	3. 48	2. 83
May	75. 8	53. 6	64. 7	96	1925	27	1950	85	42	3. 88	2. 53
June	83. 9	62. 5	73. 2	102	1959	38	1930	92	51	3. 36	6. 00
July	87. 5	67. 1	77. 3	104	1936 [3]	47	1944	94	58	4. 74	3. 82
August	85. 7	65. 5	75. 6	101	1900	43	1934	93	55	5. 03	5. 58
September	79. 7	58. 6	69. 2	100	1932	35	1904	88	44	3. 95	8. 26
October	68. 7	47. 8	58. 3	97	1927	25	1933	80	37	3. 18	5. 13
November	57. 7	38. 1	47. 9	82	1950	10	1930	69	26	3. 53	8. 02
December	46. 4	29. 3	37. 9	72	1951 [3]	−3	1917	59	16	3. 13	2. 95
Year	66. 4	46. 4	56. 4	104	1936 [3]	−15	1899			44. 65	8. 26

[1] Averages for the period 1931–60. Extremes for the period 1892–1965 (Mar. 1892 through Nov. 1892 missing).
[2] From record for the period 1945–1960.
[3] Also in earlier years.

TABLE 13.—*Probable dates of last freezing temperatures in spring and first in fall*

(Data from Easton in Talbot County, Md.)

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

county are divided two ways. To the east water drains from the soils into the Tuckahoe Creek and Choptank River, and to the west it drains into the Wye, Miles, and Tred Avon Rivers. All surface drainage is within the Chesapeake Bay watershed.

Talbot County has three distinct topographic features. These features are tidal marshes, the Talbot Plain, and the Wicomico Plain. Tidal marshes are discussed in the section "Descriptions of the Soils." The Talbot Plain and the Wicomico Plain are more significant geologically than are the tidal marshes. The Wicomico Plain lies at a higher elevation than the Talbot Plain and is made up of older marine sediments. The escarpment between these two formations is easily recognized through much of the county (*3*). It runs roughly north and south. (See figure 22, p. 76.) In many areas on this boundary, what are believed to be buried soil horizons have been seen. These horizons are at varying depths beneath the sediments of the Talbot formation. The most prominent buried horizon is normally black, high in organic-matter content, and about 10 inches thick. Below this black layer, horizons are lacking or barely discernible. In some places, pieces of rotted wood are in the black horizon.

Both the Wicomico and Talbot formations were developed during interglacial periods from sediments carried by streams that are now the Delaware, Susquehanna, and Potomac Rivers. Some uplifting and subsidence of the land has taken place at various intervals and has caused some stream cutting and filling. Material from the Wicomico formation was deposited before the material from the Talbot. Consequently, soils, such as Sassafras, on the Wicomico Plain are better developed than those on the Talbot Plain. Soils on the younger Talbot Plain show only slight horizon formation.

Several kinds of soils, especially the Keyport soils on the Talbot Plain, reveal large blocks where the soils are cut horizontally. The blocks generally are very dense and brittle and tend to hold together well (fig. 23). The material between the blocks is usually gray and silty. Because *precipitation at Easton, Md.*[1]

04′ W. Elevation 40 feet]

Year	Precipitation—Continued							Average number of days with—				
	One year in 10 will have—		Snow, sleet					Precipitation 0.10 in. or more	Temperature			
									Maximum		Minimum	
	Less than—	More than—	Average	Maximum	Year	Greatest daily	Year		90° and above	32° and below	32° and below	0° and below
	Inches	*Inches*		*Inches*		*Inches*						
1936	1. 6	6. 3	3. 8	27. 5	1922	24. 0	1922	7	0	3	22	(4)
1896	1. 7	4. 2	4. 4	50. 3	1899	13. 0	1936	7	0	2	20	(4)
1912	2. 1	6. 1	3. 3	14. 1	1914	10. 0	1931	8	0	1	14	0
1929	1. 9	5. 7	. 2	10. 0	1915	10. 0	1915	7	(4)	0	2	0
1919	1. 7	6. 3	0	0	0	0	0	7	1	0	(4)	0
1903	. 9	5. 3	0	0	0	0	0	6	8	0	0	0
1960	1. 9	9. 2	0	0	0	0	0	7	12	0	0	0
1955	2. 0	11. 4	0	0	0	0	0	6	9	0	0	0
1935	1. 9	7. 5	0	0	0	0	0	6	2	0	0	0
1910	1. 4	4. 9	(5)	2. 5	1925	2. 5	1925	5	(4)	0	1	0
1956	1. 1	6. 0	. 7	8. 5	1938	7. 3	1953	6	0	(4)	9	0
1941	1. 6	5. 2	2. 8	20. 0	1935	9. 0	1960	6	0	2	21	(4)
1935	39. 4	53. 5	15. 2	66. 2	1898/99	24. 0	1922	78	32	8	89	(4)

