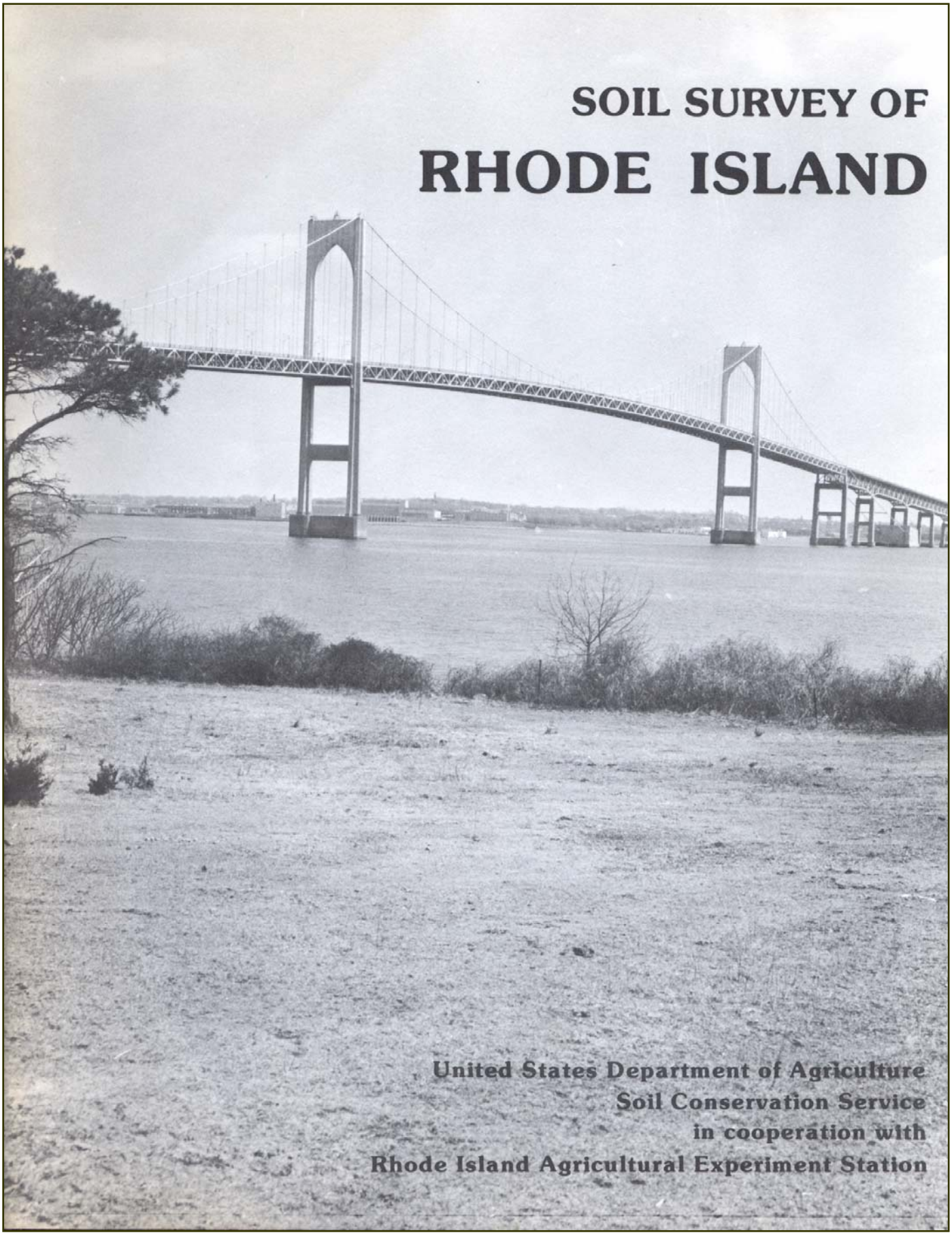
SOIL SURVEY OF
RHODE ISLAND



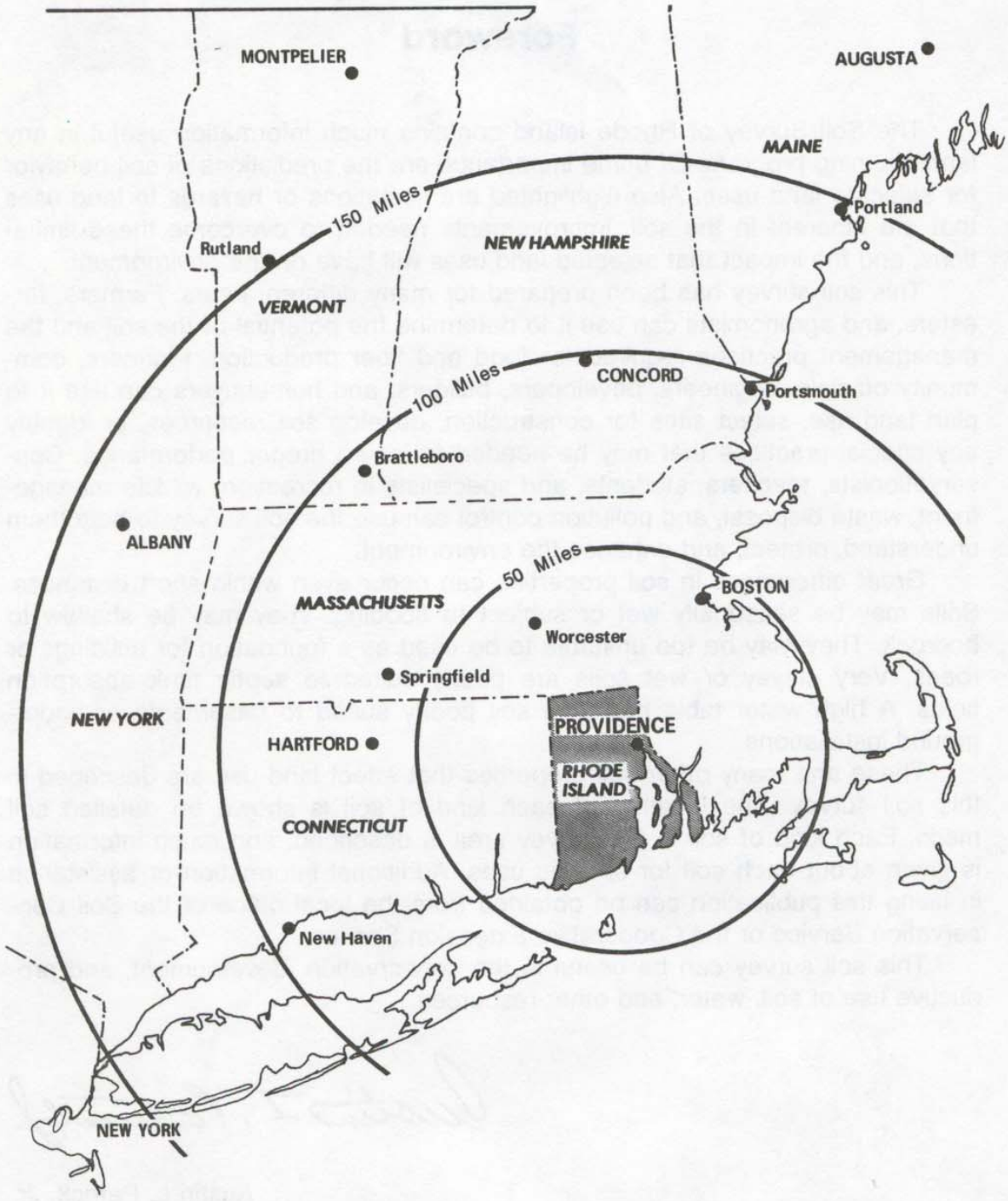
United States Department of Agriculture
Soil Conservation Service
in cooperation with
Rhode Island Agricultural Experiment Station

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

Major fieldwork for this soil survey was completed in the period 1970-77. Soil names and descriptions were approved in 1977. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1977. This survey was made cooperatively by the Soil Conservation Service and the Rhode Island Agricultural Experiment Station, with financial aid from the Statewide Planning Program of the Rhode Island Department of Administration. It is part of the technical assistance furnished to the Eastern Rhode Island Conservation District, the Northern Rhode Island Conservation District, and the Southern Rhode Island Conservation District.

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

Cover: The Newport Bridge spans Narragansett Bay. An area of Newport soils is in the foreground.



Location of Rhode Island.

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SOIL SURVEY OF RHODE ISLAND

By Dean D. Rector, Soil Conservation Service

Fieldwork by Craig Ditzler, Anthony Dore, Bruce Laskey, Daniel Spangler, Dale Sprankle, Everett Stuart, and Mark Townsend, Soil Conservation Service

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

RHODE ISLAND is in the southeastern part of New England. It is made up of the mainland and 13 islands of various sizes. The State has a total area of 677,120 acres, or 1,058 square miles, making it the smallest of the 50 states. But the 1970 population of 946,725 indicates an average of 895 persons per square mile, which is second in density only to New Jersey. About 60 percent of the population lives on about 14 percent of the land. Providence, with a population of 179,116, is the largest city. It is the State capital and the center of commerce.

Nearly two-thirds of Rhode Island is forested. The rest of the area is used for urban purposes, farming, and miscellaneous purposes.

General nature of the area

This section provides information on the history, climate, and physiography and geology of Rhode Island. Also described in this section are drainage patterns in the State, transportation facilities, and water supply.

History

The first settlement in the area was founded in 1636 by Roger Williams and a band of followers from Massachusetts. They settled in an area in what is now East Providence on the east side of the Seekonk River. Farming was the major pursuit of the early settlers. The main crops were Indian corn, rye, barley, beans, and potatoes. Settlements gradually spread throughout the area, and in 1663 King Charles II granted a charter, thus making Rhode Island one of the 13 original colonies.

The colonists of Rhode Island took an active role in the fight against Britain during the Revolutionary War. The first overt act against Britain occurred in Newport on July 19, 1769, when the British revenue ship *Liberty* was destroyed. The first naval engagement occurred in the waters of Narragansett Bay when the British frigate *Rose* was run aground on Conanicut shore and captured.

Climate

In Rhode Island, winters are cold and summers are warm. Both the start and the end of the warm period are influenced by the moderating effect of the Atlantic Ocean. In winter the ground is frequently, but not continuously, covered with snow. Total annual precipitation is nearly always adequate for crops commonly grown in the area.

Tables 1 and 2 give data on temperature and precipitation for the survey area, as recorded at Providence and Kingston, Rhode Island, for the period 1951 to 1974.

Tables 3 and 4 show probable dates of the first freeze in fall and the last freeze in spring. Tables 5 and 6 provide data on length of the growing season.

In winter the average temperature is 30 degrees F, and the average daily minimum temperature is 20 degrees. The lowest temperature on record, which occurred at Kingston on January 18, 1954, is -18 degrees. The lowest temperature on record at Providence during the period was -9 degrees on January 15, 1957. In summer the average temperature is 70 degrees, and the average daily maximum temperature is 80 degrees. The highest recorded temperature, which occurred at Providence on September 21, 1953, is 99 degrees.

Growing degree days, shown in tables 1 and 2, are equivalent to heat units. During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 22 inches, or 45 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 18 inches. The heaviest 1-day rainfall during the period of record was 5.39 inches at Providence on August 27, 1971, and 6.48 inches at Kingston on September 21, 1961. Thunderstorms occur on about 21 days each year, and most occur in summer.

Average seasonal snowfall is 36 inches. The greatest snow depth at any one time during the period of record was 30 inches. On the average, 19 days have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 75 percent. The percentage of possible sunshine is 60 in summer and 55 in winter. The prevailing wind is from the southwest. Average windspeed is highest, 13 miles per hour, in April.

Climatic data in this section were specially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

Physiography and geology

All of what is now Rhode Island was covered by glacial ice sheets several thousand feet thick during the Pleistocene epoch, which began 2.5 to 3 million years ago. As the glacier moved south, it scoured and picked up older glacial deposits, bedrock, and soil. The final deposition of glacial material occurred during the Wisconsin glaciation 10,000 to 12,000 years ago. As the glacier melted and receded, it deposited unconsolidated material consisting mainly of unsorted glacial till and beds of meltwater-sorted sand, gravel, and silt. Glacial till is the most extensive of these deposits. The meltwater and the eroded material it carried caused a landscape of kames, eskers, terraces, and outwash plains, all of which contain stratified outwash and fluvial deposits.

The glacial deposits in Rhode Island are divided into four types. They are mainly of Pleistocene age and are shown in figure 1 (*3*). Following is a description of those deposits.

The *upland till plains* are the most extensive example of glacial till in Rhode Island. The till is derived mostly from granite, schist, and gneiss rock. Glacial stones and boulders are commonly scattered on the surface of these plains, and bedrock outcrops are in some areas. Much of the till is relatively loose and unconsolidated. Some areas, however, were compacted, leaving deposits of dense material that is difficult to penetrate with a hand shovel. Canton soils formed in the unconsolidated deposits, and Paxton soils formed in the compact deposits.

The *Narragansett till plains* make up the area immediately around Narragansett Bay. This area is covered by glacial till derived from sedimentary rock, shale, sand stone, conglomerate, and, in a few places, coal. The till is generally compacted, dark gray to olive-colored, and finer textured than the till derived from granitic rock. The area has few bedrock outcrops, and most of the land- forms are drumloidal and have been smoothed by glacial action. The Newport soils formed in these deposits.

Rhode Island has several major glacial end moraines; the most important of these are the *Charlestown and Block Island moraines*. These moraines are accumulations of glacial drift caused when the ice front stayed at the same place for a long time but the ice itself continued to bring up boulders, sand, and silt. The Charlestown moraine is a rough, irregular ridge running from near Wakefield to Watch Hill. Drainage patterns in the southern part of Rhode Island tend toward the south, but are cut short of Rhode Island Sound by the blocking action of the Charlestown moraine. Consequently, the Pawcatuck River, which drains a large portion of the area north of the moraine, flows generally westward and empties into the ocean near Westerly. Block Island is geologically unique; it is part of an end moraine that extends from Long Island on the west to Martha’s Vine- yard on the east, and the deposits in the moraine are much older than the recent glacial drift on the mainland. Block Island has no known rock outcrops, and the depth to hard rock may be as much as 1,000 feet below sea level.

Outwash deposits are widespread in small, scattered areas and broad, level plains. The outwash consists of particles of gravel, sand, silt, and clay that were deposited in irregular layers by glacial meltwater as the water moved toward the sea. Some of the larger deposits of outwash in Rhode Island are along the Wood and Pawcatuck Rivers in the eastern part of West Greenwich and in North Kingstown, Warwick, Providence, and North Smithfield. Significant areas of outwash are located in almost every town and city in the State. Some of these outwash areas are capped with windblown deposits of silt. Bridgehampton soils formed in these windblown deposits.

The bedrock formations of Rhode Island are in four main groups (fig. 2). From oldest to youngest, the groups are : (1) the Blackstone series of metamorphic (recrystallized) rock along the Blackstone Valley, in areas chiefly in the western

part of the State and along the southern border of the State; (2) older granite rock of considerable variety and possibly of several ages; (3) Pennsylvanian (coal-age) sedimentary rock of the Narragansett Basin in eastern Rhode Island; and (4) younger granite rock that is exposed at Narragansett and which extends west to Westerly. Not included in these four groups are a few trap dikes and quartz veins.

Drainage

Rhode Island can be divided into five drainage basins (fig. 3): the Narragansett Bay Basin, the Pawcatuck River Basin, the Rhode Island Coastal Basin, the Thames River Basin, and the Massachusetts Coastal Basin.

The *Narragansett Bay Basin*, the most important basin, includes the system of waterways that discharge into the Atlantic Ocean between Point Judith in Narragansett and Sakonnet Point in Little Compton. The bay, reaching inland 26 miles, has a water area of approximately 140 square miles and a total shoreline, including that of the islands within the bay, of about 250 miles. The Narragansett Bay Basin also comprises the watershed tributaries to Narragansett Bay and the small waterways that flow into the Atlantic Ocean from Sakonnet Point east to the Massachusetts-Rhode Island state line. The basin area is 1,850 square miles, 1,030 square miles of which is in Massachusetts and 820 in Rhode Island.

Three major rivers, the Taunton, Blackstone, and Pawtuxet, and a number of small streams drain into Narragansett Bay proper or one of its arms. The Taunton River Basin is almost entirely in Massachusetts. It flows into Mount Hope Bay east of Bristol. The Blackstone River drains from Massachusetts south through Woonsocket, Manville, Central Falls, and Pawtucket and then south to the Providence River. The southernmost part of the Blackstone River is called the Seekonk River. Two major tributaries of the Blackstone River are the Ten Mile River, which flows into Seekonk River through East Providence, and the North Branch Pawtuxet River, which originates at Kent Dam at the Scituate Reservoir and flows south into the South Branch of the Pawtuxet River near Westcott in West Warwick. The South Branch of the Pawtuxet River originates at Flat River Reservoir Dam in Coventry and flows east to confluence with the North Branch.

The *Thames River Basin* drains the western part of Rhode Island. All streams from Robbins Brook in Burrillville to Roaring Brook in Coventry flow west into Connecticut and eventually into the Thames River. The Moosup River Basin is the major area of the Thames River Basin in Rhode Island. The Mossup River drains the areas west of Route 102 in the town of Coventry and the southern part of the town of Foster.

The *Rhode Island Coastal Basin* includes the area between Watch Hill Point in the town of Westerly and Point Judith in the town of Narragansett. Many of Rhode Island's saltwater ponds are in this basin. Going from east to west along the Block Island Sound they are: Winnapoug Pond, Quonochontaug Pond, Ninigret Pond, Green Hill Pond, Truston Pond, Cards Pond, Potter Pond, and Point Judith Pond. A few small streams drain into these ponds. Yawgunsk Brook

drains into Ninigret Pond, and the Saugatucket River, Browns Brook, and Indian Run drain into Point Judith Pond.

The *Pawcatuck River Basin* is in southwestern Rhode Island. The Pawcatuck River starts in Warden Pond in the western part of South Kingstown and flows southwest to its mouth at little Narragansett Bay, an arm of Fishers Island Sound. The lower 10 miles of the river forms the boundary between Connecticut and Rhode Island. The Usequepaug, Wood, and Ashway Rivers are the principal tributaries of the Pawcatuck River. The Usequepaug River starts in the Glen Rock Reservoir in the northwest corner of South Kingstown and flows into the Pawcatuck River south of Warden Pond. The Wood River is formed by the confluence of the Phillips and Acid Factory Brooks in the southwestern part of West Greenwich. The Wood River flows in a southerly direction to the Pawcatuck River. The Ashaway River is formed by the junction of the Green Fall River and Parmenter Brook in the western part of Hopkinton and flows south to its confluence with the Pawcatuck River at the boundary between Hopkinton and Westerly.

The *Massachusetts Coastal Basin* is the smallest of the five basins. Adamsville Brook is the only major stream in the basin. It flows east into Massachusetts near the town boundaries of Tiverton and Little Compton.

Transportation

Three Federal highways—Interstates 95, 195, and 295—and a network of State and town roads make up the major automotive routes in Rhode Island. T.F. Green Airport in Warwick is the largest airport in the State and is the State's major commercial airline facility. Four other airports in Rhode Island serve the public with local and charter flights.

Narragansett Bay, the world's largest sheltered bay, provides facilities for tanker and barge transportation of such bulk commodities as petroleum products and building materials. Freight is carried on two major railroads in the State and on several shortline rail lines that serve local industry. The State has one high-speed passenger rail line.

Water supply

In 1969 Rhode Island had 24 public and institutional water systems and about 20 minor (serving fewer than 500 persons) water systems. Wells supply about 24 percent of the water used in these systems. Ground water is a primary source in the State's southern areas, but the statewide use of ground water is only 25 percent of the total estimated supply.

Most of the lakes and ponds in the State are used for home water supply, recreation, fire protection, irrigation, and consumption by livestock. The largest inland body of water, the Scituate Reservoir, is the principal freshwater supply for the Providence metropolitan area. The rural areas of the State depend on wells and constructed ponds.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; 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, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in states nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures (4, 5).

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photo graphs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the section ‘Soil maps for detailed planning.”

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the

potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section “Use and management of the soils.”

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have a profile that is almost alike make up a soil series. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped. The Newport series, for example, was named for the town of Newport in Newport County.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a sail phase commonly indicates a feature that affects use or management. For example, Newport silt loam, 0 to 3 percent slopes, is one of several phases within the Newport series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes and undifferentiated groups.

A soil complex consists of areas of two or, more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area includes some of each of the two or more dominant soils, and the pattern and proportion are somewhat similar in all areas. Bridgehampton-Char complex, very stony, 0 to 8 percent slopes, is an example.

An undifferentiated group is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. Canton and Charlton fine sandy loams, 0 to 3 percent slopes, is an undifferentiated group in this survey area.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or

strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called miscellaneous areas; they are delineated on the soil map and given descriptive names. Pits, gravel, is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

In table 7 the acreage of each map unit is listed by counties and the total acreage and proportionate extent of the unit in the State is given. Tables 8 through 14 give the approximate acreage of each map unit in the towns and cities of the State. The towns and cities are listed in alphabetical order. Additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See “Summary of Tables.”) Many of the terms used in describing soils are defined in the Glossary.

Aa - Adrian muck.
This nearly level, very poorly drained soil is in depressions and small drainageways of glacial till uplands and outwash plains. Most areas are oval and range from 2 to 20 acres. Slopes are dominantly less than 2 percent.

Typically the surface layer is black muck 20 inches thick. The substratum extends to a depth of 60 inches or more. It is gray fine sand to a depth of 22 inches and grayish brown gravelly sand at a depth of more than 22 inches.

Included with this soil in mapping are small areas of poorly drained Ridgebury and Raypol soils and very poorly drained Carlisle, Scarboro, and Whitman soils. Also included are areas in Newport County that are underlain by loamy material. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid. Available water capacity is high. Runoff is very slow, and water is ponded on some areas. A few areas adjacent to streams are subject to flooding. The surface layer is strongly acid through slightly acid. This soil has a high water table at or near the surface most of the year.

Most areas of this soil are in woodland or have a marsh grass and sedge plant cover.

The high water table, ponding, and the low strength of the surface layer make this soil unsuitable for community development. If the soil is drained, the organic material in the surface layer shrinks and subsides, lowering the soil surface. Slopes of excavated areas are unstable.

This soil is not suited to cultivated crops. It is limited mainly by wetness, and many areas do not have suitable drainage outlets.

This soil is suited to wetland wildlife habitat, but wet ness makes the soil poorly suited to woodland wildlife habitat or open-land wildlife habitat. Capability subclass is VIw, woodland group is 5w.

AfA - Agawam fine sandy loam, 0 to 3 percent slopes.

This nearly level, well drained soil is on terraces and outwash plains. Areas are irregular in shape and mostly range from 3 to 200 acres.

Typically the surface layer is dark brown fine sandy loam about 7 inches thick. The subsoil is yellowish brown, reddish yellow and light yellowish brown fine sandy loam 25 inches thick. The substratum extends to a depth of 60 inches or more. It is pale brown sand to a depth of 31 inches and gravelly sand at a depth of more than 31 inches.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Enfield soils, and moderately well drained Ninigret and Sudbury soils. Also included are small areas of soils that have slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid or rapid in the lower part of the subsoil, and rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil is very strongly acid through slightly acid.

This soil is suited to community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable.

This soil is suited to cultivated crops, and most of the areas are used for farming. The use of cover crops and return of crop residue to the soil help to maintain organic matter content and tilth.

This soil is suitable for trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability class I; woodland group 4o.

AfB - Agawam fine sandy loam, 3 to 8 percent slopes.

This gently sloping, well drained soil is on terraces and outwash plains. Areas are irregular in shape and mostly range from 5 to 20 acres.

Typically the surface layer is dark brown fine sandy loam about 7 inches thick. The subsoil is yellowish brown, reddish yellow, and light yellowish brown fine

sandy loam 25 inches thick. The substratum extends to a depth of 60 inches or more. It is pale brown sand to a depth of 38 inches and pale brown gravelly sand at a depth of more than 38 inches.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Enfield soils, and moderately well drained Ninigret and Sudbury soils. Also included are small areas of soils that have slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid or rapid in the lower part of the subsoil, and rapid in the substratum. Available water capacity is moderate, and runoff is medium. This soil is very strongly acid through slightly acid.

This soil is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. The use of straw bale sediment barriers, mulching, providing siltation basins, and quickly establishing plant cover help to control erosion during construction.

This soil is suited to cultivated crops, and most of the areas are used for farming. The hazard of erosion is moderate. Stripcropping, the use of cover crops, and the return of crop residue to the soil help to control erosion and maintain tilth and organic mailer content.

This soil is suitable for trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIe; woodland group 4o.

Ba - Beaches.

These nearly level to gently sloping areas are along the shore of the ocean. They consist of sand dunes or escarpments and of sandy, gravelly, and cobbly areas that are exposed during low tide. Areas are long and narrow and mostly range from S to 60 acres. They are unprotected from the ocean and are subject to severe erosion during storms. Slopes range from 0 to 8 percent.

Included with this unit in mapping are small areas of Udipsamments, undulating; rock outcrops; and Matunuck soils. Included areas make up about 5 percent of this map unit.

Beaches are used intensively for summer recreation activities such as sun bathing and surf fishing. They are not suitable for woodland wildlife habitat or openland wildlife habitat because of daily inundations, but the areas are suited to wetland wildlife species that thrive in saltwater. Capability subclass VIIIw;

woodland group not assigned.

Soil Map Unit Description from the RI Soil Survey Report

Bc—Birchwood sandy loam.

This nearly level, moderately well drained soil is on the crests of upland hills and drumlins and in transitional positions between up lands and outwash terraces. Areas are irregular in shape and mostly range from 6 to 30 acres. Slopes range from 0 to 3 percent.

Typically the surface layer is dark brown sandy loam about 10 inches thick. The subsoil is 14 inches thick. It is yellowish brown loamy sand that is mottled in the lower part. The substratum is very firm, black gravelly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Poquonock, Newport, and Paxton soils; moderately well drained Woodbridge and Pittstown soils; and poorly drained Stissing soils. Also included are small areas of soils that have slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer, rapid in the subsoil, and slow or very slow in the substratum. Available water capacity is low, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

Wetness and the slow or very slow permeability of the substratum limit this soil for community development. Onsite septic systems need special design and installation, If suitable outlets are available, subsurface drains help prevent wet basements. Lawn grasses, shallow- rooted trees, and shrubs require watering in summer. Roads and streets on this soil need special design to prevent frost heaving.

Many areas of this soil are farmed, a use to which it is suited. Wetness is the main limitation. The soil dries out and warms up slowly in the spring, and artificial drainage is needed, but irrigation is necessary in dry seasons. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIw; wood land group 4o.

BhA - Bridgehampton silt loam, 0 to 3 percent slopes.

This nearly level, well drained to moderately well drained soil is on outwash plains and terraces. Areas are irregular in shape and mostly range from 5 to 80 acres.

Typically the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is 33 inches thick. The upper 16 inches of the subsoil is dark yellowish brown and brown silt loam; the next 8 inches is grayish brown, mottled silt loam; the next 6 inches is strong brown silt loam; and the lower 3 inches is light olive brown, very fine sandy loam. The substratum is grayish brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Agawam and Enfield soils and moderately well drained Scio and Tisbury soils. Also included are small areas of soils that have slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is high, and runoff is slow. This soil is strongly acid through medium acid.

This soil is suited to community development. Onsite septic systems need careful design and installation to prevent pollution of ground water, and roads and streets need special design to prevent frost heaving. Slopes of excavated areas are commonly unstable.

Most areas of this soil are farmed, a use to which the soil is suited. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.
This soil is suitable for trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability class I woodland group 3o.

BhB - Bridgehampton silt loam, 3 to 8 percent slopes.

This gently sloping, well drained to moderately well drained soil is on outwash plains and terraces. Areas are irregular in shape and range from 5 to 100 acres.

Typically the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is 33 inches thick. The upper 16 inches of the subsoil is dark yellowish brown and brown silt loam; the next 8 inches is grayish brown, mottled silt loam, the next 6 inches is strong brown silt loam; and the lower 3 inches is light olive brown, mottled very fine sandy loam. The substratum is grayish brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Agawam and Enfield soils and moderately well drained Scio and Tisbury soils. Also included are small areas of soils that have slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is high, and runoff is medium. This soil is very strongly acid through medium acid.

This soil is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water, and roads and streets need special design and installation to prevent frost heaving. Slopes of excavated areas are commonly unstable. The use of straw bale sediment barriers, mulching, quickly establishing plant cover, and the use of siltation basins help to control erosion during construction.

Most areas of this soil are farmed, a use to which the soil is suited. The hazard of erosion is moderate. Strip- cropping, the use of diversions and cover crops, and the return of crop residue to the soil help to control erosion and maintain organic manor content and tilth.
This soil is suitable for trees, woodland wildlife habitat, and openland wildlife habitat, It is too dry to provide wetland wildlife habitat. Capability subclass IIe; woodland group 3o.

BmA - Bridgehampton silt loam, till substratum, 0 to 3 percent slopes.

This nearly level, well drained to moderately well drained soil is on crests of upland hills. Areas are irregular in shape and mostly range from 5 to 100 acres.

Typically the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is 33 inches thick. The upper 16 inches of the subsoil is dark yellowish brown and brown silt loam; the next 8 inches is grayish brown, mottled silt loam; the next 6 inches is strong brown silt loam; and the lower 3 inches is light olive brown, mottled very fine sandy loam. The substratum is grayish brown gravelly sandy loam to a depth of 60 inches
or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Narragansett soils and moderately well drained Wapping and Scio soils. Also included are small areas of soils that have slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is high, and runoff is slow. This soil is very strongly acid through medium acid.

This soil is suitable for community development, but roads and streets need special design to help reduce frost heaving. The soil is a poor source of sand and gravel.
Most areas of this soil are used for farming, and the soil is suited to cultivated crops. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suitable for trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability class I woodland group 3o.

BmB - Bridgehampton silt loam, till substratum, 3 to 8 percent slopes.

This gently sloping, well drained to moderately well drained soil is on side slopes and crests of upland hills. Areas are irregular in shape and mostly range from 5 to 100 acres.

Typically the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is 33 inches thick. The upper 16 inches of the subsoil is dark yellowish brown and brown silt loam; the next 8 inches is grayish brown, mottled silt loam; the next 6 inches is strong brown silt loam; and the lower 3 inches is light olive brown, mottled very fine sandy loam. The substratum is grayish brown gravelly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Narragansett soils and moderately well drained Wapping and Scio soils. Also included are small areas of soils that have slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is high, and runoff is medium.

This soil is very strongly acid through medium acid.

This soil is suitable for community development, but roads and streets need proper design to reduce frost heaving. The use of straw bale sediment barriers and siltation basins and quickly establishing plant cover help to reduce erosion during construction. This soil is a poor source of sand and gravel.

Most areas of this soil are farmed, and the soil is suited 10 cultivated crops. The hazard of erosion is moderate. Strip-cropping, the use of diversions and cover crops, and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suitable for trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIe, woodland group 3o.

BnB – Bridgehampton - Charlton complex, very stony, 0 to 8 percent slopes.

This complex consists of nearly level to gently sloping, well drained to moderately well drained soils on slopes and crests of upland hills. Stones and boulders cover 2 to 10 percent of the surface of the complex. Areas are irregular in shape and mostly range from 5 to 150 acres. The complex is approximately 60 percent Bridgehampton soils, 25 percent Charlton soils, and 15 percent other soils. The soils are so intermingled that it was n practical to map them separately.

Typically, the Bridgehampton soils have a surface layer of very dark grayish brown silt loam about 2 inches thick. The subsoil is 39 inches thick. The upper 22 inches of the subsoil is dark yellowish brown and brown silt loam; the next 8 inches is grayish brown, mottled silt loam; the next 6 inches is strong brown silt loam; and the lower 3 inches is light olive brown, mottled very fine sandy loam. The substratum is grayish brown gravelly sandy loam to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches of the subsoil is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The substratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with this complex in mapping are small areas of well drained Canton and Narragansett soils and moderately well drained Wapping and Scio soils. Also included are small areas of soils that have slopes of more than 8 percent and small areas of soils that do not have stones on the surface.

The permeability of the Bridgehampton soils is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is high and runoff is slow to medium. The soils are very strongly acid through medium acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is slow to medium. The soils are very strongly acid through medium acid.

Most areas of this complex are in woodland. A small acreage is cleared and used for pasture.

These soils are suitable for community development, but roads and streets need special design to prevent frost heaving, and the removal of stones and boulders from the surface is necessary for landscaping. The use of straw bale sediment barriers, mulching, and quickly establishing plant cover help to control erosion during construction. The soils in this complex are a poor source of sand and gravel.

The stones and boulders on the surface make these soils poorly suited to cultivated crops and severely hinder the use of farming equipment. These soils are suited to grasses and legumes for pasture. The hazard of erosion is moderate. Minimum tillage and maintaining a permanent plant cover help to control erosion.

These soils are suited to woodland wildlife habitat, but stoniness limits suitability for openland wildlife habitat and the soils are too dry to provide wetland wildlife habitat. Capability subclass VIs; Bridgehampton part in woodland group 3o, Charlton part in woodland group 4o.

BnC – Bridgehampton - Charlton complex, very stony, 8 to 15 percent slopes.

This complex consists of sloping, well drained to moderately well drained soils on side slopes of upland hills. Stones and boulders cover 2 to 10 percent of the surface of the complex. Areas are irregular in shape and mostly range from 5 to 100 acres. The complex is approximately 60 percent Bridgehampton soils, 25 percent Charlton soils, and 15 percent other soils. The soils in this complex are so intermingled on the landscape that it was not practical to map them separately.

Typically the Bridgehampton soils have a surface layer of very dark grayish brown sill loam about 2 inches thick. The subsoil is 39 inches thick. The upper 22 inches of the subsoil is dark yellowish brown and brown silt loam; the next 8 inches is grayish brown, mottled silt loam; the next 6 inches is strong brown silt loam; and the lower 3 inches is light olive brown, mottled very fine sandy loam. The substratum is grayish brown gravelly sandy loam to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with this complex in mapping are small areas of well drained Canton and Narragansett soils and moderately well drained Wapping and Scio soils. Also

included are small areas of soils that have slopes of more than 15 percent and small areas of soils that do not have stones on the surface.

