

# SOIL SURVEY OF Franklin County, Vermont



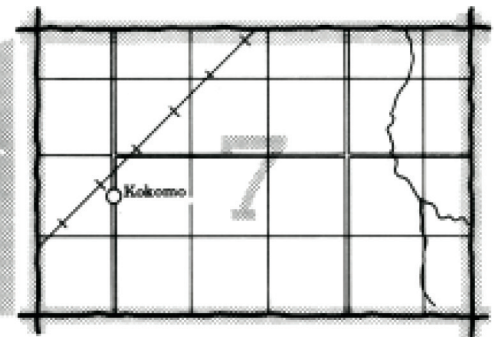
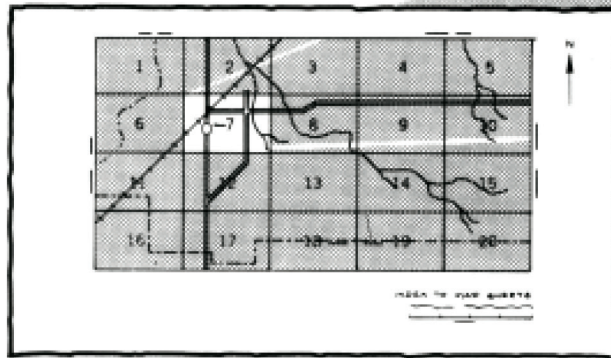
**United States Department of Agriculture  
Soil Conservation Service**

in cooperation with the

**Vermont Agricultural Experiment Station and the  
Vermont Agency of Environmental Conservation**

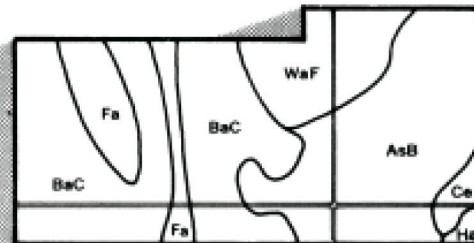
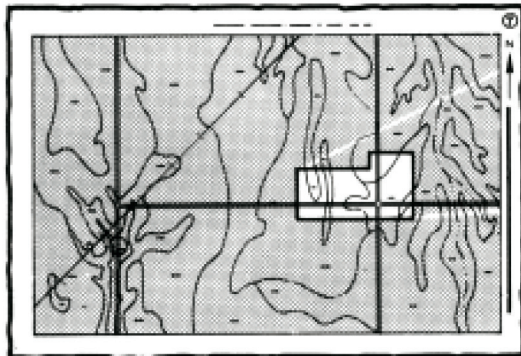
# HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

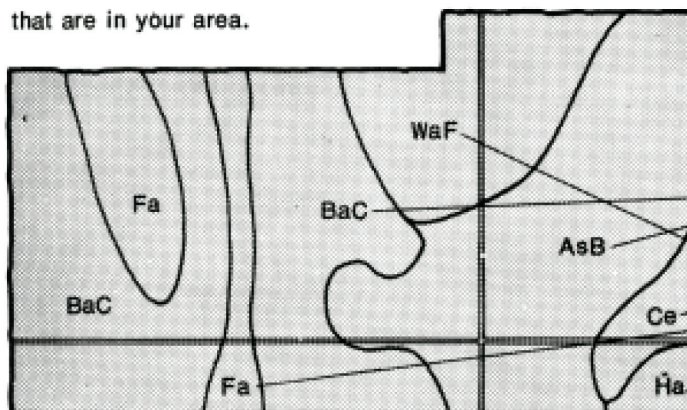


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



4. List the map unit symbols that are in your area.



## Symbols

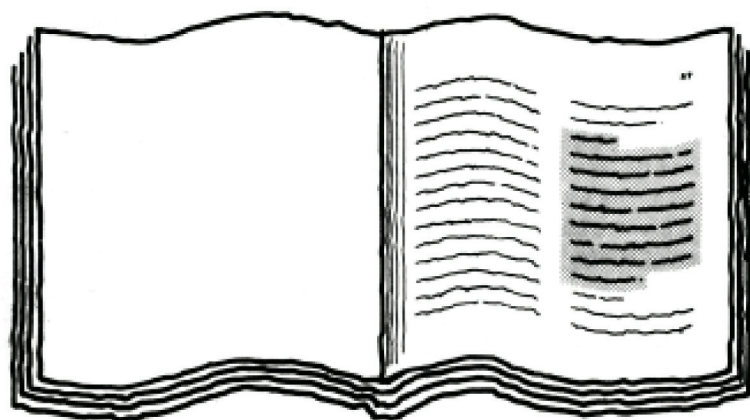
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# THIS SOIL SURVEY

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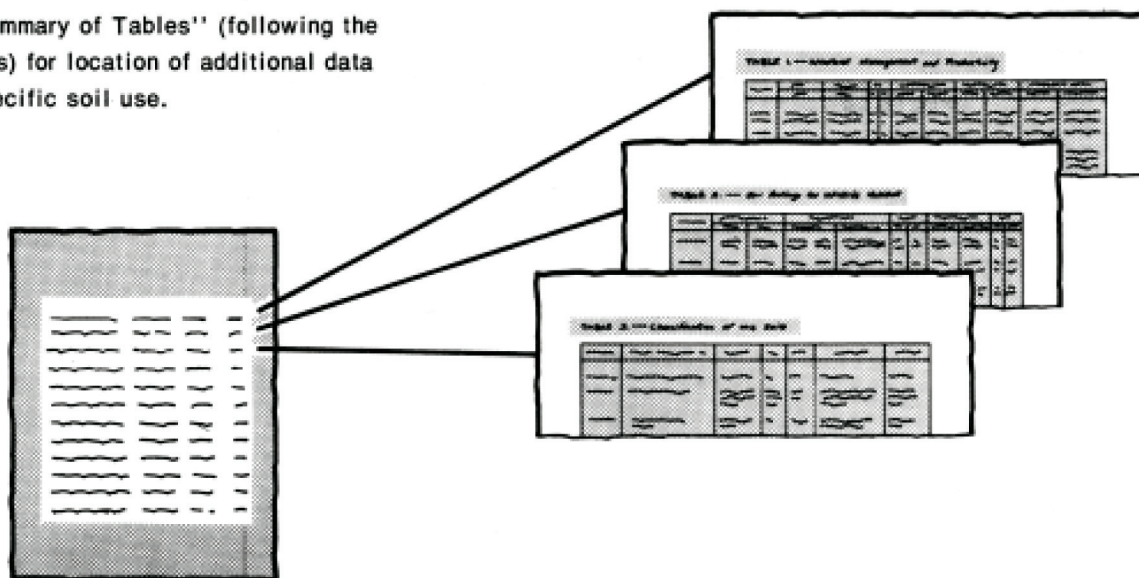
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6.

See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7.

Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

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 1968-75. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service and the Vermont Agricultural Experiment Station and the Vermont Agency of Environmental Conservation. It is part of the technical assistance furnished to the Franklin County Natural Resources 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: Typical foothill landscape in Franklin County.**



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## Foreword

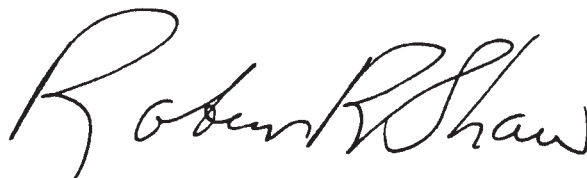
The Soil Survey of Franklin County, Vermont, contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

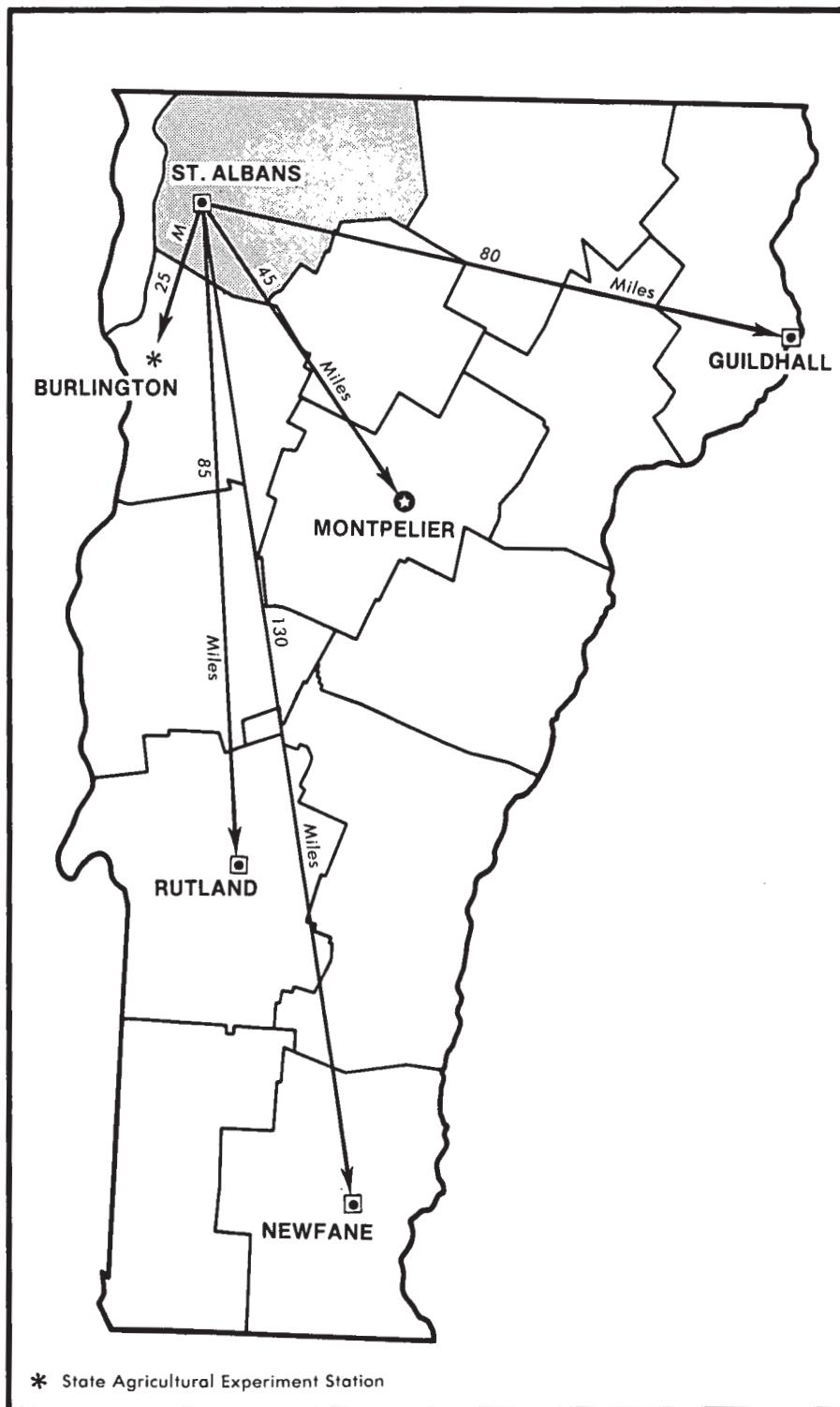
Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

A handwritten signature in black ink, reading "Robert Shaw". The signature is fluid and cursive, with the first name "Robert" and last name "Shaw" clearly legible.

Robert Shaw  
State Conservationist  
Soil Conservation Service



Location of Franklin County in Vermont.