[4] Less than one-half day.
[5] Trace, an amount too small to measure.

this material is friable, tree roots grow in it rather than in the dense blocks.

Water Supply

Deep drilled wells are the major, almost exclusive, source of water in Talbot County. Water from deep wells is available in all parts of the county, and the depth a well is drilled depends on the desired quantity and quality of water. Generally, water from drilled wells is hard because it contains dissolved minerals. The kinds of mineral and the amount dissolved depend on the kinds of geologic strata penetrated in drilling (*3*).

Many streams in the county have been dammed to provide water for small mills, but streams have not been used as a source of water supply. Springs are few in the county. Most of them are intermittent or have poor flow. Also, they are subject to contamination, though the natural quality of spring water usually is good. Shallow wells formerly were the major source of water, but they are now uncommon, mainly because expanding community development and the use of septic systems have made shallow wells susceptible to pollution. Generally, water from shallow wells is soft because it contains so little mineral matter.

History and Population

White settlement of the area that is now Talbot County began in 1631, more than a century after the Chesapeake Bay and bordering lands were discovered by the Spanish in 1524. The earliest recorded grants of land in Talbot County were issued in 1658 by Lord Baltimore. Before Talbot County was settled, it was inhabited by Indians who lived mainly by hunting and fishing along the creeks and rivers. These Indians were mainly Nanticokes, but there were also some Choptanks and Matapeakes.

Talbot County was settled mainly by people of English descent. They cultivated the soils, chiefly to corn, wheat, squash, and beans until about 1660. After 1660, farming centered on tobacco. Tobacco was so important that it became the medium of exchange, for warehouse receipts passed as currency. Farming again changed at about the end of the 18th century, this time because the soils had been depleted and the tobacco market was unstable. The changed system of farming was based on corn, wheat, and hay.

Talbot County was established in 1661 and consisted of what is now Queen Annes County and parts of Kent and Caroline Counties. Talbot County was named for Grace Talbot by her brother Caecilius Calvert, who was the second Lord Baltimore. When Queen Annes County was established in 1706, the boundaries of the county were changed to where they are today (*8*).

According to the U.S. Census, the population of the county had increased to 13,084 by 1790. Population continued to increase until industrialization and World War I. By 1900 the population was 20,342, but it declined to 18,306 by 1920. It remained fairly stable until the boom after World War II raised it to 19,428 in 1950. The 1960 census shows an increase to 21,578. In 1960, Easton, the largest town, had 6,337 people, and its population is increasing. The main towns and villages and their populations were St. Michaels, 1,484; Oxford, 852; Tilghman, 804; and Trappe, 358.