The permeability of the Bridgehampton soils is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is high, and runoff is medium. The soils are very strongly acid through medium acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is medium. The soils are very strongly acid through medium acid.

Most areas of this complex are in woodland. A small acreage is cleared and used for pasture.

This complex is suitable for community development but slope is a main limitation. Onsite sewage disposal systems need careful design and installation and local roads and streets need special design to prevent frost heaving. Quickly establishing plant cover, mulching, and the use of diversions and siltation basins help to control erosion during construction. The soils in this complex are a poor source of sand and gravel.

The stones and boulders on the surface make these soils poorly suited to cultivated crops and severely hinder the use of farming equipment. The soils are suited to grasses and legumes for pasture. The hazard of erosion is severe. Maintaining a permanent plant cover and minimum tillage help to control erosion.

These soils are suitable for trees and woodland wildlife habitat. Stoniness limits use for openland wildlife habitat, and the soils are too dry to provide wetland wildlife habitat. Capability subclass VIs; Bridgehampton part in woodland group 3o, Charlton part in woodland group 4o.

BoC – Bridgehampton - Charlton complex, extremely stony, 3 to 15 percent slopes.

These gently sloping to sloping, well drained to moderately well drained soils are on side slopes of glacial upland hills. Stones and boulders cover I 0 to 35 percent of the surface of the complex. Areas are irregular in shape and mostly range from 5 to 100 acres. The complex is approximately 80 percent Bridgehampton soils, 25 percent Charlton soils, and IS percent other soils. The soils are so intermingled that it was not practical to map them separately.

Typically the Bridgehampton soils have a surface layer of very dark brown silt loam about 2 inches thick. The subsoil is 39 inches thick. The upper 22 inches of the subsoil is dark yellowish brown and brown silt loam: the next 8 inches is grayish brown, mottled silt loam: the next 6 inches is strong brown silt loam; and

the lower 3 inches is light olive brown, mottled very fine sandy loam. The substratum is grayish brown gravelly sandy loam to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches of the subsoil is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The substratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with this complex in mapping are small areas of well drained Canton and Narragansett soils and moderately well drained Wapping, Sutton, and Scio soils. Also included are small areas of soils that have slopes of more than 15 percent and small areas of soils that do not have stones on the surface.

The permeability of the Bridgehampton soils is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is high, and runoff is medium. The soils are very strongly acid through medium acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is medium. The soils are very strongly acid through medium acid.

This complex is suitable for community development, but stoniness is a major limitation. Onsite sewage disposal systems need careful design and installation and local roads and streets need special design to prevent frost heaving. The use of straw bale sediment barriers and siltation basins and quickly establishing plant cover help to control erosion during construction. The soils in this complex are a poor source of sand and gravel.

These soils are suited to trees, and most areas are in woodland. The stones and boulders on the surface hinder the use of logging equipment.

The stones and boulders on the surface make the soils unsuitable for cultivated crops and the use of farming equipment impractical. The hazard of erosion is moderate to severe and can be controlled by establishing permanent plant cover.

This complex is suited to woodland wildlife habitat. Stoniness limits use for openland wildlife habitat, and the soils are too dry to provide wetland wildlife habitat. Capability subclass VIIs; Bridgehampton part in woodland group 3x, Charlton part in woodland group 4x.

BrA - Broadbrook slit loam, 0 to 3 percent slopes.

This nearly level, well drained soil is on the crests of upland hills and drumlins. Areas are oval and mostly range from 5 to 80 acres.

Typically the surface layer is dark brown silt loam about 9 inches thick. The subsoil is yellowish brown and light olive brown silt loam 27 inches thick. The substratum is light yellowish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Narragansett, Paxton, and Newport soils and moderately well drained Rainbow, Pittstown, and Woodbridge soils. Also included are small areas of soils that have slopes of more than 3 percent.

Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow. This soil is very strongly acid through medium acid.

This soil is suitable for community development. The main limitation is the slow or very slow permeability of the substratum. Onsite sewage disposal systems need special design and installation, and roads and streets need careful design to prevent frost heaving. Steep slopes of excavations slump when saturated. Where out lets are available, footing drains help prevent wet basements. Quickly establishing plant cover and the use of mulch help to control erosion during construction.

This soil is suited to cultivated crops, and most areas are farmed. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.
This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability class I woodland group 3o.

BrB - Broadbrook slit loam, 3 to 8 percent slopes.

This gently sloping, well drained soil is on the side slopes of glacial upland hills and drumlins. Areas are irregular in shape and mostly range from 6 to 80 acres.

Typically the surface layer is dark brown silt loam about 9 inches thick. The subsoil is yellowish brown and light olive brown silt loam 27 inches thick. The substratum is light yellowish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Narragansett, Newport, and Paxton soils and moderately well drained Rainbow, Pittstown, and Woodbridge soils. Also included are small areas of soils that have slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is medium. This soil is very strongly acid through medium acid.

This soil is suitable for community development. The main limitation is the slow or very slow permeability of the substratum. Onsite sewage disposal systems need special design and installation to prevent effluent from seeping to the surface, and roads and streets need careful design to prevent frost heaving. Steep slopes of excavations slump when saturated. Footing drains help prevent wet basements. The use of siltation basins and straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

Most areas of this soil are used for farming, a use to which the soil is suited. The hazard of erosion is moderate. Stripcropping, the use of diversions and cover crops, and the return of crop residue to the soil help to maintain tilth and organic matter content and control erosion.

This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. This soil is too dry to provide wetland wildlife habitat. Capability subclass IIe; woodland group 3o.

BsB - Broadbrook very stony silt loam, 0 to 8 percent slopes.

This nearly level to gently sloping, well drained soil is on crests and side slopes of glacial upland hills and drumlins. Stones and boulders cover 2 to 10 percent of the surface of the soil. Areas are oval and mostly range from 5 to 80 acres.

Typically the surface layer is dark brown silt loam about 9 inches thick. The subsoil is yellowish brown and light olive brown silt loam 27 inches thick. The substratum is light yellowish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Narragansett, Charlton and Paxton soils and moderately well drained Rainbow and Woodbridge soils. A included are small areas of soils that have slopes of more than 8 percent and soils that do not have stones on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil is very strongly acid through medium acid.

This soil is suited to trees and pasture, and most areas are in woodland or pasture grasses and legumes.

This soil is suitable for community development but is limited by the slow or very slow permeability of the substratum and the stony surface. Onsite sewage disposal systems need special design and installation to prevent effluent from seeping to the surface, and roads and streets need careful design to prevent frost heaving. Removal of stones and boulders is necessary for landscaping. The use of straw bale sediment barriers and siltation basins and quickly establishing plant cover help to control erosion during construction.

The stony surface makes this soil suited to cultivated crops and severely hinders the use of farming equipment. The hazard of erosion is moderate, but maintaining a permanent plant cover helps to control this hazard.

This soil is suitable for woodland wildlife habitat. Stoniness limits the suitability for openland wildlife habitat. The soil is too dry to provide wetland wildlife habitat. Capability subclass VIs; woodland group 3o.

CaC - Canton-Charlton-Rock outcrop complex, 8 to 15 percent slopes.

This complex consists of gently sloping to moderately sloping, well drained soils intermingled with areas of bare, hard exposed bedrock. The complex is on side slopes and crests of upland hills and ridges. Stones and boulders cover 10 to 35 percent of the surface. Areas are irregular in shape and mostly range from 5 to 40 acres. The complex is approximately 40 percent Canton soils, 20 percent Charlton soils, 20 percent rock outcrops, and 20 percent other soils. The soils and out crops are so intermingled that it was not practical to map them separately.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish-brown, and light olive brown fine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 15 percent and small areas of soils with bedrock at a depth of less than 40 inches.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is medium.

This soil is extremely acid through strongly acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is medium. This soil is very strongly acid through medium acid.

This complex is suitable for community development but is limited by the stony surface and rock outcrops. Onsite sewage disposal systems need careful design and installation to prevent effluent from seeping to the surface, and rock outcrops make excavation difficult. Removal of stones and boulders is necessary for landscaping. The use of straw bale sediment barriers, siltation basins, and mulch and quickly establishing plant cover help to control erosion during construction.

Most areas of these soils are in woodland. The complex is suited to trees, but stoniness and rock outcrops hinder the use of equipment.

The stony surface and rock outcrops make this complex unsuitable for cultivated crops and the use of farming equipment impractical.

This complex is suitable for woodland wildlife habitat. Stoniness and rock outcrops limit the suitability for open- land wildlife habitat. The soils are too dry to provide wetland wildlife habitat. Capability subclass VIIs; wood land group 4x.

CaD - Canton-Charlton-Rock outcrop complex, 15 to 35 percent slopes.

This complex consists of moderately steep to very steep, well drained soils intermingled with areas of bare, hard exposed bedrock. The complex is on side slopes of upland hills and ridges. Stones and boulders cover 10 to 35 percent of the surface. Areas are irregular in shape and mostly range from 5 to 50 acres. The complex is approximately 40 percent Canton soils. 20 percent Charlton soils, 20 percent rock outcrops, and 20 percent other soils. The soils and rock outcrops are so intermingled that it was not practical to map them separately.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish brown and light olive brown fine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 6 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish

brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of less than 15 percent and small areas of soils with bedrock at a depth of less than 40 inches.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is rapid.

This soil is extremely acid through strongly acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is rapid. This soil is very strongly acid through medium acid.

The steep slopes, the stony surface, and rock out crops make this complex poorly suited to community development. Onsite septic systems require special design and installation to prevent effluent from seeping to the surface, and rock outcrops make excavation difficult. The use of diversions, mulching, and quickly establishing plant cover help to control erosion during construction.

Although this complex is poorly suited to trees, most areas are in woodland, and the soils are better suited to woodland than to most other uses. The main imitations are the steep slopes, stony surface, and rock outcrops, all of which limit the use of equipment. Logging roads and trails require careful layout to prevent erosion.

These soils are not suited to cultivated crops. Stones, boulders, and rock outcrops make the use of farming equipment impractical. The hazard of erosion is severe.

This complex is suitable for woodland wildlife habitat. Stoniness and rock outcrops make the use of the soils for openland wildlife habitat impractical. The soils are too dry to provide wetland wildlife habitat. Capability sub class VIIs; woodland group 4x.

CB – Canton - Urban land complex.

This complex consists of well drained Canton soils and areas of Urban land. The complex is on side slopes and crests of glacial upland hills in the more densely populated areas Of the State. Areas are irregular in shape and mostly range from

10 to 200 acres. Slopes are commonly about 6 percent but range from 0 to 15 percent. The complex is approximately 40 percent Canton soils, 30 percent Urban land, and 30 percent other soils. The areas are in such an intricate pattern that it was not practical to map them separately.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Urban land consists of areas covered by streets, parking lots, and shopping centers and other structures.

Included with this complex in mapping are areas, up to 10 acres in size, of somewhat excessively drained Gloucester soils; well drained Charlton Paxton, and Narragansett soils; Udorthents; and moderately well drained Sutton soils. Also included are small areas that have slopes of more than 15 percent.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is medium on areas of the Canton soils. The Canton soils are extremely acid through strongly acid.

Areas of this complex are used mainly for homesites, shopping centers, industrial parks, streets, and other urban uses. The homesites are mostly 10,000 to 50,000 square feet.

Slope is the major limitation of this complex for community development. Quickly establishing plant cover and using mulch, straw bale sediment barriers, siltation basins, and diversions help to control erosion during construction.

Areas of this complex require onsite investigation and evaluation for most uses. Capability subclass and wood land group not assigned.

CC – Canton - Urban land complex, very rocky.

This complex consists of well drained Canton soils and areas of Urban land. The complex is on side slopes and crests of glacial upland hills in the more densely populated areas of the State. The surface consists of up to 10 percent bedrock outcrops, and 2 to 10 percent of the area is covered by stones and boulders. Areas are irregular in shape and mostly range from 10 to 150 acres. Slopes are mainly about 6 percent but range from 0 to 15 percent. The complex is approximately 40 percent Canton soils, 30 percent Urban land, and 30 percent other soils and rock outcrops. The areas are in such an intricate pattern that it was not practical to map them separately.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown tine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Urban land consists of areas covered by streets, park ing lots, and shopping centers and other structures.

Included with this complex in mapping are areas, up to 10 acres in size, of somewhat excessively drained Gloucester soils; well drained Charlton, Paxton, and Narragansett soils; Udorthents; and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 15 percent and areas where bedrock is less than 40 inches from the surface.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. Runoff is medium on areas of the Canton soils. The Canton soils are extremely acid through strongly acid.

Areas of this complex are used mainly for homesites and streets. The homesites are mostly 10,000 to more than 50,000 square feet.

The main limitations of this soil for community development are the rock outcrops and slope. Onsite sewage disposal systems need careful design and installation to prevent effluent from seeping to the surface. Quickly establishing plant cover and the use of mulch, temporary diversions, straw bale sediment barriers, and siltation basins help to control erosion during construction.

Areas of this complex require onsite investigation and evaluation for most uses. Capability subclass and wood land group not assigned.

CdA - Canton and Charlton fine sandy loams, 0 to 3 percent slopes.

These nearly level, well drained soils are on crests of glacial upland hills and ridges. Areas are irregular in shape and mostly range from 5 to 50 acres. The mapped acreage of this unit is approximately 60 percent Canton soils, 30 percent Charlton soils, and 10 percent other soils. The areas of this unit consist of Canton soils or Charlton soils or both. These soils were mapped together because they have no major differences in use and management.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 6 inches thick. The subsoil is dark yellowish brown, yellowish-brown, and light olive brown fine sandy loam l inches thick. The substratum is

olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 6 inches thick. The subsoil is 21 inches thick. The upper ?? inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 3 percent and small areas with stones on the surface.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is slow.

This soil is extremely acid through strongly acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate and runoff is slow. This soil is very strongly acid through medium acid.

Most areas of these soils are cleared and used for farming. A small acreage is cleared and used for pasture.

Those soils are suitable for community development. Quickly establishing plant cover and the use of siltation basins help to control erosion during construction.

These soils are suited to cultivated crops. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

The soils are suitable for trees, woodland wildlife habitat, and openland wildlife habitat.

They are too dry to provide wetland wildlife habitat. Capability class I; Canton part in woodland group 5o, Charlton part in woodland group 4o.

CdB - Canton and Charlton fine sandy loams, 3 to 8 percent slopes.

These gently sloping, well drained soils are on the crests and side slopes of glacial upland hills and ridges. Areas are irregular in shape and mostly range from 5 to 50 acres. The mapped acreage of this unit is approximately 60 percent Canton soils, 30 percent Charlton soils, and 10 percent other soils. The areas of this unit consist of either Canton soils or Charlton soils or both. The soils were

mapped together because they have no major differences in use and management.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick.

The subsoil is dark yellowish brown, yellowish-brown, and light olive brown fine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 8 percent.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is medium.

This soil is very strongly acid through strongly acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is medium. This soil is extremely acid through medium acid.

Most areas of these soils are cleared and used for farming. A small acreage is cleared and used for pasture.

These soils are suitable for community development. The use of siltation basins, straw bale sediment barriers, and mulch and quickly establishing plant cover help to control erosion during construction.

These soils are suited to cultivated crops. The hazard of erosion is moderate. Strip-cropping, the use of cover crops, and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

These soils are suitable for trees, woodland wildlife habitat, and openland wildlife habitat. The soils are too dry to provide wetland wildlife habitat. Capability sub class IIe; Canton part in woodland group 5o, Charlton part in woodland group 4o.

CdC - Canton and Charlton fine sandy loams, 8 to 15 percent slopes.

These sloping, well drained soils are on the crests and side slopes of glacial upland hills and ridges. Areas are long and narrow and mostly range from 5 to 50 acres. The mapped acreage of this unit is approximately 60 percent Canton soils, 30 percent Charlton soils, and 10 percent other soils. The areas of this unit consist of either Canton soils or Charlton soils or both. The soils were mapped together because they have no major differences in use and management.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish-brown, and light olive brown fine sandy loam 19 inches thick.

The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils and well drained Paxton and Narragansett soils. Also included are small areas of soils that have slopes of more than 15 percent and small areas with stones on the surface.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is medium.

The soil is extremely acid through strongly acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is medium. This soil is very strongly acid through medium acid.

These soils are suitable for community development, but they are limited by slope. Onsite sewage disposal systems need careful design and installation to prevent effluent from seeping to the surface. Quickly establishing plant cover and the use of mulch, temporary diversions, straw bale sediment barriers, and siltation basins help to control erosion during construction.

Most areas of these soils are used for farming, a use to which the soils are suited. The main limitation is slope. The hazard of erosion is severe. The use of cover crops, grassed waterways, strip-cropping, and diversions and the return of

crop residue to the soil help to control erosion and maintain tilth and organic matter content.

These soils are suited to trees, woodland wildlife habitat, and openland wildlife habitat.

They are too dry to provide wetland wildlife habitat. Capability subclass IIIe; Canton part in woodland group 5o, Charlton part in woodland group 4o.

CeC - Canton and Charlton fine sandy loams, very rocky, 3 to 15 percent slopes.

These gently sloping to sloping, well drained soils are on side slopes and crests of glacial upland hills and ridges. Stones and boulders cover 2 to 10 percent of the surface, and rock outcrops cover up to 10 percent. Areas are irregular in shape and mostly range from 3 to 250 acres. The mapped acreage of this unit is approximately 50 percent Canton soils, 30 percent Charlton soils, and 20 percent other soils. The areas of this unit consist of either Canton soils or Charlton soils or both. The soils were mapped together be cause they have no major differences in use and management.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish-brown, and light olive brown fine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 15 percent, small areas of soils where more than 10 percent of the surface is stony, and areas where bedrock is less than 40 inches from the surface.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is medium.

This soil is extremely acid through strongly acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is medium. This soil is very strongly acid through medium acid.

Most areas of these soils are in woodland, and the soil is suited to trees. A small acreage is cleared and used for pasture.

These soils are suitable for community development but are limited by stoniness, bedrock outcrops, and slope. Onsite sewage disposal systems need careful design and installation to prevent effluent from seeping to the surface. Stones and boulders need to be removed for landscaping. The use of straw bale sediment barriers, siltation basins, and temporary diversions and quickly establishing plant cover help to control erosion during construction.

Stones and rock outcrops make these soils unsuitable for cultivated crops and severely hinder the use of farming equipment.

These soils are suitable for woodland wildlife habitat. Stoniness and rock outcrops limit suitability for openland wildlife habitat, and the soils are too dry to provide wet land wildlife habitat. Capability subclass VIs; Canton part in woodland group 5o, Charlton part in woodland group 4o

ChB - Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes.

These gently sloping, well drained soils are on side slopes and crests of glacial upland hills and ridges. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and mostly range from 10 to 150 acres. The mapped acreage of this unit is approximately 60 percent Canton soils, 30 percent Charlton soils, and 10 percent other soils. The areas of this unit consist of either Canton soils or Charlton soils or both. The soils were mapped together because they have no major differences in use and management.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish-brown, and light olive brown fine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The substratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 3 percent and small areas with stones on the surface.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil is extremely acid through strongly acid.
The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate and runoff is slow. This soil is very strongly acid through medium acid.

Most areas of these soils are cleared and used for farming. A small acreage is cleared and used for pasture.

Those soils are suitable for community development. Quickly establishing plant cover and the use of siltation basins help to control erosion during construction.

These soils are suited to cultivated crops. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.
The soils are suitable for trees, woodland wildlife habitat, and openland wildlife habitat. They are too dry to provide wetland wildlife habitat. Capability class I; Canton part in woodland group 5o, Charlton part in woodland group 4o.

ChC—Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes.

These sloping, well drained soils are on side slopes of glacial upland hills and ridges. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and mostly range from 15 to 250 acres. The mapped acreage of the unit is approximately 60 percent Canton soils, 30 percent Charlton soils, and 10 percent other soils. The areas of this unit consist of Canton soils or Charlton soils or both. The soils were mapped together because they have no major differences in use and management.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The substratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 15 percent and small areas of soils where more than 10 percent of the surface is covered by stones and boulders.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is medium. This soil is extremely acid through strongly acid.
The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is medium. This soil is very strongly acid through medium acid.

Most areas of these soils are in woodland, and the soils are suited to trees. A small acreage is cleared and used for pasture.

These soils are suitable for community development. Surface stoniness and slope are main limitations, and onsite sewage disposal systems need careful design and installation to prevent effluent from seeping to the surface. Stones and boulders need to be removed for landscaping. Quickly establishing plant cover and the use of mulch, temporary diversions, straw bale sediment barriers, and siltation basins help to control erosion during construction.

The stones and boulders on the surface make these soils unsuitable for cultivated crops and severely hinder the use of farming equipment. The hazard of erosion is severe.
These soils are suited to woodland wildlife habitat. Stoniness limits suitability for openland wildlife habitat. The soils are too dry to provide wetland wildlife habitat. Capability subclass VIs; Canton part in woodland group 5o, Charlton part in woodland group 4o.

ChD—Canton and Charlton very stony fine sandy loams, 15 to 25 percent slopes.

These moderately steep, well drained soils are on side slopes of glacial upland hills and ridges. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and mostly range from 15 to 100 acres. The mapped acreage of this unit is approximately 60 percent Canton soils, 30 percent Charlton soils, and 10 percent other soils. The areas of this unit consist of Canton soils or Charlton soils or both. The soils were mapped together because they have no major differences in use and management.
Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 19 inches thick. The substratum is

olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 1 5 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 25 percent and small areas of soils where more than 10 percent of the surface is covered by stones and boulders.

The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is rapid.

The soil is extremely acid through strongly acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is rapid. The soil is very strongly acid through medium acid.

The steep slopes make these soils poorly suited to community development. Onsite septic systems need special design and installation to prevent effluent from seeping to the surface. Stones and boulders need to be removed for landscaping. Quickly establishing plant cover and the use of temporary diversions and siltation basins help to control erosion during construction.

These soils are suited to trees, and most areas are wooded. The steep slopes hinder the use of some equipment.

These soils are not suitable for farming. The stones and boulders on the surface and the steep slopes hinder the use of equipment. The hazard of erosion is severe.

These soils are suited to woodland wildlife habitat. Stoniness and steep slopes limit suitability for openland wildlife habitat. The soils are too dry to provide wetland wildlife habitat. Capability subclass VIs; Canton part in woodland group 5r, Charlton part in woodland group 4r.

CkC—Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes.

These gently sloping to sloping, well drained soils are on side slopes of glacial upland hills and ridges. Stones and boulders cover 10 to 35 percent of the surface. Areas are irregular in shape and mostly range from 10 to 150 acres. The mapped acreage of this unit is approximately 60 percent Canton soils, 30 percent Charlton soils, and 10 percent other soils. The areas of this unit consist of Canton soils or Charlton soils or both. These soils were mapped together because they have no major differences in use and management

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish brown and light olive brown fine sandy loam 19 inches thick. The substratum is light olive gray gravelly loamy sand to a depth of 60 inches or more.

Typically the Charlton soils have a surface layer of very dark brown fine sandy loam about 2 inches thick. The subsoil is 25 inches thick. The upper 15 inches is dark yellowish brown fine sandy loam, and the lower 10 inches is yellowish brown gravelly sandy loam. The sub stratum is light brownish gray gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Paxton and Narragansett soils, and moderately well drained Sutton soils. Also included are small areas of soils that have slopes of more than 15 percent and small areas where stones and boulders cover less than 10 percent of the surface.

The permeability of Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is medium. This soil is extremely acid through strongly acid.

The permeability of the Charlton soils is moderate to moderately rapid. Available water capacity is moderate, and runoff is medium. This soil is very strongly acid through medium acid.

These soils are suitable for community development, but stones and boulders hinder the use of excavating equipment and need to be removed for landscaping. Onsite sewage disposal systems need careful design and installation to prevent effluent from seeping to the surface. Quickly establishing plant cover and the use of mulch, temporary diversions, straw bale sediment barriers, and siltation basins help to control erosion during construction.

These soils are suited to trees, and most of the areas are wooded. Stones and boulders hinder the use of most types of harvesting equipment.

The stones and boulders on the surface make these soils unsuitable for farming and the use of equipment impractical. The hazard of erosion is moderate to severe.

These soils are suited to woodland wildlife habitat. Stoniness limits suitability for Capability subclass VIIs; Canton part in woodland group 5x, Charlton part in woodland group 4x.

Co—Carlisle muck.

This nearly level, very poorly drained soil is in depressions of outwash plains and glacial upland till plains. Areas are irregular in shape and mostly range from 5 to 100 acres. Slopes are less than 2 percent.

Typically this soil has a surface layer of black and dark reddish brown muck 55 inches thick. The substratum is gray loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of poorly drained Walpole and Leicester soils and very poorly drained Adrian, Scarboro, and Whitman soils. Included areas make up about 10 percent of this unit.

The permeability of this soil is moderately slow through moderately rapid. Available water capacity is high, and runoff is very slow. The soil has a seasonal high water table at or near the surface during most of the year. The soil is subject to ponding, and a few areas adjacent to streams are frequently flooded. This soil is medium acid through neutral.

This soil is poorly suited for community development. The high water table and the low strength of the surface layer are the main limitations. The use of onsite septic systems is not feasible in this soil. When the soil is drained, the surface layer shrinks and subsides.

This soil is poorly suited to trees, but it is better suited to woodland than to most other uses, and most of the areas are wooded or in grassy bogs. The high water table restricts the root depth of trees, and they are subject to being blown over by strong winds. Seedlings are difficult to establish.

Wetness makes this soil poorly suited to cultivated crops. Suitable drainage outlets are not available in most places. If this soil is drained, care is needed to prevent excessive subsidence of the surface layer.

This soil is suitable for wetland wildlife habitat, but wetness makes the soil poorly suited to woodland wild life habitat or openland wildlife habitat. Capability sub class VIw; woodland group 4w.

Dc—Deerfield loamy fine sand.

This nearly level, moderately well drained soil is in low-lying areas of outwash plains and terraces. Areas are irregular in shape and mostly range from 5 to 50 acres. Slopes range from 0 to 3 percent.

Typically the surface layer is black loamy fine sand about 8 inches thick. The subsoil is 26 inches thick. The upper 10 inches is dark yellowish brown loamy sand. The next 6 inches is yellowish brown, mottled loamy sand. The lower 10 inches is light olive brown, mottled fine sand. The substratum is olive, mottled fine sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Sudbury soils and poorly drained Walpole soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low, and runoff is slow. The soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. This soil is very strongly acid through slightly acid.

Most areas of this soil are cleared and used for farming or openland wildlife habitat.

This soil is suitable for community development. The seasonal high water table is a main limitation, but lawn grasses, shallow-rooted trees, and shrubs require watering in summer. Onsite sewage disposal systems need special design and installation to prevent pollution of the ground water. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Slopes of excavated areas are commonly unstable.

This soil is suited to trees. Droughtiness in the summer is the main limitation for seedlings.

This soil is suited to cultivated crops. The soil dries out and warms up slowly in the spring, delaying early planting and machinery operation. Artificial drainage, irrigation in dry seasons, use of cover crops, and the return of crop residue to the soil are suitable management practices for farming.

This soil is suitable for woodland wildlife habitat and openland wildlife habitat. It is too dry in summer to provide wetland wildlife habitat. Capability subclass IIw; woodland group 4s.

Du—Dumps.

This unit consists of areas used for trash disposal. The areas are throughout the State, and most are on outwash terraces. Many of the dumps are adjacent to streams. Most range from 3 to 40 acres.

Dumps are commonly called landfills or sanitary landfills. They consist mostly of trash from residential and commercial areas. The trash is largely composed of paper, cans, plastic, and bottles and is covered daily with soil material. The older parts of some dumps were commonly burned but not covered with soil material. A few dumps include industrial waste, tree stumps, car bodies, concrete, and debris from demolished buildings.

Included with this unit in mapping are areas, generally less than 1 acre in size, of excessively drained Hinckley soils; somewhat excessively drained Merrimac soils; well drained Canton, Charlton and Narragansett soils; and Udorthents. Also included are a few small dumps that have bedrock outcrops and a few dumps along the larger streams that are subject to flooding.

Dumps require onsite investigation and evaluation for land use decisions. A few dumps have been used for industrial sites. One of the major factors affecting use is the liquid that percolates through the material in the dumps. Capability subclass and woodland group not as signed.

EfA—Enfleld slit loam, 0 to 3 percent slopes.

This nearly level, well drained soil is on terraces and outwash plains. Areas are irregular in shape and mostly range from 2 to 150 acres.

Typically the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is strong brown and light olive brown silt loam 18 inches thick. The substratum is brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam and Bridgehampton soils, and moderately well drained Tisbury soils. Also included are small areas of soils that have slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and very rapid in the substratum. Avail able water capacity is moderate, and runoff is slow. The soil is very strongly acid through medium acid.

This soil is suitable for community development. Onsite sewage disposal systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable.

This soil is suited to cultivated crops. Most areas are used for crops or sod. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

The soil is suitable for woodland wildlife habitat and openland wildlife habitat. it is too dry to provide wetland wildlife habitat. Capability class I; woodland group 3o.

EfB—Enfield gently sloping, outwash plains.

This nearly level, well drained soil is on terraces and outwash plains. Areas are irregular in shape and mostly range from range from 2 to 50 acres.

Typically the surface layer is loam about 7 inches thick. The subsoil is strong brown and light olive brown silt loam 18 inches thick. The substratum is brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam and Bridgehampton soils, and moderately well drained Tisbury soils. Also included are small areas of soils that have slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and very rapid in the substratum. Avail able water capacity is moderate, and runoff is medium. This soil is very strongly acid through medium acid.

This soil is suitable for community development. Onsite sewage disposal systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

Most areas of this soil are farmed, a use to which the soil is suited. The hazard of erosion is moderate. Con tour stripcropping, the use of diversions and cover crops, and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIe; woodland group 3o.

GBC—Gloucester-Bridgehampton complex, rolling.

These somewhat excessively drained and well drained soils are on side slopes and crests of glacial till upland hills and ridges on Block Island. Areas are irregular in shape and mostly range from 2 to 160 acres. Slopes range from 3 to 15 percent. This complex is approximately 50 percent Gloucester soils, 30 percent Bridgehampton soils, and 20 percent other soils. The soils are so intermingled that it was not practical to map them separately.

Typically the Gloucester soils have a surface layer of dark brown gravelly sandy loam about 5 inches thick. The subsoil is 17 inches thick. The upper 9 inches is brownish yellow gravelly sandy loam, and the lower 8 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly loamy sand to a depth of 60 inches or more.

Typically the Bridgehampton soils have a surface layer of very dark grayish brown silt loam about 8 inches thick. The subsoil is 33 inches thick. The upper 16 inches is yellowish brown and brown silt loam; the next 8 inches is grayish brown, mottled silt loam; the next 6 inches is strong brown silt loam; and the lower 3 inches is light olive brown, mottled very fine sandy loam. The substratum is grayish brown very gravelly sand to a depth of 60 inches or more.

Included with these soils in mapping are areas, up to 10 acres in size, of somewhat excessively drained Hinckley soils, well drained Narragansett soils, and moderately well drained Wapping soils. Also included are small areas of soils that have slopes of more than 15 percent and small areas that have stones on the surface.

The permeability of the Gloucester soils is rapid. Available water capacity is low, and runoff is medium. This soil is extremely acid through medium acid.

The permeability of the Bridgehampton soils is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is high, and runoff is medium. This soil is very strongly acid through medium acid.

These soils are suitable for trees, but the strong prevailing winds and salt spray on Block Island severely hinder tree growth. Most areas are in shrubs and brush or unimproved pasture.

The soils are suitable for community development. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs on the Gloucester soils in this complex require watering in summer. Roads and streets on the Bridgehampton soils need proper design to prevent frost heaving. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

The strong prevailing winds and salt spray on Block Island limit the soils for crop production. The hazard of erosion is moderate to severe. Use of cover crops, strip-cropping, and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

Some areas of these soils are suitable for openland wildlife habitat. The soils are poorly suited to woodland wildlife habitat because of the small acreage of wood land on Block Island. The soils are too dry to provide wetland wildlife habitat.

Capability subclass IIIe; Gloucester part in woodland group 4s, Bridgehampton part in woodland group 3o.

GBD—Gloucester-Bridgehampton complex, hilly.

These somewhat excessively drained and well drained soils are on side slopes of glacial till upland hills and ridges on Block Island. Areas are irregular in shape and mostly range from 2 to 165 acres. Slopes range from 15 to 35 percent. This complex is approximately 50 percent Gloucester soils, 30 percent Bridgehampton soils, and 20 percent other soils. The soils are so intermingled that it was not practical to map them separately.

Typically the Gloucester soils have a surface layer of dark brown gravelly sandy loam about 2 inches thick. The subsoil is 20 inches thick. The upper 12 inches is brownish yellow gravelly sandy loam, and the lower 8 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly loamy sand to a depth of 60 inches or more.

Typically the Bridgehampton soils have a surface layer of very dark grayish brown silt loam about 2 inches thick. The subsoil is 39 inches thick. The upper 22 inches is dark yellowish brown and brown silt loam; the next 8 inches is grayish brown, mottled silt loam; the next 6 inches is strong brown silt loam; and the lower 3 inches is light olive brown, mottled very fine sandy loam. The substratum is grayish brown very gravelly sand to a depth of 60 inches or more.

Included with these soils in mapping are areas, up to 10 acres in size, of excessively drained Hinckley soils, well drained Narragansett soils, and moderately well drained Wapping soils. Also included are small areas of soils that have slopes of less than 15 percent and small areas with stones on the surface.

The permeability of the Gloucester soils is rapid. Avail able water capacity is low, and runoff is medium. This soil is extremely acid through medium acid.

The permeability of the Bridgehampton soils is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is high, and runoff is medium. This soil is very strongly acid through medium acid.

These soils are suited to trees, but the strong prevailing winds and salt spray on Block Island severely hinder tree growth. Most areas are in shrubs and brush.

The steep slopes make these soils poorly suited to community development. Onsite sewage disposal systems need careful design and installation to prevent effluent from seeping to the surface. Lawn grasses, shallow-rooted trees, and shrubs on the Gloucester soils need watering in summer. Quickly establishing

plant cover and the use of straw bale sediment barriers help to control erosion during construction.

These soils are not suited to cultivated crops. The steep slopes are the main limitation. The hazard of erosion is severe.