# SOIL SURVEY OF FRANKLIN COUNTY, VERMONT

By Dennis J. Flynn and Robert V. Joslin, Soil Conservation Service

Fieldwork by Dennis J. Flynn, Robert V. Joslin, John A. Pratt,  
and Carl T. Britt, Soil Conservation Service, and John Doles, Edward White,  
Henry Ferguson, and Drew Adam, Vermont Agency of Environmental Conservation

United States Department of Agriculture, Soil Conservation Service,  
in cooperation with the Vermont Agricultural Experiment Station and the  
Vermont Agency of Environmental Conservation

FRANKLIN COUNTY is in the northwest corner of Vermont. The county is 421,760 acres, or 659 square miles. St. Albans, the largest city and county seat, is in the southwestern part of the county, near Lake Champlain. About 50 percent of the county is in woodland; 45 percent is in farms; and 5 percent is urbanized, is used for recreation, or is idle. The farms are mainly in the Champlain Valley and the major river valleys. Small family farms are being replaced by larger corporate farms or are being subdivided and sold as second homes. The manufacture of packaging materials and the shipment of bulk milk are major industries in the county.

## General nature of the area

This section provides general information about Franklin County. It briefly discusses settlement and population, farming, transportation, and climate and describes the physiography, geology, and drainage of the county.

## Settlement and population

What is considered the first settlement in Vermont was made in the early 1600's in Franklin County when the St. Francis Indians, a part of the Abenaki Tribe of Maine, settled at Swanton, along the banks of the Missisquoi River. Though the French mapped and deeded the areas, the first settlers to take up permanent residence in the county were from Massachusetts. St. Albans was chartered in 1763, and Franklin County was organized 1792.

The population of Franklin County grew steadily from the 1700's to about 1900. Farming and the influx of small light industry, especially in Enosburg Falls, Sheldon, and St. Albans, were the major reasons for the increase. From 1900 to 1965, however, the population steadily declined. The demise of the small farm and the development of the large industrial complex in the Midwest and along the East Coast accounted for much of the loss in population. Since 1965, the population of Franklin County has increased. The resurgence of the small farm, the purchase

of second homes by city dwellers, and the return of light industry are the main reasons for the increase.

## Farming

Farming is the main source of income in Franklin County. The county is a major producer of maple products and milk, and it is a major supplier for the State and the New England region.

In the 18th century Franklin County was a major source of grain for feed and food for Vermont and the Northeast. Later, the farmers began raising beef cattle and sheep. In the mid-1800's the dairy industry was established in the county.

Franklin County farmers raise hay and silage corn as feed for their dairy cattle. Grain for feed, fertilizer and herbicides for crops, and fuel for farm equipment are imported. The average size of the dairy herds in Franklin County increased from 28.6 cows in 1953 to 60.1 cows in 1974. The number of dairy herds in production decreased from 1,405 in 1953 to 662 in 1974 (6).

## Transportation

The major highway in Franklin County is Interstate 89, which passes north-south through the county and links the area with Montreal to the north and Burlington, Vermont, and Boston, Massachusetts, to the south. Other highways in the counties are U.S. route 7 and Vermont routes 104, 105, 108, 36, and 78. Commercial carriers provide bus service along the major highways in the county.

Private air transportation facilities are available at Franklin County State Airport, at Swanton, Vermont. Commercial air service is available outside the county at Burlington International Airport in Burlington, Vermont, or at Dorval or Maribel International Airports in Montreal, Canada.

Daily passenger rail service is provided at St. Albans and links the county to all the major passenger rail lines in the United States. Freight service is provided by three railroads that cross the county.

Ferry service across Lake Champlain is available to the north at Grand Isle and to the south at Burlington.

## Climate

Table 1 gives data on temperature and precipitation for the survey area, as recorded at St. Albans for the period 1956 to 1974. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 19 degrees F, and the average daily minimum temperature is 11 degrees. The lowest temperature on record, which occurred at St. Albans on January 15, 1957, is -32 degrees. In summer the average temperature is 69 degrees, and the average daily maximum temperature is 78 degrees. The highest recorded temperature, which occurred on July 2, 1963, is 95 degrees.

Growing degree days, shown in table 1, 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, 20 inches, or 61 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 16 inches. The heaviest 1-day rainfall during the period of record was 2.5 inches at St. Albans on August 28, 1971. Thunderstorms occur on about 25 days each year, and most occur in summer.

Average seasonal snowfall is 44 inches. The greatest snow depth at any one time during the period of record was 39 inches. On the average, 62 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 80 percent. The percentage of possible sunshine is 60 in summer and 40 in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in December.

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

## Physiography, geology, and drainage

Franklin County is within two physiographic divisions—the Champlain Lowland and the Green Mountains. The Champlain Lowland is part of the Ridge and Valley province, and the Green Mountains are part of the New England province.

The Champlain Lowland occupies the western third of the county, trending north-south and ranging in width from 7 miles in the south to nearly 15 miles in the north.

It is bounded by Lake Champlain on the west and the Fairfield Hill escarpment on the east (3). Elevation ranges from 97 feet on the Missisquoi delta to 900 feet on several klippen near St. Albans.

The Green Mountain division generally starts at the Fairfield Hill escarpment and extends east out of the county. It is a landscape of hills and valleys in the west and high mountains in the east. These mountains trend north-northeast, and the highest elevation is just south of the Vermont-Quebec border. Big Jay, the highest peak in the county, has an elevation of 3,780 feet. Since these eastern areas of high elevation and strong relief coincide with the increased metamorphic grade, it is likely that this relief is caused by the greater erosion resistance of the higher grade metamorphic rocks of this area.

The soils of the Champlain Lowland are underlain by shale, slate, limestone, and dolostone of Ordovician age. Some lenses of marble are in the calcic rocks around Swanton and have been quarried. Much limestone is now quarried at these sites for bulk application to farmland. East of the valley, in the foothills and Green Mountains, the soils are underlain by Cambrian phyllite, greenstone, graphitic slate, quartzite, gneiss, schist, and some minor lenses of dolostone and marble.

The rocks in the lowland are the most nearly horizontal and least altered of any in Vermont. The lowland is part of a slight downfold, or syncline, known as the St. Albans synclinorium. This synclinorium is between the Champlain thrust fault, which strikes north-south along the lake, and the Hinesburg thrust fault, which is at the base of the Fairfield Hill escarpment.

The Champlain and Hinesburg thrusts formed during the taconic orogeny of late Ordovician time and are part of a major series of thrust faults extending from Pennsylvania to Canada.

The area which is now the Green Mountains was a huge ocean trough, or geosyncline, in the early Paleozoic era. Vast amounts of sediment poured into this trough, and the rocks formed in the trough buckled and folded in late Devonian time. During this uplift and folding, the rocks were metamorphosed into the present schists, greenstones, phyllites, and gneisses.

The soils of Franklin County developed in glacial material, recent alluvium, or organic deposits. The glacial material was deposited on fresh bedrock that had been exposed by movement of the ice cap. The gross physical features of the county are determined to a great extent by the shape of the bedrock. Some of the bedrock either was not covered by glacial deposition or has been exposed by erosion since deposition. These areas of rock are quite common on the higher ridges in the Champlain Lowland and in the Green Mountains. In most of the Champlain Valley, however, little bedrock is exposed. The glacial deposits in some places are 100 feet thick or more.

Franklin County was covered by the Labrador Ice Sheet of the late Wisconsin Glaciation. The ice sheet is estimated to have been roughly 10,000 feet thick. During the wastage of the ice, the Champlain Valley was occu-



pied by an ice lobe fed from the north and the Green Mountains to the east were dominated by ice. The uplift of the Hudson Valley formed a new glacial lake, Lake Vermont, at the southern end of the Champlain Valley. As the ice receded, Lake Vermont grew and covered much of the lowland west of the Fairfield escarpment except for the higher areas such as Aldis, St. Albans, and Carter Hills. The lake drained southward into the Hudson Valley.

As the ice margin shrank from the south side of the St. Lawrence lowland, a connection with the sea was made along the lower St. Lawrence River and seawater flooded the valley as far south as Whitehall, New York. Whale fossils have been unearthed in the clays of Addison County, about 50 miles south, and many microfossils are in the higher sands of the Franklin County Champlain Lowland. The present Lake Champlain formed when differential uplift brought the northern end of the Champlain Valley out of the water and cut the valley off from the sea. During the time water covered the Champlain Valley, sediments were carried into the lake by streams flowing from the mountains. The silt and clay carried in these stream were deposited in the lake, and the sands were deposited closer to the lakeshore, particularly in such areas as Sheldon Springs and Highgate.

All drainage in the county is to the west into Lake Champlain, although a few streams wander north into Canada before returning to Lake Champlain. The two major rivers, the Missisquoi and the Lamoille, are superimposed on the taconic features and suggest that the area may once have been a peneplain draining to the west. Many consequent streams flow into these two large rivers, notably the Trout River, Tyler Branch, Black Creek, the Fairfield River, and the Mill River. Lake Carmi, Fairfield Pond, Arrowhead Lake, and Metcalf Pond are the largest of the numerous small lakes and ponds in the county.

## 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 counties nearby and in places more distant.

Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

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 photographs 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 sections "General soil map for broad land use planning" and "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 rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

## General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.



Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

The soils in the survey area vary widely in their potential for major land uses. Table 4 shows the extent of the map units shown on the general soil map and gives general ratings of the potential of each, in relation to the other map units, for major land uses. Soil properties that pose limitations to the use are indicated. The ratings of soil potential are based on the assumption that practices in common use in the survey area are being used to overcome soil limitations. These ratings reflect the ease of overcoming the soil limitations and the probability of soil problems persisting after such practices are used.

Each map unit is rated for *cultivated farm crops, specialty crops, woodland, urban uses, and recreation areas*. Cultivated farm crops are those grown extensively by farmers in the survey area. Specialty crops include vegetables, fruits, and nursery crops grown on limited acreage and generally requiring intensive management. Woodland refers to land that is producing either trees native to the area or introduced species. Urban uses include residential, commercial, and industrial developments. Intensive recreation areas include campsites, picnic areas, ballfields, and other areas that are subject to heavy foot traffic. Extensive recreation areas include those used for nature study and as wilderness.

## Soils that formed in water deposited material on flood plains

### 1. Limerick-Rumney Variant-Winooski

*Deep, level, moderately well drained to poorly drained loamy soils; on flood plains*

This map unit consists of soils in areas adjacent to the major and minor rivers in the county. The map unit makes up about 3 percent of the county. It is about 40 percent Limerick soils, 26 percent Rumney Variant soils, 10 percent Winooski soils, and 24 percent soils of minor extent.

The Limerick soils are in depressional areas on flood plains and are poorly drained. The Rumney Variant soils are poorly drained and have a coarser texture than the Limerick soils. The Winooski soils are moderately well drained. All three soils are subject to flooding from once every 5 years to twice a year, and all have a seasonal high water table.

The minor soils in this map unit are well drained Hadley and Ondawa Variant soils and moderately well drained Podunk Variant soils.

Most areas of this map unit have been cleared of trees and are farmed intensively. The main crops are corn, hay, and pasture. Flooding is a limitation for crops during spring and other wet periods.

If properly drained the soils of this map unit have good potential for farming. Wetness and the hazard of flooding make potential for residential and other urban uses poor. The potential for woodland is fair and is limited by wetness. The potential for wildlife habitat is good.

## Soils that formed in glacial till in the Champlain Valley

### 2. Farmington-Lordstown-Rock outcrop

*Shallow and moderately deep, gently sloping to very steep, somewhat excessively drained and well drained loamy soils and Rock outcrop; on uplands*

This map unit consists of soils in extensive areas in the Champlain Valley on knolls and ridges that are generally oriented in a north-south direction. The soils are underlain by limestone and shale bedrock. The map unit makes up about 6 percent of the county. It is about 40 percent Farmington soils, 25 percent Lordstown soils, 25 percent Rock outcrop, and 10 percent soils of minor extent.