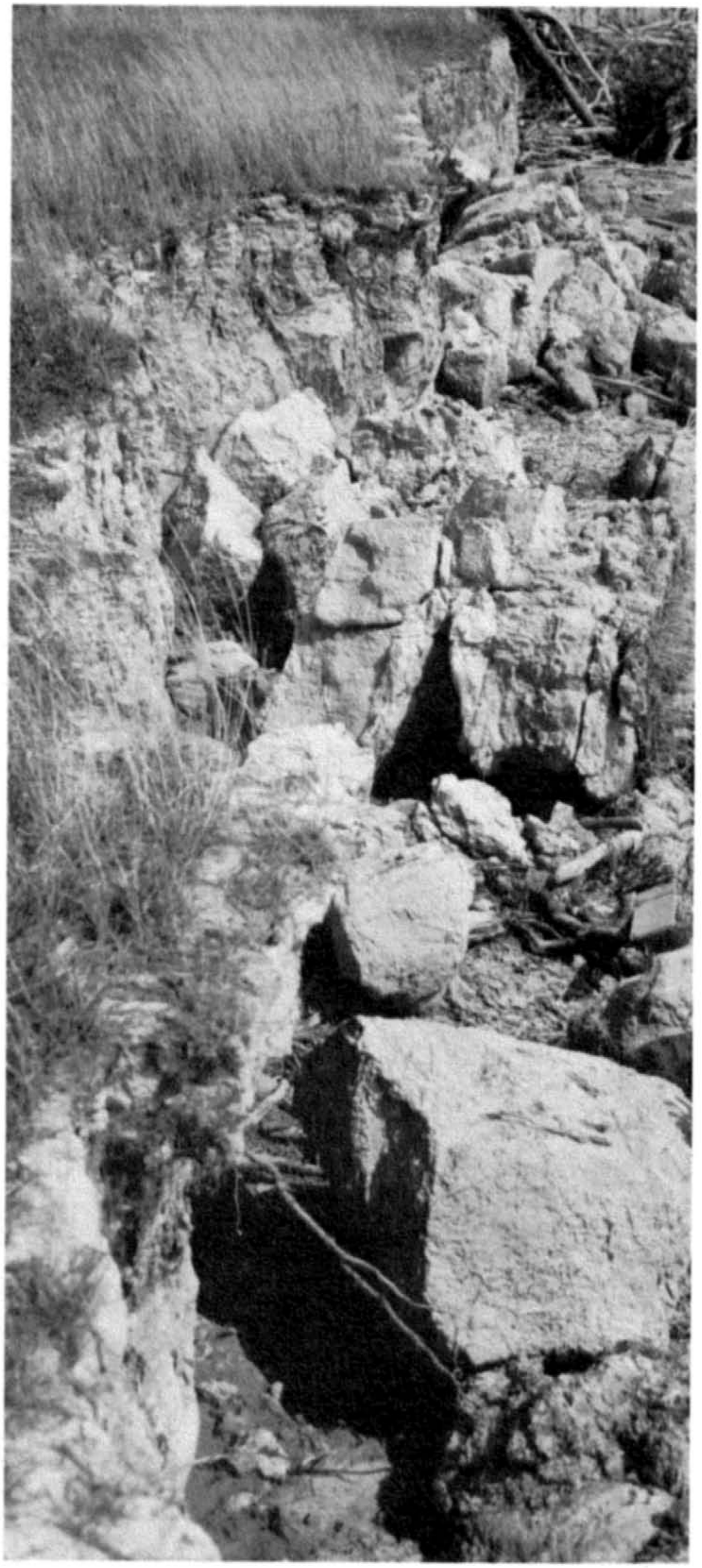

Figure 23.—An area of Keyport soils in which tidal water has undercut the soils and has caused large blocks to drop on the beach.

Industry and Transportation

Farming and related industries are by far the most important enterprises in Talbot County. The seafood industry ranks second. Also in the county are more than 50 other small light industries, including electronics, safety devices, printing and binding, metal fabrication, boatbuilding, and textiles.

The Pennsylvania Railroad provides daily freight service to Easton and has a branch line through St. Michaels to McDaniel. From the county airport at Easton one can charter passenger and freight flights to most anywhere. This airport has 4,000 foot runways and provides storage facilities and major repair services.

U.S. Highway No. 50 is the principal highway in the county. It connects with the Chesapeake Bay Bridge and Delaware Memorial Bridge, which are on major routes to the west and north, respectively. This highway also connects with the bridge and tunnel at Cape Charles on the major routes to the south. Six motor freight companies service all parts of the county.

Oil, grain, road materials, and other bulk cargos are shipped to and from Easton and other small harbors in the county by barges and bay freighters. Pleasure crafts use the waterways and harbors extensively.

Farming

According to the census of agriculture, in 1964 there were 125,196 acres in farms in Talbot County. Of the 432 farms reported, the operators from 87 worked off the farm for more than 100 days during the year. The average-sized farm is about 290 acres, or larger than the average for Maryland.

The main type of farm is cash-grain, though poultry farms and dairy farms are numerous. About 3,061 acres of vegetable crops were harvested in 1964.