These soils are poorly suited to openland wildlife habitat. The soils are poorly suited to woodland wildlife habitat; tree growth on Block Island is limited by the strong winds and salt spray. The soils are too dry to provide wetland wildlife habitat. Capability subclass IVe; Gloucester part in woodland group 4s, Bridgehampton part in woodland group 3r.

GhC—Gloucester-Hinckley very stony sandy loams, rolling.

These excessively drained and somewhat excessively drained soils are on hills and ridges. Areas are irregular in shape and mostly range from 10 to 500 acres. Stones and boulders cover 2 to 10 percent of the surface of the Gloucester soils and 0 to 3 percent of the surface of the Hinckley soils. Slopes range from 3 to 15 percent. This complex is approximately 50 percent Gloucester soils, 25 percent Hinckley soils, and 25 percent other soils. The soils in this complex are so intermingled that it was not practical to map them separately.

Typically the Gloucester soils have a surface layer of dark brown gravelly sandy loam about 2 inches thick. The subsoil is 20 inches thick. The upper 12 inches is brownish yellow gravelly sandy loam, and the lower 8 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly loamy sand to a depth of 60 inches of more.

Typically the Hinckley soils have a surface layer of dark brown gravelly sandy loam 2 inches thick. The sub soil is 15 inches thick. The upper 8 inches is yellowish brown gravelly sandy loam, and the lower 7 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly sand to a depth of 60 inches or more.

Included with these soils in mapping are small areas of excessively drained Windsor soils, somewhat excessively drained Merrimac soils, and moderately well drained Sudbury soils. Also included are small areas with no stones on the surface.

The permeability of the Gloucester soils is rapid. Available water capacity is low, and runoff is slow to medium. The soil is extremely acid through medium acid.

The permeability of the Hinckley soils is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low, and runoff is slow to medium. This soil is extremely acid through medium acid.

This complex is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

These soils are suited to trees, and most areas are wooded. Droughtiness in summer is the main limitation. Seedlings are difficult to establish.

The stony surface makes these soils unsuitable for cultivated crops. The hazard of erosion is moderate, and establishing a permanent plant cover helps to control erosion.

This complex is suitable for woodland wildlife habitat. Because of the stony surface, the soils are poorly suited to openland wildlife habitat. They are too dry to provide wetland wildlife habitat. Capability subclass VIs; Gloucester part in woodland group 4s, Hinckley part in woodland group 5s.

GhD—Gloucester-Hinckley very stony sandy loams, hilly.

These excessively drained and somewhat excessively drained soils are on hills and ridges. Areas are irregular in shape and mostly range from 10 to 300 acres. Stones cover 2 to 10 percent of the surface of the Gloucester soils and 0 to 3 percent of the surface of the Hinckley soils. Slopes range from 15 to 35 percent. This complex is approximately 50 percent Gloucester soils, 25 percent Hinckley soils, and 25 percent other soils. The soils are so intermingled that it was not practical to map them separately.

Typically the Gloucester soils have a surface layer of dark brown gravelly sandy loam about 2 inches thick. The subsoil is 20 inches thick. The upper 12 inches is brownish yellow gravelly sandy loam, and the lower 8 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly loamy sand to a depth of 60 inches or more.

Typically the Hinckley soils have a surface layer of dark brown gravelly sandy loam 2 inches thick. The sub soil is 15 inches thick. The upper 8 inches is yellowish brown gravelly sandy loam, and the lower 7 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly sand to a depth of 60 inches or more.

Included with these soils in mapping are small areas of excessively drained Windsor soils, somewhat excessively drained Merrimac soils, and moderately well drained Sudbury soils. Also included are small areas of soils that do not have stones on the surface.

The permeability of the Gloucester soils is rapid. Avail able water capacity is low, and runoff is medium. This soil is extremely acid through medium acid.

The permeability of the Hinckley soils is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low, and runoff is rapid. This soil is extremely acid through medium acid.

The steep slopes and stony surface make this complex poorly suited to community development. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surface or polluting the ground water. Slopes of excavated areas are commonly unstable. The use of straw bale sediment barriers and siltation basins and quickly establishing plant cover help to control erosion during construction.

These soils are suited to trees, and most areas are wooded. Steep slopes and droughtiness are the main limitations.

These soils are not suited to cultivated crops because of steep slopes and the stony surface. The hazard of erosion is severe.

This complex is suitable for woodland wildlife habitat. The soils are not suited to openland wildlife habitat; the stony surface and steep slopes are the main limitations. These soils are too dry to provide wetland wildlife habitat. Capability subclass VIIs; Gloucester part in woodland group 4s, Hinckley part in woodland group 5s.

HkA—Hinckley gravelly sandy loam, 0 to 3 percent slopes.

This nearly level, excessively drained soil is on terraces and outwash plains. Areas are irregular in shape and mostly range from 5 to 75 acres.

Typically the surface layer is dark brown gravelly sandy loam about 6 inches thick. The subsoil is 11 inches thick. The upper 4 inches is yellowish brown gravelly sandy loam, and the lower 7 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor and Quonset soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils and small areas of soils with stones on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low, and runoff is slow. This soil is extremely acid through medium acid.

This soil is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer.

This soil is suited to trees. The major limitation for woodland is droughtiness, which makes tree seedlings difficult to establish.

This soil is suited to cultivated crops, and most areas are farmed or idle. Droughtiness is the main limitation, and irrigation is needed. Cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suitable for woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIIs; woodland group 5s.

HkC—Hinckley gravelly sandy loam, rolling.

This excessively drained soil is on terraces, outwash plains, kames, and eskers. Areas are irregular in shape and mostly range from 2 to 20 acres. Slopes range from 3 to 15 percent.

Typically the surface layer is dark brown gravelly sandy loam about 6 inches thick. The subsoil is 11 inches thick. The upper 4 inches is yellowish brown gravelly sandy loam, and the lower 7 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor and Quonset soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils and small areas with a few stones on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low, and runoff is slow. The soil is extremely acid through medium acid.

This soil is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

Many areas of this soil are wooded. The soil is suited to trees but is limited by droughtiness. Tree seedlings are difficult to establish.

The soil is suited to cultivated crops, and some areas are used for pasture. The hazard of erosion is moderate. The use of cover crops, stripcropping, the return of crop residue to the soil, and irrigation are suitable management practices for farming.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IVs; woodland group 5s.

HkD—Hinckley gravelly sandy loam, hilly.

This excessively drained soil is on terraces, outwash plains, kames, eskers, and recessional moraines. Areas are irregular in shape and mostly range from 5 to 40 acres. Slopes range from 15 to 35 percent.

Typically the surface layer is dark brown gravelly sandy loam about 2 inches thick. The subsoil is 15 inches thick. The upper 8 inches is yellowish brown gravelly sandy loam, and the lower 7 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor and Quonset soils and small areas of soils that have slopes of less than 15 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low, and runoff is medium. The soil is extremely acid through medium acid.

Steep slopes make this soil poorly suited to community development. Onsite septic systems need special design and installation to prevent effluent from seeping to the surface or polluting the ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. Quickly establishing plant cover, providing temporary diversions, and using siltation basins help to control erosion during construction.

This soil is suited to trees, and most areas are wooded. The major limitations for woodland are steep slopes and droughtiness.

Because of the steep slopes, the soil is poorly suited to cultivated crops. The hazard of erosion is severe.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat, and it is too dry to provide wetland wildlife habitat. Capability subclass VIIs; woodland group 5s.

HnC – Hinckley - Enfield complex, rolling.

These rolling, excessively drained and well drained soils are on hills and ridges of recessional moraines, kames, and eskers. The Hinckley soils are mostly on the crests of the kames and eskers, and the Enfield soils are in con cave positions. Areas are irregular in shape and mostly range from 10 to 50 acres. Slopes range from 3 to 15 percent. The complex is approximately 60 percent Hinckley soils, 30 percent Enfield soils, and 10 percent other soils. The soils are so intermingled that it was not practical to map them separately.

Typically the Hinckley soils have a surface layer of dark bro gravelly sandy loam 6 inches thick. The subsoil is 11 inches thick. The upper 4 inches is yellowish-brown gravelly sandy loam, and the lower 7 inches is light yellowish brown gravelly loamy sand. The substratum is light brownish gray very gravelly sand to a depth of 60 inches or more.

Typically the Enfield soils have a surface layer of dark grayish brown silt loam 7 inches thick. The subsoil is strong brown and light olive brown silt loam 18 inches thick. The substratum is brown very gravelly sand to a depth of 60 inches or more.

Included with these soils in mapping are small areas of excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam and Bridgehampton soils, and moderately well drained Tisbury and Sudbury soils. Also included are small areas of soils that have slopes of more than 15 percent.

The permeability of the Hinckley soils is rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low, and runoff is slow to medium. The soils are extremely acid through medium acid.

The permeability of the Enfield soils is moderate in the surface layer and subsoil and very rapid in the substratum. Available water capacity is moderate, and runoff is slow to medium. The soils are very strongly acid through medium acid.

This complex is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs on the Hinckley soils need watering during the summer. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

These soils are suited to trees, and many areas are wooded. Droughtiness on the Hinckley soils is the main limitation and makes seedling establishment difficult.

These soils are suited to cultivated crops. Some areas are used for pasture. The hazard of erosion is moderate to severe. Irrigation is needed. The use of cover crops and stripcropping and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

The complex is suitable for woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IVs; Hinckley part in woodland group 5s, Enfield part in woodland group 3r.

Ip - Ipswich peat.

This nearly level, very poorly drained soil is in tidal marshes in bays and coves. It is subject to tidal inundation. Most areas are irregular in shape and range from 10 to 200 acres. Slopes are less than 1 percent.

Typically this soil has a surface layer of very dark grayish brown peat 11 inches thick. The subsurface layers are very dark grayish brown mucky peat to a depth of 70 inches or more.

Included with this soil in mapping are small areas of very poorly drained Matunuck soils and small areas of soils that have a surface layer 16 to 51 inches thick. Included areas make up about 5 percent of this map unit.

The permeability of this soil is moderate through rapid. Available water capacity is high, and runoff is very slow. The soil is strongly acid through neutral.

Tidal inundation, a high water table at the surface and a high salt content make this soil unsuitable for most uses except as wetland wildlife habitat for saltwater-tolerant species. Capability subclass VIIIw; woodland group not assigned.
Soil Map Unit Description from the RI Soil Survey Report

LgC - Lippitt gravelly sandy loam, very rocky, 3 to 15 percent slopes.

This gently sloping to sloping, somewhat excessively drained soil is on side slopes and crests of glacial till upland hills. Areas are irregular in shape and mostly range from 2 to 100 acres. Rock outcrops cover 5 to 10 percent of surface of the soil.

Typically the surface layer is dark brown gravelly sandy loam about 5 inches thick. The subsoil is brown gravelly sandy loam 11 inches thick. The substratum is dark yellowish brown very gravelly loam 10 inches thick. Highly weathered rippable bedrock is at a depth of 26 inches.

Included with this soil in mapping are small areas of somewhat excessively drained Gloucester soils; well drained Char Canton, and Narragansett soils; and moderately well drained Sutton soils. Also included are small stony areas. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is very low, and runoff is slow or medium. This soil is very strongly acid through medium acid.

The shallow depth to bedrock and the rock outcrops on the surface make this soil poorly suited to community development. Onsite septic systems need special design and installation to prevent pollution of ground water. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. Excavation is difficult in this soil, and blasting is required in places. Use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, and most areas are wooded. The major limitations are droughtiness and the shallow rooting depth.

Rock outcrops severely hinder the use of farming equipment and make the soils poorly suited to cultivated crops. The hazard of erosion is moderate to severe.

This soil is suited to openland wildlife habitat and woodland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass VIs; woodland group 5d.

Ma—Mansfield mucky silt loam.

This nearly level, very poorly drained soil is in depressions and small drainageways of drumlins in the southeastern part of the State. Areas are irregular in shape and mostly range from 2 to 20 acres. Slopes range from 0 to 3 percent but are dominantly less than 2 percent.

Typically the surface layer is black mucky silt loam about 8 inches thick. The subsoil is dark gray silt loam 7 inches thick. The substratum is dark gray and olive gray channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of poorly drained Stissing soils that make up about 5 per cent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff

is slow. This soil has a seasonal high water table at or near the surface from late fall through midsummer. The soil is extremely acid through medium acid.

The high water table makes this soil poorly suited to community development. The use of onsite septic systems is not feasible without extensive filling.

Wetness makes the soil unsuitable or poorly suited to cultivated crops, to trees, or to wildlife habitat except wetland wildlife habitat. Many areas have water ponded on the surface during wet seasons, and most do not have suitable drainage outlets. The soil is mainly used for pasture or wetland wildlife habitat. Capability subclass Vw; woodland group 5w.

Mc - Mansfield very stony mucky silt loam.

This nearly level, very poorly drained soil is in depressions and small drainageways of drumlins in the southeastern part of the State. Areas are irregular in shape and mostly range from 2 to 20 acres. Stones and boulders cover 2 to 10 percent of the surface area. Slopes range from 0 to 3 percent but are dominantly less than 2 percent.

Typically the surface layer is black mucky silt loam about 8 inches thick. The subsoil is dark gray silt loam 7 inches thick. The substratum is dark gray and olive gray channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of poorly drained Stissing soils and small areas of soils that do not have stones or boulders on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at or near the surface from late fall through midsummer. The soil is extremely acid through medium acid.

The high water table makes this soil poorly suited to community development. The use of onsite septic systems is not feasible without extensive filling.

Wetness and the stony surface make this soil unsuitable or poorly suited to cultivated crops, to trees, or to wildlife habitat except wetland wildlife habitat. Many areas have water ponded on the surface during wet seasons, and most do not have suitable drainage out lets. The soil is mainly used for woodland. Capability subclass VIIs; woodland group 5w.

Mk - Matunuck mucky peat.

This nearly level, very poorly drained soil is in tidal marshes and is subject to tidal inundation. Most areas are in salt marshes. Slopes are dominantly less than 1 percent.

Typically this soil has a surface layer of very dark gray mucky peat 12 inches thick. The underlying material is gray sand to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of very poorly drained Ipswich soils and small areas of soils with a surface layer 16 to 51 inches thick or less than 12 inches thick. Included areas make up about 5 percent of this map unit.

The permeability of this soil is rapid in the surface layer, rapid to very rapid between depths of about 12 and 18 inches, and very rapid at a depth of more than 18 inches. Available water capacity is low. Runoff is very slow, and water is ponded on some areas. The soil is strongly acid through neutral.

The daily tidal flooding and a high salt content make this soil unsuitable for most uses except as habitat for saltwater-tolerant wildlife. Capability subclass VIIIw; not assigned to a woodland group.

MmA - Merrimac sandy loam, 0 to 3 percent slopes.

This nearly level, somewhat excessively drained soil is on outwash plains and terraces. Areas are irregular in shape and mostly range from 2 to 400 acres.

Typically the surface layer is dark brown sandy loam about 8 inches thick. The subsoil is yellowish brown and dark yellowish brown sandy loam 17 inches thick. The substratum is light yellowish brown gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor and Hinckley soils, well drained Agawam soils, and moderately well drained Ninigret and Sudbury soils. Also included are small areas of soils with slopes of more than 3 percent and a few areas of darker colored soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid to rapid in the lower part of the subsoil, and rapid in the substratum. Available water capacity is moderate, and runoff is slow. The soil is extremely acid through medium acid.

This soil is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees,

and shrubs require watering in the summer. Quickly establishing plant cover helps to control erosion during construction.

This soil is suited to trees. Droughtiness causes seedling mortality in the summer.

This soil is suited to cultivated crops, and most areas are used for farming. Irrigation is needed. Cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

The soil is suitable for woodland wildlife habitat and openland wildlife habitat, but it is too dry to provide wetland wildlife habitat. Capability subclass Is; woodland group 4s.

MmB - Merrimac sandy loam, 3 to 8 percent slopes.

This gently sloping, somewhat excessively drained soil is on undulating terraces and outwash plains. Areas are irregular in shape and mostly range from 2 to 75 acres.

Typically the surface layer is dark brown sandy loam about 8 inches thick. The subsoil is yellowish brown and dark yellowish brown sandy loam 17 inches thick. The substratum is light yellowish brown gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor and Hinckley soils, well drained Agawam soils, and moderately well drained Ninigret and Sudbury soils. Also included are small areas of soils that have slopes of less than 3 percent and areas of darker colored soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid to rapid in the lower part of the subsoil, and rapid in the substratum. Available water capacity is moderate, and runoff is medium. The soil is extremely acid through medium acid.

This soil is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow- rooted trees, and shrubs require watering in the summer. The use of straw bale sediment barriers, quickly establishing plant cover, and providing temporary siltation basins help to control erosion during construction.

This soil is suited to trees, but droughtiness causes seedling mortality in the summer.

This soil is suited to cultivated crops. Irrigation is needed, and the hazard of erosion is moderate. Strip- cropping, cover crops, and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIs; woodland group 4s.

MU - Merrimac-Urban land complex.

This complex consists of well drained Merrimac soils and areas of Urban land. The complex is on terraces and outwash plains in densely populated areas of the State, mainly in the areas of Providence and Warwick. Areas are irregular in shape and mostly range from 10 to 400 acres. Slopes are mainly about 1 percent but range from 0 to 15 percent. The complex is about 40 percent Merrimac soils, 40 percent Urban land, and 20 percent other soils. The soils and urban land are so intermingled that it was not practical to map them separately.

Typically the Merrimac soils have a surface layer of dark brown sandy loam 8 inches thick. The subsoil is yellowish brown and dark yellowish brown sandy loam 17 inches thick. The substratum is light yellowish brown gravelly sand to a depth of 60 inches or more.

Urban land consists of areas covered by streets, parking lots, buildings, and other urban structures.

Included with this complex in mapping are areas, up to 10 acres in size, of Udorthents, excessively drained Hinckley and Windsor soils, well drained Agawam and Enfield soils, and moderately well drained Sudbury and Ninigret soils. Also included are areas of darker colored soils.

The permeability of the Merrimac soils is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid to rapid in the lower part of the subsoil, and rapid in the substratum. The available water capacity is moderate. Runoff is slow to medium on the Merrimac soils. The soil is extremely acid through medium acid.

This complex is mainly used for home sites, shopping centers, industrial parks, and other urban purposes. The home sites mostly range from 5,000 to 50,000 square feet.

Onsite septic systems in this complex need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in the summer. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

Areas of this complex require onsite investigation and evaluation for most uses. Capability subclass and wood land group not assigned.

NaA - Narragansett silt loam, 0 to 3 percent slopes.

This nearly level, well drained soil is on the crests of glacial till upland hills and till plains. Areas are irregular in shape and mostly range from 2 to 50 acres.

Typically the surface layer is dark brown silt loam about 7 inches thick. The subsoil is yellowish brown and light olive brown silt loam 26 inches thick. The substratum is yellowish brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton and Bridgehampton soils and moderately well drained Wapping and Woodbridge soils. Also included are small areas of soils with slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil is very strongly acid through medium acid.

This soil is suitable for community development. Roads and streets need careful design to prevent frost heaving. The use of temporary diversions and siltation basins and quickly establishing plant cover help to control erosion during construction.

This soil is suited to cultivated crops, and most areas are used for farming. The hazard of erosion is moderate. The use of cover crops and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suitable for woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability class I; woodland group 4o.

NaB - Narragansett slit loam, 3 to 8 percent slopes.

This gently sloping, well drained soil is on the crests and side slopes of glacial till uplands and till plains. Areas are irregular in shape and mostly range from 2 to 50 acres.

Typically the surface layer is dark brown silt loam about 7 inches thick. The subsoil is yellowish brown and light olive brown silt loam 26 inches thick. The substratum is yellowish brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Bridgehampton soils and moderately well drained Wapping and Woodbridge soils. Also included are small areas of soils that have slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is moderate, and runoff is medium. The soil is very strongly acid through medium acid.

This soil is suitable for community development. The use of straw bale sediment barriers and siltation basins and quickly establishing plant cover help to control erosion during construction.

This soil is suited to cultivated crops, and many areas are used for farming. The hazard of erosion is moderate. Stripcropping, the use of diversions and cover crops, and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIe; woodland group 4o.

NbB - Narragansett very stony slit loam, 0 to 8 percent slopes.

This nearly level to gently sloping, well drained soil is on crests and side slopes of glacial till uplands. Areas are irregular in shape and mostly range from 5 to 200 acres. Stones and boulders cover 2 to 10 percent of the surface of the soil.

Typically the surface layer is dark brown silt loam about 7 inches thick. The subsoil is yellowish brown and light olive brown silt loam 26 inches thick. The substratum is yellowish brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton and Bridgehampton soils and moderately well drained Wapping, Scio, and Wood- bridge soils. Also included are small areas of soils that have slopes of more than 8 percent and small areas of soils that do not have stones or boulders on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil is strongly acid through medium acid.

This soil is suitable for community development. Roads and streets need careful design to prevent frost heaving. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and severely hinder the use of farming equipment, but some areas are used for pasture. The hazard of erosion is slight to moderate.

This soil is suited to trees and woodland wildlife habitat. It is poorly suited to openland wildlife habitat and is too dry to provide wetland wildlife habitat. Capability sub class VIs; woodland group 4o.

NbC - Narragansett very stony silt loam, 8 to 15 percent slopes.

This sloping, well drained soil is on side slopes of glacial till uplands. Areas are irregular in shape and mostly range from 5 to 100 acres. Stones and boulders cover 2 to 15 percent of the surface.

Typically the surface layer is dark brown silt loam about 7 inches thick. The subsoil is yellowish brown and light olive brown silt loam 26 inches thick. The substratum is yellowish brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton and Bridgehampton soils and moderately well drained Wapping, Scio, and Wood- bridge soils. Also included are small areas of soils that have slopes of more than 15 percent and small areas of soils that do not have stones or boulders on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is moderate, and runoff is rapid. The soil is strongly acid through medium acid.

This soil is suitable for community development. The main limitation is slope. Roads and streets need careful design to prevent frost heaving. The use of straw bale sediment barriers and temporary diversions and quickly establishing plant cover help to control erosion during construction.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and hinder the use of farming equipment, but some areas are used for pasture. The hazard of erosion is severe.

This soil is suited to trees and woodland wildlife habitat. It is poorly suited to openland wildlife habitat and is too dry to provide wetland wildlife habitat. Capability sub class VIs; woodland group 4r.

NcC - Narragansett extremely stony silt loam, 3 to 15 percent slopes.

This gently sloping to sloping, well drained soil is on the side slopes of glacial till upland hills. Areas are long and narrow and mostly range from 2 to 200 acres. Stones and boulders cover 10 to 35 per cent of the surface (fig. 4).

Typically the surface layer is dark brown silt loam about 4 inches thick. The subsoil is yellowish brown and light olive brown silt loam 29 inches thick. The substratum is yellowish brown gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Bridgehampton soils and moderately well drained Wapping and Woodbridge soils. Also included are small areas where less than 10 percent of the surface is covered by stones and boulders. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. Available water capacity is moderate, and runoff is medium to rapid. The soil is strongly acid through medium acid.

This soil is suitable for community development. Stone removal is needed for site preparation and landscaping. Roads and streets need careful design to prevent frost heaving. The use of straw bale sediment barriers and temporary diversions and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, and most areas are wooded. Stones and boulders hinder the use of planting and harvesting equipment.

The stones and boulders on the surface make the soil unsuitable for cultivated crops and severely hinder the use of farming equipment. The erosion hazard is moderate to severe.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat and is too dry to provide wetland wildlife habitat. Capability subclass VIIs; woodland group 4x.

NeA - Newport silt loam, 0 to 3 percent slopes.

This nearly level, well drained soil is on the crests of drumlins and glacial till plains in the southeastern part of the State. Areas are long and narrow and mostly range from 5 to 50 acres.

Typically the surface layer is very dark brown silt loam 8 inches thick. The subsoil is olive brown and olive silt loam 16 inches thick. The substratum is olive gray channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Poquonock soils and moderately well drained Pittstown and Birchwood soils. Also included are small areas of soils that have slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is medium. The soil is very strongly acid through medium acid.

This soil is suitable for community development. It is limited mainly by the slow or very slow permeability of the substratum. Onsite sewage disposal systems need special design and installation. Roads and streets need careful design to prevent frost heaving. Quickly establishing plant cover helps to control erosion during construction.

This soil is suited to cultivated crops, and most areas are used for farming. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic mailer content.

This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability class I; woodland group 3o.

NeB - Newport silt loam, 3 to 8 percent slopes.

This gently sloping, well drained soil is on the side slopes of drumlins and glacial till plains in southeastern Rhode Island. Areas are irregular in shape and mostly range from 5 to 100 acres.

Typically the surface layer is very dark brown silt loam 8 inches thick. The subsoil is olive brown and olive silt loam 16 inches thick. The substratum is olive gray channery silt loam to a depth of 60 inches or more.

Included with the soil in mapping are small areas of well drained Poquonock soils and moderately well drained Pittstown and Birchwood soils. Also included are small areas of soils that have slopes of more than 8 percent. Included areas make up about 10 percent of the map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is

moderate, and runoff is medium. This soil is very strongly acid through medium acid.

This soil is suitable for community development but is limited by the slow or very slow permeability of the sub stratum. Onsite sewage disposal systems need special design and installation. Roads and streets need careful design to prevent frost heaving. The use of straw bale sediment barriers, temporary diversions, and siltation basins and quickly establishing plant cover help to control erosion during construction.

This soil is suited to cultivated crops. Most areas are used for farming. The hazard of erosion is moderate. The use of cover crops and diversions, stripcropping, and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIe; woodland group 3o.

NeC Newport silt loam, 8 to 15 percent slopes.

This sloping well drained soil is on side slopes of drumlins and glacial till uplands in southeastern Rhode Island. Areas are long and narrow and mostly range from 5 to 40 acres.

Typically the surface layer is very dark brown silt loam 8 inches thick. The subsoil is olive brown and olive silt loam 16 inches thick. The substratum is olive gray channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Poquonock soils and moderately well drained Pittstown and Birchwood soils. Also included are small areas of soils that have slopes of less than 8 percent. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and stow or very slow in the substratum. Available water capacity is moderate, and runoff is rapid. The soil is very strongly acid through medium acid.

This soil is suitable for community development but is limited by the slow or very slow permeability in the substratum and by the steep slopes. Onsite sewage disposal systems need special design and installation to prevent effluent from coming to the surface. Roads need careful design to prevent frost heaving. Quickly establishing plant cover and the use of mulch, diversions, and straw bale sediment barriers help to control erosion during construction.

This soil is suited to cultivated crops, and some areas are used for pasture. The hazard of erosion is severe. Stripcropping and using long crop rotations help to control erosion.

This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass l wood land group 3o.

NfB—Newport very stony silt loam, 3 to 8 percent slopes.

This gently sloping, well drained soil is on side slopes of drumlins and glacial till plains in southeastern Rhode Island. Stones cover 2 to 10 percent of the surface area. Areas are long and narrow and mostly range from 5 to 50 acres.

Typically the surface layer is very dark brown silt loam 8 inches thick. The subsoil is olive brown and olive silt loam 16 inches thick. The substratum is olive gray channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Poquonock soils and moderately well drained Pittstown and Birchwood soils. Also included are small areas of nearly level soils and small areas of soils that have slopes of more than 8 percent. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is medium to rapid. The soil is very strongly acid through medium acid.

Most areas of this soil are in woodland, and the soil is suited to trees. A small acreage is cleared and used for pasture.

This soil is suitable for community development but is limited by the slow or very slow permeability in the substratum. Onsite sewage disposal systems need special design and installation. Roads and streets need careful design to prevent frost heaving. Stones and boulders require removal for landscaping. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and severely hinder the use of farming equipment. The hazard of erosion is moderate, and maintaining a permanent plant cover helps to control this hazard.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat and is too dry to provide wetland wildlife habitat. Capability subclass VIs; woodland group 3o.

NoC—Newport extremely stony silt loam, 3 to 15 percent slopes.

This gently sloping and sloping, well drained soil is on drumlins and glacial till plains in south eastern Rhode Island. Stones cover 10 to 35 percent of the surface. Areas are long and narrow and mostly range from 5 to 50 acres.

Typically the surface layer is very dark brown silt loam 3 inches thick. The subsoil is olive brown and olive silt loam 21 inches thick. The substratum is olive gray channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Poquonock soils and moderately well drained Pittstown and Birchwood soils. Also included are small areas of nearly level soils and small areas of soils that have slopes of more than 15 percent. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is medium to rapid. The soil is very strongly acid through medium acid.

This soil is suitable for community development but is limited by the slow or very slow permeability of the substratum and the stones on the surface. Onsite sewage disposal systems need special design and installation. Roads and streets need careful design to prevent frost heaving, and stones and boulders require removal for landscaping. Quickly establishing plant cover and the use of straw bale sediment barriers help to control erosion during construction.

This soil is suited to trees, and most of the areas are wooded. The stones on the surface hinder the use of planting and harvesting equipment.

The stones on the surface make this soil unsuitable for cultivated crops and severely hinder the use of farming equipment. The hazard of erosion is moderate to severe, and maintaining permanent plant cover helps to control this hazard.

This soil is suitable for woodland wildlife habitat. It is poorly suited to openland wildlife habitat and is too dry to provide wetland wildlife habitat. Capability subclass VIIs; woodland group 3x.

NP—Newport-Urban land complex.

This complex consists of well drained Newport soils and areas of Urban land. The complex is on drumlins and glacial till plains of densely populated areas mainly in southeastern Rhode Island. Slopes are about 6 percent but range from 1 to 15 percent. Areas are irregular in shape and mostly range from 10 to 100 acres. The complex is about 40 percent Newport soils, 30 percent Urban land, and 30 percent other soils. The soils and Urban land are so intermingled that it

was not practical to map them separately.

Typically the Newport soils have a surface layer of very dark brown silt loam 8 inches thick. The subsoil is olive brown and olive silt loam 16 inches thick. The substratum is olive gray channery silt loam to a depth of 60 inches or more.

Urban land consists of areas that are covered by streets, parking lots, buildings, and other urban structures.

Included with the complex in mapping are areas, up to 10 acres in size, of well drained Poquonock soils, moderately well drained Pittstown and Birchwood soils, and Udorthents.

The permeability of the Newport soils is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium to rapid on the Newport soils. The soils are very strongly acid through medium acid.

Areas of this complex are used mainly for homesites, shopping centers, industrial parks, and other urban purposes. The homesites range mostly from 10,000 to 50,000 square feet.

The main limitation of the Newport soils for community development is the slow or very slow permeability in the substratum. Onsite sewage disposal systems need special design and installation. Roads and streets require careful design to prevent frost heaving. Quickly establishing plant cover and the use of mulch, temporary diversions, and straw bale sediment barriers help to control erosion during construction.

Areas of this complex require onsite investigation and evaluation for most uses. Capability subclass and wood land group not assigned.

Nt—Ninigret fine sandy loam.

This nearly level, moderately well drained soil is in slight depressions of terraces and outwash plains. Slopes range from 0 to 3 percent but are dominantly less than 2 percent. Areas are irregular in shape and mostly range from 2 to 20 acres.

Typically the surface layer is dark brown fine sandy loam about 10 inches thick. The subsoil is 20 inches thick. It is brownish yellow, yellowish brown, and pale brown fine sandy loam that is mottled in the lower part. The substratum extends to a depth of 60 inches or more. It is yellowish brown loamy sand to a depth of 42 inches and light yellowish brown gravelly loamy sand at a depth of more than 42 inches.

Included with this soil in mapping are small areas of somewhat excessively drained Merrimac soils; well drained Agawam soils; moderately well drained Sudbury, Deerfield, and Tisbury soils; and poorly drained Walpole and Raypol soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development but is limited by the seasonal high water table. Onsite septic systems need special design and installation to prevent pollution of ground water. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Slopes of excavated areas are commonly unstable.

This soil is suited to farming, and most areas are used for that purpose. The soil dries out and warms up slowly in the spring, limiting early planting and machinery operation. Use of artificial drainage and cover crops and the return of crop residue to the soil are suitable farming management practices.

This soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass Iw; wood land group 3o.

PaA—Paxton fine sandy loam, 0 to 3 percent slopes.

This nearly level, well drained soil is on crests of glacial till uplands and drumlins. Areas are irregular in shape and mostly range from 5 to 100 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brown and yellowish brown fine sandy loam 18 inches thick. The substratum is light brownish gray, yellowish brown and grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton and Char soils and moderately drained Woodbridge soils. Also included are small areas of soils with stones on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow. The soil is very strongly acid through slightly acid.

This soil is suitable for community development but is limited by the slow or very slow permeability of the substratum. Onsite sewage disposal systems need special design and installation. Quickly establishing plant cover helps to control erosion during construction.

This soil is suited to cultivated crops. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic mailer content.

The soil is suited to trees, woodland wildlife habitat, and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability class I; woodland group 3o.

PaB—Paxton fine sandy loam, 3 to 8 percent slopes.

This gently sloping, well drained soil is on side slopes of glacial till uplands and drumlins. Areas are irregular in shape and mostly range from 5 to 75 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brown and yellowish brown fine sandy loam 18 inches thick. The substratum is light brownish gray, yellowish brown, and grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton and Char soils and moderately well drained Woodbridge and Sutton soils. Also included are small areas of soils with stones on the surface. Included areas make up about 10 percent of this map unit.

The permeability of the soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. The soil is very strongly acid through slightly acid.

Most areas of this soil are used for farming. Some are in woodland, and the soil is suitable for trees.

This soil is suitable for community development but is limited by the slow or very slow permeability in the substratum. Onsite sewage disposal systems need special design and installation. The use of straw bale sediment barriers, temporary diversions, and siltation basins and quickly establishing plant cover help to control erosion during construction.

This soil is suited to cultivated crops. The hazard of erosion is moderate. Stripcropping, the use of diversions and cover crops, and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass VIe; woodland group 3o.

PbB—Paxton very stony fine sandy loam, 0 to 8 percent slopes.

This nearly level to gently sloping, well drained soil is on side slopes of glacial till uplands and drumlins. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and mostly range from 5 to 100 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brown and yellowish brown fine sandy loam 18 inches thick. The substratum is light brownish gray, yellowish brown and grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton and Char soils and moderately well drained Woodbridge and Sutton soils. Also included are areas of poorly drained Ridgebury and Leicester soils in small drainageways. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow to medium. The soil is very strongly acid through slightly acid.