The Farmington soils are mainly on limestone bedrock and are somewhat excessively drained. The Lordstown soils are in areas of shale and slate outcrops and are well drained.

The minor soils in this map unit are moderately well drained Georgia soils and somewhat excessively drained St. Albans soils.

This map unit is used for pasture and cultivated crops. Excessive drainage, areas of Rock outcrop, and steep slopes limit this unit for cultivated crops.

The soils of this unit have poor potential for urban development because of the outcrops and steep slopes. The potential is poor for farming and fair for woodland. The potential for wildlife habitat is poor and is limited by droughty conditions and a lack of adequate plant cover.

### 3. Georgia-St. Albans

*Deep, nearly level to very steep, moderately well drained and well drained loamy soils; on uplands*

This map unit consists of soils in areas on the sides of ridges and knolls in the Champlain Valley. The map unit makes up about 4 percent of the county. It is about 53 percent Georgia soils, 38 percent St. Albans soils, and 9 percent soils of minor extent.

The Georgia soils are moderately well drained, and the St. Albans soils are well drained. In most places the Georgia soils are at a slightly lower elevation than the St. Albans soils.

The minor soils in this map unit are somewhat excessively drained Copake soils, somewhat poorly drained Massena soils, and very poorly drained Lyons soils.

Most areas of this map unit have been cleared and are extensively farmed.

These soils have good potential for farming. The potential for urban development is fair and is limited by the seasonal high water table in some areas, mainly in the

Georgia soils. The potential for wildlife habitat and woodland is good.

#### 4. Massena-Lyons

*Deep, level to gently sloping, somewhat poorly drained and poorly drained loamy soils in depressional areas; on uplands*

This map unit consists of soils in areas throughout the Champlain Valley. The map unit makes up about 6 percent of the county. It is about 82 percent Massena soils, 11 percent Lyons soils, and 7 percent soils of minor extent.

The Massena soils are sloping and somewhat poorly drained. The Lyons soils are very poorly drained. The Massena soils are at a slightly higher position on the landscape than the Lyons soils. Both soils have a perched water table.

The minor soils in this map unit are moderately well drained Georgia soils and well drained St. Albans soils.

The soils in this unit are used for hay, corn, and pasture. The perched water table and stones in some areas limit the use of these soils for farming.

These soils have fair potential for farming. The potential for urban development is poor and is limited by wetness. The potential for woodland is fair and is limited by wetness. These soils have good potential for wildlife habitat.

### Soils that formed in water deposited material on terraces and old lake plains

#### 5. Au Gres-Enosburg-Wareham

*Deep, level to gently sloping, somewhat poorly drained and poorly drained sandy soils; on old lake plains and terraces*

This map unit consists of soils on the margins of old lake beds and on terraces in areas throughout the county. The map unit makes up about 3 percent of the county. It is about 38 percent Au Gres soils, 28 percent Enosburg soils, 24 percent Wareham soils, and 10 percent soils of minor extent.

The Au Gres soils are somewhat poorly drained and are on terraces and sides of valleys. The Enosburg soils are poorly drained and are underlain by loamy material. They formed on deltas, old beaches, and terraces. The Wareham soils are poorly drained and typically are in depressional areas.

The minor soils in this map unit are excessively drained Windsor soils and moderately well drained Deerfield soils.

The soils in this map unit are used mainly for hay and pasture, but some areas are used for corn.

This map unit has poor potential for urban uses and farming and is limited by a high water table. The potential for wildlife habitat is fair, and the potential for woodland is poor.

#### 6. Munson-Buxton-Belgrade

*Deep, gently sloping to steep, somewhat poorly drained and moderately well drained silty and clayey soils; on old lake plains*

This map unit consists of soils on old freshwater lake beds that are in the larger valleys above the flood plains (fig. 1). The areas are throughout the county. The map unit makes up about 5 percent of the county. It is about 56 percent Munson soils, 25 percent Buxton soils, 10 percent Belgrade soils, and 9 percent soils of minor extent.

The Munson soils are somewhat poorly drained, clayey, and gently sloping to moderately steep. The Buxton soils are moderately well drained, clayey, and moderately steep to steep. The Belgrade soils are somewhat poorly drained, silty, and gently sloping to moderately steep.

The minor soils in this map unit are poorly drained Scantic soils and somewhat poorly drained Raynham soils.

This map unit is used mainly for corn, hay, and pasture.

If artificially drained, these soils have good potential for farming. Potential is poor for urban uses and is limited by wetness and poor stability. Potential for wildlife habitat and woodland is good.

#### 7. Scantic-Raynham-Binghamville

*Deep, level to gently sloping, poorly drained silty and clayey soils; in depressions or on old lake plains*

This map unit consists of soils mainly on old lake plains in large, irregularly shaped areas in the Champlain Valley and in small, narrow areas in other parts of the county. The map unit makes up about 6 percent of the county. It is about 53 percent Scantic soils, 19 percent Raynham soils, 17 percent Binghamville soils, and 11 percent soils of minor extent.

The Scantic and Binghamville soils are on lower slopes and in level areas. The Raynham soils are on slopes. All three soils have a silty surface layer, and the lower part of the subsoil and the substratum of the Scantic soils are clayey.

The minor soils in this map unit are moderately well drained Buxton soils, poorly drained Birdsall soils, and somewhat poorly drained Munson soils.

This map unit is used mainly for dairy farming. Some areas are cultivated, and hay, corn, and pasture are the main crops.

The soils in this map unit have fair potential for farming and are limited by wetness in spring and fall. The soils have poor potential for urban development and are limited by wetness and poor stability. Potential is fair for wildlife habitat and poor for woodland, and wetness is the main limitation for these uses.

#### 8. Kingsbury-Covington

*Deep, level to gently sloping, somewhat poorly drained and poorly drained clayey soils; on old lake plains*



This map unit consists of soils on the low part of the landscape in the Champlain Valley. The soils formed under saltwater and are mainly in the towns of St. Albans and Georgia. The map unit makes up about 1 percent of the county. It is about 48 percent Kingsbury soils, 42 percent Covington soils, and 10 percent soils of minor extent.

The Kingsbury soils are somewhat poorly drained and are on slightly convex slopes in areas above the Covington soils. The Covington soils are poorly drained and remain wet for a longer period than the Kingsbury soils. Both soils have a seasonal high water table.

The minor soils in this map unit are very poorly drained Livingston soils and somewhat poorly drained Massena soils.

This map unit is used extensively for dairy farming. Some areas are cultivated, and corn, hay, and pasture are the main crops.

These soils have fair potential for farming and are limited by wetness and high clay content. The potential for urban development is poor because of poor stability, the high water table, and slow permeability. The potential for wildlife habitat and woodland is fair.

#### 9. Windsor-Missisquoi

*Deep, nearly level to very steep, excessively drained sandy soils; on beaches, deltas, and terraces*

This map unit consists of soils in areas throughout the county. The larger areas are near the major streams. The map unit makes up about 8 percent of the county. It is about 41 percent Windsor soils, 36 percent Missisquoi soils, and 23 percent soils of minor extent.

The Windsor and Missisquoi soils are sandy, but the Missisquoi soils are gravelly in the lower part of the subsoil and in the substratum.

The minor soils in this map unit are moderately well drained Deerfield soils, well drained Hinesburg soils, and moderately well drained Eldridge soils.

This map unit is used for dairying, farming, woodland, and community development. The steep areas are mainly in woodland. The more nearly level areas are used extensively for corn.

These soils have good to fair potential for farming and are limited by droughtiness and low nutrient content. The potential for urban development is good. These soils have poor potential for wildlife habitat and fair potential for woodland. The major limitation for these uses is droughtiness.

### Soils that formed in organic material and in glacial till mainly on the Green Mountains and on foothills

#### 10. Carlisle-Terric Medisaprists

*Deep and shallow, level, very poorly drained organic soils; in depressions*

This map unit consists of soils in areas throughout the county and in a large area near the mouth of the Missisquoi River. The map unit makes up about 4 percent of the county. It is about 40 percent Carlisle muck, 27 percent Terric Medisaprists, and 33 percent soils of minor extent.

Carlisle muck and Terric Medisaprists consist of organic deposits in bog areas. The Terric Medisaprists have a thinner layer of organic material than Carlisle muck and are mineral at a shallower depth.

The minor soils in this map unit are very poorly drained Peacham and Wallkill soils.

This map unit is used mainly for wetland wildlife habitat. Plant species are limited to those that are water tolerant.

These soils have poor potential for farming, and most areas do not have suitable outlets for artificial drainage. Potential for urban development and woodland is poor. The soils have good potential for wetland wildlife habitat.

#### 11. Woodstock-Tunbridge-Rock outcrop

*Shallow and moderately deep, gently sloping to very steep, somewhat excessively drained to excessively drained and well drained loamy soils and Rock outcrop; on Green Mountains and foothills*

This map unit consists of soils on bedrock ridges on uplands and the Green Mountains (fig. 2). The map unit makes up about 29 percent of the county. It is about 32 percent Woodstock soils, 29 percent Tunbridge soils, 28 percent Rock outcrop, and 11 percent soils of minor extent.

The Woodstock soils are excessively drained and are shallower than the Tunbridge soils, which are somewhat excessively drained. These soils are in an intricate pattern with areas of Rock outcrop that is mainly schist.

The minor soils in this map unit are somewhat poorly drained Westbury soils, moderately well drained Peru soils, and somewhat poorly drained to poorly drained Cabot soils.

Most of this map unit is used for woodland. The climax forest is beech, birch, and maple.

The potential for farming is poor in this map unit and is limited by steep slopes and the common areas of Rock outcrop. The potential for urban development is poor and is also limited by the steep slopes and areas of Rock outcrop. Potential is good for wildlife habitat and fair for woodland.

#### 12. Peru-Stowe

*Deep, gently sloping to steep, moderately well drained and well drained loamy soils that have a fragipan; on Green Mountains and foothills*

This map unit consists of soils on uplands and in the Champlain Valley (fig. 3). The areas are large and irregularly shaped and are on the sides of hills and mountains. The map unit makes up about 15 percent of the county. It

is about 70 percent Peru soils, 18 percent Stowe soils, and 12 percent soils of minor extent.

The Peru soils are moderately well drained and are on lower foot slopes in areas below the Stowe soils. The Stowe soils are well drained. Both soils have a fragipan at a depth of less than 3 feet.

The minor soils in this map unit are somewhat poorly drained to poorly drained Cabot soils, excessively well drained Woodstock soils, somewhat excessively drained Tunbridge soils, and excessively well drained Colton soils.

This map unit is used mainly for hay, corn, pasture, and woodland.

These soils have good potential for farming, wildlife habitat, and woodland. The potential for urban uses is poor to fair and is limited by the fragipan and steep slopes.

### 13. Cabot-Westbury

*Deep, nearly level to sloping, somewhat poorly drained and poorly drained loamy soils that have a fragipan; on lower slopes and in depressions of foothills and on Green Mountains*

This map unit consists of soils in low areas on uplands and mountains and in areas in the Champlain Valley. The areas are irregularly shaped. The map unit makes up about 10 percent of the county. It is about 60 percent of Cabot soils, 25 percent Westbury soils, and 15 percent soils of minor extent.

The Cabot soils are somewhat poorly drained and poorly drained. The Westbury soils are somewhat poorly drained. Both soils have a fragipan at a depth of less than 3 feet.

The minor soils in this map unit are moderately well drained Peru soils, well drained Stowe soils, and very poorly drained Peacham soils.

This map unit is used mainly for hay and pasture. Artificial drainage is needed in most areas.