Fewer but larger farms has been the trend for many years. Also, there has been a shift from vegetables and wheat to corn for grain and soybeans. Livestock farms have become fewer, and a greater emphasis is placed on crops.

Most farms are highly mechanized, mainly because the soils are level, fields are large, and labor is expensive.

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Glossary

Acidity, soil. (See Reaction, soil.)

Alluvium. Fine soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available moisture capacity. The capacity of a soil to hold water in a form available to plants. The difference between the amount of water in a soil at field capacity and the amount at the permanent wilting point in the same soil. Commonly expressed in inches of water per inch depth of soil.

Chroma. See Color, Munsell notation.

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

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: Clay coat, clay skin.

Color, Munsell notation. A system for designating color by degrees of three simple variables—hue, value, and chroma. For example, the notation 10YR 6/4 stands for a color with a hue of 10YR, a value of 6, and a chroma of 4. Hue is the dominant spectral color; value relates to the relative lightness of color; and chroma is the relative purity or strength of color that increases as grayness decreases.

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, soil crushes easily under gentle to moderate pressure between thumb and forefinger and can be pressed 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 pull free from other material.

Hard.—When dry, moderately resists 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 and brittle; little affected by moistening.

Diversion or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, protect areas downslope from the effects of such runoff.

Drainage, soil. As a soil condition, the rapidity and extent of the removal of water from the soil under natural conditions in relation to natural additions of water. Most water is removed by runoff, by flow through the soil to underground spaces, or by a combination of both processes. As a farm management operation, the removal of excess water from the soil.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Gleization. The reduction, translocation, and segregation of soil compounds, notable of iron, normally in the subsoil or substratum; a result of poor aeration and drainage, expressed in the soil by mottled colors dominated by gray. The soil-forming processes leading to development of a gleyed soil generally characterized by horizons with yellow and gray mottling.

Gravel. A mass of rounded or angular rock fragments ¼ inch to 3 inches in diameter.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the underlying material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath the A or B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hue. See Color, Munsell notation.

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

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristic of the soil profile and underlying layers, and by the height of water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Leaching. The removal of soluble materials from soils or other materials by percolating water.

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

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

Mottles. Spots of different colors that vary in number and size and generally indicate poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.*

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

Parent material. The weathered rock or partly weathered soil material from which a soil has formed. See C horizon.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to described permeability are *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

pH value. A numerical means for designating relatively weak acidity and alkalinity in soils. A pH value of 7.0 indicates neutrality, and a lower numerical value, acidity. See Reaction, soil.

Plowpan. A compacted layer formed in the soil immediately below the plowed layer.

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

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

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

Relief. Elevations or inequalities of the land surface, considered collectively.

Saline soil. A soil that contains soluble salts in amounts that impair growth of plants but that does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments 0.05 to 2.0 millimeters in diameter. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Silt. As a soil separate, individual mineral particles 0.002 to 0.05 millimeter in diameter. As a textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil. The natural medium for the growth of land plants on the surface of the earth; composed of mineral and organic materials.

Solum. The genetic soil developed by soil-forming processes; the A and B horizons; does not include the parent material (C horizon).

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregated longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

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

Substratum. Any layer lying beneath the solum, or true soil; the C or D horizon.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness.

Terrace. See Diversion or diversion terrace.

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, loam, silt loam, silt, 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."

Tilth, soil. The condition of the soil in relation to growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Upland (geologic). Land consisting of material unworked by water in recent geologic time and ordinarily lying at a higher elevation than flood plains and stream terraces.

Value. See Color, Munsell notation.

V-type ditches. Drainage ditches that are V-shaped and have smooth side slopes.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
College Park, Maryland 20740
March 26, 1971

ERRATA SHEET

NOTICE TO USERS OF THE SOIL SURVEY OF TALBOT COUNTY, MARYLAND
ISSUED DECEMBER 1970

Please make the following corrections:

Page 67 - Table 8 - Soil Limitations for Selected Nonfarm Uses - in the column entitled "Sanitary land fills (trench method) - for the Fallsington (Fa,ff,fg) - the limitation should read "Severe: high water table" rather than "Slight", as shown.

General Soil Map (color fold-out) - in the southern part of the county, the small area of Soil Association 6, in which the town of Trappe is located, should be changed to Soil Association 5 (Fallsington-Pocomoke).

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