This soil is suitable for community development but is limited by the slow or very slow permeability in the substratum. Onsite sewage disposal systems need special design and installation. Roads and streets require careful design to prevent frost heaving. Stones and boulders need to be removed for landscaping. Straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees. Most areas of the soil are wooded.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and hinder the use of farming equipment. The hazard of erosion is slight to moderate; maintaining a permanent vegetative cover helps to control erosion.

This soil is suited to woodland Wildlife habitat. It is poorly suited to openland wildlife habitat and is too dry to provide wetland wildlife habitat. Capability subclass VIs; woodland group 3o.

PbC—Paxton very stony fine sandy loam, 8 to 15 percent slopes.

This sloping, well drained soil is on side slopes of glacial till uplands and drumlins. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and mostly range from 5 to 80 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brown and yellowish brown fine sandy loam 18 inches thick. The substratum is light brownish gray, yellowish brown and grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton and Charlton soils and moderately well drained Woodbridge and Sutton soils. Also included are small areas of poorly drained Ridgebury and Leicester soils in drainageways. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is rapid. The soil is very strongly acid through slightly acid.

This soil is suitable for community development but is limited by the slow or very slow permeability in the substratum. Onsite sewage disposal systems need special design and installation to prevent effluent from coming to the surface. Roads and streets need careful design to prevent frost heaving, and the stones and boulders on the surface need to be removed for landscaping. The use of straw bale sediment barriers, siltation basins, and temporary diversions and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees. Most areas of the soil are wooded.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and hinder the use of farming equipment. The hazard of erosion is severe.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat and is too dry to provide wetland wildlife habitat. Capability subclass VIs; woodland group 3o.

PcC—Paxton extremely stony fine sandy loam, 3 to 15 percent slopes.

This gently sloping and sloping, well drained soil is on side slopes of glacial till uplands and drumlins. Stones and boulders cover 10 to 35 per cent of the surface. Areas are irregular in shape and mostly range from 5 to 200 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brown and yellowish brown fine sandy loam 18 inches thick. The substratum is light brownish gray, yellowish brown, and grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton and Char soils, moderately well drained Woodbridge and Sutton soils, and soils with slopes of more than 15 percent. Also included are small areas of poorly drained Ridgebury and Leicester soils in drainageways. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is medium to rapid. The soil is very strongly acid through slightly acid.

The soil is suited to trees, and most areas are in woodland.

This soil is suitable for community development but is limited by the slow or very slow permeability in the substratum and the stones and boulders on the surface. Onsite sewage disposal systems need special design and installation. Roads and streets need careful design to prevent frost heaving, and the stones and boulders need to be removed for site preparation and landscaping. The use of straw bale sediment barriers and siltation basins helps to control erosion during construction.

The stones and boulders on the surface make this soil unsuitable for farming and the use of farming equipment impractical.

This soil is suited to woodland wildlife habitat. It is unsuitable for openland wildlife habitat or wetland wildlife habitat. Capability subclass VIs; woodland group 3x.

PD—Paxton-Urban land complex.

This complex consists of well drained Paxton soils and areas of Urban land. The complex is on glacial till uplands and drumlins in densely populated areas. Slopes are mainly about 6 percent but range from 0 to 15 percent. Areas are irregular in shape and mostly range from 10 to 200 acres. The complex is about 40 percent Paxton soils, 30 percent Urban land, and 30 percent other soils. The soils and Urban land are so intermingled that it was impractical to map them separately.

Typically the surface layer of the Paxton soils is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brown and yellowish brown fine sandy loam 18 inches thick. The substratum is light brownish gray, yellowish brown, and grayish brown fine sandy loam to a depth of 60 inches or more.

Urban land consists of areas covered by streets, parking lots, buildings, and other urban structures.

Included with this complex in mapping are areas, up to 10 acres in size, of well drained Broadbrook soils, moderately well drained Woodbridge and Sutton soils, and Udorthents.

The permeability of the Paxton soils is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate. Runoff is medium to rapid on the Paxton soils. The soil is very strongly acid through slightly acid.

This complex is used mainly for homesites, shopping centers, industrial parks, streets, and other urban purposes. Homesites range mostly from 10,000 to 50,000 square feet.

The Paxton soils in the complex are limited for community development by the slow or very slow permeability in the substratum. Onsite sewage systems need special design and installation. Roads and streets require careful design and installation to prevent frost heaving, and footing drains help prevent wet basements. Quickly establishing plant cover, mulching, and the use of diversions, siltation basins, and straw bale sediment barriers help to control erosion during construction.

Areas of this complex require onsite investigation and evaluation for most uses. Capability subclass and wod land group not assigned.

Pg—Pits, gravel.

This unit consists of areas that have been excavated for sand or gravel. The areas are mostly on broad outwash plains and terraces of stream valleys and generally range from 3 to 30 acres. These areas have sparse vegetation consisting of drought-resistant plants. Slopes range mostly from 0 to 25 percent and steep escarpments are along the edges of the pits.

Included with this unit in mapping are small, intermingled areas of Udorthents, excessively drained Hinckley and Windsor soils, and somewhat excessively drained Lippitt and Merrimac soils. A few areas have bedrock outcrops and small bodies of water, and a few are used for parking lots and buildings. Included areas make up about 2 percent of this map unit.

This unit consists mostly of sand or sand and gravel. The permeability is rapid or very rapid. In places, the water table is at or near the surface most of the year. A few areas are adjacent to streams and are subject to flooding.

Areas of this unit require onsite investigation and evaluation for most uses. Capability subclass and woodland group not assigned.

Pk—Pits, quarries.

construction. The areas of the unit are mainly on bed rock-controlled glacial upland hills and range mostly from 3 to 50 acres. Slopes are mostly 0 to 4 percent, and escarpments are along the edges of the pits.

Included with this unit in mapping are small, intermingled areas of Udorthents, somewhat excessively drained Lippitt and Gloucester soils, and well drained Canton, Charlton, and Narragansett soils. Included areas make up about 2 percent of this map unit.

The areas of this unit are unsuitable for most uses. Capability subclass and woodland group not assigned.

PmA—Pittstown silt loam, 0 to 3 percent slopes.

This nearly level, moderately well drained soil is on the crests of glacial upland hills and drumlins. Areas are oval and range mostly from 3 to 20 acres.

Typically the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is 20 inches thick. It is dark yellowish brown and olive brown silt loam that is mottled in the lower part. The substratum is olive gray, mottled channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Newport soils and poorly drained Stissing soils. Also included are small areas of soils with stones on the surface. Included areas make up about 10 per cent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through mid spring. The soil is very strongly acid through medium acid.

This soil is suited to woodland, but most areas are cleared and used for farming or nursery stock.

This soil is suitable for community development but is limited by the high water table and the slow permeability of the substratum. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving. Quickly establishing plant cover helps to control erosion during construction.

This soil is suited for farming. It dries out and warms up slowly in the spring, limiting early planting and machinery operation. Drainage is needed. The use of

cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited for wetland wildlife habitat. Capability subclass I woodland group 3o.

PmB—Pittstown slit loam, 3 to 8 percent slopes.

This gently sloping, moderately well drained soil is on side slopes of glacial upland hills and drumlins. Areas are oval and range mostly from 5 to 100 acres.

Typically the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is 20 inches thick. It is dark yellowish brown and olive brown silt loam that is mottled in the lower part. The substratum is olive gray, mottled channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Newport soils and poorly drained Stissing soils. Also included are small areas of nearly level soils, that have slopes of more than 8 percent, and stony soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate, and runoff is medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

The soil is suitable for trees, but most areas are cleared and used for farming or openland wildlife habitat.

This soil is suitable for community development but is limited by the seasonal high water table and the slow permeability of the substratum. Onsite sewage disposal systems need special design and installation. Roads and streets need careful design to prevent frost heaving. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

The soil is suited to farming. It dries out and warms up slowly in the spring, limiting early planting and machinery operation. The use of cover crops, diversions, stripcropping, and artificial drainage and the return of crop residue to the soil are suitable farming management practices.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited for wetland wildlife habitat because it is too dry during the summer. Capability subclass IIw; woodland group 3o.

PnB—Pittstown very stony silt loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is on side slopes and crests of glacial upland hills and drumlins. Stones and boulders cover 2 to 10 percent of the surface. Areas are oval and range mostly from 5 to 80 acres.

Typically the surface layer is very dark grayish brown silt loam about 5 inches thick. The subsoil is 20 inches thick. It is dark yellowish brown and olive brown silt loam that is mottled in the lower part. The substratum is olive gray, mottled channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Newport soils and poorly drained Stissing soils. Also included are small areas of soils that have slopes of more than 8 percent and small areas of soils that do not have stones or boulders on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

Most areas of the soil are in woodland or are cleared and used for pasture.

This soil is suitable for community development but is limited by the seasonal high water table and the slow permeability of the substratum. Onsite sewage disposal systems need special design and installation. Roads and streets need careful design to prevent frost heaving. Subsurface drains help prevent wet basements, and the stones and boulders on the surface need to be removed for landscaping. The use of straw bale sediment barriers, quickly establishing plant cover, and the use of temporary diversions and siltation basins help to prevent erosion during construction.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and severely hinder the use of farming equipment. The hazard of erosion is slight to moderate.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat or wetland wild life habitat. Capability subclass VIs; woodland group 3o.

Pp—Podunk fine sandy loam.

This nearly level, moderately well drained soil is on flood plains. Slopes range from 0 to 3 percent but are dominantly less than 2 percent. Areas are long and narrow and range mostly from 5 to 40 acres.

Typically the surface layer is black fine sandy loam about 1 inch thick. The subsoil is 37 inches thick. It is dark yellowish brown and yellowish brown fine sandy loam that is mottled in the lower part. The substratum is yellowish brown gravelly loamy coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained soils and poorly drained Rumney soils. Also included are small areas of soils with a surface layer and subsoil of silt loam. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer, moderately rapid in the sub soil, and moderately rapid to rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring and is subject to flooding. The soil is very strongly acid through slightly acid.

The soil is suited to trees, and most areas are wooded or used for pasture and hay.

The hazard of flooding when the water table is high makes this soil poorly suited to community development. Roads and streets need careful design to prevent frost heaving and flooding. Slopes of excavated areas are commonly unstable.

This soil is suited to farming. It dries out and warms up slowly in the spring, limiting early planting and machinery operation. The use of artificial drainage and cover crops and the return of crop residue to the soil are suitable farming management practices.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it lacks adequate moisture in the summer. Capability subclass I woodland group 3o.

PsA—Poquonock loamy fine sand, 0 to 3 percent slopes.

This nearly level, well drained to somewhat excessively drained soil is on crests of drumlins and hills. Areas are irregular in shape and range mostly from 3 to 40 acres.

Typically the surface layer is dark brown loamy fine sand about 8 inches thick. The subsoil is 20 inches thick. The upper 10 inches is dark yellowish brown loamy fine sand, and the lower 10 inches is light olive brown loamy sand. The substratum is dark gray and gray gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor soils; well drained Broadbrook, Newport, and Paxton soils; and moderately well drained Birchwood soils. Also included are small areas of soils that have slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid in the surface layer and subsoil and slow to very slow in the substratum. Available water capacity is low, and runoff is slow. The soil is very strongly acid through medium acid.

This soil is suitable for community development but is limited by the slow or very slow permeability in the substratum. Onsite sewage disposal systems need special design and installation. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer.

This soil is suited to trees, but most areas are cleared and used for farming. The main limitation for woodland is droughtiness. Seedling mortality is high during dry summers.

This soil is suited to farming. Irrigation is needed in dry seasons. Cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIs; woodland group 4s.

PsB—Poquonock loamy fine sand, 3 to 8 percent slopes.

This gently sloping, well drained to somewhat excessively drained soil is on side slopes of drumlins and glacial till uplands. Areas are irregular in shape and range mostly from 5 to 100 acres.

Typically the surface layer is dark brown loamy fine sand about 8 inches thick. The subsoil is 20 inches thick. The upper 10 inches is dark yellowish brown loamy fine sand, and the lower 10 inches is light olive brown loamy sand. The substratum is dark gray and gray gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor soils; well drained Broadbrook, Newport, and Paxton soils; and moderately well drained Birchwood soils. Also included are small areas of nearly level soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid in the surface layer and subsoil and slow to very slow in the substratum. Available water capacity is slow, and runoff is medium. The soil is very strongly acid through medium acid.

This soil is suitable for community development. The main limitation for this use is the slow or very slow permeability in the substratum. Onsite sewage disposal systems need special design and installation. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, but most areas are cleared and used for farming or openland wildlife habitat. Droughtiness is the main limitation for woodland. Seed ling mortality is high during dry summers.

This soil is suited to farming, but irrigation is needed. The hazard of erosion is moderate. The use of cover crops, diversions, and stripcropping and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIs; woodland group 4s.

QoA—Quonset gravelly sandy loam, 0 to 3 percent slopes.

This nearly level, excessively drained soil is on terraces and outwash plains. Areas are irregular in shape and range mostly from 5 to 75 acres.

Typically the surface layer is very dark gray gravelly sandy loam about 3 inches thick. The subsoil is dark yellowish brown and light olive brown gravelly loamy sand. The substratum is dark gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor and Hinckley soils, some what excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Included areas make up about 10 percent of this map unit

The permeability of this soil is moderately rapid or rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low, and runoff is slow. The soil is extremely acid through strongly acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum.

This soil is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of

excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer.

This soil is suited to trees, but most areas are cleared and used for farming. The main limitation for woodland is droughtiness; seedling mortality is high during dry summers.

This soil is suited to cultivated crops. Irrigation is needed. Cover crops and the return of crop residue to the soil help to maintain tilth and organic mailer content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IIIs; woodland group 5s.

QoC—Quonset gravelly sandy loam, rolling.

This excessively drained soil is on terraces, outwash plains, kames, and eskers. Slopes range from 3 to 15 percent. Areas are irregular in shape and range mostly from 2 to 20 acres.

Typically the surface layer is very dark gray gravelly sandy loam about 3 inches thick. The subsoil is dark yellowish brown and light olive brown gravelly loamy sand 13 inches thick. The substratum is dark gray very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor and Hinckley soils, some what excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid or rapid in the surface layer and subsoil and very rapid in the substratum. Available water capacity is low and runoff is slow. The soil is extremely acid through strongly acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum.

Most areas of the soil are in woodland or are cleared and used for pasture.

This soil is suitable for community development. Onsite septic systems need careful design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to farming. The hazard of erosion is moderate, and irrigation is needed. The use of cover crops, diversions, and stripcropping and the return of

crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is too dry to provide wetland wildlife habitat. Capability subclass IVs; woodland group 5s.

RaA—Rainbow silt loam, 0 to 3 percent slopes.

This nearly level, moderately well drained soil is on crests and side slopes of drumlins and glacial till plains.

Areas are long and narrow and range mostly from 10 to 50 acres.

Typically the surface layer is very dark grayish brown silt loam about 5 inches thick. The subsoil is 18 inches thick. It is yellowish brown and light olive brown silt loam that is mottled in the lower part. The substratum is olive gray fine sandy loam to a depth of 60 inches or more. It is mottled between depths of 23 and 38 inches.

Included with this soil in mapping are small areas of well drained Broadbrook and Paxton soils and moderately well drained Wapping and Woodbridge soils. Also included are small areas of soils with slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

This soil is suited to trees, but most areas are cleared and used for farming.

This soil is suitable for community development. The main limitations for this purpose are the slow permeability in the substratum and the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving. Quickly establishing plant cover helps to control erosion during construction.

This soil is suited to farming. The soil dries out and warms up slowly in the spring, limiting early planting and machinery operation. Artificial drainage is needed. Cover crops and the return of crop residue to the soil help to maintain tilth and organic mailer content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it is too dry during the summer. Capability subclass IIw.; woodland group 3o.

RaB—Rainbow silt loam, 3 to 8 percent slopes.

This gently sloping, moderately well drained soil is on side slopes of glacial upland hills and drumlins. Areas are long and narrow and range mostly from 15 to 40 acres.

Typically the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is 18 inches thick. It is yellowish brown and light olive brown silt loam that is mottled in the lower part. The substratum extends to a depth of 60 inches or more. It is olive gray fine sandy loam that is mottled in the upper part.

Included with this soil in mapping are small areas of well drained Broadbrook and Paxton soils and moderately well drained Wapping and Woodbridge soils. Also included are small areas of nearly level souls and soils with slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow to very slow in the substratum. Available water capacity is moderate, and runoff is medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

This soil is suitable for community development. The main limitations for this use are the slow to very slow permeability in the substratum and the seasonal high water table. Onsite sewage disposal systems need special design and installation. Subsurface drains can be used to help prevent wet basements, and roads and streets need careful design to prevent frost heaving. The use of straw bale sediment barriers, siltation basins, and temporary diversions and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, but most areas are cleared and used for farming.

This soil is suited to farming. It dries out and warms up slowly in the spring, limiting early planting and machinery operation, and drainage is needed. The use of cover crops, diversions, and stripcropping and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited for wetland wildlife habitat because it is too dry in the summer. Capability subclass IIw; woodland group 3o.

RbB—Rainbow very stony silt loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is on the crests and side slopes of glacial upland hills and drumlins. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and range mostly from 5 to 50 acres.

Typically the surface layer is dark grayish brown silt loam about 3 inches thick. The subsoil is 20 inches thick. It is yellowish brown and olive brown silt loam that is mottled in the lower part. The substratum extends to a depth of 60 inches or more. It is olive gray fine sandy loam that is mottled in the upper part.

Included with this soil in mapping are small areas of well drained Broadbrook and Paxton soils and moderately well drained Wapping and Woodbridge soils. Also included are small areas of soils that have slopes of more than 8 percent and soils that do not have stones or boulders on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall midspring. The soil is very strongly acid through acid in the surface layer and subsoil and very acid through slightly acid in the substratum.

The soil is suited to trees, and most areas are in woodland. A small acreage is cleared and used for pasture.

This soil is suitable for community development. The main limitations for this use are the slow to very slow permeability in the substratum and the seasonal high water table. Onsite sewage disposal systems need special design and installation. Subsurface drains can be used to help prevent wet basements, and roads and streets need careful design to prevent frost heaving. The stones and boulders on the surface need to be removed for landscaping. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and severely hinder the use of farming equipment. The hazard of erosion is slight to moderate.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat because of the stones on the surface and is poorly suited to wetland wildlife habitat because it is too dry in the summer. Capability subclass VIs; woodland group 3o.

Rc—Raypol silt loam.

This nearly level, poorly drained soil is in depressions or low areas of terraces and outwash plains. Slopes range from 0 to 3 percent but are dominantly less than 2 percent. Areas are irregular in shape and range mostly from 2 to 50 acres.

Typically the surface layer is very dark grayish brown silt loam about 4 inches thick. The subsoil is light olive brown, mottled silt loam 18 inches thick. The substratum is grayish brown and yellowish brown, mottled gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Scio soils, poorly drained Walpole soils, and very poorly drained Scarboro soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil has a seasonal high water table at or near the surface from late fall through midspring. The soil is very strongly acid or strongly acid above a depth of 40 inches and strongly acid through slightly acid below a depth of 40 inches.

The seasonal high water table makes this soil poorly suited to community development. Onsite septic systems require special design and installation to prevent pollution of the ground water, and areas require extensive filling.

Most areas of the soil are wooded, but the soil is poorly suited to trees. The main limitation is wetness.

Tree windthrow is common, and the use of equipment is limited during wet seasons.

This soil is suitable for farming, but the soil dries out and warms up slowly and artificial drainage is needed. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to most types of wildlife habitat. Capability subclass IIIw woodland group 4w.

Re—Ridgebury fine sandy loam.

This nearly level, poorly drained soil is in depressions and drainageways of glacial upland hills and drumlins. Slopes range from 0 to 3 percent but are dominantly less than 2 percent. Areas are long and narrow and range mostly from 5 to 75 acres.

Also included are small areas of soils that have stones on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil has a seasonal high water table at or near the surface from late fall through spring. The soil is very strongly acid through medium acid.

Most areas of this soil are wooded or are cleared and used for crops and pasture.

The slow or very slow permeability in the substratum and the seasonal high water table make this soil poorly suited to community development. Onsite septic systems require special design and installation, and areas need extensive filling. Subsurface drains are needed to help prevent wet basements. Quickly establishing plant cover and the use of siltation basins and temporary diversions help to control erosion during construction.

This soil is suited to trees. The main limitation for woodland is wetness; tree windthrow is common, and the use of equipment is limited during wet seasons.

This soil is suitable for farming, but artificial drainage is needed. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content. The soil is suited to most types of wildlife habitat. Capability subclass IIIw; woodland group 4w.

Rf—Ridgebury, Whitman, and Leicester extremely stony fine sandy loams.

These nearly level, poorly drained and very poorly drained soils are along drainageways and in depressions in glacial till uplands.

Stones and boulders cover 10 to 35 percent of the surface of the unit. Slopes range from 0 to 3 percent but are dominantly less than 2 percent. Areas are long and narrow and range mostly from 10 to 150 acres. The mapped acreage of this unit is about 30 percent Ridgebury soils, 30 percent Whitman soils, 20 percent Leicester soils, and 20 percent other soils. The areas of this unit consist of Ridgebury soils, Whitman soils, or Leicester soils or of all three soils. The soils were mapped together because they have no major differences in use and management.

Typically the surface layer of the Ridgebury soils is black fine sandy loam about 4 inches thick. The subsoil is 16 inches thick. It is grayish brown fine sandy loam that is mottled in the lower pan. The substratum is yellowish brown, mottled gravelly fine sandy loam to a depth of 60 inches or more.

Typically the surface layer of the Whitman soils is black fine sandy loam about 10 inches thick. The substratum extends to a depth of 60 inches or more. It is gray gravelly fine sandy loam that is mottled at a depth of more than 18 inches.

Typically the surface layer of the Leicester soils is very dark grayish brown fine sandy loam about 8 inches thick. The subsoil is light brownish gray and light yellowish brown, mottled fine sandy loam 18 inches thick. The substratum is gray, mottled gravelly sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of moderately welt drained Woodbridge and Sutton soils and very poorly drained Adrian soils. Also included are areas where stones cover less than 10 percent of the surface.

The permeability of the Ridgebury and Whitman soils is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The permeability of the Leicester soils is moderate or moderately rapid in the surface layer and subsoil and moderate to rapid in the substratum. Available water capacity in all three soils is moderate, and runoff is slow to medium. These soils are very strongly acid through medium acid.

The high water table and the slow or very slow permeability in the Ridgebury and Whitman soils make this unit poorly suited to community development. The use of onsite septic systems is not feasible without extensive filling.

These soils are poorly suited to trees. The main limitations for woodland are wetness and the stones and boulders on the surface, which hinder the use of equipment. Tree windthrow is common.

The stones and boulders on the surface make these soils unsuitable for cultivated crops and the use of farming equipment impractical.

These soils are suited to woodland wildlife habitat and wetland wildlife habitat. They are not suited to openland wildlife habitat. Capability subclass VIIs; Ridgebury and Leicester parts in woodland group 4x, Whitman part in woodland group 5x.

Rk—Rock outcrop.

This unit consists of level to very steep areas of exposed bedrock along the shore of Narragansett Bay and Block Island Sound. The areas are long and narrow and range mostly from 5 to 25 acres. Slopes range from 0 to 50 percent. The areas are unprotected from the ocean. During storms they are subject to strong wave action.

Included with this unit in mapping are small areas of well drained Newport soils, poorly drained Matunuck soils, and Beaches. In places in the intertidal zone the

rock is sparsely covered with aquatic plants. Small tidal pools are common. Included areas make up about 20 percent of this map unit.

Rock outcrop is suitable for summer recreation activities, including surf fishing, sunbathing, and hiking. Capability subclass and woodland group not assigned.

Rp—Rock outcrop-Canton complex.

This complex consists of bare, hard rock and well drained soils on glacial upland hills and ridges. Stones and boulders cover 2 to 10 percent of the surface of the complex. Slopes range from 0 to 35 percent. Areas are irregular in shape and range mostly from S to 100 acres. The complex is about 50 percent rock outcrop, 25 percent Canton soils, and 25 percent other soils. The soils and rock are so intermingled that it was not practical to map them separately.

Typically the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 19 inches thick. The substratum is olive gray and light olive gray gravelly loamy sand to a depth of 60 inches or more.

Included with this complex in mapping are small areas of somewhat excessively drained Lippitt soils, well drained Charlton and Narragansett soils, moderately well drained Sutton and Woodbridge soils, and poorly drained Leicester soils.

The permeability of Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is medium. The soil is extremely acid through medium acid.

The areas of rock, the stones and boulders on the surface, and the steep slopes make this complex poorly suited to community development. Onsite septic systems need special design and installation. The use of straw bale sediment barriers and temporary diversions and quickly establishing plant cover help to control erosion during construction.

This complex is poorly suited to trees and cultivated crops, but most areas are wooded. The main limitations are the rock outcrops and stones and boulders on the surface.

This complex is poorly suited to woodland wildlife habitat and is not suited to openland wildlife habitat or wetland wildlife habitat. Capability subclass VIIIs; Rock outcrop not assigned to a woodland group, Canton part in woodland group 5r.

Ru—Rumney fine sandy loam.

This nearly level, poorly drained soil is on flood plains. Slopes range from0 to 3 percent but are dominantly less than 2 percent. Areas are long and narrow and range mostly from 5 to 30 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is dark grayish brown, mottled fine sandy loam 17 inches thick. The substratum is gray and dark grayish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Podunk soils and very poorly drained Adrian soils. Also included are small areas of soils with a surface layer and subsoil of silt loam. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate, and runoff is slow. The soil has a seasonal high water table at a depth of about 6 inches from late fall through spring and is subject to frequent flooding. The soil is very strongly acid through slightly acid.

Most areas of this soil are in woodland or are used for pasture or hay.

The high water table and flooding make this soil un suitable for community development. Slopes of excavated areas are commonly unstable.

This soil is poorly suited to trees. The major limitations for woodland are wetness and flooding. Tree windthrow is common.

The soil is suited to cultivated crops but is limited by wetness and flooding. The soil dries out and warms slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed. Flooding during the growing season damages some crops. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suitable for most types of wildlife habitat. Capability subclass IIIw; woodland group 4w.

Sb—Scarboro mucky sandy loam.

This nearly level, very poorly drained soil is in depressions and drainageways of terraces and outwash plains. Slopes range from 0 to 3 percent but are dominantly less than 1 percent. Areas are irregular in shape and range mostly from 2 to 50 acres.

Typically the surface layer is very dark grayish brown mucky sandy loam about 6 inches thick. The substratum extends to a depth of 60 inches or more. The upper

part is gray, mottled loamy sand. The lower part is light brownish gray, mottled coarse sand.

Included with this soil in mapping are small areas of moderately well drained Sudbury and Ninigret soils and poorly drained Raypol and Walpole soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and rapid or very rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at or near the surface from late fall through midsummer. A few small areas are subject to flooding. The soil is very strongly acid through medium acid.

The seasonal high water table makes this soil unsuitable for community development or cultivated crops.

The soil is poorly suited to trees, but most areas are in woodland or water-tolerant shrubs. The major limitation for woodland is wetness. Tree windthrow is common, and the use of equipment is difficult in wet seasons.

This soil is poorly suited to woodland wildlife habitat and is not suited to openland wildlife habitat. The soil, however, is suited to wetland wildlife habitat. Capability subclass Vw; woodland group 5w.

ScA—Scio silt loam, 0 to 3 percent slopes.

This nearly level, moderately well drained soil is in depressions of glacial till plains. Areas are long and narrow and range mostly from 5 to 20 acres.

Typically the surface layer is very dark grayish brown silt loam about 9 inches thick. The subsoil is 22 inches thick. The upper 6 inches is dark brown silt loam. The lower 16 inches is yellowish brown and light olive brown, mottled silt loam. The substratum extends to a depth of 60 inches or more. The upper part is olive gray, mottled silt loam. The lower part is grayish brown, mottled fine sandy loam.

included with this soil in mapping are small areas of well drained to moderately well drained Bridgehampton soils, moderately well drained Ninigret and Tisbury soils, and poorly drained Rumney and Raypol soils. Also included are small areas of soils that have slopes of more than 3 percent. Included areas make up about 10 per cent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow through rapid in the substratum. Available water capacity is high, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium

acid above a depth of 40 inches and strongly acid through slightly acid below a depth of 40 inches.

The soil is suitable for community development but is limited by the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving. Quickly establishing plant cover helps to control erosion during construction.

The soil is suited to trees, but most areas are cleared and used for farming.

This soil is suited to cultivated crops. It dries out and warms up slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it is too dry in summer. Capability subclass IIw; woodland group 3o.

SdB—Scio very stony slit loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is on glacial till plains. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and range mostly from 5 to 30 acres.

Typically the surface layer is very dark grayish brown silt loam about 9 inches thick. The subsoil is 22 inches thick. The upper 6 inches is dark brown silt loam, and the lower 16 inches is yellowish brown and light olive brown, mottled silt loam. The substratum extends to a depth of 60 inches or more. It is gray, mottled silt loam in the upper part and grayish brown, mottled fine sandy loam in the lower part.

Included with this soil in mapping are small areas of well drained to moderately well drained Bridgehampton soils and moderately well drained Wapping, Tisbury, and Sudbury soils. Also included are small areas of soils that do not have stones or boulders on the surface. Included areas make up abut 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow through rapid in the substratum. Available water capacity is high, and runoff is slow or medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development but is limited by the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving, and the stones and boulders on the surface need to be removed for landscaping. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, and most areas are in woodland.

The soil is not suited to cultivated crops. The stones and boulders on the surface severely hinder the use of farming equipment.

This soil is suited to woodland wildlife habitat. It is not suited to openland wildlife habitat. The soil is poorly suited to wetland wildlife habitat because it is too dry in summer. Capability subclass VIs; woodland group 3o.

Se—Stissing silt loam. 

This nearly level, poorly drained soil is on glacial upland hills and drumlins in the southeastern part of the State. Slopes range from 0 to 3 percent. Areas are irregular in shape and range mostly from 5 to 150 acres.

Typically the surface layer is very dark gray silt loam about 8 inches thick. The subsoil is dark grayish brown, mottled silt loam 7 inches thick. The substratum is dark gray, mottled silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Pittstown soils and very poorly drained Mansfield soils. Also included are small areas of soils that have stones on the surface and a few small areas of soils with a surface layer and subsoil of sandy loam. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table near the surface from late fall through spring. The soil is extremely acid through medium acid.

The seasonal high water table and the slow permeability in the substratum make this soil poorly suited to community development. Onsite septic systems need special design and installation, and areas require extensive filling.

This soil is suited to trees, but most areas are cleared and used for pasture. Wetness is the main limitation for woodland. Tree windthrow is common.

This soil is suited to cultivated crops, but artificial drainage is needed. The use of cover crops helps to maintain tilth and organic matter content.

This soil is suited to most types of wildlife habitat. Capability subclass IIIw; woodland group 4w.

Sf—Stissing very stony silt loam.

This nearly level, poorly drained soil is on glacial upland hills and drumlins in the southeastern part of the State. Stones and boulders cover 2 to 10 percent of the surface area. Areas are irregular in shape and range mostly from 5 to 150 acres. Slopes range from 0 to 3 percent.

Typically the surface layer is very dark gray silt loam about 8 inches thick. The subsoil is mottled, dark grayish brown silt loam 7 inches thick. The substratum is mottled, dark gray silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Pittstown soils and very poorly drained Mansfield soils. Also included are small areas of soils that do not have stones or boulders on the surface and small areas of soils that have a surface layer and subsoil of fine sandy loam. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table near the surface from late fall through spring. The soil is extremely acid through medium acid.

The seasonal high water table and the slow permeability in the substratum make this soil poorly suited to community development. Onsite septic systems need special design and installation, and areas require extensive filling.

This soil is suited to trees, and most areas are in woodland. The seasonal high water table is the main limitation for trees. Tree windthrow is common.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and severely hinder the use of farming equipment.

The soil is suited to woodland wildlife habitat and wetland wildlife habitat. It is poorly suited to openland wildlife habitat. Capability subclass VIIs; woodland group 4w.

Ss—Sudbury sandy loam.

This nearly level, moderately well drained soil is in depressions in terraces and outwash plains. Areas are irregular in shape and range mostly from 3 to 50 acres. Slopes range from 0 to 3 percent.

Typically the surface layer is dark brown sandy loam about 6 inches thick. The subsoil is 22 inches thick. The upper 9 inches is dark yellowish brown sandy loam; the middle 6 inches is yellowish brown, mottled sandy loam; and the lower 7 inches is yellowish brown, mottled loamy sand. The substratum is yellowish brown, mottled gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley and Windsor soils, some what excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Ninigret and Deerfield soils, and poorly drained Walpole soils. Also included are small areas of soils with slopes of more than 3 percent. Included areas make up about 10 per cent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a high water table at a depth of about 20 inches from late fall through midspring. The soil is extremely acid through medium acid.

This soil is suitable for community development. The main limitation for this use is the seasonal high water table. Onsite sewage disposal systems need special design and installation to prevent pollution of ground water. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Slopes of excavated areas are commonly unstable.

This soil is suited to trees, but most areas are cleared and used for cultivated crops and pasture.

The soil is suited to cultivated crops. It dries out and warms up slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed.

The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is not suited to wetland wild life habitat because it is too dry in the summer. Capability subclass IIw; woodland group 4o.

StA—Sutton fine sandy loam, 0 to 3 percent slopes.

This nearly level, moderately well drained soil is in depressions of glacial uplands and in low areas that border the uplands. Areas are irregular in shape and range mostly from 3 to 50 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is 22 inches thick. The upper 14 inches is dark brown and yellowish brown fine sandy loam, and the lower 8 inches is yellowish brown, mottled sandy loam. The substratum is light olive brown, mottled gravelly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester soils. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

This soil is suitable for community development but is limited by the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving.

The soil is suited to trees, but most areas are cleared and used for farming.

This soil is suited to cultivated crops. It dries out and warms slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it lacks adequate water in the summer. Capability subclass IIw; woodland group 4o.

StB—Sutton fine sandy loam, 3 to 8 percent slopes.