These soils have fair to poor potential for farming and are limited by wetness and surface stones. The potential for urban development is poor and is limited by wetness and a fragipan. The potential for woodland and wildlife habitat is fair.

## 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.

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 *soil phase* commonly indicates a feature that affects use or management. For example, Belgrade silt loam, 2 to 8 percent slopes, is one of several phases within the Belgrade series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes, soil associations, 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. Lordstown-Rock outcrop complex, 5 to 15 percent slopes, is an example.

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. Marsh is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 5, and 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.

## Soil descriptions and potentials

**AuA—Au Gres loamy fine sand, 0 to 6 percent slopes.** This nearly level to gently sloping, somewhat poorly drained soil is in irregularly shaped areas that range from 3 to 50 acres. Slopes are 40 to 400 feet long.

Typically, the surface layer is very dark grayish brown loamy fine sand 9 inches thick. The subsurface layer is gray fine sand 3 inches thick. The subsoil is 13 inches thick. It is dark brown fine sand in the upper part and yellowish brown fine sand in the lower part. It is very friable and mottled. The underlying material is light olive brown fine sand to a depth of 60 inches.

Included with this soil in mapping are small areas of the Deerfield and Eldridge soils on slight rises and Wareham and Enosburg soils in depressional areas. Also included are areas of soils that have thin layers of fine textured material at a depth of less than 40 inches and areas of soils that have a surface layer of fine sand or loamy sand. The Deerfield, Eldridge, and Enosburg soils make up 15 to 30 percent of this map unit, and the Wareham soils make up 10 to 15 percent.

Permeability is rapid in this soil, and available water capacity is very low. The root zone extends to a depth of 30 inches, but root growth is restricted by a seasonal high water table. In unlimed areas the surface layer is strongly acid to slightly acid and the subsoil is medium acid to neutral. Runoff is slow. Tilth is good, but tillage is delayed in places because of wetness. This soil has low natural fertility. A seasonal high water table is evident from late fall to midspring. The hazard of erosion is slight. Frost action potential is moderate.

This soil is mainly used for hay, pasture, and woodland. Small areas are used for cultivated crops, silage corn, homesites, and recreation, and a few small areas are idle. The soil is a good source of sand and gravel, but excavations fill with water. If properly managed, the soil has fair potential for woodland. It has fair potential for farming and poor potential for wildlife habitat and most non-farm uses.

This soil is limited for cultivated crops by a seasonal high water table, the hazard of soil blowing, and very low available water capacity after prolonged dry periods. The hazard of soil blowing is severe if this soil is left unvegetated. The seasonal high water table and wetness after prolonged rains are management concerns. Crops on this soil respond well to lime and fertilizer. Installation of tile drainage helps to reduce the water table, and seeding a winter crop of rye helps to reduce the hazard of soil blowing and increase the available water capacity.

The major concerns of pasture management on this soil are lowering the water table, increasing available water capacity during dry periods, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing. Installation of tile drainage to reduce the water

table, use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are some suitable management practices. Ladino clover and orchardgrass are common grass and legume mixtures used for pasture on this soil.

This soil is limited for woodland by the seasonal high water table. Eastern hemlock and balsam fir are the main plantation trees. The dominant native species are red maple, white birch, and gray birch.

This soil is limited for community development by the seasonal high water table. Installation of tile drainage helps to reduce the water table in places to allow construction of buildings without basements.

This soil is limited for recreation by the seasonal high water table and the hazard of soil blowing in unvegetated areas during dry periods. Capability subclass IVw; woodland ordination 3s.

**BeB—Belgrade silt loam, 2 to 8 percent slopes.** This nearly level to sloping, moderately well drained soil is in irregularly shaped areas that range from 5 to 20 acres. Slopes are convex and 100 to 300 feet long.

Typically, the surface layer is brown to dark brown silt loam 5 inches thick. The subsoil is 17 inches thick. It is friable dark yellowish brown, olive gray, and dark grayish brown silt loam and very fine sandy loam and is mottled distinct red and brown in the lower part. The underlying material extends to a depth of 60 inches. It is dark grayish brown silt loam in the upper part and brown to dark brown silt loam in the lower part.

Included with this soil in mapping are small areas of the Raynham, Eldridge, and Munson soils in slight depressions and drainageways; small areas of soils that have coarse textured material at a depth of less than 40 inches; and a few areas of soils that have fine textured material at a depth of less than 40 inches. Also included are areas of soils that have stones on the surface and that are shown on the map by a spot symbol. The included Raynham and Eldridge soils make up 20 to 35 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate to moderately slow in this soil, and available water capacity is high. The root zone extends to a depth of 25 inches, but root growth is restricted by the seasonal high water table. In unlimed areas the surface layer and subsoil are strongly acid to medium acid and the substratum is slightly acid to neutral. Runoff is slow. Tilth is good, but tillage is delayed in places because of wetness. This soil has high natural fertility. A seasonal high water table is evident from late fall through early spring. The hazard of erosion is slight. Frost action potential is high.

This soil is mainly used for hay and silage corn. A few areas are idle, are in pasture and woodland, or are used for recreation and urban development. This soil has good potential for farming, woodland, recreation, and wildlife habitat. It has poor potential for most urban uses.

This soil is well suited to most cultivated crops. Wetness caused by a seasonal high water table and slow permeability in the subsoil is the main limitation. Tile drainage is a suitable management practice in some areas of this soil. Open ditches on the perimeter of some cultivated fields help to reduce the seasonal high water table. Crops respond well to lime and fertilizer, and cool-season crops are suited to this soil.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes, preventing overgrazing, and lowering the seasonal high water table are the major concerns of pasture management. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime are suitable management practices. Installation of tile drainage and diversion ditches helps to reduce the seasonal high water table. Kentucky bluegrass and timothy are the common pasture grasses.

This soil is suited to trees. The dominant species are red pine and white pine.

This soil is limited for most urban uses by the seasonal high water table, slow permeability, and high frost action potential. Footer drains around homesites and interceptor ditches along the development perimeter help to lower the seasonal high water table in places.

This soil is well suited to recreational use. Diversion ditches and tile drainage help to reduce wetness caused by the seasonal high water table.

This soil is well suited to most types of wildlife habitat, but it is poorly suited to wetland wildlife habitat. Capability subclass IIw; woodland ordination 3o.

**BeC—Belgrade silt loam, 8 to 15 percent slopes.** This sloping, moderately well drained soil is in irregularly shaped areas that range from 5 to 20 acres. Slopes are convex and 75 to 200 feet long.

Typically, the surface layer is brown to dark brown silt loam 5 inches thick. The subsoil is 17 inches thick. It is dark yellowish brown, olive gray, and dark grayish brown, friable silt loam and very fine sandy loam and is mottled distinct red and brown in the lower part. The underlying material extends to a depth of 60 inches. It is dark grayish brown silt loam in the upper part and brown to dark brown silt loam in the lower part.

Included with this soil in mapping are small areas of the Raynham, Eldridge, and Munson soils in slight depressions and in drainageways; small areas of soils that have coarse textured material at a depth of less than 40 inches; and a few areas of soils that have fine textured material at a depth of less than 40 inches. Also included are areas of soils that have stones on the surface and that are shown on the map by a spot symbol. The included Raynham and Eldridge soils make up 15 to 30 percent of this map unit, and the other included soils make up 5 to 15 percent.

Permeability is moderate to moderately slow in this soil, and available water capacity is high. The root zone extends to a depth of 25 inches, but root growth is

restricted by the seasonal high water table. In unlimed areas the surface layer and subsoil are strongly acid to medium acid and the substratum is slightly acid to neutral. Runoff is medium. Tillage is good, but tillage is delayed in places because of wetness. This soil has high natural fertility. A seasonal high water table is evident from late fall through early spring. The hazard of erosion is moderate. Frost action potential is high.

This soil is mainly used for hay or pasture. A few areas are in corn, in woodland, or are idle, and a few small areas are used for recreation and urban development. This soil has good potential for woodland, farming, and some types of wildlife habitat. It has poor potential for most urban uses.

This soil is suited to cultivated crops. The major management concerns are the hazard of erosion in un-vegetated areas, a seasonal high water table, and slow permeability in the subsoil. No-till and contour farming and maintaining a cover crop are suitable management practices. Tile drainage and open ditches on the perimeter of cultivated fields are needed in places on this soil.

If properly managed, this soil is well suited to pasture. Controlling erosion on cowpaths, establishing and maintaining a mixture of grasses and legumes, preventing overgrazing, and lowering the seasonal high water table are the major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime are suitable management practices. Tile drainage on less sloping adjacent soils helps to reduce the seasonal high water table. Kentucky bluegrass and timothy are common pasture grasses.

This soil is suited to woodland. Mulching and using skid trails and water bars help to control the hazard of erosion. The dominant tree species are red spruce, red oak, red pine, and white pine.

This soil is limited for most urban uses by the erosion hazard in un-vegetated areas, slow permeability, and high frost action potential. Quick seeding, mulching, and using footer drains around homesites and interceptor ditches along the development perimeter help to reduce the hazard of erosion and lower the seasonal high water table.

This soil is suited to recreational use. The hazard of erosion is a management concern where this soil is un-vegetated. Mulching of paths and trails and rotating recreational areas are suitable management practices.

This soil is well suited to openland and woodland wildlife habitat. It is poorly suited to wetland wildlife habitat. Capability subclass IIIe; woodland ordination 3r.

**Bg—Binghamville silt loam.** This level or depressional, deep, poorly drained soil is in irregularly shaped areas on old glacial lake plains. The areas range from 4 to 200 acres. Slopes are generally less than 1 percent. Plowed areas of this soil have a smooth surface, and unplowed areas have an uneven surface that is characterized by tree throw mounds and that is subject to trampling by cattle.



Typically, the surface layer is very dark grayish brown silt loam about 11 inches thick. The subsoil is grayish brown and olive gray silt loam about 16 inches thick. The substratum is gray and dark grayish brown silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Raynham, Scantic, and Enosburg soils. Also included are areas of Binghamville soils that have slopes of 1 to 3 percent, areas near lakes and slow moving streams of soils that are subject to flooding and ponding, and a few areas of soils that have gravel, cobbles, and stones on the surface. The Raynham and Scantic soils make up 25 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is slow in this soil. Available water capacity and natural fertility are high. The root zone extends to a depth of 27 inches or more, but root growth is restricted by an apparent high water table from late fall to late spring. In unlimed areas of this soil, the surface layer is medium acid to neutral and the subsoil and substratum are strongly acid to neutral. Runoff is slow. Tilth is good, but tillage is delayed or difficult because of wetness. The hazard of erosion is slight. Frost action potential is high.

Most of the acreage of this soil is used for hay or pasture. A small acreage is idle or is used for silage corn or woodland. This soil has good potential for use as pond sites and for wetland wildlife habitat. It has fair potential for farming and woodland. Potential is poor for most urban and recreational uses.

This soil is limited for cultivated crops, hay, and pasture by excess wetness and the restricted rooting depth. Plant species are restricted to those that are water tolerant. If suitable outlets are available, tile drainage helps to reduce wetness. Open ditches on the perimeter of cultivated fields help lower the seasonal high water table. Crops on this soil respond well to lime and fertilizer.

The major concerns of pasture management on this soil are lowering the water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. If suitable outlets are available, tile drainage and diversion ditches on the perimeter of pastures help to lower the water table.

Excess wetness and a seasonal high water table limit the use of this soil for woodland. The dominant tree species are alders and aspen.

During the wet season the high water table limits this soil for most types of community development. Septic tank absorption fields are saturated during the spring and other wet periods, and the soil provides a poor foundation for streets and access roads.

The major limitation of this soil for recreation is the seasonal high water table. The soils become saturated and have a poor capacity for supporting foot and vehicular traffic. Parking areas, athletic fields, and playgrounds

become unstable during wet periods, and they dry out slowly after rains and in the spring. Capability subclass IIIw; woodland ordination 4w.

**Br—Birdsall silt loam.** This level, very poorly drained soil is in circular areas that range from 2 to 10 acres. Slopes are mainly less than 1 percent but are as much as 3 percent.

Typically, this soil is covered by 11 inches of very dark brown muck. The surface layer is very dark brown silt loam 5 inches thick. The subsoil is dark gray and gray, mottled silt loam and very fine sandy loam 16 inches thick. The substratum is dark gray silt loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Binghamville soils, Terric Medisaprists, and Carlisle soils. Included soils make up 15 to 30 percent of this map unit.

Permeability is slow or very slow in this soil. Available water capacity and natural fertility are high. The root zone extends to a depth of 35 inches, but root growth is restricted by the seasonal high water table. In unlimed areas reaction ranges from medium acid to neutral. Runoff is very slow or ponded. Tilth is good, but tillage is very difficult because of wetness. The water table is at or above the surface most of the year. Frost action potential is high.

This soil is mostly in woodland and pasture, or it is idle. It has good potential for wetland wildlife habitat and as a site for pond reservoirs. It has poor potential for most farm and nonfarm uses because of the high water table, slow or very slow permeability, and frost action potential.

This soil is limited for pasture by a seasonal high water table and slow permeability. Drainage is difficult because of a lack of suitable outlets. Empire trefoil and climax timothy are the main pasture grasses.

Although much of this soil is wooded, it is unsuitable for merchantable trees. A high water table is the main limitation. Eastern white pine and red maple are the dominant tree species.

This soil is unsuitable for urban development. The main limitations are a high water table, slow permeability, and high frost action potential. The lack of suitable outlets prevents drainage.

This soil is well suited to use as pond sites or for water recreational areas. The soil is well suited to wetland wildlife habitat. Capability subclass VIw; woodland ordination 5w.

**BxC—Buxton silt loam, 8 to 15 percent slopes.** This sloping, moderately well drained soil is in narrow, convex areas that range from 3 to 20 acres. Slopes are 30 to 250 feet long.

Typically, the surface layer is dark brown silt loam about 9 inches thick. The subsoil is 22 inches thick. In sequence downward, it is 3 inches of strong brown silt loam, 4 inches of light brownish gray silt loam, 3 inches of grayish brown silty clay loam that has faint to prominent mottles and gray clay films, and 12 inches of gray silty clay that has distinct mottles. The substratum extends to a depth of 60 inches. It is mottled grayish brown silty clay and olive brown fine sand and has gray clay films.

Included with this soil in mapping are small areas of Munson soils that are mainly in drainageways, in draws, or around springs; a few areas of soils that have sand at depths of less than 40 inches; and areas of eroded soils that have a thinner solum than this Buxton soil. Also included are a few areas of soils that are silty clay loam in the upper part of the profile. The included Munson soils make up 20 to 30 percent of this map unit, and the other included soils make up 20 percent.

Permeability is moderately slow to slow in the surface layer and subsoil and slow in the substratum. Available water capacity and natural fertility are high. The root zone is deep, but root growth is restricted by the clayey subsoil. In unlimed areas reaction ranges from strongly acid to neutral. Runoff is medium. Tilth is fair. When this soil is dry, tillage is difficult because of the high clay content. A perched water table is evident from late fall to midspring. The hazard of erosion is moderate. Frost action potential is high.

Most of the acreage of this soil is used for hay or pasture. A few areas are used for woodland and wildlife habitat. The soil has good potential for farming and some types of wildlife habitat. It has poor potential for most urban and recreational uses because of the seasonal high water table.

This soil is limited for cultivated crops and hay by wetness. Plant species are restricted to those that are water tolerant. Tile drainage is needed in places, and open ditches on the perimeter of cultivated fields help to reduce the seasonal high water table. Crops respond well to lime and fertilizer. Cool-season crops are suited to this soil.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are the major concerns of pasture management. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are some suitable management practices.

This soil is limited for woodland by a seasonal high water table and slope. Eastern white pine and red spruce are the dominant species.

This soil is limited for many urban uses by a seasonal high water table from late fall to midspring. Septic tank absorption fields are commonly saturated during spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Tile drains around foundation footings help lower the seasonal high water table. Because of the saturated conditions, high content of clay, and frost action potential, this soil is limited for construction of streets and access roads.

This soil is limited for recreational uses by the seasonal high water table. Because of the saturated conditions, this soil has poor capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become unstable during wet periods, and they dry out slowly after rains and in spring.

This soil is suited to openland wildlife habitat and woodland wildlife habitat. Capability subclass IIIe; woodland ordination 4r.

**BxD—Buxton silt loam, 15 to 25 percent slopes.** This moderately steep, moderately well drained soil is in irregularly shaped areas or on sides of gullies. Areas range from 3 to 30 acres.

Typically, the surface layer is dark brown silt loam about 9 inches thick. The subsoil is 22 inches thick. In sequence downward, it is 3 inches of strong brown silt loam, 4 inches of light brownish gray silt loam, 3 inches of grayish brown silty clay loam that has faint to prominent mottles and gray clay films, and 12 inches of gray silty clay that has distinct mottles. The substratum extends to a depth of 60 inches. It is mottled grayish brown silty clay and olive brown fine sand and has gray clay films.

Included with this soil in mapping are small areas of Munson soils that are mainly in drainageways, in draws, or around springs; small areas of Belgrade soils near the tops of slopes; a few areas of soils that have sand at a depth of less than 40 inches; and areas of eroded soils that have a thinner solum than this Buxton soil. Also included are a few areas of soils that are silty clay loam in the upper part of the profile. The included Munson soils make up 25 to 40 percent of this map unit, and the other included soils make up 10 percent.

Permeability is slow or very slow. Available water capacity and natural fertility are high. The root zone is deep, but root growth is restricted by the clayey subsoil. In unlimed areas reaction ranges from strongly acid to neutral. Runoff is rapid. Tilth is fair. A seasonal high water table is evident from late fall to midspring. Frost action potential is high.

Most of the acreage of this soil is used for pasture. A few acres are used for woodland. This soil has fair potential for farming. Because of slope and wetness, it has poor potential for most urban and recreational uses and for wildlife habitat. Potential is good for woodland.

This soil is limited for cultivated crops, hay, and pasture by the erosion hazard in unvegetated areas and the restricted rooting depth. Crops respond well to lime and fertilizer. Maintaining a cover crop helps to reduce erosion. Tile drainage is needed in areas used for hay.

If properly managed, this soil is suited to pasture. The hazard of erosion is a major limitation. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are some suitable management practices.

Erosion and slope limit the use of this soil for woodland. Using water bars and mulching skid trails help to reduce erosion in places. Eastern white pine and red spruce are the dominant tree species.

This soil is poorly suited to urban uses, and it is limited by slope, a severe erosion hazard in unvegetated areas, and a seasonal high water table from late fall to mid-



spring. Septic tank absorption fields are commonly saturated during spring and other wet periods. Special design and construction is needed to prevent water from seeping into basements and other excavations. Tile drains around foundation footings help to reduce the seasonal high water table. Because of the saturated conditions, high clay content, and frost action potential, this soil is limited for construction of streets and access roads.

This soil is poorly suited to recreational uses. The major limitations are slope and the seasonal high water table. Because of slope and high clay content, this soil has poor capacity to support foot and vehicular traffic when wet. The hazard of erosion is severe in unvegetated areas. Parking areas, paths, and trails become saturated and unstable during wet periods. Capability subclass IVE; woodland ordination 4r.

**BxE—Buxton silt loam, 25 to 45 percent slopes.** This steep, moderately well drained soil is in irregularly shaped areas on terrace breaks and sides of gullies. The areas range from 3 to 40 acres. Slopes are 30 to 250 feet long.

Typically, the surface layer is dark brown silt loam about 9 inches thick. The subsoil is 22 inches thick. In sequence downward, it is 3 inches of strong brown silt loam, 4 inches of light brownish gray silt loam, 3 inches of grayish brown silty clay loam that has faint to prominent mottles and gray clay films, and 12 inches of gray silty clay that has distinct mottles. The substratum extends to a depth of 60 inches. It is mottled grayish brown silty clay and olive brown fine sand and has gray clay films.

Included with this soil in mapping are small areas of Munson soils that are mainly at the bottom of slopes and around seep spots, a few areas of soils that have sand at a depth of less than 40 inches, very small areas of Belgrade soils at the top of slopes, and areas of eroded soils that have a thinner solum than this Buxton soil. Also included are a few areas of soils that are silty clay loam in the upper part of the profiles. The included Munson soils make up 10 to 20 percent of this map unit, and the other included soils make up 15 percent.

Permeability is slow or very slow in this soil. Available water capacity and natural fertility are high. The root zone is deep, but root growth is restricted by the clayey subsoil. Reaction ranges from strongly acid to neutral. Runoff is very rapid. Tilth is fair. A seasonal high water table is evident from late fall to midspring. Frost action potential is high.

Most of the acreage of this soil is used for pasture, woodland, and wildlife habitat. This soil has poor potential for farming. It has poor potential for most urban and recreational uses because of slope and erosion, and it has fair potential for woodland.

This soil is limited for cultivated crops, hay, and pasture by the erosion hazard in unvegetated areas and the restricted rooting depth. Tillage and the use of farm equipment are limited by the hazard of erosion and slope.

If properly managed, this soil is suited to unimproved pasture. Controlling erosion and preventing overgrazing

are the major concerns of pasture management. Rotation of pastures and deferment of grazing are suitable management practices.

The hazard of erosion and steep slope limit the use of this soil for woodland. The use of equipment is limited by slope. Using special logging equipment and mulching of logging trails help to reduce erosion. Eastern white pine and red spruce are the dominant tree species.

This soil is unsuitable for most urban uses and is limited by steep slopes and the erosion hazard in unvegetated areas. The soil is limited for community development by the moderate frost action potential and slow permeability. The steep slopes, erosion hazard, high clay content, and frost action potential limit the soil for construction of streets and access roads.

This soil is unsuitable for most recreational uses. The major limitation is the steep slope. Because of slope and high clay content, this soil has poor capacity to support foot and vehicular traffic.

Slope limits the use of most types of wildlife habitat. Capability subclass VIe; woodland ordination 4r.

**CaA—Cabot stony fine sandy loam, 0 to 3 percent slopes.** This somewhat poorly drained to poorly drained, nearly level soil is in concave and slightly depressional areas. The areas range from 3 to 30 acres. Slopes are 50 to 300 feet long. Most areas of this soil have been cleared of stones. This soil has a fragipan at a depth of 12 to 24 inches.

Typically, the surface layer is very dark grayish brown fine sandy loam 7 inches thick. The subsoil is 9 inches thick. It is mottled, very dark grayish brown fine sandy loam in the upper part and mottled, grayish brown gravelly fine sandy loam in the lower part. The underlying material is a fragipan of very firm, olive gray gravelly fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Peacham and Scantic soils in depressions and Westbury soils that are on high mounds or are more sloping than this Cabot soil; areas of soils that have a fragipan at a depth of less than 12 inches or more than 24 inches; and areas of bedrock exposures, which are shown on the soil map with spot symbols. The included Westbury and Scantic soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is very high. The root zone generally extends to a depth of 24 inches, but root growth is restricted by the fragipan and a seasonal high water table. In unlimed areas this soil is medium acid to neutral throughout the profile. Runoff is very slow. Tilth is good, but tillage is difficult or delayed in places by stones on the surface or in the subsoil or by the seasonal high water table, which is evident from late fall to late spring. The hazard of erosion is slight. The frost action potential is high.