This gently sloping, moderately well drained soil is on the lower side slopes of glacial uplands. Areas are irregular in shape and range mostly from 5 to 100 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is 22 inches thick. The upper 14 inches is dark brown and yellowish brown fine sandy loam, and the lower 8 inches

is yellowish brown, mottled sandy loam. The substratum is light olive brown, mottled gravelly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester soils. Also included are small areas of soils with stones on the surface and soils with slopes of more than 8 percent. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid. Available water capacity is moderate, and runoff is medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

This soil is suitable for community development. The main limitation for this use is the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

The soil is suited to trees, but most areas are cleared and used for farming.

This soil is suited to cultivated crops. It dries out and warms up slowly in the spring, limiting early planting and machinery operation. The use of cover crops, diversions, and stripcropping and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it is too dry in summer. Capability subclass IIw; woodland group 4o.

SuB—Sutton very stony fine sandy loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is in small depressions and on lower side slopes of the uplands. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and range mostly from 3 to 150 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is 22 inches thick. The upper 14 inches is dark brown and yellowish brown fine sandy loam, and the lower 8 inches is yellowish brown, mottled sandy loam. The substratum is light olive brown, mottled gravelly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester soils. Also included more than 8 percent soil in mapping are small areas of and Charlton soils, moderately well soils, and poorly drained Leicester are areas of soils with slopes of and soils with a surface layer of silt loam. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid. Available water capacity is moderate, and runoff is slow to medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

Most areas of this soil are in woodland. Some small areas are cleared and used for pasture.

This soil is suitable for community development but is limited by the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving, and the stones and boulders on the surface need to be removed for landscaping. The use of straw bale sediment barriers and quickly establishing plant cover help control erosion during construction.

The stones and boulders on the surface make the soil unsuitable for cultivated crops and severely hinder the use of farming equipment.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat or wetland wild life habitat. Capability subclass VIs; woodland group 4o.

SvB—Sutton extremely stony fine sandy loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is on the lower side slopes of glacial upland hills and in low areas that border up lands. Stones and boulders cover 10 to 35 percent of the surface. Areas are irregular in shape and range mostly from 3 to 100 acres.

Typically the surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The subsoil is 22 inches thick. The upper 14 inches is dark brown and yellowish brown fine sandy loam, and the lower 8 inches is yellowish brown, mottled sandy loam. The substratum is light olive brown, mottled gravelly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton and Char soils, moderately well drained Woodbridge soils, and poorly drained

Leicester soils. Also included are small areas of soils with slopes of more than 8 percent and soils with a surface layer of silt loam. Included areas make up about 15 percent of this map unit.

The permeability of this soil is moderate or moderately rapid. Available water capacity is moderate. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

This soil is suitable for community development but is limited by the seasonal high water table and the stones and boulders on the surface. Onsite sewage disposal systems need special design and installation because of the wetness. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving, and the stones and boulders need to be re moved for landscaping. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, and most areas are wooded. The stones and boulders on the surface hinder the use of planting and harvesting equipment.

The soil is not suited to cultivated crops, because the stones and boulders make the use of farming equipment impractical.

This soil is suited to woodland wildlife habitat. It is not suited to openland wildlife habitat and is poorly suited to wetland wildlife habitat. Capability subclass VIIs; wood land group 4x.

Tb—Tisbury silt loam.

This nearly level, moderately well drained soil is in depressions in terraces and outwash plains. Slopes range from 0 to 3 percent but are dominantly less than 2 percent. Areas are irregular in shape and range mostly from 5 to 50 acres.

Typically the surface layer is dark brown silt loam about 8 inches thick. The subsoil is 20 inches thick. It is yellowish brown silt loam that is mottled in the lower part. The substratum is pale brown, mottled very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Enfield and Bridgehampton soils and poorly drained Raypol soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate, and

runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development but is limited by the seasonal high water table. Onsite sewage disposal systems need special design and installation to prevent pollution of ground water. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving.

This soil is suited to trees, but most areas are used for farming or openland wildlife habitat.

The soil is suited to cultivated crops. It dries out and warms slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic mailer content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because of a lack of adequate water in the summer. Capability subclass 1 woodland group 3o.

UAB—Udipsamments, undulating.

This unit consists of sand dunes and depressional or level, sandy areas that have been stabilized by vegetation. The areas are along beaches, are long and narrow, and mostly range from 5 to 75 acres. The areas of this unit that are subject to foot and vehicular traffic have less than 10 percent of the surface covered by vegetation, but in undisturbed areas vegetation covers about 65 percent of the surface.

Included with this unit in mapping are areas, up to 10 acres in size, of Beaches and Matunuck mucky peat. Included areas make up about 2 percent of this map unit.

The permeability of this soil is very rapid. Available water capacity is very low, and runoff is very slow.

Most areas of this soil are used for summer recreation activities or for community development purposes such as summer cottages and parking lots.

The soil is not suited to trees or most other uses. The major limitations are droughtiness and position on the landscape. Capability subclass and woodland group not assigned.

UBE—Udorthents, very steep.

This unit consists of well drained to excessively drained soils along mainly the southern edge of Block Island adjacent to Block Island Sound in the Mohegan Bluff area. Wind, waves, and rain have eroded these soils and undercut areas on bluffs. Areas are long and narrow and mostly range from 10 to 200 acres. This unit consists of about 50 percent Udorthents, 20 percent steep, severely eroded areas without vegetation, 15 percent Beaches, and 15 percent other soils.

Included with this unit in mapping are areas, up to 10 acres in size, of excessively drained Gloucester and Hinckley soils and well drained to moderately well drained Bridgehampton soils.

This unit is used for summer recreation activities such as sunbathing, surf fishing, and hiking. The unit is unsuited or poorly suited to most other uses because of slope, position on the landscape, erosion, and exposure to winds and salt spray. Capability subclass and woodland group not assigned.

UD—Udorthents-Urban land complex.

This complex consists of moderately well drained to excessively drained soils that have been disturbed by cuffing or filling, and areas that are covered by buildings and pavement. The areas are mostly larger than 5 acres. The complex is about 70 percent Udorthents, 20 percent Urban land, and 10 percent other soils. Most areas of these components are so intermingled that is was not practical to map them separately.

Udorthents are in areas that have been cut to a depth of 2 feet or more or are on areas with more than 2 feet of fill. Udorthents consist primarily of moderately coarse textured soil material and a few small areas of medium textured material.

Included with this complex in mapping are areas, up to 10 acres in size, of undisturbed soils. Also included are a few areas that are entirely Udorthents.

Most cut areas were used as a source of fill material, but in some areas cuts were made in order to level sites for buildings, recreational facilities, and roads. Most of the filled areas were built up and leveled for urban development. In some areas fill has been used to build up recreational areas and highways.

The permeability and stability of this unit are variable. The unit requires onsite investigation and evaluation for most uses. Capability subclass and woodland group not assigned.

Ur—Urban land.

These areas consist mostly of sites for buildings, paved roads, and parking lots. Most areas are in intensely built-up portions of Providence and New port

Counties. The areas are mostly rectangular and range from 5 to 100 acres. Slopes range from 0 to 10 percent but are dominantly 0 to 5 percent.

Included with this unit in mapping are small, intermingled areas of Udorthents; somewhat excessively drained Merrimac soils; well drained Canton, Charlton, and New port soils; and moderately well drained Pittstown, Sudbury, and Sutton soils. Included areas make up about 15 percent of this map unit.

Areas of this unit require onsite investigation and evaluation for most land use decisions. Capability subclass and woodland group not assigned.

Wa—Walpole sandy loam.

This nearly level, poorly drained soil is in depressions and small drainageways of terraces and outwash plains. Areas are irregular in shape and range mostly from 2 to 70 acres.

Typically the surface layer is very dark brown sandy loam about 7 inches thick. The subsoil is light brownish gray, mottled sandy loam 12 inches thick. The substratum is dark yellowish brown and grayish brown, mottled gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Sudbury soils and very poorly drained Scarboro soils. Also included are a few small areas with a surface layer of silt loam. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at a depth of about 6 inches from late fall through midspring. The soil is very strongly acid through medium acid.

Most areas of this soil are in woodland. Some small areas are cleared and used for pasture or wildlife habitat.

The seasonal high water table makes the soil poorly suited to community development. Onsite septic systems need special design and installation, and areas require extensive filling. Slopes of excavated areas are commonly unstable. Roads and streets need careful design to prevent frost heaving.

This soil is suited to trees. The main limitation for woodland is wetness, and tree windthrow is common.

The soil is suited to cultivated crops but is limited by the high water table. Artificial drainage is needed. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

The soil is suited to most types of wildlife habitat. Capability subclass IIIw; woodland group 4w.

WbA—Wapping slit loam, 0 to 3 percent slopes.

This nearly level, moderately well drained soil is in depressions on the crests of glacial upland hills and in drainageways. Areas are irregular in shape and range mostly from 10 to 100 acres.

Typically the surface layer is very dark brown and very dark grayish brown silt loam 5 inches thick. The subsoil is 25 inches thick. The upper 14 inches is dark yellowish brown and yellowish brown silt loam, and the lower 11 inches is dark brown, mottled silt loam. The substratum extends to a depth of 60 inches or more. It is brown, mottled sandy loam to a depth of 37 inches and dark yellowish brown gravelly loamy sand at a depth of more than 37 inches.

Included with this soil in mapping are small areas of well drained Narragansett and Bridgehampton soils and poorly drained Leicester soils. Also included are small areas with stones on the surface. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderate or moderately rapid in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development. The main limitation for this use is the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving.

The soil is suited to trees, but most areas are cleared and used for farming and openland wildlife habitat.

This soil is suited to cultivated crops. It dries out and warms slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed.

The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it is too dry in the summer. Capability subclass IIw; woodland group 3o.

WbB—Wapping silt loam, 3 to 8 percent slopes.

This gently sloping, moderately well drained soil is on the crests and side slopes of glacial upland hills. Areas range from 10 to 100 acres and are mostly irregular in shape.

Typically the surface layer is very dark grayish brown silt loam 5 inches thick. The subsoil is 25 inches thick. The upper 14 inches is dark yellowish brown and yellowish brown silt loam, and the lower 11 inches is dark brown, mottled silt loam. The substratum extends to a depth of 60 inches or more. It is brown, mottled sandy loam to a depth of 37 inches and dark yellowish brown gravelly loamy sand at a depth of more than 37 inches.

Included with this soil in mapping are small areas of well drained Narragansett and Bridgehampton soils and poorly drained Leicester soils. Also included are areas of soils with slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderate to moderately rapid in the substratum. Available water capacity is moderate, and runoff is medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development. The main limitation for this use is the seasonal high water table. Onsite sewage disposal systems need special design and installation because of the wetness. If suit able outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

The soil is suited to trees, but most areas are cleared and used for farming or openland wildlife habitat.

This soil is suited to cultivated crops. It dries out and warms up slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed. The use of cover crops, diversions, and stripcropping and the return of crop residue to the soil help to control erosion and maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it is too dry in the summer. Capability subclass IIw; woodland group 3o.

WcB—Wapping very stony silt loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is on side slopes and crests of glacial upland hills. Stones and boulders cover 2 to 10 percent of the surface. Areas are irregular in shape and range mostly from 10 to 100 acres.

Typically the surface layer is very dark grayish brown silt loam 5 inches thick. The subsoil is 25 inches thick. The upper 14 inches is dark yellowish brown and yellowish brown silt loam, and the lower 11 inches is dark brown, mottled silt loam. The substratum extends to a depth of 60 inches or more. It is brown, mottled sandy loam to a depth of 37 inches and dark yellowish brown gravelly loamy sand at a depth of more than 37 inches.

Included with this soil in mapping are small areas of well drained Narragansett and Bridgehampton soils and poorly drained Leicester soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderate or moderately rapid in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

The soil is suited to trees, and most areas are in woodland. A small acreage is cleared and used for pasture.

This soil is suitable for community development. The main limitation for this use is the seasonal high water table. Onsite sewage disposal systems need special design and installation because of wetness. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving, and the stones and boulders on the surface need to be removed for landscaping. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

The stones and boulders on the surface make this soil unsuitable for cultivated crops and severely hinder the use of farming equipment. The hazard of erosion is slight to moderate.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat or wetland wild life habitat. Capability subclass VIs; woodland group 3o.

WdB—Wapping extremely stony silt loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is on side slopes and crests of glacial upland hills. Stones and boulders cover 10 to 35 percent of the surface. Areas are irregular in shape and range mostly from 10 to 75 acres.

Typically the surface layer is very dark grayish brown silt loam 5 inches thick. The subsoil is 25 inches thick. The upper 14 inches is dark yellowish brown and yellow ish brown silt loam, and the lower 11 inches is dark brown, mottled silt loam. The substratum extends to a depth of 60 inches or more. It is brown, mottled sandy loam to a depth of 37 inches and dark yellowish brown gravelly loamy sand at a depth of more than 37 inches.

Included with this soil in mapping are small areas of well drained Narragansett and Bridgehampton soils and poorly drained Leicester soils. Also included are small areas with slopes of more than 8 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate in the surface layer and subsoil and moderate or moderately rapid in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development but is limited by the seasonal high water table and the stones and boulders on the surface. Onsite sewage disposal systems need special design and installation because of the wetness. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving, and the stones and boulders need to be re moved for landscaping. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, and most areas are wooded. The main limitation for woodland is the stones and boulders on the surface, which hinder planting and harvesting equipment.

The stones and boulders make this soil unsuitable for farming and the use of equipment impractical.

This soil is suited to woodland wildlife habitat. It is not suited to openland wildlife habitat; it is poorly suited for wetland wildlife habitat because it is too dry in the summer. Capability subclass VIIs; woodland group 3x.

WgA—Windsor loamy sand, 0 to 3 percent slopes.

This nearly level, excessively drained soil is on terraces, outwash plains, kames, and eskers. Areas are irregular in shape and range mostly from 2 to 50 acres.

Typically the surface layer is very dark grayish brown and gray loamy sand 2 inches thick. The subsoil is dark yellowish brown and yellowish brown loamy sand 26 inches thick. The substratum is light brownish gray fine sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Deerfield and Sudbury soils. Also included are small areas of soils with slopes of more than 3 percent. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid. Available water capacity is low, and runoff is slow. This soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

Most areas of the soil are cleared and used for farming. Some are used for white pine forests.

This soil is suitable for community development. Onsite septic systems need special design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer.

This soil is suited to trees, but it is limited by droughtiness. Seedling mortality is high in the summer.

The soil is suited to farming. Irrigation is needed, and the use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is unsuited to wetland wildlife habitat because it is too dry. Capability subclass IIIs; woodland group 5s.

WgB—Windsor loamy sand, 3 to 8 percent slopes.

This gently sloping, excessively drained soil is on terraces, outwash plains, kames, and eskers. Areas are irregular in shape and range from 2 to 100 acres.

Typically the surface layer is very dark grayish brown and gray loamy sand 2 inches thick. The subsoil is dark yellowish brown and yellowish brown loamy

sand 26 inches thick. The substratum is light brownish gray fine sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Deerfield and Sudbury soils. Also included are small areas of nearly level soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is rapid. Available water capacity is low, and runoff is medium. This soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

This soil is suitable for community development. Onsite septic systems need special design and installation to prevent pollution of ground water. Slopes of excavated areas are commonly unstable. Lawn grasses, shallow-rooted trees, and shrubs require watering in summer. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, and most areas are wooded. The main limitation for woodland is droughtiness. Seedling mortality is high in summer.

The soil is suited to cultivated crops, but it is droughty. Irrigation is needed, and the use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife. It is not suited for wetland wildlife habitat because it is too dry. Capability subclass IIIs; wood land group 5s.

WhA—Woodbridge fine sandy loam, 0 to 3 percent slopes.

This nearly level, moderately well drained soil is on crests of upland hills and drumlins. Areas are irregular in shape and range mostly from 5 to 50 acres.

Typically the surface layer is dark brown fine sandy loam about 7 inches thick. The subsoil is 25 inches thick. It is dark yellowish brown and yellowish brown fine sandy loam that is mottled in the lower part. The substratum is dark grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development. The main limitations for this use are the very slow permeability in the substratum and the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving.

This soil is suited to trees, but most areas are cleared and used for farming.

The soil is suited to cultivated crops. It dries out and warms slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed. The use of cover crops and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it is too dry in the summer. Capability subclass IIw; woodland group 3o.

WhB—Woodbridge fine sandy loam, 3 to 8 percent slopes.

This gently sloping, moderately well drained soil is on side slopes and crests of upland hills and drumlins. Areas are irregular in shape and range mostly from 5 to 75 acres.

Typically the surface layer is dark brown fine sandy loam about 7 inches thick. The subsoil is 25 inches thick. It is dark yellowish brown and yellowish brown fine sandy loam that is mottled in the lower part. The substratum is dark grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development. The main limitations for this use are the slow to very slow permeability in the substratum and the high water table.

Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent frost heaving. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, but most areas are cleared and used for farming.

The soil is suited to farming. It dries out and warms slowly in the spring, limiting early planting and machinery operation, and artificial drainage is needed. The use of cover crops, stripcropping, and diversions and the return of crop residue to the soil help to maintain tilth and organic matter content.

This soil is suited to woodland wildlife habitat and openland wildlife habitat. It is poorly suited to wetland wildlife habitat because it is too dry in the summer. Capability subclass IIw; woodland group 5o.

WoB—Woodbridge very stony fine sandy loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is on side slopes and crests of upland hills and drumlins. Areas are irregular in shape and range mostly from 5 to 100 acres. Stones and boulders cover 2 to 10 percent of the surface area.

Typically the surface layer is dark brown fine sandy loam about 3 inches thick. The subsoil is 29 inches thick. It is dark yellowish brown and yellowish brown fine sandy loam that is mottled in the lower part. The substratum is dark grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Also included are areas of soils that have slopes of more than 8 percent and small areas of soils in drainageways. Included areas make up about 10 percent of this map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow to medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid through medium acid.

This soil is suitable for community development. The main limitations for this use are the slow or very slow permeability in the substratum and the seasonal high water table. Onsite sewage disposal systems need special design and installation. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Roads and streets need careful design to prevent

frost heaving. The use of straw bale sediment barriers and quickly establishing plant cover help to control erosion during construction.

This soil is suited to trees, and most areas are in woodland.

The soil is not suited to cultivated crops because the stones and boulders on the surface severely hinder the use of farming equipment.

This soil is suited to woodland wildlife habitat. It is poorly suited to openland wildlife habitat or wetland wild life habitat. Capability subclass VIs; woodland group 3o.

WrB—Woodbridge extremely stony fine sandy loam, 0 to 8 percent slopes.

This nearly level to gently sloping, moderately well drained soil is on side slopes and crests of upland hills and drumlins. Stones and boulders cover 10 to 35 percent of the surface. Areas are irregular in shape and range mostly from 5 to 50 acres.

Typically the surface layer is dark brown fine sandy loam about 3 inches thick. The subsoil is 29 inches thick. It is dark yellowish brown and yellowish brown fine sandy loam that is mottled in the lower part. The substratum is dark grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Also included are small areas of soils with slopes of more than 8 percent. Included areas make up about 10 percent of the map unit.

The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity is moderate, and runoff is slow or medium. This soil has a seasonal high water table at a depth of about 20 inches from late fall through midspring. The soil is very strongly acid to medium acid.

This soil is suitable for community development. The main limitations for this use are the slow to very slow permeability in the substratum, the high water table, and the stones and boulders on the surface. Onsite sewage disposal systems need special design and installation. Roads and streets need careful design to prevent frost heaving. If suitable outlets are available, subsurface drains can be used to help prevent wet basements. Removal of stones and boulders is necessary for landscaping and site preparation.

This soil is suited for trees, and most areas are wooded. The stones and boulders hinder the use of equipment.

The soil is not suitable for farming. The stones and boulders make the use of equipment impractical.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, for woodland, as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities, and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

The major management concerns in the use of the soils for crops and pasture are in the descriptions of the map units in the section “Soil maps for detailed planning.” In this section the system of land capability classification used by the Soil Conservation Service is explained and the estimated yields of the main crops and hay and pasture plants are presented for each soil.

About 10 percent of the land in Rhode Island is used for farming, according to the 1969 Census of Agriculture. The major farming activities include the production of potatoes, nursery stock, sod, truck crops, orchard crops, and dairy and poultry products. Dairy and poultry farms are located in every county in the State. The larger nurseries and potato farms are on some of the better farmland on the nearly level outwash plains of Washing-ton County and gently sloping drumlins of Newport County. The major nursery crops are yews and rhododendrons, and most of the crop is sold to retail dealers throughout the United States. The sod farms are in Washington County, generally on land that had been used for potatoes. Most truck farms are in Providence and Newport Counties, and the orchards, most of which produce apples, are in Providence County.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 15. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the crop is not suited to or not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby states were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 15.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 15 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are 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 land-forming 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 rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit (*5*). The capability classes and subclasses are defined in the following paragraphs. A survey area may not have soils of all classes. Capability units are not used in this survey area.

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. The classes are 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 Ill soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

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, lle. 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 contains only the subclasses indicated by *w, s*, or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass and the acreage of the soil in each county are indicated in table 16. All soils in the survey area except those named at a level higher than the series are included. Some of the soils that are well suited to crops and pasture may be in low-intensity use, for example, soils in capability classes I and II. Data in this table can be used to determine the farming potential of such soils.

The capability subclass is identified in the description of each soil map unit in the section “Soil maps for detailed planning.”

Woodland management and productivity

Table 17 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Map unit symbols for soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. The ordination symbol is also identified in the description of each soil map unit in the section “Soil maps for detailed planning.” All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w,* excessive water in or on the soil; *d,* restricted root depth; *s*, sandy texture; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soi has more than one limitation, priority in placing the soil into a limitation class is in the following order: *x, w, d, s*, and *r.*

In table 17 the soils are also rated for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe,* more than 50 percent.

Considered in the ratings of *windthrow hazard* are characteristics of the soil that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight*, indicates that trees in wooded areas are not expected to be blown down by commonly occurring winds; *moderate*, that some trees are blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in 50 years. The site index applies to fully stocked, even-aged, unmanaged stands. Site index is listed for trees that woodland managers generally favor for wood crop production. The trees are the most important species based on growth rate, quality, value, and marketability. Other tree species that commonly occur on the soil are also listed, regardless of potential value or growth rate.

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils.

Engineering

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers.

The ratings in the engineering tables are based on test data and estimated data in the “Soil properties” section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known

relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major layer of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 18 shows, for each kind of soil, the degree and kind of limitations for building site development; table 19, for sanitary facilities; and table 21, for water management. Table 20 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping are indicated in table 18. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to layers below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 18 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in- place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 18 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Lawns and landscaping require soils that are suitable for the establishment and maintenance of turf for lawns and ornamental trees and shrubs for landscaping. The best soils are firm after rains, are not dusty when dry, and absorb water readily and hold sufficient moisture for plant growth. The surface layer should be free of stones. If shaping is required, the soils should be thick enough over bedrock or hardpan to allow for necessary grading. In rating the soils, the availability of water for sprinkling is assumed.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 19 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight,* soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe,* soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good, fair*, or *poor,* which, respectively, mean about the same as the terms *slight, moderate*, and *severe.*

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be in stalled or the size of the absorption field can be in creased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic mailer and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor.

In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon’s capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 19 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted till in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the layers, the surface layer in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the surface layer for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils sur- rounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 20 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the surface and a depth of 5 to 6 feet. It is assumed that soil layers will be mixed during excavation and spreading. Many soils have layers of contrasting suitability. The estimated engineering properties in table 24 provide specific information about the nature of each layer. This information can help determine the suitability of each layer for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low potential frost action, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and gravel are used in great quantities in many kinds of construction. The ratings in table 20 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 24.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can limit or prevent plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated fair are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils and very firm clayey soils; soils with suitable layers less than 8 inches thick; soils having large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface layer is generally preferred for topsoil because of its organic-matter con tent. This layer is designated as the Al or Ap horizon in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 21 soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seep age potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

Aquifer-fed excavated ponds are bodies of water made by excavating a pit or dugout into a ground-water aquifer.

Excluded are ponds that are fed by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Ratings in table 21 are for ponds that are properly designed, located, and constructed. Soil properties and site features that affect aquifer-fed ponds are depth to a permanent water table, permeability of the aquifer, quality of the water, and ease of excavation.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

The soils of the survey area are rated in table 22 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the

limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 22 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 19, and interpretations for dwellings without basements and for local roads and streets, given in table 18.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They should have a surface that is free of stones and boulders and have moderate slopes. Suitability of the soil for traps, tees, or greens was not considered in rating the soils. Irrigation is an assumed management practice.

Wildlife habitat

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

It the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 23, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn and wheat.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds that provide food and cover for wildlife. Major soil properties that

affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, gold- enrod, beggarweed, wheatgrass, and grama.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of native plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil proper ties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, and cordgrass and rushes, sedges, and reeds.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds. The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail rabbit, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, raccoon, arid deer.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH, or reaction, of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area.

They also present data about pertinent soil and water features.

Engineering properties

Whitney T. Ferguson. State Conservation engineer, assisted in preparing this section.

Table 24 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 24 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section “Soil series and morphology.”

Texture is described in table 24 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. “Loam,” for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles

coarser than sand, an appropriate modifier is added, for example, “gravelly loam.” Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (Unified) (*1*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*2)*.

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-mailer content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MN, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The estimated classification, without group index numbers, is given in table 24. Also in table 24 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard), is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

Physical and chemical properties

Table 25 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts.

Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of

soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 26 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are: Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding; and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific,

however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 26 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils.

Potential frost action refers to the likelihood of damage to pavements and other structures by frost heaving and low soil strength after thawing. Frost action results from the movement of soil moisture into the freezing temperature zone in the soil, which causes ice lenses to form. Soil texture, temperature, moisture content, porosity, permeability, and content of organic matter are the most important soil properties that affect frost action. It is assumed that the soil is not covered by insulating vegetation or snow and is not artificially drained. Silty and clayey soils that have a high water table in winter are most susceptible to frost action. Well drained very gravelly or sandy soils are the least susceptible.

Risk of corrosion pertains to the potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Formation of the soils

Soil is produced by physical and chemical processes acting upon geologic materials. Hence, soil formation is a continuing process. Some processes occur

seasonally; others occur slowly over hundreds, even thousands of years. The magnitude of change is influenced by five factors of soil formation—parent material, climate, living organisms, relief, and time. Each does not act independently, but modifies the effects of one another.

Climate and living organisms are the dominant active agents that modify parent material deposited by geologic events. In Rhode Island these active forces have influenced soil formation for the 10,000 years or more since the last glacier.

The soil characteristics produced by soil formation are the sum of many physical and chemical processes. Glacial ice ground local bedrock and moved it to different locations. Meltwater from the glacier transported and segregated particles of sediment and deposited them, forming new landscapes. Strong winds redistributed fine soil particles before vegetation became established. As the climate warmed and vegetation became established, chemical processes of weathering began to exert an increasing influence on soil formation.

The differences between soils in Rhode Island are primarily attributable to differences in parent material, relief, and time. The influence of climate and living organisms has been relatively uniform throughout the State and does not account for major differences in soils. Rocks pulverized by the glacier have provided the parent materials. Relief has influenced soil formation through differences in slope and drainage. Soils formed in recent sediment on flood plains have had less time to be influenced by soil forming processes. In the following paragraphs the soil forming factors are described as they apply to the distribution and soils in Rhode Island.

Climate

The climate of Rhode Island is modified by Narragansett Bay and the Atlantic Ocean. The average annual precipitation of 45 inches is fairly evenly distributed throughout the year. Detailed information on climate is given in the section “General nature of the area.”

Temperature and precipitation are the elements of climate that most affect soil formation. These elements react directly on parent material and indirectly on living organisms. Water moving through a soil alters its chemical composition over a period of time. The rate of soluble chemicals leached from the soil is related to the amount of rainfall.

Rainfall causes soils to erode if they are not protected by vegetation. Erosion caused by man’s activities modifies the natural soil layers, obliterating them completely in places.

Temperature influences the native vegetation, the living organisms within the soil, and the rate of the chemical weathering processes. The mean annual temperature of 50 degrees F. in the State assures rapid biological activity and rather rapid decomposition of organic mailer if the soils are well aerated. In poorly drained and very poorly drained areas, where the soil is saturated for long periods, biological activity is slow and organic mailer accumulates.

The action of frost affects soil structure and increases the aggregation of soil particles within the frost zone. Increased aggregation increases the rate of water movement through the soil and increases leaching of soluble chemicals.

Parent material

Parent material is the unconsolidated mass in which the soil forms. It determines the mineralogical and chemical composition of the soil and, to a large extent, the rate at which the soil forms.

Soils inherit characteristics from the parent material. For example, the darker colored phyllite, slate, shale, and schist from Newport and Bristol Counties in the southeastern part of the State formed darker colored or black soils. The grayish gneiss, schists, and granites in other parts of the State formed soils with a grayish or olive-colored substratum.

Parent material forms the mineral part of the soil and influences mineralogy and texture of the soil. Rock fragments contain many kinds of minerals, but when pulverized to sand, silt, and clay size particles, they are often reduced to individual mineral particles. Soil minerals in Rhode Island are mainly quartz, feldspar, and mica. Other minerals are hornblende, tourmaline, epidote, magnetite, augite, and garnet. Vermiculite and illite are the dominant clay minerals in most of the soils. Small amounts of chlorite, kaolinite, and hydrated iron oxides are in the clay fraction of some soils.

The soils in the State formed in glacial drift of many textures. Glacial till, deposited as a mass by the glacier, consists of a mixture of particles ranging in size from large boulders to clay particles.

Glacial till overlies bedrock at a depth ranging from a few inches to a hundred feet or more. Glacial outwash was deposited where water from the melting glacier laid down stratified deposits of sand, gravel, and, in many places, cobbles. Glacial outwash is primarily in the valleys or outwash plains, but occasional deposits are high above the valley in kames or ice-contact deposits.

The substratum of most soils has the same texture as when deposited by the glacier. The surface layer and subsoil have been more influenced by soil forming factors and generally have smaller particles and are finer textured than the substratum.

The youngest soils in the State formed in alluvial sediments on flood plains. In most places, these soils receive annual deposits of sediment.

Other young soils in the State are in tidal marshes along Block Island Sound, Narragansett Bay, or Rhode Island Sound. These areas receive small deposits of silt and clay from daily tidal inundation and from surrounding uplands. The sediments are deposited with plant remains of salt-tolerant plants growing in the marshes.

Living organisms

One of the features that distinguishes a soil from the parent material from which it formed is its organic constituents, the living plants and animals and their decayed or decaying remains.

Living organisms such as bacteria and fungi influenced the weathering process early in soil formation. Later these simple life forms were supplemented with a more complex plant and animal life. In Rhode Island, the dominant form of plant life that developed was forest vegetation. Presently, the forest cover is mainly oak, hickory, maple, hemlock, white pine, pitch pine, and mountain laurel.

Although vegetation is the most common type of living organism, soil formation is strongly influenced by other life forms. These are mainly micro-organisms, earth worms, larvae, burrowing animals, and other forms of life, including man. They are important in the cycle of decaying regenerating vegetation which produces organic matter and nutrients. Nutrients absorbed by plants are returned to the soil by leaf fall and by decay of the plant itself. Organic matter is mixed into the soil by earth worms, burrowing animals, and decaying roots. Tree windthrow and the activities of man hasten soil mixing.

Man’s activities have had an effect on soil formation during the last few centuries. Clearing of land, cultivation, use of lime and fertilizers, artificial drainage, grading, and the introduction of new plants are several ways man has affected soil formation, which in turn affects soil characteristics.

Relief

The effect of relief on soil formation is influenced by slope gradient and orientation. In places where parent materials are similar, the soils formed on steep areas have a thinner surface layer and subsoil and less developed structure than the soils formed on less sloping areas. On landforms with steep slopes, orientation has an effect on vegetation: south-facing slopes are warmer and dryer; north-facing slopes are cool and moist. This difference affects plant species and the kinds of animals living in and on the soil.

Relief influences the drainage of soils. Poorly drained and very poorly drained soils are in nearly level or concave positions and in depressions on the landscape. Moderately well drained soils are on nearly level to sloping, generally concave positions. Well drained to excessively drained soils are on convex slopes and the higher parts of the landscape, where runoff cannot accumulate.

Time

The degree of profile expression is dependent not only on the intensity of soil formation processes, but also on the duration of these processes. In terms of pedological time, the soils of Rhode Island are young, about 10,000 to 15,000 years old. These comparatively young soils have layers that, except for color, are weakly developed. In the upland area, where the parent material is gneiss, schist, and granite, the color is well developed in the subsoil. In soils developed in darker phyllite, slate, shale, and schist, the color development is somewhat masked by the inherited darker color of the parent material.

The soils of recent alluvial origin are younger than the soils formed in glacial drift. The recent alluvial soils lack even the color development that characterizes the soils formed in glacial drift. Many soils of alluvial origin continue to receive sediment. Soils in the tidal marshes receive annual increments of silt, clay, and organic matter eroded from surrounding uplands or winnowed from the bottoms of Block Island Sound and Rhode Island Sound and deposited on the marsh surface by daily tides.

Morphology of soils

Most soils contain three major horizons, or layers, called the A, B, and C horizons. Some soils, particularly those in forests and tidal marshes, also have a 0 horizon at the surface, and it consists mainly of organic material. The major horizons can be subdivided by the use of numbers and letters to indicate differences within the horizon. The C1 g horizon, for example, represents the uppermost part of a C horizon. The Whitman soils have a C1g horizon.

The A horizon is a mineral surface layer. An A1 horizon is darkened by humified organic matter. An Ap horizon is a plow layer, commonly also darkened by organic matter. The A horizon is the layer of maximum leaching of clay and iron. If considerable leaching has taken place and organic matter has not darkened the material, the horizon is called the A2. Where it occurs, the A2 horizon is normally the lightest colored horizon in the soil.

The B horizon underlies the A horizon and is commonly called the subsoil. It is the horizon of maximum accumulation of clay, iron, aluminum, or other substances leached from the A horizon. In some soils, the B horizon is formed by alteration in place rather than by accumulation. The alteration may be caused by oxidation and reduction of iron or by weathering of clay minerals. The B horizon generally is firmer and lighter colored than the A horizon but darker colored than the C horizon.