This soil is used mostly for hay, pasture, or woodland. A few small artificially drained areas are used for cul-

tivated crops. This soil has good potential for shallow and deep pond areas. It has good potential for wetland wildlife habitat.

If properly managed, this soil is suited to hay and cultivated crops. Wetness caused by the seasonal high water table and slow permeability of the fragipan is the main limitation. Tile drainage is needed. Open ditches on the perimeter of cultivated fields help to reduce the seasonal high water table in places. Crops respond well to lime and fertilizer.

If properly managed, this soil is suitable for pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are the major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, use of lime and fertilizer, and use of tile drainage and open ditches are suitable management practices. Kentucky bluegrass and climax timothy are the common pasture grasses.

This soil is suitable for woodland. Wetness is the main limitation. The major tree species are eastern white pine, red spruce, and northern white-cedar.

This soil is limited for most urban uses by a high water table, slow permeability in the fragipan, and frost action potential. Special design and maintenance is needed for urban structures on this soil.

Wetness limits this soil for recreational use. Ponding is a hazard during spring on picnic areas and playgrounds. Tile drainage and diversion ditches help to lower the seasonal high water table in places. Capability subclass IIIw; woodland ordination 4w.

**CaB—Cabot stony fine sandy loam, 3 to 8 percent slopes.** This gently sloping, somewhat poorly drained to poorly drained soil is in concave and slightly depressional areas. The areas range from 3 to 20 acres. Slopes are 50 to 300 feet long. Most areas of this soil have been cleared of stones. This soil has a fragipan at a depth of 12 to 24 inches.

Typically, the surface layer is very dark grayish brown fine sandy loam 7 inches thick. The subsoil is 9 inches thick. It is mottled, very dark grayish brown fine sandy loam in the upper part and mottled, grayish brown gravelly fine sandy loam in the lower part. The underlying material is a fragipan of very firm, olive gray gravelly fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Peacham soils in depressions and Westbury soils that are on high mounds or are more sloping than this Cabot soil; areas of soils that have a fragipan at a depth of less than 12 inches or more than 24 inches; and areas of bedrock exposures, which are shown on the soil map with spot symbols. The included Westbury soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is very high. The root zone generally extends to a depth of 24 inches, but root growth

is restricted by the fragipan and a seasonal high water table. In unlimed areas this soil is medium acid to neutral throughout the profile. Runoff is slow. Tilth is good, but tillage is difficult or delayed by stones on the surface or in the subsoil or by the seasonal high water table. A high water table is evident from late fall to late spring. The hazard of erosion is slight. The frost action potential is high.

This soil is used mostly for hay, pasture, or woodland. A few small artificially drained areas are used for cultivated crops. This soil has good potential as a site for shallow and deep ponds. It has poor potential for most other nonfarm uses because of the high water table and the slow permeability of the fragipan.

If properly managed, this soil is suited to cultivated crops and hay. Wetness caused by the seasonal high water table and slow permeability of the fragipan is the main limitation. Crops respond well to lime and fertilizer. Tile drainage is needed. Open ditches on the perimeter of cultivated fields help to reduce the seasonal high water table in places.

If properly managed, this soil is suitable for pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Use of tile drainage and open ditches helps to lower the water table. Kentucky bluegrass and climax timothy are the common pasture grasses.

This soil is suitable for woodland. Wetness is the main limitation. The dominant tree species are eastern white pine, red spruce, and northern white-cedar.

This soil is limited for most urban purposes by the high water table, slow permeability of the fragipan, and frost action potential. Special planning and design is needed for urban structures on this soil.

This soil is poorly suited to recreation. Wetness is the main limitation. Tile drainage and diversion ditches help to lower the seasonal high water table in places.

This soil is poorly suited to use as wildlife habitat. Capability subclass IIIw; woodland ordination 4w.

**CbA—Cabot extremely stony fine sandy loam, 0 to 3 percent slopes.** This nearly level, somewhat poorly drained to poorly drained soil is in concave and slightly depressional areas that range from 5 to 200 acres (fig. 4). Slopes are 50 to 500 feet long. The surface of this soil has stones 2 to 5 feet apart and common hummocks caused by cattle trampling and tree throw. This soil has a fragipan at a depth of 12 to 24 inches.

Typically, the surface layer is very dark grayish brown fine sandy loam 7 inches thick. The subsoil is 9 inches thick. It is mottled, very dark grayish brown fine sandy loam in the upper part and mottled, grayish brown gravelly fine sandy loam in the lower part. The underlying material is a fragipan of very firm, olive gray gravelly fine sandy loam to a depth of 60 inches.



Included with this soil in the mapping are small areas of stony Cabot soils and Westbury, Peacham, and Scantic soils. The Cabot and Westbury soils are on high mounds or are more sloping than this Cabot soil. The Peacham and Scantic soils are in depressional areas. Also included are areas of soils that have a fragipan at a depth of less than 12 inches or more than 24 inches and areas of bedrock exposures, which are shown on the map by a spot symbol. The included Westbury and Cabot soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is very high. The root zone generally extends to a depth of 24 inches, but root growth is restricted by the fragipan and a seasonal high water table. This soil is medium acid to neutral throughout the profile. Runoff is very slow and is impeded by the hummocks. Tilt is good, but tillage is severely limited by stones on the surface and in the subsoil. A high water table is evident from late fall to late spring. The frost action potential is high.

This soil is used mostly for unimproved pasture or woodland (fig. 4). A small acreage is used for pond sites (fig. 5). This soil has good potential as a site for shallow or deep ponds. It has good potential as a habitat for wetland wildlife and poor potential for most other uses.

This soil is unsuited to cultivated crops and hay. Large stones on the surface restrict the use of equipment, and the soil is limited by a perched high water table and slow permeability in the fragipan.

This soil is suitable for unimproved pasture. Large stones and hummocks on the surface restrict plant growth. Use of tile drainage and open ditches helps to lower the water table. Kentucky bluegrass is the common unimproved pasture grass.

This soil is suitable for woodland. Wetness and large stones on the surface restrict the use of equipment and are the main limitations. The dominant tree species are ash, red maple, alders, eastern white pine, white spruce, and northern white-cedar.

Large stones, a high water table, slow permeability in the fragipan, and frost action potential make this soil poorly suited to urban development. Special planning and design is needed for urban structures on this soil.

This soil is limited for recreation by wetness and large stones. Ponding is a hazard during spring on picnic areas and playgrounds.

This soil is suitable for wetland wildlife habitat. It is poorly or very poorly suited to other types of wildlife habitat. Capability subclass VII<sub>s</sub>; woodland ordination 4x.

**CbB—Cabot extremely stony fine sandy loam, 3 to 15 percent slopes.** This somewhat poorly drained to poorly drained, gently sloping to sloping soil is in concave and slightly depressional areas. The areas range from 5 to 150 acres. Slopes are 50 to 500 feet long. The surface of this soil has stones 2 to 5 feet apart and common hummocks caused by cattle trampling and tree throw.

Typically, the surface layer is very dark grayish brown fine sandy loam 7 inches thick. The subsoil is 9 inches thick. It is mottled, very dark grayish brown fine sandy loam in the upper part and mottled, grayish brown gravelly fine sandy loam in the lower part. The underlying material is a fragipan of very firm, olive gray gravelly fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of stony Cabot soils and Westbury, Peacham, and Scantic soils. The Cabot and Westbury soils are on high mounds or are more sloping than this Cabot soil. The Peacham and Scantic soils are in depressional areas. Also included are areas of soils that have a fragipan at a depth of less than 12 inches or more than 24 inches and areas of bedrock exposures, which are shown on the map by a spot symbol. The Westbury and Cabot soils make up 20 to 35 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is very high. The root zone generally extends to a depth of 24 inches, but root growth is restricted by the fragipan and a seasonal high water table. The soil is medium acid to neutral throughout the profile. Runoff is very slow. Tilt is good, but tillage is severely restricted by stones on the surface and in the subsoil. A seasonal high water table is evident from late fall to late spring. The frost action potential is high.

This soil is used mostly for unimproved pasture or woodland. A few small areas are idle. This soil has poor potential as a site for deep ponds.

This soil is unsuited to cultivated crops and hay. Use of equipment is limited by large stones on the surface. The perched high water table limits use of the soil for cultivated crops and hay.

This soil is suitable for unimproved pasture. The main limitations are large stones and hummocks on the surface of the soil. Kentucky bluegrass is the common unimproved pasture grass.

This soil is suitable for woodland. Wetness and large stones are the main limitations. The dominant tree species are eastern white pine, white spruce, northern white-cedar, ash, red maple, and alders.

This soil is unsuited to most urban uses and to recreation. Large stones, a high water table, slow permeability in the fragipan, frost action potential, and wetness are the main limitations. Special planning and design is needed for urban structures on this soil.

This soil is poorly or very poorly suited to most types of wildlife habitat. Capability subclass VII<sub>s</sub>; woodland ordination 4x.

**Ce—Carlisle muck.** This very poorly drained, deep, level or depressional organic soil is in bogs, where ground water is at or above the surface throughout the year. Areas are irregularly shaped and range from 2 to 25 acres.

Typically, the surface layer is black and very dark gray muck 8 inches thick. The subsurface layer is black and very dark brown muck to a depth of 60 inches.

Included with this soil in mapping are small areas of Terric Medisaprists and Marsh and Wareham, Peacham, and Limerick soils. The Terric Medisaprists make up 5 to 20 percent of the map unit, and the Wareham, Peacham, and Limerick soils and Marsh make up 5 to 20 percent.

Permeability is moderately rapid in this soil. Available water capacity is very high. The root zone extends to a depth of 10 inches, and root growth is restricted by water that is at or near the surface throughout the year. The surface layer and subsurface layer are very strongly acid to mildly alkaline. Runoff is very slow. Natural fertility is low. A seasonal high water table is present from early fall to early summer.

Most of the acreage of this soil is used for wetland wildlife habitat, or it is idle. A few small areas are used for pasture and woodland. This soil has good potential for wetland wildlife habitat. It has poor potential for most other uses.

This soil is limited for cultivated crops and hay by cool summer temperatures, a short growing season, surface water, and a lack of suitable outlets for drainage.

Surface water and a lack of suitable outlets for drainage limit the use of this soil for pasture.

Although a small acreage is wooded, this soil is unsuitable for merchantable trees. Excess wetness and a seasonal high water table are the main limitations. Alders, brown ash, and red maple are the dominant tree species on this soil.

This soil is unsuited to urban development and is limited by wetness, excess humus, and low strength when dry. The soil is unsuited to recreation and is limited by excess humus and wetness.

This soil is suitable for wetland wildlife habitat. It is very poorly suited to most other types of wildlife habitat. Capability subclass VIIw; woodland ordination 4w.

**CoB—Colton gravelly loamy sand, 2 to 8 percent slopes.** This nearly level to gently sloping, excessively drained, deep soil is in irregularly shaped areas on terraces and kames in many of the stream valleys of the county. The areas range from 3 to 20 acres. Slopes are 50 to 300 feet long.

Typically, the surface layer is dark brown gravelly loamy sand 7 inches thick. The subsoil is 18 inches thick. It is yellowish red and reddish yellow, very friable loamy sand in the upper part and brownish yellow, loose gravelly sand in the lower part. The substratum is dark yellowish brown gravelly sand to a depth of more than 60 inches.

Included with this soil in mapping are Deerfield soils in small depressional areas and Missisquoi soils in smooth areas or on low ridges. Also included are areas of soils that have short, steep slopes on terrace breaks and areas of soils that have stones on the surface. The Deerfield and Missisquoi soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. The root zone ex-

tends to a depth of 40 inches or more. In unlimed areas the soil is strongly acid to medium acid throughout the profile. Runoff is very slow. Tilth is good. The water table is at a depth of more than 5 feet. The hazard of erosion is slight. Cobbles are scattered throughout the surface of this soil.

This soil is used mainly for cultivated crops, hay, and pasture. It is a suitable source of roadfill and gravel. Small areas of this soil are used for pine plantations, cemeteries, and housing developments. This soil has good potential for community development, as a source of gravel, and for woodland. It has fair potential for cultivated crops, pasture, and recreational uses. It has poor potential for most types of wildlife habitat and as a site for water impoundment.

The main limitations of this soil for cultivated crops are a moderate hazard of soil blowing in unvegetated areas, restricted root growth during droughty periods, low natural fertility, and low available water capacity. Using cover crops such as rye and using fertilizer helps to improve natural fertility and available water capacity. Crops respond well to lime and fertilizer. No-till farming helps to reduce the hazard of soil blowing. Cool-season vegetables are suitable for this soil if contour farming is used.

This soil is suitable for pasture. It is limited by low available water capacity and low natural fertility. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are the main concerns of pasture management. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Climax timothy and clover are common mixtures used for pasture on this soil.

This soil is limited for woodland by low natural fertility and low available water capacity. Eastern white pine, red pine, and red spruce are the dominant tree species on this soil.

This soil is limited for recreation by small stones on or near the surface and droughtiness in places during dry periods.

This soil is mainly unsuitable for wildlife habitat. Low natural fertility and low available water capacity are the main limitations. Capability subclass IIIs; woodland ordination 4s.

**CoC—Colton gravelly loamy sand, 8 to 15 percent slopes.** This sloping, excessively drained, deep soil is in irregularly shaped areas on terraces and kames in many of the stream valleys of the county. These areas range from 2 to 30 acres. Slopes are 50 to 300 feet long.

Typically, the surface layer is dark brown gravelly loamy sand 7 inches thick. The subsoil is 18 inches thick. It is yellowish red and reddish yellow gravelly loamy sand and gravelly sand in the upper part and brownish yellow gravelly sand in the lower part. It is very friable in the upper part and loose in the lower part. The substratum is dark yellowish brown gravelly sand to a depth of 60 inches or more.



Included with this soil in mapping are Deerfield soils in small depressional areas and Missisquoi soils in smooth areas or on low ridges. Also included are areas of steep soils with short slopes on terrace breaks and areas of soils that have stones on the surface. The Deerfield and Missisquoi soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. The root zone extends to a depth of 40 inches or more. Unlimed areas of this soil are strongly acid to medium acid throughout the profile. Runoff is slow. Tilth is good. The water table is at a depth of more than 5 feet. The hazard of erosion is slight. Cobbles are scattered throughout the surface of this soil. The hazard of soil blowing is moderate.

This soil is used mainly for hay and pasture. It is used as a source of roadfill and gravel, and a few small areas are used for community development. Small areas support pine plantations. This soil has good potential as a source of gravel and for woodland. It has fair potential for pasture, recreational uses, most types of wildlife habitat, and cultivated crops.

This soil is limited for hay by low available water capacity during droughty periods. Crops respond well to lime and fertilizer. The main management concerns are low natural fertility and low available water capacity. Planting cover crops such as rye and using fertilizers help to improve available water capacity and fertility. Contour plowing and no-till planting help to reduce the hazard of soil blowing.

This soil is limited for pasture mainly by low available water capacity, low natural fertility, and soil blowing in unvegetated areas. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Climax timothy and clover are commonly used for pasture on this soil.

This soil is limited for woodland by low natural fertility and low available water capacity. Using water bars and mulching of road banks help to reduce the hazard of erosion in unvegetated areas. Eastern white pine, red pine, and red spruce are the dominant tree species on this soil.

Small stones on or near the surface, slope, erosion, and droughtiness during dry periods limit the use of this soil for community development and recreation.

This soil is suited to some types of wildlife habitat. Low natural fertility and low available water capacity are the main limitations. Capability subclass IVs; woodland ordination 4s.

**CoD—Colton gravelly loamy sand, 15 to 25 percent slopes.** This moderately steep, excessively drained, deep soil is in irregularly shaped areas on terrace and kame escarpments in many of the stream valleys of the county. These areas range from 5 to 50 acres. Slopes are 50 to 300 feet long.

Typically, the surface layer is dark brown gravelly loamy sand 7 inches thick. The subsoil is 18 inches thick. It is yellowish red and reddish yellow gravelly loamy sand and gravelly sand in the upper part and brownish yellow gravelly sand in the lower part. It is very friable in the upper part and loose in the lower part. The substratum is dark yellowish brown gravelly sand to a depth of more than 60 inches.

Included with this soil in mapping are Deerfield soils in small depressional areas and Missisquoi soils in smooth areas or on low ridges. Also included are areas of steep soils with short slopes on terrace breaks and areas of soils that have stones on the surface. The Missisquoi soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. The root zone extends to a depth of 40 inches or more. Unlimed areas of this soil are strongly acid to medium acid throughout the profile. Runoff is slow. Tilth is good. The water table is at a depth of more than 5 feet. The hazard of erosion is moderate. Cobbles are scattered throughout the surface layer of this soil.

This soil is used mainly for woodland and pasture, and it is used as a source of roadfill and gravel. Small areas of this soil support pine plantations, and a few small areas are used for hay. This soil has good potential as a source of gravel. It has fair potential for woodland and pasture and poor potential for most types of wildlife habitat and other nonfarm uses.

This soil is limited for hay by the hazard of soil blowing in unvegetated areas, low natural fertility, and low available water capacity. Crops respond well to lime and fertilizer. Planting cover crops such as rye and using fertilizers help to reduce the hazard of soil blowing and increase available water capacity and fertility.

Low available water capacity and low natural fertility are the major limitations of this soil for pasture. Controlling soil blowing in unvegetated areas, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are the major concerns of pasture management. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Climax timothy and clover are commonly used for pasture on this soil.

This soil is limited for many tree species by low natural fertility and low available water capacity. Use of equipment is limited by slope and the hazard of erosion. Using water bars and mulching of road banks help to reduce erosion in unvegetated areas. Eastern white pine, red pine, and red spruce are the dominant tree species on this soil.

This soil is limited for most urban uses by slope and erosion. It is limited for most types of recreation by small stones on or near the surface, by slope, by erosion, and by drought during dry periods.

This soil is not suited to wildlife habitat. Low natural fertility and low available water capacity are the main limitations. Capability subclass VIs; woodland ordination 4s.

**CoE—Colton gravelly loamy sand, 25 to 60 percent slopes.** This steep, excessively drained, deep soil is in long, narrow areas on terrace escarpments or cut valley walls. The areas range from 5 to 50 acres. Slopes are 50 to 300 feet long.

Typically, the surface layer is dark brown gravelly loamy sand 7 inches thick. The subsoil is 18 inches thick. It is yellowish red and reddish yellow gravelly loamy sand and gravelly sand in the upper part and brownish yellow gravelly sand in the lower part. It is very friable in the upper part and loose in the lower part. The substratum is dark yellowish brown gravelly sand to a depth of more than 60 inches.

Included with this soil in mapping are Deerfield soils in small depressional areas and Missisquoi soils that have slopes of less than 25 percent or that are on low ridges. Also included are areas of soils that have stones on the surface. The Missisquoi soils make up 20 to 35 percent of this map unit, and the Deerfield soils make up 10 to 15 percent.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. The root zone extends to a depth of 40 inches or more. Unlimed areas of this soil are strongly acid to medium acid throughout. Runoff is slow. Tilth is good. The water table is at a depth of more than 5 feet. The hazard of erosion is moderate. Cobbles are scattered throughout the surface layer of this soil.

This soil is used mainly for woodland and unimproved pasture, and it is a source of roadfill and gravel. This soil has good potential as a source of gravel. It has fair potential for woodland and unimproved pasture. It has poor potential for most types of wildlife habitat and other non-farm uses.

This soil is poorly suited to farming. Steep slopes make equipment use very hazardous. The hazard of soil blowing is severe in unvegetated areas.

This soil is poorly suited to unimproved pasture. Low available water capacity and low natural fertility are the major limitations. Controlling soil blowing and erosion in unvegetated areas is the major management concern. Prevention of overgrazing and rotation of pastures are management practices that help reduce the hazards of erosion and soil blowing. Climax timothy and clover are commonly used for pasture on this soil.

This soil is limited for many tree species by low natural fertility, low available water capacity, slope, and erosion. Water bars and mulching of road banks help to reduce the hazard of erosion in unvegetated areas. Eastern white pine, red pine, and red spruce are the dominant tree species on this soil.

Steep slopes, erosion, small stones on or near the surface, and drought during dry periods limit the use of this soil for recreation.

This soil is not suited to wildlife habitat. Steep slopes, erosion, low natural fertility, and low available water capacity are the major limitations. Capability subclass VIIs; woodland ordination 4s.

**CpB—Copake fine sandy loam, 2 to 8 percent slopes.** This nearly level to sloping, somewhat excessively drained soil is in irregularly shaped areas that range from 2 to 30 acres. Slopes are 100 to 300 feet long.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is 13 inches thick. It is brown to dark brown sandy loam in the upper part and dark yellowish brown gravelly sandy loam in the lower part. The subsoil is friable to very friable. The underlying material is dark brown and very dark grayish brown gravelly sand to a depth of 60 inches.

Included with this soil in mapping are small areas of the St. Albans, Georgia, and Missisquoi soils; soils that have carbonates at a depth of less than 40 inches; and soils in which the combined thickness of the surface layer and subsoil is less than 20 inches. The St. Albans and Georgia soils make up 25 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate to moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is low. The root zone extends to a depth of 60 inches or more. In unlimed areas the surface layer and subsoil are medium acid to neutral. Runoff is very slow. Tilth is good. The hazard of erosion is slight. Natural fertility is medium. The water table is at a depth of more than 5 feet. Frost action potential is low.

This soil is used mostly for silage corn and hay. A few small areas are used for pasture, woodland, community development, and wildlife habitat. The soil has good potential for silage corn and for hay, pasture, woodland, community development, and most types of wildlife habitat. It has poor potential for wetland wildlife habitat.

This soil is well suited to a wide variety of crops, but it tends to be somewhat droughty during periods of low rainfall. Low available water capacity is the main management concern. Planting a cover crop such as rye and plowing it under in the spring before planting is a suitable management practice for improving the available water capability of this soil. Liberal use of fertilizers helps to improve natural fertility. Cool-season crops are suitable for this soil. Crops on this soil respond well to lime and fertilizer.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Planting a cover crop and then plowing it under help improve the low available water capacity of this soil. Climax timothy, Essex timothy, and orchardgrass are the common pasture grasses.



This soil is well suited to tree plantations, and a wide variety of trees are suitable for this soil. Low available water capacity and natural fertility are the main limitations. Eastern white pine, sugar maple, and red pine are common tree species on this soil.

The main limitations of this soil for recreation are slope and the hazard of erosion in unvegetated areas. Mulching and planting a cover crop help to reduce the hazard of erosion. Capability subclass IIs; woodland ordination 40.

**Cv—Covington clay.** This level, poorly drained, deep soil is in concave, rectangular or irregularly shaped areas on old lake plains. The areas range from 3 to 50 acres.

Typically, the surface layer is very dark brown clay 6 inches thick. The subsoil is mottled clay 21 inches thick. The upper part is gray, and the lower part is olive gray. The substratum is clay to a depth of 60 inches. The upper part is gray, and the lower part is grayish brown.