The C horizon is below the A or B horizon. It consists of materials that are little altered by the soil forming processes, but it may be modified by weathering. In youthful soils, such as those that formed in recent alluvium or in man-deposited fill materials, the C horizon may reach or nearly reach the soil surface, and the B horizon, and in places even the A horizon may be absent. The Matunuck soils, for example, do not have an A or B horizon.

Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to “Soil taxonomy” (*6*).

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories

are the result of soil genesis or of factors that affect soil genesis. In table 27, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil forming processes that have taken place. Each order is identified by a word ending in *sol.* An example is Entisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu,* meaning water, plus *ent* from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haplaquents (*Hapl, m*eaning simple horizons, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-loamy, mixed, nonacid, mesic Typic Haplaquents

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying sub stratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*4*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units, of each soil series are described in the section “Soil maps for detailed planning.”

Adrian series

The Adrian series consists of sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists. These very poorly drained soils formed in organic material derived from herbaceous plants and are underlain by sand and gravel. The soils are in depressions and small drainageways of glacial till uplands and outwash plains. Slopes are less than 2 percent.

The Adrian soils are on the landscape near excessively drained Merrimac soils, well drained Canton and Charlton soils, and very poorly drained Scarboro soils. The Adrian soils formed in a thicker layer of organic material than the Scarboro soils.

Typical pedon of Adrian muck, in Providence County, town of Scituate, about 800 feet northwest of a historical cemetery, on the southern side of Byron Randall Road:

Oa1 —0 to 5 inches, black (N 2/0) broken face, and black (10YR 2/1) rubbed muck (sapric material); 10 percent fiber, 2 percent rubbed; massive; friable; primarily herbaceous fibers; strongly acid; abrupt wavy boundary.

0a2—5 to 20 inches, black (N 2/0) broken face, and black (10YR 2/1) rubbed muck (sapric material); 2 percent fiber, less than 1 percent rubbed; massive; friable; primarily herbaceous fibers; medium acid; abrupt wavy boundary.

2C1—20 to 22 inches, gray (10YR 5/1) fine sand; single grain; loose; strongly acid; abrupt smooth boundary.

2C2—22 to 60 inches, grayish brown (10YR 5/2) gravelly sand; single grain; loose; 25 percent coarse fragments; strongly acid.

The organic layers range from 16 to 50 inches thick. The material is derived mainly from herbaceous plants. Woody fragments of twigs and sticks make up 0 to 15 percent of the organic layers. Coarse fragments make up from 0 to 30 percent of the IIC horizon. The soils are strongly acid through slightly acid.

The Oal layer has chrorna of 0 to 1. This layer is mainly sapric material; in some pedons it has thin layers of hemic material.

The 0a2 layer has hue of 5YR through 1OYR, value of 2 or 3, and chroma of 0 through 3. This layer is mainly sapric material; in some pedons it has thin layers of hemic material.

The IIC horizon has chroma of 1 or 2. It is sand, loamy sand, fine sand, or their gravelly analogs.

Agawam series

The Agawam series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. These well drained soils formed in glaciofluvial deposits derived mainly from schist, gneiss, and phyllite. The soils are on terraces and outwash plains. Slopes range from 0 to 8 percent.

Agawam soils are associated on the landscape with moderately well drained Ninigret soils. On nearby terraces are excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Enfield soils, and moderately well drained Ninigret, Sudbury, and Deerfield soils. Agawam soils have a coarser textured solum than Enfield soils.

Typical pedon of Agawam fine sandy loam, 0 to 3 percent slopes, in Washington County, town of South Kingstown, about 2,500 feet northeast of Route 138, and 50 feet east of Yawgoo Pond Road:

02—2 inches to 0, dark brown (7.5YR 3/2) partially decomposed organic matter.

Ap—0 to 7 inches, dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt wavy boundary.

B21—7 to 17 inches, yellowish brown (10YR 5/6) fine sandy loam; moderate medium subangular blocky structure; friable; common fine roots; 2 percent coarse fragments; strongly acid; clear smooth boundary.

B22—17 to 27 inches, reddish yellow (7.5YR 6/6) fine sandy loam; moderate medium subangular blocky structure; friable; few fine roots; 2 percent coarse fragments; strongly acid; clear smooth boundary.

B23—27 to 32 inches, light yellowish brown (1OYR 6/4) fine sandy loam; moderate medium subangular blocky structure; friable; strongly acid; abrupt smooth boundary.

IICl—32 to 38 inches, pale brown (10YR 6/3) sand; single grain; loose; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

IIC2—38 to 60 inches, pale brown (10YR 6/3) gravelly sand; single grain; loose; stratified; 20 percent coarse fragments; strongly acid.

Thickness of the solum ranges from 15 to 35 inches. Coarse fragments make up 0 to 5 percent of the solum, 0 to 30 percent of the IIC horizon above a depth of 40 inches, and 0 to 50 percent of the IIC horizon below a depth of 40 inches. The soil is very strongly acid through slightly acid.

The A horizon has hue of 7.5YR through 2.5Y, value of 2 through 4, and chroma of 1 through 4. The A horizon is fine sandy loam or very fine sandy loam.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 through 7, and chroma of 4 through 8. It is fine sandy loam or very fine sandy loam in the upper part and fine sandy loam in the lower part. Some pedons have a sandy loam or loamy sand B3 horizon up to 5 inches thick.

The IIC horizon has hue of 1OYR through 5Y, value of 3 through 7, and chroma of 1 through 4. It is loamy fine sand, loamy sand, fine sand, sand, or their gravelly analogs. The horizon is stratified. Consistence is very friable or loose.

Birchwood series

The Birchwood series consists of sandy, mixed, mesic Typic Fragiochrepts. These moderately well drained soils formed in compact glacial till derived mainly from schist, gneiss, and phyllite. The soils are in transitional positions between uplands and outwash terraces. Slopes range from 0 to 3 percent.

Birchwood soils are associated on the landscape with well drained Poquonock soils. Birchwood soils are near moderately well drained Woodbridge, Rainbow, and Pittstown soils and poorly drained Ridgebury and Stissing soils. Birchwood soils have a coarser textured solum than Woodbridge, Rainbow, and Pittstown soils.

Typical pedon of Birchwood sandy loam, in Bristol County, town of Bristol, about 1,250 feet west of Usher Point, on Popasquash Neck:

Ap—0 to 10 inches, dark brown (10YR 3/3) sandy loam; weak coarse granular structure; very friable; many fine roots; 2 percent rock fragments; strongly acid; abrupt smooth boundary.

B21—10 to 15 inches, yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable; common fine roots; 10 percent rock fragments; strongly acid; clear wavy boundary.

B22—15 to 24 inches, yellowish brown (10YR 5/4) loamy sand; common medium distinct dark brown (10YR 4/3) and grayish brown (10YR 5/2) mottles; single grain; loose; few fine roots; 10 percent rock fragments; strongly acid; clear wavy boundary.

IICx—24 to 60 inches, black (5Y 2/1) gravelly sandy loam; weak thick platy structure; very firm; 25 per cent rock fragments; strongly acid.

Thickness of the solum ranges from 20 to 36 inches. Rock fragments make up 0 to 10 percent of the solum and 10 to 30 percent of the substratum. The soil is very strongly acid through medium acid.

The A horizon has hue of 7.5YR or 1OYR, value of 3 or 4, and chroma of 2 or 3. It is loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

The B horizon has hue of 7.5YR through 2.5Y and value and chroma of 4 through 6. It is loamy fine sand, loamy sand, or fine sand. The lower part of the horizon has distinct or prominent mottles.

The IICx horizon has hue of 2.5Y or 5Y value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, sandy loam, loam, silt loam, or their gravelly analogs.

Bridgehampton series

The Bridgehampton series consists of coarse-silty, mixed, mesic Typic Oystrochrepts. These well drained to moderately well drained soils formed in outwash and glacial till deposits derived mainly from schist, gneiss, and phyllite. The soils are on glacial till uplands and outwash terraces. The surface ranges from nonstony to extremely stony. Slopes range from 0 to 15 percent on the mainland and 0 to 35 percent on Block Island.

The Bridgehampton soils are on the landscape with well drained Enfield and Narragansett soils; moderately well drained Tisbury, Wapping, and Scio soils; and poorly drained Raypol soils. Bridgehampton soils have a thicker solum than Narragansett or Enfield soils.

Typical pedon of Bridgehampton silt loam, 0 to 3 percent slopes, in Washington County, town of Charlestown, on the eastern edge of the U. S. Naval Air Station auxiliary landing field:

Ap—0 to 8 inches, very dark grayish brown (1OYR 3/2) silt loam; weak fine and medium granular structure; very friable; few pebbles; strongly acid; abrupt smooth boundary.

B21 —8 to 16 inches, dark yellowish brown (1OYR 4/4) silt loam; weak medium subangular blocky structure; very friable; few pebbles; strongly acid; clear wavy boundary.

B22—16 to 24 inches, brown (1OYR 5/3) silt loam; weak medium subangular blocky structure; very friable; strongly acid; clear wavy boundary.

A’2—24 to 32 inches, grayish brown (2.5YR 5/2) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; massive; very friable; strongly acid; clear wavy boundary.

B’2—32 to 38 inches, strong brown (7.5YR 5/8) silt loam; massive; very friable; strongly acid; clear wavy boundary.

B’3—38 to 41 inches, light olive brown (2.5Y 5/4) very fine sandy loam; few fine distinct grayish brown (2.5Y 5/2) mottles; massive; very friable; strongly acid; clear wavy boundary.

IIC—41 to 60 inches, grayish brown (2.5Y 5/2) very gravelly sand; single grain; loose; stratified; 55 per cent coarse fragments; common silt caps on coarse fragments; strongly acid.

Thickness of the solum ranges from 40 to 56 inches. Coarse fragments make up 0 to 10 percent of the solum and 10 to 70 percent of the substratum. The soil is very strongly acid through medium acid.

The A horizon has value and chroma of 2 or 3. It is silt loam or very fine sandy loam.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 3 through 6. It is silt loam or very fine sandy loam.

The A'2 horizon has hue of 1OYR through 5Y, value of 5 or 6, and chroma of 1 through 3. This horizon is faintly or distinctly mottled in most pedons. It is silt loam, silt, or very fine sandy loam.

The B'2 and B'3 horizons have hue of 5YR through 2.5Y, value of 4 through 6, and chroma of 4 through 8. They are silt loam, silt, or very fine sandy loam.

The IIC horizon has hue of 5YR through 5Y, value of 4 through 7, and chroma of 2 through 6. It is sandy loam through sand or their gravel or very gravelly analogs.

Broadbrook series

The Broadbrook series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These well drained soils formed in a silt mantle over compact glacial till derived mainly from schist, gneiss, and phyllite. The soils are on side slopes and crests of drumlins. Slopes range from 0 to 8 percent.

Broadbrook soils are associated on the landscape with moderately well drained Rainbow soils. They are near well drained Narragansett and Newport soils, moderately well drained Woodbridge soils, and poorly drained Ridge- bury and Stissing soils. Broadbrook soils have a lighter colored solum than Newport soils and a more compact substratum than Narragansett soils.

Typical pedon of Broadbrook silt loam in an area of Broadbrook very stony silt loam, 0 to 8 percent slopes, in Newport County, town of Tiverton, 0.2 mile east of the intersection of Route 179 and Lake Road:

Ap—0 to 9 inches, dark brown (7.5YR 3/2) silt loam; weak medium granular structure; very friable; many fine and coarse roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

B21—9 to 16 inches, yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; very friable; few coarse and medium roots; 10 percent rock fragments; strongly acid; gradual wavy boundary.

B22—16 to 28 inches, light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; very friable; few coarse and medium roots; 10 percent rock fragments; strongly acid; gradual wavy boundary.

B23—28 to 36 inches, light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent rock fragments; strongly acid; abrupt smooth boundary.

Cx—36 to 60 inches, light yellowish brown (2.5Y 6/4) fine sandy loam; weak medium platy structure; very firm; 15 percent rock fragments; strongly acid.

Thickness of the solum ranges from 20 to 40 inches. Rock fragments make up 0 to 10 percent of the solum and 10 to 25 percent of the Cx horizon. The soil is very strongly acid through medium acid.

The A horizon has hue of 7.5YR or 1OYR, value of 3 or 4, and chroma of 2 through 4. It is silt loam or very fine sandy loam.

The B horizon has hue of 1OYR or 2.5Y, value of 4 or 5, and chroma of 3 through 6. It is silt loam or very fine sandy loam.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. It is fine sandy loam, sandy loam, or their gravelly analogs. Structure is weak, medium or thick, platy.

Canton series

The Canton series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. These well drained soils formed in glacial till derived mainly from schist and gneiss. The soils are on crests and side slopes of glacial upland hills and ridges. Slopes range from 0 to 35 percent.

Canton soils are on the landscape with well drained Charlton, Narragansett, and Paxton soils; moderately well drained Sutton soils; and poorly drained Leicester and Ridgebury soils. Canton soils have a coarser textured C horizon than Charlton and Paxton soils and a coarser textured solum than Narragansett soils.

Typical pedon of Canton fine sandy loam in an area of Canton and Charlton fine sandy loams, 3 to 8 percent slopes, in Washington County, town of Exeter, Arcadia State Management Area, about 20 feet northeast of the intersection of Frost Hollow Road and Plain Road:

Al —0 to 3 inches, very dark grayish brown (1OYR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent rock fragments; very strongly acid; abrupt smooth boundary.

B21—3 to 10 inches, dark yellowish brown (1OYR 4/4) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent rock fragments; very strongly acid; gradual smooth boundary.

B22—10 to 17 inches, yellowish brown (l0 5/4) fine sandy loam; massive; very friable; common fine roots; 5 percent rock fragments; very strongly acid; gradual smooth boundary.

B23—17 to 22 inches, light olive brown (2.5Y 5/4) fine sandy loam; massive; very friable; few medium roots; 10 percent rock fragments; very strongly acid; abrupt wavy boundary.

IIC1 22 to 32 inches, olive gray (2.5Y 5/2) gravelly loamy sand; single grain; loose; few coarse roots; 30 percent rock fragments; very strongly acid; gradual wavy boundary.

IIC2—32 to 60 inches, light olive gray (5Y 6/2) gravelly loamy sand; single grain; loose; few coarse roots; 35 percent rock fragments; strongly acid.

Thickness of the solum ranges from 18 to 36 inches. Rock fragments make up 5 to 30 percent of the solum and 15 to 50 percent of the substratum. The soil is extremely acid through strongly acid.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is fine sandy loam, very fine sandy loam, or their gravelly analogs.

The B21 horizon has hue of 7.5YR or 1OYR, value of 4 or 5, and chroma of 4 through 8. The B22 and B23 horizons have hue of 1OYR or 2.5Y, value of 4 through 7, and chroma of 4 through 6. The B horizon is fine sandy loam, very fine sandy loam, or their gravelly analogs.

The IIC horizon has hue of 2.5 or 5Y, value of 5 through 7, and chroma of 2 or 3. It is loamy sand, loamy fine sand, loamy coarse sand, or their gravelly analogs. The IIC horizon is single grain, or the horizon is massive. Consistence is very friable or loose.

Carlisle series

The Carlisle series consists of euic, mesic Typic Medisaprists. These very poorly drained, organic soils formed in deep organic deposits in depressions in outwash plains, till plains, and moraines. Slopes are less than 2 percent.

Carlisle soils are on the landscape with excessively drained Hinckley soils on outwash terraces, well drained Canton and Charlton soils on till uplands, and very poorly drained Adrian soils in depressions. Carlisle soils formed in thicker organic deposits than Adrian soils.

Typical pedon of Carlisle muck, in Washington County, town of North Kingstown, 100 feet northeast of North Kingstown pumping station:

Oal—0 to 8 inches, black (5YR 2/1) broken face and rubbed muck (sapric material); 40 percent fiber, 5 percent rubbed; weak medium granular structure; slightly sticky and slightly plastic; many fine and medium roots; medium acid; clear smooth boundary.

Oa2—8 to 15 inches, black (N 2/0) broken face and rubbed muck (sapric material); 10 percent fiber, less than 5 percent rubbed; weak medium granular struc ture; slightly sticky and slightly plastic; few fine roots; medium acid; clear smooth boundary.

0a3—15 to 22 inches, black (5YR 2/1) broken face and rubbed muck (sapric material); 80 percent fiber, less than 5 percent rubbed; weak medium granular structure; slightly sticky and slightly plastic; medium acid; clear wavy boundary.

0a4—22 to 33 inches, dark reddish brown (5YR 2/2) broken face; black (5YR 2/1) rubbed muck (sapric material); 10 percent fiber, less than 5 percent rubbed; massive; slightly sticky and slightly plastic; medium acid; gradual smooth boundary.

Oa5—33 to 42 inches, dark reddish brown (5YR 2/2) broken face; black (5YR 2/1) rubbed muck (sapric material); massive; slightly sticky and slightly plastic; medium acid; abrupt smooth boundary.

Oa6—42 to 55 inches, dark reddish brown (5YR 2/2) broken face and rubbed muck (sapric material); 90 very sticky and plastic; medium acid; abrupt smooth boundary.

IIC—55 to 60 inches, gray (5Y 5/1) loamy sand; single grain; loose; medium acid.

The organic layer is more than 51 inches thick. Woody fragments of twigs and branches up to 1 foot in diameter and logs and stumps make up to 0 to 15 percent of the organic layer. The soil is medium acid through neutral. The surface layer has neutral colors, or it has hue of 5YR through 10YR, value of 2, and chroma of 0 or 1. This layer has weak or medium, coarse to fine granular structure.

The subsurface layer has neutral colors, or it has hue of 5YR through 10YR, value of 2 or 3, and chroma of 0 or 1. This layer has weak or medium, coarse to fine granular structure.

The subsurface layer has neutral colors, or it has hue of through 3. It has weak subangular blocky structure or thick platy structure, or the layer is massive. IN some pedons it has layers of hemic material as much as 10 inches thick.

The IIC horizon has hue of 10YR through 5Y, value of 2 through 5, and chroma of 1 through 3. It is sand, loamy sand, or their gravelly analogs.

Charlton series

The Charlton series consists of coarse-loamy, mixed mesic Typic Dystrochrepts. These well drained soils formed in friable glacial till deposits derived mainly from schist and gneiss. The soils are on side slopes and crests of upland hills and ridge. Slopes range from 0 to 35 percent.

Charlton soils are associated on the landscape with moderately well drained Sutton soils and poorly drained Leicester soils. They are near well drained Canton, Narragansett, and Paxton soils and poorly drained Ridgebury soils. Charlton soils have a finer textured substratum than Canton soils, a coarser textured solum than Narragansett soils, and a more friable substratum then Paxton soils.

Typical pedon of Charlton fine sand loam in an area of Canton and Charlton fine sandy loams, 8 to 15 percent slopes, in Kent County, town of Coventry, in a road cut on Read School House Road, 1.4 miles north of the junction with Rhode Island Route 117:

0—2 inches to 0, partially decomposed and well decomposed forest litter.

A1—0 to 2 inches, very dark brown (10YR 2/2) fine sandy loam; weak fine granular structure; very friable; few fine roots; 5 percent rock fragments strongly acid; abrupt smooth boundary.

B21—2 to 17 inches, dark yellowish brown (10YR 4/6) fine sandy loam; weak medium granular structure; very friable; common fine roots; 10 percent rock fragments; strongly acid; clear smooth boundary.

B22--17 to 27 inches, yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; very friable; common fine and medium roots; 25 percent rock fragments; strongly acid; clear smooth boundary.

C—27 to 60 inches, light brownish gray (2.5Y 6/2) gravelly sandy loam; weak medium granular structure very friable; few fine roots; 35 percent rock fragments; strongly acid.

Thickness of the solum ranges from 20 to 36 inches. Rock fragments make up 5 to 35 percent of this soil. The soil is very strongly acid through medium acid. The A1 horizon has value and chroma of 2 or 3. The value of 3 or 4, and chroma of 2 through 4. The horizon is fine sandy loam or sandy loam.

The B21 and B22 horizons have hue of 7.5YR or 10YR and value and chroma of 4 through 6. The B horizon is fine sandy loam, sandy loam, or their gravelly analogs. The B horizon is massive. Consistence is very friable or friable.

The C horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 4. It is fine sandy loam, or their gravelly analogs.

Deerfield series

The Deerfield series consists of mixed, mesic Aquic Udipsamments. These moderately well drained soils formed in sandy outwash deposits derived from granite, gneiss, and quartzite. They are in low-lying areas of terraces and outwash plains. Slopes range from 0 to 3 percent.

The Deerfield soils are on the landscape with excessively drained Hinckly and Windsor soils, somewhat excessively drained Merrimac soils, moderately well drained Sudbury soils, and poorly drained Walpole soils. Deerfield soils are coarser textured then Sudbury soils.

Typical pedon of Deerfield loamy fine sand, in Washington County, town of Richmond about 2,000 feet east of Town House Road and 2,500 feet north of Shannock Hill Road:

Ap—0 to 8 inches, black (10YR 2/1) loamy fine sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B21—8 to 18 inches, dark yellowish brown (10YR 4/4) loamy sand; weak medium granular structure; very friable; common fine and medium roots; medium acid; clear wavy boundary.

B22—18 to 24 inches, yellowish brown (10YR 5/4) loamy sand; common medium distinct dark brown (7.5YR 4/4) mottles; weak medium granular structure; very friable; common fine and medium roots; medium acid; clear smooth boundary.

B3—24 to 34 inches, light olive brown (2.5Y 5/4) fine sand; many medium distinct dark brown (7.5YR 4/4) mottles; single grain; loose; few fine roots; medium acid; clear wavy boundary.

C—34 to 60 inches, olive (5Y 5/3) fine sand; few fine faint light olive gray (5Y 6/2) mottles and many medium distinct dark yellowish brown (10YR 4/4) mottles; single grain; loose; strongly acid.

The solum ranges from 15 to 35 inches thick. Coarse fragments make up as much as 15 percent of the solum and up to 20 percent of the substratum. The soil is very strongly acid through slightly acid.

The A horizon has value of 2 through 4 and chroma of 1 through 3. The horizon is fine sandy loam through sand. Structure is weak or medium granular.

The B horizon has hue of 7.5YR through 2.5Y, value of 3 through 6, and chroma of 2 through 6. The horizon is fine sandy loam through sand to a depth of 10 inches and loamy fine sand through coarse sand below a depth of 10 inches. It has weak, fine to medium granular structure, or the horizon is single grain.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 1 through 4. It is loamy sand through coarse sand.

Enfield series

The Enfield series consists of coarse-silty over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. These well drained soils formed in silt mantled outwash deposits derived mainly from schist, gneiss, and phyllite. The soils are on terraces and outwash plains. Slopes range from 0 to 15 percent.

The Enfield soils are on the landscape with excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Bridgehampton and Agawam soils, moderately well drained Tisbury soils, and poorly drained Walpole soils. Enfield soils formed in a thinner silt mantle than Bridgehampton soils and have a finer textured solum than Agawam soils.

Typical pedon of Enfield silt loam, 0 to 3 percent slopes, in Washington County, town of South Kingstown, about 50 feet south of Matunuck School House Road, on the northeast corner of the Trustom Pond Refuge:

Ap—0 to 7 inches, dark grayish brown (1OYR 4/2) silt loam; moderate fine granular structure; friable; many fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—7 to 16 inches, strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; many fine roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B22—16 to 25 inches, light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; 5 percent coarse f ragments; strongly acid; abrupt wavy boundary.

IIC—25 to 60 inches, brown (10YR 5/3) very gravelly sand; single grain; loose; stratified; 50 percent coarse fragments; strongly acid.

The solum ranges from 15 to 40 inches thick. Coarse fragments make up as much as 10 percent of the solum and 25 to 70 percent of the substratum. The soil is very strongly acid through medium acid.

The A horizon has value of 3 or 4 and chroma of 2 or 3. The horizon is silt loam or very fine sandy loam. It has weak or moderate, fine or medium granular structure.

The B21 horizon has hue of 7.5YR or 1OYR, value of 4 or 5, and chroma of 3 through 8. The B22 horizon has hue of 1OYR or 2.5Y, value of 4 through 6, and chroma of 3 through 6. It is silt loam or very fine sandy loam.

The IIC horizon has neutral colors, or it has hue of 1OYR through 2.5Y, value of 4 through 6, and chroma of 0 to 6. The horizon is sand, coarse sand, fine sand, or their gravelly or very gravelly analogs. The horizon is stratified.

Gloucester series

The Gloucester series consists of sandy-skeletal, mixed, mesic Typic Dystrochrepts. These somewhat excessively drained soils formed in glacial till derived mainly from schist, gneiss, and granite. They are on side slopes and crests of glacial till upland hills and recessional moraines. Slopes range from 3 to 35 percent.

Gloucester soils are on the landscape with excessively drained Hinckley soils and well drained Paxton, Canton, and Charlton soils.

Typical pedon of Gloucester sandy loam in an area of Gloucester-Hinckley very stony sandy loams, rolling, in Washington County, town of South Kingstown, about 250 feet northeast of the junction of old U.S. Route 1 and Ministerial Road:

01—2 inches to 1 inch, loose leaves and largely undecomposed organic debris.

02—1 inch to 0, black (10YR 2/1) partially decomposed organic matter.

Ap—0 to 5 inches, dark brown (10YR 4/3) gravelly sandy loam; weak medium granular structure; very friable; common medium roots; 20 percent rock fragments; strongly acid; abrupt smooth boundary.

B21 —5 to 14 inches, brownish yellow (1OYR 6/6) gravelly sandy loam; weak medium granular structure; very friable; few fine roots; 35 percent rock fragments; strongly acid; gradual wavy boundary.

B22—14 to 22 inches, light yellowish brown (2.5Y 6/4) gravelly loamy sand; weak tine granular structure; very friable; few tine roots; 35 percent rock fragments; strongly acid; abrupt smooth boundary.

C—22 to 60 inches, light brownish gray (2.5Y 6/2) very gravelly loamy sand; single grain; loose; few fine roots; 55 percent rock fragments; strongly acid.

The solum ranges from 20 to 36 inches thick. Rock fragments make up 35 to 65 percent of the soil. The soil is extremely acid through medium acid.

The Ap horizon has value of 3 or 4 and chroma of 2 or 3. The Al horizon, where present, has value of 2 through 4 and chroma of 1 through 3. The A horizon is fine sandy loam, sandy loam, loamy sand, or their gravelly analogs.

The B21 horizon has hue of 7.5YR or 1OYR. The B22 horizon has hue of 1OYR or 2.5Y. The B horizon has value of 4 through 6 and chroma of 3 through 8. It is

fine sandy loam, sandy loam, loamy sand, or their gravelly and very gravelly analogs to a depth of 15 inches. Below 15 inches, it is loamy fine sand, loamy sand, loamy coarse sand, or their gravelly and very gravelly analogs.

The C horizon has hue of 1OYR or 2.5Y, value of 4 through 6, and chroma of 1 through 4. It is loamy coarse sand, loamy fine sand, loamy sand, or their gravelly and very gravelly analogs.

Hinckley series

The Hinckley series consists of sandy-skeletal, mixed, mesic Typic Udorthents. These excessively drained soils formed in glaciofluvial deposits derived mainly from schist and gneiss. The soils are on terraces, outwash plains, and recessional moraines. Slopes range from 0 to 35 percent.

Hinckley soils are on the landscape with excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Hinckley soils have more coarse fragments than Windsor soils.

Typical pedon of Hinckley gravelly sandy loam, rolling, in Providence County, town of Johnston, about 1,300 feet northwest of Brown Avenue and 1.1 miles north of

U.S. Route 6:

Ap—O to 6 inches, dark brown (1OYR 4/3) gravelly sandy loam; weak fine granular structure; very friable; many fine roots; 20 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—6 to 10 inches, yellowish brown (10YR 5/6) gravelly sandy loam; weak medium granular structure; very friable; common fine roots; 30 percent coarse fragments; strongly acid; clear wavy boundary.

B22—10 to 17 inches, light yellowish brown (10YR 6/4) gravelly loamy sand; single grain; loose; few fine roots; 30 percent coarse fragments; strongly acid; abrupt wavy boundary.

C—17 to 60 inches light brownish gray (10YR 6/2) very gravelly sand; single grain; loose; stratified; 55 percent coarse fragments; medium acid.

The solum ranges from 12 to 30 inches thick. Coarse fragments make up 10 to 50 percent of the solum and 35 to 60 percent of the substratum. The soil is extremely acid through medium acid.

The Ap or Al horizon has value of 2 through 4 and chroma of 1 through 3, with value of 2 limited to the Al horizon. The A horizon is very fine sandy loam through loamy coarse sand or their gravelly analogs. It has weak, fine or medium granular structure. Consistence is friable or very friable.

The B21 horizon has hue of 7.5YR or 1OYR, value of 4 or 5, and chroma of 4 through 8. The B22 horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 4 through 8. To a depth of 10 inches the B horizon is fine sandy loam through loamy coarse sand, or their gravelly analogs. Below 10 inches it is

loamy fine sand through loamy coarse sand or their gravelly or very gravelly analogs. The B horizon has weak granular structure, or it is single grain. Consistence is very friable or loose.

The C horizon has hue of 1OYR through 2.5Y, value of 5 through 7, and chroma of 2 through 4. It is gravelly loamy fine sand through gravelly coarse sand or their very gravelly analogs. The horizon is stratified.

Ipswich series

The lpswich series consists of euic, mesic Typic Sulfi hemists. The soils are very poorly drained and are subject to daily saltwater tidal inundation. lpswich soils formed in organic material derived from salt-tolerant her baceous plants. The soils are on tidal flats and marshes along bays and coves. Slopes are less than 1 percent.

lpswich soils are on the landscape with very poorly drained Matunuck soils, Beaches, and Udipsamments. lpswich soils formed in a thicker organic layer than Matunuck soils.

Typical pedon of lpswich peat, in Newport County, town of Tiverton, about 0.6 mile west of Route 77, and 400 feet east of Sapowet Road, in the Sapowet Marsh Wildlife Preserve:

0I—0 to 11 inches, very dark grayish brown (1OYR 3/2) peat, 80 percent fiber, 45 percent rubbed; dense mat of roots, stems, and leaves; massive; many roots; herbaceous fibers; 30 percent silt and very fine sand; 43,000 parts per million total salt; neutral; abrupt smooth boundary.

Oel—l1 to 17 inches, very dark grayish brown (10YR 3/ 2) mucky peat; 60 percent fiber, 30 percent rubbed; herbaceous fibers; 40 percent silt and very fine sand; 39,000 parts per million total salt; neutral; abrupt smooth boundary.

0e2—17 to 46 inches, very dark grayish brown (10YR 3/2) mucky peat; 40 percent fiber, 25 percent rubbed; herbaceous fibers; 40 percent silt and very fine sand; 37.000 parts per million total salt; neutral; abrupt smooth boundary.

0e3—46 to 70 inches, very dark grayish brown (2.5Y 3/2) mucky peat; 70 percent fiber, 20 percent rubbed; herbaceous fibers; 40 percent silt and very fine sand; 35,000 parts per million total salt; neutral.

The organic layer is more than 51 inches thick. This soil is strongly acid through neutral in its natural condition. Thin layers of very fine sand and silt are common in the organic layer.

The surface layer has neutral colors, or it hue of 1OYR through 5Y, value of 2 through 4, and chroma of 0 through 3. Mineral content is 15 to 80 percent.

The subsurface layer has neutral colors, or it has hue of 1OYR through 5Y, value of 2 through 4, and chroma of 0 through 3. Mineral content ranges from 25 to 80 percent.

The bottom layer has neutral colors, or it has hue of 2.5Y or 5Y, value of 2 through 4, and chroma of 0 through 3. Mineral content ranges from 25 to 80 percent.

Leicester series

The Leicester series consists of coarse-loamy, mixed, acid, mesic Aeric Haplaquepts. These poorly drained soils formed in loamy glacial till derived mainly from schist, gneiss, and granite. The soils are in depressions and small drainageways in glacial till uplands. The surface is extremely stony. Slopes range from 0 to 3 percent.

Leicester soils are on the landscape with well drained Charlton and Paxton soils, moderately well drained Sutton and Woodbridge soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils. Leicester soils have a more friable C horizon than Ridgebury soils.

Typical pedon of Leicester fine sandy loam, in an area of Ridgebury, Whitman, and Leicester extremely stony fine sandy loams, in Washington County, town of Charlestown, about 150 feet north of Shumankantuc Hill Road and 2,000 feet west of the intersection of Kings Factory Road:

A1—0 to 8 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; common fine roots; 10 percent rock fragments; strongly acid; clear wavy boundary.

B21 g—8 to 18 inches, light brownish gray (1OYR 6/2) fine sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak fine granular structure; friable; few fine roots; 15 percent rock fragments; strongly acid; clear wavy boundary.

B22—18 to 26 inches, light yellowish brown (2.5Y 6/4) fine sandy loam; common fine distinct yellowish brown (1OYR 5/6) and strong brown (7.5YR 5/6) mottles; weak fine granular structure; friable; few fine roots; 15 percent rock fragments; strongly acid; clear wavy boundary.

Cg—26 to 60 inches, gray (5Y 5/1) gravelly sandy loam; common fine prominent brown (7.5YR 5/4) and gray (N 5/0) mottles; massive; friable; 20 percent rock fragments; strongly acid.

The solum ranges from 20 to 36 inches thick. Rock fragments make up 5 to 35 percent of the solum and 10 to 35 percent of the substratum. The soil is very strongly acid to medium acid.

The Ap or Al horizon has value of 2 or 3 and chroma of 1 or 2. The A horizon is fine sandy loam, very fine sandy loam, or their gravelly analogs. Consistence is friable or very friable.

The B21 horizon has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 1 or 2. The B22 horizon has chroma of 1 through 4. It is fine sandy loam, sandy loam, or their gravelly analogs. The B horizon has weak subangular blocky or weak granular structure, or the horizon is massive. It has distinct or prominent mottles.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 1 through 4. It is fine sandy loam, sandy loam, or their gravelly analogs. Consistence is very friable to firm. The C horizon has distinct or prominent mottles that are less abundant with depth.

Lippitt series

The Lippitt series consists of loamy-skeletal, mixed, mesic Typic Dystrochrepts. These moderately deep, somewhat excessively drained soils formed in glacial till derived mainly from schist, gneiss, and granite. Lippitt soils are on side slopes and crests of bedrock controlled glacial till upland hills. Slopes range from 3 to 15 percent.

Lippitt soils are on the landscape with somewhat excessively drained Gloucester soils; well drained Charlton Canton, and Narragansett soils; and moderately well drained Sutton soils. Lippitt soils have bedrock nearer to the surface than Gloucester soils.

Typical pedon of Lippitt gravelly sandy loam, very rocky, 3 to 1 5 percent slopes, in the city of Cranston, Providence County, 400 feet south of Route 12 and 1 mile west of Interstate 295:

Ap—0 to 5 inches, dark brown (10YR 3/3) gravelly sandy loam; weak medium granular structure; friable; common fine and medium roots; 30 percent rock fragments; medium acid; clear wavy boundary.

B2—5 to 16 inches, brown (7.5YR 5/4) gravelly sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 30 percent rock fragments; medium acid; clear wavy boundary.

C—16 to 26 inches, dark yellowish brown (10YR 4/4) very gravelly sandy loam; massive; friable; few fine roots; 80 percent rock fragments; medium acid; clear wavy boundary.

Cr—26 to 72 inches, highly weathered gneiss bedrock.

R—72 inches, hard unweathered gneiss bedrock.

The solum ranges from 10 to 24 inches thick. The depth to highly weathered, rippable bedrock ranges from 20 to 40 inches. The depth to unweathered bedrock is 72 inches or more. Rock fragments make up 10 to 45 percent of the A horizon, 20 to 50 percent of the B horizon, and 45 to 80 percent of the C horizon. This soil is very strongly acid through medium acid.

The A horizon has hue of 7.5YR or 1OYR, value of 3 through 5, and chroma of 2 through 4. It is sandy loam, fine sandy loam, or their gravelly analogs.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 4 through 8. It is fine sandy loam, sandy loam, or their gravelly analogs. The horizon has fine or medium granular or subangular blocky structure.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 2 through 6. The C horizon is gravelly sandy loam through gravelly loamy coarse sand and their very gravelly analogs.

Mansfield series

The Mansfield series consists of coarse-loamy, mixed, mesic Humic Fragiaquepts. These very poorly drained soils formed in compact glacial till derived mainly from dark gray phyllite, shale, conglomerate, and schist. The soils are on nearly level areas, in depressions, and in drainageways of drumlins and glacial till plains. The surface ranges from nonstony to very stony. Slopes range from 0 to 3 percent.

Mansfield soils are on the landscape with well drained Newport soils, moderately well drained Pittstown soils, and poorly drained Stissing soils.

Typical pedon of Mansfield mucky silt loam, in Newport County, town of Little Compton, about 2.7 miles north of the village of Little Compton and 1,000 feet north of Pachet Brook Reservoir:

02—2 inches to 0, very dark gray (10YR 3/1) silty muck.

A1—0 to 8 inches, black (10YR 2/1) mucky silt loam; weak coarse granular structure; very friable; strongly acid; abrupt smooth boundary.

B2g—8 to 15 inches, dark gray (N 4/0) silt loam; weak medium subangular blocky structure; friable; 5 percent phyllite fragments; strongly acid; clear wavy boundary.

Clx—15 to 40 inches, dark gray (N 4/0) channery silt loam; common medium distinct dark grayish brown (2.5Y 4/2) and light olive brown (2.5Y 5/6) mottles; weak thick platy structure; very firm; 20 percent phyllite fragments; strongly acid; clear wavy boundary.

C2x—40 to 60 inches, olive gray (5Y 4/2) channery silt loam; common medium distinct light gray (5Y 7/1) and light olive brown (2.5Y 5/6) mottles; massive; very firm; 25 percent phyllite fragments; strongly acid.

The solum ranges from 12 to 22 inches thick. Rock fragments make up 0 to 25 percent of the solum and 10 to 35 percent of the Cx horizon. The soil is extremely acid through medium acid.

The A horizon has neutral colors, or it has hue of 1OYR, value of 2 or 3, and chroma of 0 or 2. It is mucky silt loam to mucky very fine sandy loam or their channery analogs.

The B2 horizon has neutral colors, or it has hue of 1OYR through 5Y, value of 3 through 6, and chroma of 0 or 1. It is silt loam, very fine sandy loam, or their channery analogs. The horizon has weak subangular blocky or weak granular structure, or it is massive. Consistence is friable or firm.

The Cx horizon has neutral colors, or it has hue of 2.5Y through 5Y, value of 3 through 6, and chroma of 0 through 2. Below a depth of 30 inches chroma ranges from 0 through 4. The horizon is silt loam, fine sandy loam, or their channery analogs. It is massive or has thick platy structure. Consistence is very firm or extremely firm.

Matunuck series

The Matunuck series consists of sandy, mixed, mesic Typic Sulfaquents. These very poorly drained soils formed in a thin organic layer over sand deposits derived mainly from schist, gneiss, and granite. Matunuck soils are in tidal marshes and are subject to tidal saltwater inundation. Slopes are dominantly less than 1 percent.

Matunuck soils are on the landscape with very poorly drained Ipswich soils, Beaches, and Udipsamments. Matunuck soils have a thinner organic layer than Ipswich soils.

Typical pedon of Matunuck mucky peat, in Washington County, town of Narragansett, about 0.6 mile east of the Village of Galilee and 200 feet north of Galilee Road:

02—12 inches to 0, very dark gray (10YR 3/1) mucky peat, dark gray (10YR 6/1) dry; 65 percent fiber, 25 percent rubbed; dense mat of roots, stems, and leaves; massive; many fine medium and coarse roots; light gray (10YR 7/1) sodium pyrophosphate extract; herbaceous fibers; mixed fine and medium sand; 55 percent organic matter; total salt 25,000 parts per million; slightly acid; abrupt smooth boundary.

C1—0 to 6 inches, gray (10YR 5/1) sand, gray (5Y 6/1) dry; thin lenses of very dark grayish brown (1OYR 3/ 2) organic materials; single grain; loose; common fine and medium roots; total salt 20,000 parts per million; neutral; clear wavy boundary.

C2—6 to 60 inches, gray (2.5Y 5/1) sand, gray (5Y 6/1) dry; single grain; loose; total salt 20,000 parts per million; neutral.

The organic layer is 8 to 16 inches thick. The soil is strongly acid through neutral. Total salt content is generally more than 10,000 parts per million, but ranges from 1,000 to 35,000 parts per million.

The 0 horizon has neutral colors, or it has hue of 1OYR through 5Y, value of 2 through 4, and chroma of 0 through 2. Fiber content is 25 to 80 percent; rubbed fiber content ranges from 15 to 40 percent. Organic matter content ranges from 20 to 75 percent.

The C horizon has neutral colors, or it has hue of 1OYR through 5GY, value of 2 through 7, and chroma of 0 through 3. Organic mailer content ranges from 1 to 10 percent. Some pedons have a C1 horizon of fine sandy loam through coarse sand. The C2 horizon is loamy sand, medium sand, or coarse sand. Shell fragments and herbaceous fibers are common in the C horizon of most pedons.

Merrimac series

The Merrimac series consists of sandy, mixed, mesic Typic Dystrochrepts. These somewhat excessively drained soils formed in outwash deposits derived from schist, gneiss, and phyllite. The soils are on outwash plains and terraces. Slopes range from 0 to 8 percent.

Merrimac soils are on the landscape with excessively drained Hinckley and Windsor soils, well drained Agawam and Enfield soils, moderately well drained Sudbury soils, and poorly drained Walpole soils.

Typical pedon of Merrimac sandy loam, 0 to 3 percent slopes, in Providence County, town of Gloucester, 2,000 feet west of Mowry Paine Brook, 1,200 feet north of Douglas Hook Road:

01—2 inches to 1 inch, undecomposed organic lifter.

02—1 inch to 0, decomposed and partly decomposed organic litter.

Ap—0 to 8 inches, dark brown (1OYR 4/3) sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent coarse fragments; very strongly acid; abrupt smooth boundary.

B21—8 to 12 inches, yellowish brown (10YR 5/6) sandy loam; weak fine granular structure; very friable; few fine roots; 5 percent coarse fragments; very strongly acid; clear smooth boundary.

B22—12 to 17 inches, dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; few fine roots; 5 percent coarse fragments; very strongly acid; clear smooth boundary.

B23—17 to 25 inches, yellowish brown (1OYR 5/6) sandy loam; weak fine granular structure; very friable; few fine roots; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

IIC—25 to 60 inches, light yellowish brown (2.5Y 6/4) gravelly sand; single grain; loose; 30 percent coarse fragments; strongly acid.

The solum ranges from 18 to 30 inches thick. Coarse fragments make up 5 to 30 percent of the solum and 25 to 55 percent of the substratum. This soil is extremely acid through medium acid.

The Ap horizon has hue of 7.5YR and 1OYR, value of 3 or 4, and chroma of 2 through 4. The Al horizon has hue of 7.5YR or 1OYR, value of 2 or 3, and chroma of 1 or 2. The A horizon is fine sandy loam, sandy loam, or their gravelly analogs.

The B21 horizon has hue of 7.5YR or 1OYR. It is fine sandy loam, sandy loam, or their gravelly analogs. The B22 and B23 horizons have hue of 7.5YR through 2.5Y.

The B horizon has value of 3 through 6 and chroma of 3 through 8. It is sandy loam, loamy sand, or their gravelly analogs. The B horizon has weak, fine to medium granular structure, or the horizon is massive.

The IIC horizon has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 2 through 6. The horizon is gravelly or very gravelly sand.

Narragansett series

The Narragansett series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These well drained soils formed in glacial till derived mainly from

schist, gneiss, and phyllite. The soils are on side slopes and crests of glacial till upland hills. The surface ranges from nonstony to extremely stony. Slopes range from 0 to 15 percent.

Narragansett soils are on the landscape with well drained Charlton and Canton soils, moderately well drained Wapping and Sutton soils, and poorly drained Leicester soils. Narragansett soils have a finer textured solum than Charlton or Canton soils.

Typical pedon of Narragansett silt loam in an area of Narragansett very stony silt loam, 0 to 8 percent slopes, in Washington County, town of Richmond, 3/4 mile south of Route 138, 1/4 mile west of Meadowbrook Trail:

Ap—O to 7 inches, dark brown (1 0YR 3/3) silt loam, weak coarse granular structure; very friable; many fine and medium roots; 2 percent rock fragments; strongly acid; abrupt wavy boundary.

B21—7 to 25 inches, yellowish brown 10YR 5/4) silt loam; weak coarse subangular blocky structure; very friable; many fine and medium roots; 2 percent rock fragments; strongly acid; clear wavy boundary.

B22—25 to 33 inches, light olive brown (2.5Y 5/4) silt loam; weak coarse subangular blocky structure; very friable; common medium roots; 5 percent rock fragments; very strongly acid; abrupt wavy boundary.

IIC—33 to 60 inches, yellowish brown (1OYR 5/4) gravelly loamy sand; single grain; loose; few medium and coarse roots; 25 percent rock fragments; strongly acid.

The solum ranges from 16 to 36 inches thick. Rock fragments make up 2 to 20 percent of the solum and 15 to 30 percent of the IIC horizon. The soil is very strongly acid through medium acid.

The Ap or Al horizon has hue of 7.5YR or 1OYR, value of 3 or 4, and chroma of 2 through 4. The A horizon is silt loam or very fine sandy loam.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 4 through 8. It is silt loam or very fine sandy loam.

The IIC horizon has hue of 7.5YR through 5Y, value of 3 through 5, and chroma of 2 through 6. It is fine sandy loam through loamy coarse sand or their gravelly analogs.

Narragansett soils in this survey area are a taxadjunct because they are coarser textured in the IIC horizon at a depth of less than 40 inches than is defined for the Narragansett series.

Newport series

The Newport series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These well drained soils formed in compact glacial till derived mainly from dark sandstone, conglomerate, argillite, and phyllite. The soils are on the crests of

drumlins and glacial till plains in the southeastern part of the State. The surface ranges from nonstony to extremely stony. Slopes range from 0 to 15 percent.

Newport soils are on the landscape with well drained Poquonock soils, moderately well drained Birchwood and Pittstown soils, poorly drained Stissing soils, and very poorly drained Mansfield soils. Newport soils have a finer textured solum than Poquonock soils.

Typical pedon of Newport silt loam, 3 to 8 percent slopes, in Newport County, town of Middletown, about 690 feet north of the junction of Green End Avenue and 260 feet west of Indian Avenue:

Ap—O to 8 inches, very dark brown (1OYR 2/2) silt loam; weak medium granular structure; very friable; many fine roots; 5 percent rock fragments; strongly acid; clear smooth boundary.

B21—8 to 19 inches, olive brown (2.5Y 4/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; 15 percent rock fragments; strongly acid; clear wavy boundary.

B22—19 to 24 inches, olive (5Y 4/3) silt loam; weak medium and coarse subangular blocky structure; friable; few fine roots; 15 percent rock fragments; strongly acid; clear wavy boundary.

Cx—24 to 60 inches, olive gray (5Y 4/2) channery silt loam; few dark yellowish brown (1OYR 3/4) pockets in the upper 6 inches; weak thick platy structure; firm; 25 percent rock fragments; strongly acid.

The solum ranges from 20 to 38 inches thick. Rock fragments of gravel or channery make up 5 to 30 percent of the solum and 10 to 35 percent of the substratum. The soil is very strongly acid through medium acid.

The A horizon has hue of 1OYR or 2.5Y, value of 2 through 4, and chroma of 1 through 3. It is silt loam, fine sandy loam, or their gravelly or channery analogs. The horizon has weak, fine or medium granular structure. Consistence is friable or very friable.

The B horizon has hue of 2.5Y or 5Y and chroma of 2 through 4. The B21 horizon has value of 4 or 5. The B22 horizon has value of 3 through 5. The B horizon is silt loam, fine sandy loam, or their gravelly or channery analogs. The horizon has weak subangular blocky structure, or it is massive. Consistence is friable or very friable.

The Cx horizon has hue of 2.5Y or 5Y, value of 2 through 5, and chroma of 1 through 3. It is loam, silt loam, fine sandy loam, or their gravelly or channery analogs. The horizon has thin to thick platy structure, or it is massive. Consistence is firm or very firm.

Ninigret series

The Ninigret series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts. These moderately well drained soils formed in outwash deposits derived mainly from schist, gneiss, and phyllite. The soils are in

slight depressions in outwash plains and terraces. Slopes range from 0 to 3 percent.

Ninigret soils are on the landscape with the somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury, Deerfield, and Tisbury soils. Ninigret soils have a finer textured solum than Sudbury or Deerfield soils and a coarser textured solum than Tisbury soils.

Typical pedon of Ninigret fine sandy loam, in Providence County, town of Burrillville, 600 feet northwest of the intersection of Round Top Road and Hill Road:

Ap—0 to 10 inches, dark brown (1OYR 3/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 2 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—1O to 18 inches, brownish yellow (10YR 6/6) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 2 percent coarse fragments; strongly acid; clear smooth boundary.

B22—18 to 25 inches, yellowish brown (1OYR 5/4) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; weak fine granular structure; very friable; common fine roots; 2 percent coarse fragments; medium acid; abrupt smooth boundary.

B23—25 to 30 inches, pale brown (1OYR 6/3) fine sandy loam; common medium distinct light brownish gray (1OYR 6/2) and yellowish brown (1OYR 5/8) mottles; weak fine granular structure; very friable; few fine roots; 2 percent coarse fragments; medium acid; abrupt smooth boundary.

IIC1—30 to 42 inches, yellowish brown (10YR 5/4) loamy sand; single grain; loose; 15 percent coarse fragments; medium acid; clear smooth boundary.

IIC2—42 to 60 inches, light yellowish brown (2.5Y 6/4) gravelly loamy sand; single grain; loose; 30 percent coarse fragments; medium acid.

The solum ranges from 18 to 34 inches thick. Coarse fragments make up 0 to 10 percent of the solum, 0 to 30 percent of the substratum to a depth of 40 inches, and 0 to 60 percent of the substratum at a depth of more than 40 inches. The soil is very strongly acid through medium acid.

The Ap or Al horizon has value of 2 through 4 and chroma of 1 through 4. The A horizon is very fine sandy loam or fine sandy loam.

The B21 horizon has hue of 1OYR or 7.5YR and value and chroma of 4 through 6. The B22 and B23 horizons have hue of 1OYR through 5Y, value of 4 through 6, and chroma of 2 through 6. The B horizon is fine sandy loam, sandy loam, or loamy fine sand. Sandy loam and loamy fine sand lenses less than 5 inches thick are in some pedons.

The IIC horizon has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 2 through 6. It is loamy fine sand through sand or their gravelly analogs.

Paxton series

The Paxton series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These well drained soils formed in compact glacial till derived mainly from gneiss and schist. They are on side slopes and crests of glacial till upland hills and drumlins. The surface ranges from nonstony to extremely stony. Slopes range from 0 to 15 percent.

Paxton soils are on the landscape with well drained Broadbrook soils, moderately well drained Woodbridge and Rainbow soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils. Paxton soils have a coarser textured solum than Broadbrook soils.

Typical pedon of Paxton fine sandy loam, 0 to 3 per cent slopes, in Washington County, town of Exeter, in a white oak and red oak forest, about 2,000 feet northwest of the intersection of Slocumville Road and Reynolds Road:

01—1 inch to 0, partially decomposed leaves and twigs.

Al —0 to 5 inches, very dark grayish brown (1OYR 3/2) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; 3 percent coarse fragments; strongly acid; clear smooth boundary.

B21—5 to 15 inches, brown (7.5YR 5/4) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; 5 percent coarse fragments; medium acid; gradual wavy boundary.

B22—15 to 23 inches, yellowish brown (1OYR 5/6) fine sandy loam; weak fine sub- angular blocky structure; friable; few fine roots; 5 percent coarse fragments; strongly acid; clear smooth boundary.

Clx—23 to 32 inches, light brownish gray (2.5Y 6/2) and yellowish brown (1OYR 5/4) fine sandy loam; moderate thick platy structure; firm, brittle; 10 percent coarse fragments; strongly acid; clear wavy boundary.

C2x—32 to 60 inches, grayish brown (2.5Y 5/2) and light brownish gray (1OYR 6/2) fine sandy loam; weak thick platy structure; very firm, brittle; 15 percent coarse fragments; strongly acid.

The solum ranges from 15 to 36 inches thick. Stones and boulders cover 0 to 35 percent of the surface. Rock fragments make up 3 to 30 percent of the soil. This soil is very strongly acid through slightly acid.

The Ap or Al horizon has value of 2 through 4 and chroma of 1 through 4. The A horizon is fine sandy loam, sandy loam, or their gravelly analogs. Structure is dominantly weak, fine or medium granular.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6. It is fine sandy loam, sandy loam, or their gravelly analogs. The horizon has weak, fine or medium granular or weak fine sub-angular blocky structure. It is friable or very friable.

The C horizon has value of 4 through 6. It is fine sandy loam or sandy loam and their gravelly analogs. The horizon is firm, very firm, or extremely firm and brittle.

Pittstown series

The Pittstown series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These are moderately well drained soils formed in compact glacial till derived mainly from dark phyllite, slate, shale, and schist. The soils are on side slopes and crests of glacial upland hills and drumlins. Slopes range from 0 to 8 percent.

Pittstown soils are on the landscape with well drained Newport soils, poorly drained Stissing soils, and very poorly drained Mansfield soils.

Typical pedon of Pittstown silt loam, 0 to 8 percent slopes, in Newport County, town of Middletown, about 100 feet east and 2,500 feet south of the intersection of Valley Road and Greenend Avenue:

Ap—0 to 8 inches, very dark grayish brown (1OYR 3/2) silt loam; weak fine granular structure; friable; common fine roots; 5 percent rock fragments; very strongly acid; abrupt smooth boundary.

B21—8 to 16 inches, dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable; common fine roots; 5 percent rock fragments; very strongly acid; clear wavy boundary.

B22—16 to 20 inches, olive brown (2.5Y 4/4) silt loam; weak fine sub-angular blocky structure; friable; few fine roots; 5 percent rock fragments; very strongly acid; clear wavy boundary.

B23—20 to 28 inches, olive brown (2.5Y 4/4) silt loam; few fine distinct dark yellowish brown (1OYR 4/6) mottles; weak fine sub-angular blocky structure; friable; few fine roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Cx—28 to 60 inches, olive gray (5Y 4/2) channery silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate thick platy structure; very firm; 20 percent rock fragments; strongly acid.

The solum ranges from 15 to 30 inches thick. Rock fragments make up 5 to 35 percent of the soil. The soil is very strongly acid through medium acid.

The Al or Ap horizon has value of 2 through 4 and chroma of 2 or 3. The A horizon is silt loam, very fine sandy loam, or their channery and slaty analogs. The horizon has weak or moderate, fine or medium granular structure and is very friable or friable.

The B21 horizon has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 3 or 4. The horizon has weak, fine or medium granular structure and is friable or very friable. The B22 and B23 horizons have hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 3 or 4. The B23 horizon has distinct or prominent mottles. The B horizon is silt loam, very fine sandy loam, or their channery or slaty analogs.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 or 3. The C horizon is silt loam, very fine sandy loam, or their channery or slaty analogs. The horizon has moderate, medium to thick platy structure and is very firm or extremely firm.

Podunk series

The Podunk series consists of coarse-loamy, mixed, nonacid, mesic Fluvaquentic Dystrochrepts. These moderately well drained soils formed in recent alluvium derived mainly from granite, gneiss, and schist. Slopes range from 0 to 3 percent.

Podunk soils are on the landscape with poorly drained Rumney soils and very poorly drained Scarboro soils.

Typical pedon of Podunk fine sandy loam, in Washington County, town of Richmond, on the west side of the Pawcatuck River, about 800 feet south of the Amtrak railroad line, and 200 feet southeast of Wood River Junction:

Al—0 to 1 inch, black (10YR 2/1) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt wavy boundary.

B21—1 inch to 12 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; clear wavy boundary.

B22—12 to 38 inches, yellowish brown (10YR 5/6) fine sandy loam; few fine distinct light gray (2.5Y 7/2) and few fine faint pale brown (1OYR 6/3) mottles; weak fine granular structure; friable; common medium roots; strongly acid; abrupt wavy boundary.

IIC—38 to 60 inches, yellowish brown (10YR 5/6) gravelly loamy coarse sand; grayish brown (2.5Y 6/2) mottles; single grain; loose; few fine roots; 30 percent rock fragments; strongly acid.

The solum ranges from 20 to 40 inches thick. Rock fragments make up 0 to 5 percent of the solum and 0 to 35 percent of the IIC horizon. The soil is very strongly acid through slightly acid.

The Al or Ap horizon has hue of 1OYR or 2.5Y, value of 2 through 5, and chroma of 1 through 4. The A horizon is fine sandy loam or sandy loam. It has weak or moderate, fine or medium granular structure.

The B horizon has hue of 1OYR through 5Y and value and chroma of 3 through 6. Few to common distinct mottles with chroma of 2 or less are at a depth of 12 to 24 inches. This horizon is fine sandy loam or sandy loam and is very friable or friable.

The IIC horizon has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 1 through 6. The horizon is mottled. It is loamy fine sand to coarse sand. Some pedons have strata of sandy loam, sand, gravel, or silt less than 5 inches thick.

Poquonock series

The Poquonock series consists of sandy, mixed, mesic Typic Fragiochrepts. These well drained to somewhat excessively drained soils formed in a sandy mantle over compact glacial till derived mainly from schist, gneiss, and phyllite.

The soils are on side slopes and crests of drumlins and hills. Slopes range from 0 to 8 percent.

Poquonock soils are on the landscape with well drained Newport soils, moderately well drained Birchwood and Pittstown soils, poorly drained Stissing soils, and very poorly drained Mansfield soils. Poquonock soils have a coarser textured solum than Newport soils.

Typical pedon of Poquonock loamy fine sand, 3 to 8 percent slopes, in Newport County, town of Middletown, 1.2 miles south of the Middletown-Portsmouth town line and 500 feet east of Narragansett Bay:

Ap—0 to 8 inches, dark brown (1OYR 3/3) loamy fine sand; weak medium granular structure; very friable; many fine roots; 2 percent rock fragments; strongly acid; abrupt wavy boundary.

B21—8 to 18 inches, dark yellowish brown (10YR 4/4) loamy fine sand; weak medium granular structure; very friable; few fine roots; 1 percent rock fragments; strongly acid; clear wavy boundary.

B22—18 to 28 inches, light olive brown (2.5Y 5/4) loamy sand; single grain; loose; few fine roots; 5 percent rock fragments; strongly acid; clear wavy boundary.

IICx—28 to 60 inches, dark gray (N 4/0) and gray (N 5/0) gravelly loam; weak thick platy structure; very firm, brittle; 25 percent rock fragments; strongly acid.

The solum ranges from 24 to 36 inches thick. Rock fragments make up 0 to 10 percent of the solum and 10 to 30 percent of the substratum. The soil is very strongly acid through medium acid.

The Ap or Al horizon has hue of 7.5YR or 1OYR and value and chroma of 2 through 4. It is loamy fine sand or sandy loam.

The B horizon has hue of 7.5YR through 2.5Y and value and chroma of 4 through 6. It is loamy fine sand or loamy sand.

The Cx horizon has neutral colors, or it has hue of 2.5Y or 5Y, value of 3 through 5, and chroma of 0 through 3. It is silt loam, fine sandy loam, sandy loam, loam, or their gravelly analogs. The horizon has weak, thick, platy structure, or it is massive.

Quonset series

The Quonset series consists of sandy-skeletal, mixed, mesic Typic Udorthents. These excessively drained soils formed in glaciofluvial deposits derived mainly from phyllite, shale, schist, and gneiss. The soils are on terraces and outwash plains. Slopes range from 0 to 15 percent.

The Quonset soils are on the landscape with excessively drained Hinckley and Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Quonset soils are darker than Hinckley or Windsor soils.

Typical pedon of Quonset gravelly sandy loam, 0 to 3 percent slopes, in Washington County, town of North Kingstown, about 500 feet northwest of the intersection of Old Baptist Road and RI. Route 102:

A1—0 to 3 inches, very dark gray (10YR 3/1) gravelly sandy loam; weak fine granular structure; very friable; 20 percent coarse fragments; strongly acid; abrupt irregular boundary.

B21—3 to 10 inches, dark yellowish brown (10YR 4/4) gravelly loamy sand; weak fine granular structure; very friable; 25 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—10 to 16 inches, light olive brown (2.5Y 5/4) gravelly loamy sand; weak medium granular structure; very friable; 30 percent coarse fragments; strongly acid; abrupt wavy boundary.

C—16 to 60 inches, dark gray (5Y 4/1) very gravelly sand; single grain; loose; stratified; 55 percent coarse fragments; strongly acid.

The solum ranges from 15 to 30 inches thick. Coarse fragments make up 0 to 50 percent of the solum and 50 to 65 percent of the substratum. The soil is extremely acid through strongly acid in the solum, and strongly acid through slightly acid in the substratum.

The Al or Ap horizon has value of 2 through 4 and chroma of 1 through 4. The A horizon is fine sandy loam, sandy loam, loamy sand, or their channery, gravelly, slaty, or shaly analogs.

The upper part of the B horizon has hue of 7.5YR or 1OYR, value of 4 to 5, and chroma of 4 or 6. The lower part of the horizon has hue of 1OYR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. The B horizon below a depth of 10 inches is loamy sand and its channery, gravelly, shaly, or slaty analogs.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 through 4. It is sand or coarse sand or their very channery, very gravelly, very shaly, or very slaty analogs. The horizon is stratified.

Rainbow series

The Rainbow series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These moderately well drained soils formed in silt mantled compact glacial till derived mainly from schist, gneiss, and granite. The soils are on drumlins and glacial till plains. The surface ranges from nonstony to very stony. Slopes range from 0 to 8 percent.

Rainbow soils are on the landscape with well drained Broadbrook and Paxton soils, moderately well drained Woodbridge and Wapping soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils. The Rainbow soils have a finer textured solum than Woodbridge soils. They have a more compact and firmer C horizon than Wapping soils.

Typical pedon of Rainbow silt loam, 0 to 3 percent slopes, in Washington County, town of Narragansett, 125 feet west of Ocean Road and 15 feet south of Fairway Court:

Ap—0 to 5 inches, very dark grayish brown (1OYR 3/2) silt loam; weak medium granular structure; very friable; common fine roots; 3 percent rock fragments; strongly acid; abrupt smooth boundary.

B21—5 to 15 inches, yellowish brown (10YR 5/4) silt loam; weak fine granular structure; very friable; common fine roots; 5 percent rock fragments; very strongly acid; clear smooth boundary.

B22—15 to 23 inches, light olive brown (2.5Y 5/4) silt loam; few fine faint olive (5Y 5/3) mottles; weak fine granular structure; very friable; few fine roots; 5 percent rock fragments; strongly acid; clear smooth boundary.

C1x 23 to 38 inches, olive gray (5Y 4/2) fine sandy loam; many medium prominent yellowish red (5YR 4/6) and gray (10YR 6/1) mottles; weak medium platy structure; firm; 10 percent rock fragments; strongly acid; abrupt smooth boundary.

C2x—38 to 60 inches, olive gray (5Y 4/2) fine sandy loam; massive; very firm, brittle; 15 percent rock fragments; strongly acid.

The solum ranges from 18 to 38 inches thick. Stones and boulders cover 0 to 10 percent of the surface area. Rock fragments make up 10 to 20 percent of the solum and 5 to 30 percent of the Cx horizon. The soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the Cx horizon.

The Al or Ap horizon has hue of 7.5YR or 1OYR, value of 2 through 4, and chroma of 1 through 3. The A horizon is silt loam or very fine sandy loam. Consistence is friable or very friable.

The B21 horizon has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 4 or 6. The B22 horizon has hue of 1OYR or 2.5 value of 4 or 6, and chroma of 3 through 6. The lower part of the B horizon is mottled. The B horizon is silt loam or very fine sandy loam. It has weak sub-angular blocky or weak granular structure, or it is massive.

The Cx horizon has hue of 2.5Y or 5Y and value and chroma of 2 through 4. It is fine sandy loam, sandy loam, or their gravelly analogs. The horizon has weak medium or thick platy structure, or it is massive.

Raypol series

The Raypol series consists of coarse-loamy over sandy or sandy-skeletal, mixed, acid, mesic Aeric Haplaquepts. These poorly drained soils formed in windblown or water-deposited silts derived mainly from schist, gneiss, and shale. The soils are in depressions mainly on terraces and outwash plains. Slopes range from 0 to 3 percent.

Raypol soils are on the landscape with well drained Bridgehampton and Enfield soils, moderately well drained Scio and Tisbury soils, poorly drained Walpole soils, and very poorly drained Adrian soils. Raypol soils have a finer textured solum than Walpole soils.

Typical pedon of Raypol silt loam, in Washington County, town of Richmond, in the Carolina Management Area, about 2,500 feet east of the intersection of Hope Valley Road and Kenyon Hill Trail:

A1—0 to 4 inches, very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; friable; many fine roots; 2 percent coarse fragments; strongly acid; abrupt wavy boundary.

B21—4 to 13 inches, light olive brown (2.5Y 5/4) silt loam; few fine distinct olive gray (5Y 5/2) mottles; weak medium sub-angular blocky structure; friable; common medium roots; strongly acid; clear wavy boundary.

B22—13 to 22 inches, light olive brown (2.5Y 5/4) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium sub-angular blocky structure; friable; common medium roots; strongly acid; clear wavy boundary.

IICl—22 to 29 inches, grayish brown (2.5Y 5/2) gravelly sand; common medium yellowish brown (10YR 5/6) mottles; single grain; loose; few fine roots; 25 per cent coarse fragments; strongly acid; abrupt smooth boundary.

llC2—29 to 60 inches, yellowish brown (10YR 5/4) gravelly sand; few medium distinct grayish brown (2.5Y 5/2) mottles; single grain; loose; 25 percent coarse fragments; strongly acid.

The solum ranges from 18 to 36 inches thick. Rock fragments make up 0 to 10 percent of the solum and 10 to 50 percent of the IIC horizon. The soil is very strongly acid or strongly acid above a depth of 40 inches and strongly acid through slightly acid below a depth of 40 inches.

The Ap or Al horizon has hue of 7.5YR or 1OYR, value of 2 or 3, and chroma of 1 or 2. The A horizon is silt loam or very fine sandy loam.

The B horizon has hue of 1OYR through 2.5Y, value of 4 through 6, and chroma of 1 through 4. It has distinct or prominent mottles. The B horizon is silt loam or very fine sandy loam. It has weak medium sub-angular blocky structure, or the horizon is massive.

The C horizon has hue of 1OYR or 2.5Y, value of 4 through 6, and chroma of 2 through 4. The IIC horizon is gravelly sand or sand. The horizon is stratified.

Ridgebury series

The Ridgebury series consists of coarse-loamy, mixed, mesic Aeric Fragiaquepts. These poorly drained soils formed in compact glacial till derived mainly from schist, gneiss, and granite. The soils are in depressions, drainage ways, and nearly level areas of glacial upland hills and drumlins. Slopes range from 0 to 3 percent.

Ridgebury soils are on the landscape with well drained Paxton soils, moderately well drained Woodbridge soils, poorly drained Leicester soils, and very poorly drained Whitman soils. Ridgebury soils have a more compact and firmer substratum than Leicester soils.

Typical pedon of Ridgebury fine sandy loam, 0 to 3 percent slopes, in Providence County, city of Cranston, about 1,000 feet south of Rhode Island Route 14 and 700 feet west of Comstock Parkway:

A1—0 to 4 inches, black (10YR 2/1) fine sandy loam; weak fine granular structure; very friable; common fine roots; 10 percent rock fragments; very strongly acid; abrupt wavy boundary.

B21—4 to 11 inches, grayish brown (2.5Y 5/2) fine sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium platy structure; friable; common fine roots; 15 percent rock fragments; very strongly acid; clear wavy boundary.

B22—11 to 20 inches, grayish brown (10YR 5/2) fine sandy loam; common fine distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; weak medium platy structure; friable; few fine roots; 15 percent rock fragments; very strongly acid; clear wavy boundary.

Clx—20 to 34 inches, yellowish brown (10YR 5/4) gravelly fine sandy loam; common medium distinct gray (10YR 5/1) and strong brown (7.5YR 5/6) mottles; massive; very firm; 25 percent rock fragments; very strongly acid; clear wavy boundary.

C2x—34 to 60 inches, yellowish brown (1OYR 5/4) and pockets of brown (7.5YR 5/4) gravelly fine sandy loam; massive; firm; 20 percent rock fragments; strongly acid.

The solum ranges from 10 to 30 inches thick and corresponds closely to the depth to the compact till substratum. Rock fragments make up 5 to 35 percent of the soil. The soil is very strongly acid through medium acid.

The Ap or Al horizon is neutral or has hue of 1OYR through 5Y, value of 2 or 3, and chroma of 0 through 2. The A horizon is sandy loam, fine sandy loam, or their gravelly analogs.

The B horizon has neutral colors, or it has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 0 through 3; chroma of 3 is restricted to the subhorizons. The B horizon has few or common, fine to coarse, prominent or distinct mottles. The B horizon is sandy loam, fine sandy loam, or their gravelly analogs. The horizon has weak thin or medium platy structure, or the horizon is massive.

The Cx horizon has hue of 1OYR through 5Y, value of 3 through 6, and chroma of 1 through 4. Mottles in the Cx horizon are fine to coarse and are distinct or prominent. The Cx horizon is sandy loam, fine sandy loam, or their gravelly analogs.

Rumney series

The Rumney series consists of coarse-loamy, mixed, nonacid, mesic Aeric Fluvaquents. These poorly drained soils formed in recent alluvium derived mainly from granite, gneiss, and schist. The soils are on flood plains. Slopes range from 0 to 3 percent.

Rumney soils are on the landscape with moderately well drained Podunk soils and very poorly drained Adrian soils.

Typical pedon of Rumney fine sandy loam, in Washington County, town of Exeter, about 1,500 feet north of Reynolds Road and 3,400 feet west of Slocum Road:

A1—0 to 5 inches very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

B2g—5 to 22 inches, dark grayish brown (1OYR 4/2) fine sandy loam; common medium prominent dark brown (7.5YR 4/4) mottles; weak fine granular structure; friable; few fine roots; strongly acid; abrupt smooth boundary.

IIC—22 to 60 inches, gray (10YR 5/1) and dark grayish brown (10YR 4/2) sand; single grain; loose; 10 per cent gravel; medium acid.

The solum ranges from 20 to 40 inches thick. Coarse fragments make up 0 to 10 percent of the solum and 5 to 40 percent of the IIC horizon. The soil is very strongly acid through slightly acid.

The Ap or Al horizon has hue of 1OYR or 2.5Y, value or 2 through 4, and chroma of 1 or 2. The A horizon is fine sandy loam or sandy loam. The horizon has weak fine and medium granular structure and is very friable or friable.

The B horizon has hue of 1OYR through 5Y, value of 3 through 6, and chroma of 1 or 2. Subhorizons of the B horizon have hue of IOYR or 2.5Y, value of 3 through 5, and chroma of 2. Mottles are common or many, fine through coarse, and faint through prominent. The horizon is fine sandy loam or sandy loam. Consistence is very friable or friable.

The IIC horizon has hue of 1OYR through 5Y, value of 3 through 6, and chroma of 1 through 3. The horizon is mottled. It is coarse sand, sand, fine sand, or their gravelly analogs. Some pedons have thin strata of very fine sand, silt, and organic matter.

5/4) gravelly fine sandy percent rock fragments;

Scarboro series

The Scarboro series consists of sandy, mixed, mesic Histic Humaquepts. These very poorly drained soils formed in sandy deposits derived mainly from schist, gneiss, and shale. The soils are in depressions and drainage-ways in outwash plains and terraces. Slopes range from 0 to 3 percent.

Scarboro soils are on the landscape with excessively drained Hinckley and Windsor soils, somewhat excessively drained Merrimac soils, moderately well drained Sudbury and Ninigret soils, and poorly drained Raypol and Walpole soils.

Typical pedon of Scarboro mucky sandy loam in Washington County, town of Westerly, 400 feet west of the Westerly State Airport:

02—5 inches to 0, black (2/1) muck; massive; strongly acid; abrupt wavy boundary.

Al —O to 6 inches, very dark grayish brown (1OYR 3/2) mucky sandy loam; few fine distinct yellowish brown (1OYR 5/6) mottles along root channels; moderate coarse granular structure; friable; strongly acid; abrupt smooth boundary.

Clg—6 to 19 inches, gray (10YR 5/1) loamy sand; few medium faint light olive brown (2.5Y 5/4) mottles and few fine distinct dark yellowish brown (1OYR 3/ 4) mottles; massive; very friable; 10 percent coarse fragments; strongly acid; clear wavy boundary.

C2g—19 to 60 inches, light brownish gray (1OYR 6/2) coarse sand; dark brown (1OYR 4/3) mottles; single grain; loose; 5 percent coarse fragments; very strongly acid.

Some pedons have an organic layer 4 to 16 inches thick. Coarse fragments make up to 10 percent of the soil above a depth of 30 inches and up to 50 percent below a depth of 30 inches. This soil is very strongly acid through medium acid.

The 0 horizon is mucky peat or muck.

The Al or Ap horizon has neutral colors, or it has hue of 1OYR through 2.5Y, value of 2 or 3, and chroma of 0 through 2. The A horizon is loamy sand, sand, sandy loam, fine sandy loam, loamy fine sand, or their mucky analogs. Some pedons have an A2 horizon that is neutral or has hue of 1OYR through 5Y, value of 4 through 7, and chroma of 0 to 1. Some pedons have a B horizon.

The C horizon has neutral colors, or it has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 0 through 2. Mottles are faint to prominent, few to many, and fine to coarse; less than 20 percent of the mass has chroma greater than 2. The horizon is loamy sand, sand, or fine sand above a depth of 30 inches; at a depth of more than 30 inches the texture ranges to their gravelly analogs.

Scio series

The Scio series consists of coarse-silty, mixed, mesic Aquic Dystrochrepts. These moderately well drained soils formed in silt mantled glacial till derived mainly from schist, gneiss, and phyllite. The soils are on side slopes and crests of glacial upland hills and in depressions in terraces and outwash plains. The surface ranges from non-stony to very stony. Slopes range from 0 to 8 percent.

Scio soils are on the landscape with well drained Bridgehampton soils, moderately well drained Rainbow and Wapping soils, and poorly drained Raypol

soils. The Scio soils formed in thicker silt deposits than Wapping and Rainbow soils.

Typical pedon of Scio silt loam, in an area of Scio very stony silt loam, 0 to 8 percent slopes, in Washington County, town of South Kingstown, about 100 feet south of Route 138 and 800 feet west of Rose Hill Road:

Ap—0 to 9 inches, very dark grayish brown (1OYR 3/2) silt loam; weak medium granular structure; friable; common fine and medium roots; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

B21—9 to 15 inches, dark brown (1OYR 4/3) silt loam; weak medium sub-angular blocky structure; friable; common fine and medium roots; 5 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—15 to 22 inches, yellowish brown (1OYR 5/4) silt loam; few medium faint grayish brown (1OYR 5/2) and yellowish brown (1OYR 5/6) mottles; weak medium sub-angular blocky structure; friable; common fine and medium roots; 5 percent coarse fragments; strongly acid; gradual wavy boundary.

B3—22 to 31 inches, light olive brown (2.5Y 5/4) silt loam; common medium distinct light brownish gray (1OYR 6/2), yellowish brown (1OYR 5/6), and strong brown (1OYR 5/8) mottles; weak medium sub-angular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

C1—31 to 46 inches, olive gray (5Y 5/2) silt loam; many medium distinct light olive brown (2.5Y 5/4) and light brownish gray (1OYR 6/2) mottles; massive; firm; few fine roots; strongly acid; clear wavy boundary.

IIC2—46 to 60 inches, grayish brown (2.5Y 5/2) fine sandy loam; common medium distinct yellowish brown (1OYR 5/6) mottles; weak thick platy structure; firm; 10 percent coarse fragments; strongly acid.

The solum ranges from 20 to 36 inches thick. Coarse fragments make up 0 to 5 percent of the soil above a depth of 40 inches and 5 to 60 percent below a depth of 40 inches. The soil is very strongly acid through medium acid above a depth of 40 inches and strongly acid through slightly acid below a depth of 40 inches.

The A horizon has hue of 7.5YR or 1OYR, value of 3 through 5, and chroma of 2 or 3. The horizon is silt loam or very fine sandy loam. It has weak or moderate, fine or medium granular structure and is friable or very friable.

The B horizon has hue of 7.5YR through 5Y, value of 4 or 5, and chroma of 3 through 6. It is silt loam or very fine sandy loam. The horizon has weak or moderate, fine to coarse sub-angular blocky structure and is friable or very friable.

The C horizon has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 1 through 4. It is silt loam or very fine sandy loam above a depth of 40 inches and silt loam through sand and their gravelly analogs below a depth of 40 inches. The horizon has thin to thick platy structure, or it is massive. Consistence is very friable through firm.

Stissing series

The Stissing series consists of coarse-loamy, mixed, mesic Aeric Fragiaquepts. These poorly drained soils formed in compact glacial till derived from dark gray phyllite, slate, shale, and schist. The soils are on nearly level areas or depressions of glacial upland hills and drumlins. The surface ranges from non-stony to very stony. Slopes range from 0 to 3 percent.

The Stissing soils are on the landscape with some what excessively drained Poquonock soils, well drained Newport soils, moderately well drained Pittstown and Birchwood soils, and very poorly drained Mansfield soils.

Typical pedon of Stissing silt loam, in Newport County, town of Little Compton, about 1,000 feet east of South Commons Road and 800 feet south of Simmons Road:

A1—0 to 8 inches, very dark gray (10YR 3/1) silt loam; moderate medium granular structure; friable; many roots; 10 percent coarse fragments; strongly acid; abrupt smooth boundary.

B2—8 to 15 inches, dark grayish brown (2.5Y 4/2) silt loam; many medium distinct strong brown (1OYR 5/ 6) mottles; weak medium sub-angular blocky structure; friable; few roots; 5 percent coarse fragments; medium acid; clear smooth boundary.

Clxg—15 to 28 inches, dark gray (N 4/0) silt loam; common medium, distinct strong brown (7.5YR 5/8) mottles; weak medium platy structure; firm, brittle; 10 percent coarse fragments; medium acid; abrupt wavy boundary.

C2xg—28 to 60 inches, dark gray (N 4/0) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium platy structure; very firm, brittle; 10 percent coarse fragments; medium acid.

The solum ranges from 15 to 25 inches thick and corresponds with the depth to the compact till substratum. Rock fragments make up 5 to 25 percent of the solum and 5 to 40 percent of the substratum. The soil is extremely acid through medium acid.

The A horizon has hue of 1OYR or 2.5Y, value of 2 through 4, and chroma of 1 or 2. The A horizon is silt loam, loam, or their channery analogs. It has moderate, fine or medium granular structure.

The B horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 or 2. The B horizon has few to many distinct or prominent high chroma mottles. The B horizon is silt loam, loam, or their channery analogs. The horizon has weak or moderate, fine or medium sub-angular blocky structure, or the horizon is massive.

The Cx horizon has neutral colors, or it has hue of 5Y, value of 4 through 6, and chroma of 0 to 3. The Cx horizon has common or many, medium through coarse,

distinct or prominent mottles. The Cx horizon is silt loam, loam, or their channery analogs. It has weak, thin to thick platy structure, or the horizon is massive.

Stissing soils are a tax adjunct in this survey area because they have lower chroma throughout the B and C horizon than that described for the Stissing series. The low chroma colors are inherited from the parent material.

Sudbury series

The Sudbury series consists of sandy, mixed, mesic Aquic Dystrochrepts. These moderately well drained soils formed in glaciofluvial deposits derived mainly from schist and gneiss. These soils are on terraces and outwash plains. Slopes range from 0 to 3 percent.

Sudbury soils are on the landscape with excessively drained Hinckley and Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Ninigret and Deerfield soils, and poorly drained Walpole soils. Sudbury soils have a coarser textured solum than Ninigret soils and a finer textured solum than Deerfield soils.

Typical pedon of Sudbury sandy loam, in Washington County, town of South Kingstown, about 1,600 feet northwest of junction of Yawgoo Pond Road and Sand Turn Road and 2,000 feet east of Dugway Road:

Ap—0 to 6 inches, dark brown (10YR 3/3) sandy loam; moderate fine granular structure; friable; few fine and medium roots; 5 percent coarse fragments; very strongly acid; abrupt smooth boundary.

B21—6 to 15 inches, dark yellowish brown (10YR 4/4) sandy loam; weak medium sub-angular blocky structure; very friable; few fine roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B22—15 to 21 inches, yellowish brown (10YR 5/6) sandy loam; few fine faint brown (10YR 5/3) mottles; weak medium sub-angular blocky structure; very friable; few fine roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B23—21 to 28 inches, yellowish brown (10YR 5/4) loamy sand; few fine distinct grayish brown (2.5Y 5/2) and common medium distinct strong brown (7.5YR 5/6) mottles; weak medium sub-angular blocky structure; very friable; few fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

IIC1—28 to 33 inches, yellowish brown (10YR 5/4) gravelly sand; few fine distinct yellowish red (5YR 5/8) mottles; single grain; loose; stratified; 25 percent coarse fragments; strongly acid; abrupt smooth boundary.

llC2—33 to 60 inches, yellowish brown (10YR 5/4) gravelly sand; lenses of dark red (2.5YR 3/6) gravelly sand; stratified; single grain; loose; 40 percent coarse fragments; strongly acid.

The solum ranges from 18 to 30 inches thick and corresponds to the depth to sand and gravel. Coarse fragments make up 0 to 30 percent of the solum and 25 to 75 percent of the substratum. This soil is extremely acid through medium acid.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 4. The A horizon is sandy loam, fine sandy loam, or their gravelly analogs.

The B horizon has hue of 7.5YR or 1OYR, value of 3 through 5, and chroma of 2 through 8. The B21 horizon is sandy loam, fine sandy loam, or their gravelly analogs. The B22 and B23 horizons are sandy loam through coarse sand or their gravelly analogs. The B horizon has weak fine or medium sub-angular blocky structure, or the horizon is massive.

The IIC horizon has hue of 1OYR through 5Y, value of 4 to 6, and chroma of 2 through 4. The soil is gravelly sand, gravelly coarse sand, or their very gravelly analogs. The horizon is stratified.

Sutton series

The Sutton series consists of coarse-loamy, mixed, mesic Aquic Dystrochrepts. These moderately well drained soils formed in glacial till derived mainly from schist, gneiss, and granite. The soils are on side slopes and in depressions of upland hills. The surface ranges from non-stony to extremely stony. Slopes range from 0 to 8 percent.

The Sutton soils are on the landscape with well drained Canton and Charlton soils, moderately well drained Woodbridge soils, and poorly drained Leicester and Ridgebury soils. Sutton soils have a more friable C horizon than Woodbridge soils.

Typical pedon of Sutton fine sandy loam, 3 to 8 percent slopes, in Providence County, town of Burrillville east of Wilson Trail, 2,000 feet east of Round Pond:

A1—0 to 3 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; common fine roots; 5 percent rock fragments; very strongly acid; abrupt smooth boundary.

B21—3 to 5 inches, dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; very friable; common fine roots; 5 percent rock fragments; very strongly acid; clear wavy boundary.

B22—5 to 17 inches, yellowish brown (1OYR 5/6) fine sandy loam; weak fine sub-angular blocky structure; friable; few fine roots; 5 percent rock fragments; very strongly acid; gradual wavy boundary.

B23—17 to 25 inches, yellowish brown (10YR 5/4) sandy loam; few medium distinct grayish brown (2.5Y 5/2) and yellowish brown (10YR 5/8) mottles; weak medium sub-angular blocky structure; friable; few fine roots; 10 percent rock fragments; strongly acid; gradual wavy boundary.

C—25 to 60 inches, light olive brown (2.5Y 5/4) gravelly sandy loam; few fine distinct yellowish brown (1OYR 5/6) and light brownish gray (10YR 6/2) mottles; weak thick platy structure; firm; 25 percent rock fragments; strongly acid.

The solum ranges from 20 to 36 inches thick. Rock fragments make up 5 to 35 percent of the soil. This soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

The Al or Ap horizon has hue of 7.5yr or 1OYR, value of 2 through 4, and chroma of 1 through 4. The A horizon is fine sandy loam, very fine sandy loam, or their gravelly analogs.

The B21 horizon has hue of 7.5YR or 1OYR, value of 4 or 5, and chroma of 4 through 6. The B22 and B23 horizons have hue of 1OYR or 2.5Y, value of 4 through 6, chroma of 2 through 6, and distinct or prominent mottles. The B horizon is fine sandy loam, sandy loam, or their gravelly analogs. It has weak granular or weak sub-angular blocky structure and is friable or very friable.

The C horizon has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 2 through 4. The C horizon is fine sandy loam, sandy loam, or their gravelly analogs. Some pedons have thin lenses of silt loam, sand, or loamy sand. The horizon has weak thick platy structure, or it is massive. Consistence is very friable through firm.

Tisbury series

The Tisbury series consists of coarse-silty over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts. These moderately well drained soils formed in glacioflu vial deposits derived mainly from schist, gneiss, and granite. The soils are on outwash terraces. Slopes range from 0 to 3 percent.

Tisbury soils are on the landscape with well drained Enfield and Bridgehampton soils, moderately well drained Ninigret and Sudbury soils, and poorly drained Raypol soils. Tisbury soils have a finer textured solum than Ninigret or Sudbury soils.

Typical pedon of Tisbury silt loam, in Providence County, town of Johnston, 200 feet east of the junction of Brown Ave and the Pocasset River:

Ap—0 to 8 inches, dark brown (10YR 3/3) silt loam; weak medium granular structure; very friable; common fine roots; 1 percent coarse fragments; medium acid; abrupt smooth boundary.

B21--8 to 20 inches, yellowish brown (10YR 5/6 silt loam; weak fine subangular blocky structure; very friable; 1 percent coarse fragments; strongly acid; clear wavy boundary.

B22--20 to 28 inches, yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/8) mottles; massive; very friable; 1 percent coarse fragments; strongly acid; clear wavy boundary.

IIC--28 to 60 inches, pale brown (10YR 6/3) very gravelly sand; few fine distinct light brownish gray (2.5Y 6/2) mottles; single grain loose; stratified; 50 percent coarse fragments; strongly acid.

The solum ranges from 17 to 40 inches thick. Coarse fragments make up 0 to 5 percent of the solum and 25 to 70 percent of the IIC horizon. The soil is very strongly acid through medium acid.

The A horizon has value of 2 or 3 and chroma of 1 through 3. It is silt loam or very fine sandy loam.

The B horizon has hue of 7.5YR or 10YR , value of 4 or 5, and chroma of 3 through 6. The B22 horizon has a hue 7.5YR through 2.5Y value of 4 though 6, and chroma of 3 through 6; the horizon is mottle. The B horizon is silt loam or very fine sandy loam. It has weak fine to coarse subangular blocky structure, or the horizon is massive.

The IIC horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 2 through 6. It is gravelly or very gravelly sand. The horizon is stratified..

Udipsamments

Udipsamments in this survey area consist of moderately well drained to excessively drained windblown sand dunes and blowout areas that have been stabilized by beach grasses. They are along beaches in areas mainly along Block Island South and Rhode Island Sound.

Upidsamments are on the landscape with Beaches and very poorly drained Matunuck Soils.

Coarse fragments make up less than 5 percent of the soil. Udipsamments are extremely acid through strongly acid. They are dominantly sand to a depth of 60 inches or more.

Udorthents

Udorthents are moderately well drained to excessively drained soils that have been cut, filled or eroded. The areas have had more then 2 feet of the upper part of the original soil removed or have more then 2 feet of fill on top of the original soil. Udorthents formed in loamy glacial till and in gravelly outwash with loamy mantle. They are on glacial till plains and outwash terraces.

Udorthents are on the landscape with excessively drained Hinckley and Windsor soils; well drained Charlton, Canton, Paxton, Compton, Newport, Bridgehampton, and Agawam soils; moderately well drained Rainbow, Woodbridge, Pittstown, and Sutton soils; and Urban land.

Coarse fragments make up as much as 45 percent of the soil. The soils are extremely acid to medium acid. They are dominantly loamy sand, sandy loamk, fine sandy loam, or their gravelly analogs. In places, they are very gravelly sand.

Walpole series

The Walpole series consists of sandy, mixed, mesic Aeric Haplaquepts. These poorly drained soils formed in glaciofluvial deposits derived mainly from schist,

gneiss, and granite. The soils are in depressions and drainageways. Slopes range from 0 to 3 percent.

The Walpole soils are on the landscape with excessively drained Hinckley soils; somewhat excessively Merrimac soils; well drained Agawam soils; moderately well drained Sudbury, Ninigret, and Deerfield soils; and very poorly drained Scarboro soils.

Typical pedon of Walpole sandy loam, in Washington County, town of South Kingstown, 500 feet south of U.S. Route 1 and 2,000 feet east of the intersection of Moonstone Beach Road and U.S. Route 1:

Ap--0 to 7 inches, very dark brown (10YR 2/2) sandy loam; weak fine granular structure; friable; common fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21g--7 to 15 inches, light brownish gray (10YR 6/2) sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak fine granular structure; friable; few fine roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B22g--15 to 19 inches, light brownish gray (2.5Y 6/2) sandy loam; common fine distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak fine granular structure; friable; 15 percent coarse fragments; strongly acid; clear wavy boundary.

IIC—19 to 60 inches, dark yellowish brown (10YR 4/4) and grayish brown (2.5Y 4/2) stratified gravelly sand; common coarse distinct strong brown (7.5 YR %/8) mottles; single grain; loose; 30 percent coarse fragments; strongly acid.

The solum ranges from 18 to 28 inches thick. Coarse fragments make up 0 to 25 percents of the solum and up to 50 percent of the substratum. The soil is very strongly acid through medium acid.

The Al or Ap horizon has value of 2 or 3 and chroma of 1 or 2. The A horizon is fine sandy loam, sandy loam, or their gravelly analogs.

The B horizon has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 1 through 3. The B horizon is fine sandy loam, sandy loam, or their gravelly analogs. It has weak granular or subangular blocky structure, or the horizon is massive.

The IIC horizon has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 2 through 4. The IIC horizon is sand, loamy sand, or their gravelly analogs.

Wapping series

The Wapping series consists of coarse-loamy, mixed, mesic Aquic Dystrochrepts. These moderately well drained soils formed in silt mantled glacial till. The soils are on side slopes or in depressions of glaciated uplands. Slopes range from 0 to 8 percent.

Wapping soils are on the landscape with well-drained Narragansett and Bridgehampton soils, moderately well drained Sutton soils, and poorly drained Leicester soils. The Wapping soils have a finer textured solum than the Sutton soils.

Typical pedon of Wapping silt loam, in an area of Wapping extremely stony silt loam, 0 to 8 percent slopes, in Washington County, town of Hopkinton, Yawgoo Boy Scout Camp, 3,300 feet west of Beach Pond Road, 2,900 feet southwest of Grassy pond, and 3,300 feet north of Yawgoo Pond:

01—3 inches to 0, loose leaves and twigs.

A11—0 to 2 inches, very dark brown (7.5YR 2/2) silt loam; weak fine granular structure; friable; many fine roots; very strongly acid; clear wavy boundary.

A12—2 to 5 inches, very dark grayish brown (1OYR 3/2) silt loam; weak fine granular structure; friable; many fine roots; very strongly acid; clear wavy boundary.

B21—5 to 10 inches, dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; common medium roots; very strongly acid; gradual wavy boundary.

B22—l0 to 19 inches, yellowish brown (1OYR 5/4) silt loam; weak medium subangular blocky structure; friable; common tine roots; 5 percent coarse fragments; very strongly acid; gradual wavy boundary.

B23—19 to 30 inches, dark brown (10YR 4/3) silt loam, common medium distinct yellowish brown (1OYR 5/ 4) and common medium faint grayish brown (10YR 5/2) mottles; massive; friable; few fine roots; very strongly acid; gradual wavy boundary.

IICl—30 to 37 inches, brown (10YR 5/3) sandy loam; common fine prominent reddish brown (5YR 5/3) and common medium faint grayish brown (1OYR 5/2) mottles; massive; friable; 10 percent coarse fragments; strongly acid; clear wavy boundary.

IIC2—37 to 60 inches, dark yellowish brown (10YR 4/4) gravelly loamy sand; massive; friable; 40 percent coarse fragments; strongly acid.

The solum ranges from 20 to 36 inches thick. Coarse fragments make up 0 to 20 percent of the solum and 5 to 50 percent of the 11C horizon. These soils are very strongly acid through medium acid.

The Ap or Al horizon has hue of 7.5YR or 1OYR, value of 2 through 4, and chroma of 1 through 3. It is silt loam or very fine sandy loam. Consistence is very friable or friable.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. The B22 and B23 horizons have hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6 and are mottled. The B horizon is silt loam or very fine sandy loam. It has weak, fine or medium subangular blocky structure, or the horizon is massive.

The IIC horizon has hue of 1OYR through 5Y and value and chroma of 2 through 6. It is fine sandy loam, sandy loam, loamy sand, or their gravelly analogs. Some pedons have layers of loamy sand up to 5 inches thick below a depth of 40 inches or less than 5 inches thick below a horizon of sandy loam. The IIC horizon is very friable, friable, or firm.

Whitman series

The Whitman series consists of coarse-loamy, mixed, mesic Humic Fragiaquepts. These very poorly drained soils formed in glacial till derived mainly from schist, gneiss, and granite. The soils are in depressions and drainage ways of uplands. Slopes range from 0 to 3 percent.

Whitman soils are on the landscape with well drained Canton, Charlton and Paxton soils; moderately well drained Woodbridge and Sutton soils; and poorly drained Leicester and Ridgebury soils.

Typical pedon of Whitman fine sandy loam, in an area of Ridgebury, Whitman, and Leicester extremely stony soils, in Providence County, town of Foster, about 1/2 mile southeast of the intersection of Hartford Pike and Boss Road:

A1—0 to 10 inches, black (10YR 2/1) fine sandy loam; weak medium granular structure; very friable; common medium roots; 10 percent rock fragments; very strongly acid; clear wavy boundary.

Clg—l0 to 18 inches, gray (5Y 5/1) gravelly fine sandy loam; massive; very friable; few fine roots; 20 percent rock fragments; strongly acid; clear wavy boundary.

C2xg—.-18 to 60 inches, gray (5Y 5/1) gravelly fine sandy loam; few medium distinct dark yellowish brown (10YR 4/4) mottles; massive; firm 20 percent rock fragments; stongly acid.

The solum ranges from 10 to 24 inches thick. Rock fragments make up to 10 to 25 percent of this soil. The soil is very strongly acid through medium acid.

The A horizon has neutral colors, or it has hue of 10YR, value of 2 or 3, and chroma of 0 through 2. It is fine sandy loam or sandy loam.

The C horizon has neutral colors, or it has hue of 1OYR through 5Y, value of 4 through 6, and chroma of 0 or 1. In some pedons the C horizon has few, distinct or prominent mottles. This horizon is fine sandy loam, sandy loam, or their gravelly analogs. The Cx horizon has chroma of 0 through 3 and few to many, distinct or prominent mottles. The Cx horizon is firm or very firm.

Windsor series

The Windsor series consists of mixed, mesic Typic Udipsamments. These excessively drained soils formed in glaciofluvial deposits derived mainly from schist, gneiss, and phyllite. The soils are on terraces, outwash plains, kames, and eskers. Slopes range from 0 to 8 percent.

Windsor soils are on the landscape with excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and

moderately well drained Deerfield and Sudbury soils. Windsor soils have fewer coarse fragments than Hinckley soils.

Typical pedon of Windsor loamy sand, 0 to 3 percent slopes, in Washington County, town of South Kingstown, 1/2 mile north of Route 1 and about 100 feet east of Shannock Road:

01—1 inch to 0, loose leaves and twigs.

A1—0 to 1 inch, very dark grayish brown (10YR 3/2) loamy sand; weak medium granular structure; very friable; strongly acid; abrupt smooth boundary.

A2—1 to 2 inches, gray (10YR 5/1) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B21—2 to 4 inches, dark yellowish brown (10YR 4/4) loamy sand; weak fine granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.

B22—4 to 28 inches, yellowish brown (1OYR 5/4) loamy sand; weak fine granular structure; very friable; 2 percent coarse fragments; strongly acid; clear wavy boundary.

C—28 to 60 inches, light brownish gray (2.5Y 6/2) fine sand; single grain; loose; 2 percent coarse fragments; strongly acid.

The solum ranges from 20 to 32 inches thick. Coarse fragments make up 0 to 5 percent of the solum and up to 10 percent of the substratum. This soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

The Ap or Al horizon has value of 3 or 4 and chroma of 2 through 4. Some pedons have a thin A2 horizon. The A horizon is loamy sand or loamy fine sand.

The B21 horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma 4 through 8. The B22 horizon has hue of 1OYR or 2.5Y, value of 5 or 6, and chroma of 2 through 6. The B horizon is loamy sand, loamy fine sand, medium sand, or fine sand.

The C horizon has hue of 1OYR and 2.5Y, value of 5 through 7, and chroma of 2 through 4. It is medium or fine sand.

Woodbridge series

The Woodbridge series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These moderately well drained soils formed in glacial till derived mainly from schist, gneiss, and phyllite. The soils are on lower slopes and crests of upland hills and drumlins. Slopes range from 0 to 8 percent.

Woodbridge soils are on the landscape with well drained Paxton soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils.

Typical pedon of Woodbridge fine sandy loam, 0 to 3 percent slopes, in Providence County, town of Smithfield, about 100 feet east of Brayton Road and 1,000 feet north of the intersection of Brayton Road and Mowry

Road:

Ap—0 to 7 inches, dark brown (1OYR 3/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent coarse fragments; strongly acid; clear smooth boundary.

B21—7 to 11 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak fine subangular blocky structure; very friable; common fine roots; 10 percent coarse fragments; strongly acid; gradual smooth boundary.

B22—l1 to 21 inches, yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; very friable; 10 percent coarse fragments; strongly acid; gradual smooth boundary.

B23—21 to 32 inches, yellowish brown (1OYR 5/6) fine sandy loam, common medium distinct grayish brown (2.5Y 5/2) mottles; massive; friable; 8 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—32 to 60 inches, dark grayish brown (2.5Y 4/2) sandy loam; weak thick platy structure; firm, brittle; 5 percent coarse fragments; medium acid.

The solum ranges from 15 to 36 inches thick and corresponds to the depth to compact glacial till. Rock fragments make up 5 to 30 percent of the soil. This soil is very strongly acid through medium acid.

The Al or Ap horizon has value of 2 through 4 and chroma of 1 through 3. The A horizon is fine sandy loam, sandy loam, or their gravelly analogs.

The B21 horizon has value of 3 through 5 and chroma of 3 through 6. The B22 and B23 horizons have hue of 1OYR or 2 5Y, value of 4 through 6, and chroma of 3 through 6. The horizon has weak, fine or medium granular or subangular blocky structure. The horizon is friable or very friable. It is fine sandy loam, sandy loam, or their gravelly analogs.

The C horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. It is fine sandy loam, sandy loam, or their gravelly analogs. The horizon has weak to moderate, thin to thick, platy structure. Consistence is firm to very firm in the Cx horizon.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	inches
Very low ……	…0 to 2.4
Low……	2.4 to 3.2
Moderate……..	3.2 to 5.2
High……	More than 5.2

Badland. Steep or very steep, commonly nonstony barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having base exchange properties is saturated with ex-changeable bases (sum of Ca, Mg, Na, K), ex pressed as a percentage of the exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is ex posed.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation-exchange capacity. The total amount of ex-changeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

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.

Coarse fragments. Mineral or rock particles up to 10 inches (2 millimeters to 25 centimeters) in diameter.

Coarse textured (light textured) soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water control measures is difficult.

Complex, soil. A mapping unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—
Loose.—Noncoherent when dry or moist; does not hold together in a mass.

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

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

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

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

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

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

Cemented.—Hard; little affected by moistening.

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

Cutbanks cave. Unstable walls of cuts made by earth-moving equipment. The soil sloughs easily.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

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

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

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

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

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

Moderately well drained —Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained —Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained —Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough periods during the growing season that most meso- phytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below

plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are com- monly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in “hillpeats” and “climatic moors.”

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream f lowing in a tunnel beneath a glacier.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime. Expessive carbonates, or lime, restrict the growth of some plants.

Fast intake. The rapid movement of water into the soil**.**

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May,* for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

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

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A

fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action. Freezing and thawing of soil moisture. Frost action can damage structures and plant roots.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the assorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by melt water as it flows from glacial ice.

Glacial till (geology). Unassorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

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

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

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

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

*B horizon***.**—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical

of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to diner from that in the solum the Roman numeral II precedes the letter C.

R layer—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and pan is undrained.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Large stones. Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

Liquid limit The moisture content at which the soil passes from a plastic to a liquid state.

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

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. Inadequate strength for supporting loads.

Miscellaneous areas. Areas that have little or no natural soil, are too nearly inaccessible for orderly examination, or cannot otherwise be feasibly classified.

Moderately coarse textured (moderately light textured) soil. Sandy loam and fine sandy loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Types are terminal, lateral, medial, and ground.

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

Muck. Dark colored, finely divided, well-decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 per cent.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by water that originated mainly from the melting of glacial

ice. Glacial outwash is commonly in valleys on landforms known as valley trains, outwash terraces, eskers, kame terraces, kames, outwash fans, or deltas.

Outwash plain. A land form of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Peat. Unconsolidated material, largely undecomposed organic matter that has accumulated under excess moisture.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

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

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

Piping. Moving water forms subsurface tunnels or pipelike cavities in the soil.

Pitting. Formation of pits as a result of the melting of ground ice after the removal of plant cover.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

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

	ph
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3

Mildly alkaline…… 7.4 to 7.8

Moderately alkaline……7.9 to 8.4

Strongly alkaline…..... 8.5 to 9.0

Very strongly alkaline…….. 9.1 and higher

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeters to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

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

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Stow Intake. The slow movement of water into the soil.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

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

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

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

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

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

Substratum. The part of the soil below the solum.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but the limited geographic soil area does not justify creation of a new series.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

INDEX TO MAP SHEETS

STATE OF RHODE ISLAND

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers

71°45′00″ 71°30′00″ 71°15′00″

42°00′00″ 41°45′00″ 41°30′00″

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Inset, sheet 152

Inset, sheet 137

Inset, sheet 130

Inset, sheet 71