Included with this soil in mapping are small areas of the Scantic soils in depressions and natural draws, Kingsbury soils at a slightly higher elevation, and steep soils. Also included are a few areas of soils that have cobbles and stones on the surface and that are indicated on the map by a special symbol, areas of soils that have a coarser textured surface layer than this Covington soil, and areas of soils that have bedrock or coarser textured material at a depth of less than 40 inches.

Permeability is very slow. Available water capacity and natural fertility are high. The root zone extends to a depth of 30 inches or more, but root growth is restricted by a high water table and by the clayey texture during prolonged dry periods. In unlimed areas this soil is strongly acid to mildly alkaline throughout the profile. Runoff is slow. Tilth is poor, and workability of the soil is poor because of high clay content. Depth to bedrock is more than 5 feet. A high water table is present from late fall to midspring. Shrink-swell potential is moderate, and frost action potential is high. The hazard of erosion is slight.

This soil is used mainly for hay and pasture. A few areas are used for silage corn, are in woodland, or are idle. This soil has fair potential for farming and poor potential for most urban and recreational uses. This soil has good potential for water impoundments and for wetland wildlife habitat.

If properly managed, this soil is suited to cultivated crops. The main limitations are wetness and the high clay content. This soil tends to shrink and crack when drying and to swell when wet. Crops on this soil respond well to lime and fertilizer.

If properly managed, this soil is suitable for pasture. Establishing and maintaining a mixture of grasses and legumes, preventing overgrazing, and lowering the water table are the major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of fertilizer to maintain natural fertility of the soil are suitable management practices. A climax timothy-Empire trefoil mixture is commonly used for pasture on this soil.

This soil is poorly suited to woodland. The main limitations are very slow permeability, high clay content, and wetness. The dominant tree species are brown ash, willow, poplar, red maple, and balsam fir.

This soil is poorly suited to urban uses because of very slow permeability, high clay content, high frost action potential, and low strength in excavation areas.

This soil is poorly suited to recreation. Very slow permeability and a high water table are the major limitations. Capability subclass 4w; woodland ordination 5w.

**DeB—Deerfield loamy fine sand, 0 to 8 percent slopes.** This nearly level and gently sloping soil is in irregularly shaped, depressional areas that range from 5 to 30 acres. Slopes are 50 to 300 feet long.

Typically, the surface layer is very dark grayish brown loamy fine sand 8 inches thick. The subsoil is 10 inches thick. It is loose, mottled, yellowish brown sand in the upper part and mottled, light olive brown sand in the lower part. The substratum extends to a depth of 60 inches. It is olive fine sand in the upper part and olive sand in the lower part.

Included with this soil in mapping are small areas of Au Gres, Windsor, and Wareham soils; areas of soils that have thin layers of fine textured material in the subsoil and substratum; and areas of soils that are 35 percent or more gravel at a depth of less than 40 inches. The Windsor soils are on convex slopes, and the Au Gres soils are on concave slopes and in depressions. Included soils make up 15 to 25 percent of this map unit.

Available water capacity and natural fertility are low. Permeability is very rapid. Runoff is slow. In unlimed areas the surface layer and subsoil are very strongly acid to medium acid. Tilth is good, but tillage is delayed in places because of wetness. A seasonal high water table is evident from winter to early spring. The hazard of erosion is slight.

This soil is used for hay, pasture, and intertilled crops. Some areas are in woodland or are idle. This soil has good potential for farming and woodland. It has fair potential for homesites, recreation, and openland and woodland wildlife habitat.

If properly managed, this soil is well suited to cultivated crops, hay, and pasture. Wetness caused by the seasonal high water table is the main limitation. Rooting depth is restricted by the seasonal high water table, and plant species are limited to those that are water tolerant. In places, tile drainage and open ditches on the perimeter of cultivated fields are suitable. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices.

The soil is suited to woodland. Low natural fertility and droughtiness are major limitations. The dominant tree species are red and white pine.



The seasonal high water table is the main limitation for urban development. Footer drains are suitable for reducing seasonal wetness in basements. Capability subclass IIIw; woodland ordination 4s.

**DeC—Deerfield loamy fine sand, 8 to 15 percent slopes.** This sloping soil is in irregularly shaped depressional areas that range from 3 to 15 acres. Slopes are 25 to 300 feet long.

Typically, the surface layer is very dark grayish brown loamy fine sand 8 inches thick. The subsoil is 10 inches thick. It is loose, mottled, yellowish brown sand in the upper part and mottled, light olive brown sand in the lower part. The substratum extends to a depth of 60 inches. It is olive fine sand in the upper part and olive sand in the lower part.

Included with this soil in mapping are small areas of Au Gres, Windsor, and Wareham soils; areas of soils that have thin layers of fine textured material in the subsoil and substratum; and areas of soils that are 35 percent or more gravel at a depth of less than 40 inches. The Windsor soils are on convex slopes, and the Au Gres soils are on concave slopes and in depressions. The Windsor soils make up 20 to 30 percent of this map unit, and the other included soils make up 5 to 10 percent.

Available water capacity and natural fertility are low. Permeability is very rapid. Runoff is slow. The surface layer and subsoil are very strongly acid to medium acid unless limed. The hazard of erosion is moderate. Tilth is good, but tillage is delayed in places because of wetness. A seasonal high water table is evident from winter to early spring, and it restricts rooting depth.

This soil is used for hay and pasture. Some areas are in woodland or are idle. This soil has fair potential for farming, woodland, and homesite development. It has poor potential for recreational uses and wildlife habitat.

If properly managed, this soil is well suited to cultivated crops, hay, and pasture. Plant species are restricted to those that are water tolerant. Wetness and the hazard of erosion are the main limitations. Tile drainage helps to reduce wetness in places. Use of contour planting and cover crops helps to reduce the hazard of erosion. Crops on this soil respond well to lime and fertilizer. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices.

The soil is suited to woodland. The soil is managed for red and white pine plantations. Low natural fertility, erosion, and droughtiness are the main limitations. Use of water bars and mulching of road banks help to reduce erosion in places. Dominant tree species are eastern white pine, European larch, and red pine.

This soil is limited for many urban purposes by a seasonal high water table, slope, and erosion. Footer drains help to reduce seasonal wetness in basements. Capability subclass IIIw; woodland ordination 4s.

**EdA—Eldridge loamy fine sand, 0 to 3 percent slopes.** This nearly level, deep, moderately well drained soil is in irregularly shaped areas on glacial lake plains. The areas range from 3 to 60 acres.

Typically, the surface layer is brown to dark brown loamy fine sand 7 inches thick. The subsoil is friable loamy fine sand and fine sand 19 inches thick. The upper part is yellowish brown and dark yellowish brown, and the lower part is mottled light olive brown. The substratum extends to a depth of 60 inches or more. It is olive fine sand to a depth of 28 inches and light brownish gray very fine sandy loam at a depth of more than 28 inches.

Included with this soil in mapping are small areas of Hinesburg, Enosburg, and Deerfield soils; areas of soils that are more than 5 percent coarse material in the surface layer and subsoil or that have coarse material in the subsoil and substratum; and areas of soils that have a substratum of silty clay or clay. The Enosburg soils make up 20 to 35 percent of this map unit, and the other included soils make up 5 to 15 percent.

Permeability is rapid in the surface layer and subsoil and moderately slow in the substratum of this soil. Available water capacity and natural fertility are low. The root zone extends to a depth of 40 inches. The surface layer and subsoil are strongly acid to slightly acid unless limed. The substratum is strongly acid to neutral. Runoff is very slow. Tilth is good. The hazard of erosion is slight. A seasonal high water table is evident from mid-winter to midspring. Frost action potential is moderate.

This soil is used mainly for silage corn and hay. Small areas are used for pasture, woodland, and recreation or are idle. This soil has good potential for farming, woodland, and some types of wildlife habitat. It has fair potential for recreation and poor potential for community development.

This soil is suitable for cultivated crops. Tillage is delayed in places in the spring. A seasonal high water table, low natural fertility, low available water capacity, and soil blowing in unvegetated areas are main limitations. The use of fertilizer helps to improve the available water capacity and natural fertility. Tile drainage and open ditches on the perimeter of cultivated fields help to lower the seasonal high water table, and maintaining a cover crop helps to reduce soil blowing. Cool-season vegetable crops are suitable for this soil.

If properly managed, this soil is well suited to pasture. Lowering the seasonal high water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Tile drainage and open ditches on the perimeter of pastures help to lower the seasonal high water table in places. Common pasture grasses on this soil are Empire trefoil and climax timothy.

This soil is suitable for woodland. High sand content and low natural fertility are the main limitations. The dominant tree species are northern red oak, eastern white pine, and red pine.

The seasonal high water table and slow permeability limit the use of this soil for community development. Septic tank absorption fields are commonly saturated during spring and other wet periods. Special design and construction is necessary for community development on this soil. Capability subclass IIw; woodland ordination 40.

**EdB—Eldridge loamy fine sand, 3 to 8 percent slopes.** This gently sloping, deep, moderately well drained soil is in irregularly shaped areas on glacial lake plains. The areas range from 3 to 35 acres.

Typically, the surface layer is brown to dark brown loamy fine sand 7 inches thick. The subsoil is friable loamy fine sand and fine sand 19 inches thick. The upper part is yellowish brown and dark yellowish brown, and the lower part is mottled light olive brown. The substratum extends to a depth of 60 inches or more. It is olive fine sand to a depth of 28 inches and light brownish gray very fine sandy loam at a depth of more than 28 inches.

Included with this soil in mapping are small areas of Hinesburg, Enosburg, and Deerfield soils; small areas of soils that are subject to erosion and that have a thinner surface layer than this Eldridge soil; areas of soils that are more than 5 percent coarse material in the surface layer and subsoil or that have thin layers of fine textured material in the subsoil and substratum; and areas of soils that have a substratum of silty clay or clay. The Hinesburg and Enosburg soils make up 15 to 30 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is rapid in the surface layer and subsoil and moderately slow in the substratum of this soil. Available water capacity and natural fertility are low. The root zone extends to a depth of 40 inches. In unlimed areas the surface layer and subsoil are strongly acid to slightly acid and the substratum is strongly acid to neutral. Runoff is slow. Tilth is good. The hazard of erosion is moderate. A seasonal high water table is evident from midwinter to midspring. Frost action potential is moderate.

This soil is used mainly for silage corn and hay. Small areas are used for pasture, woodland, and recreation or are idle. This soil has good potential for farming, woodland, and some types of wildlife habitat. It has fair potential for recreation and poor potential for community development.

This soil is suitable for cultivated crops and hay. Tillage is delayed in the spring in places. A seasonal high water table, low natural fertility, low available water capacity, and the hazard of soil blowing in unvegetated areas are main limitations. Fertilizer application helps to improve the available water capacity and natural fertility. Tile drainage helps to lower the seasonal high water table. Contour plowing or no-till planting helps to reduce the

hazard of erosion, and maintaining a cover crop will reduce soil blowing. Cool-season vegetables are suitable for this soil.

If properly managed, this soil is well suited to pasture. Lowering the seasonal high water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Tile drainage in pastures helps to reduce the seasonal high water table. Common pasture grasses and legumes, on this soil are Empire trefoil and climax timothy.

This soil is suitable for woodland. High sand content and low natural fertility are the major limitations. Eastern white pine and red pine plantations are managed to a small extent on this soil. The dominant tree species are northern red oak, eastern white pine, and red pine.

This soil is poorly suited to most types of community development because of a seasonal high water table, slow permeability, and erosion in unvegetated areas. Septic tank disposal fields are commonly saturated during spring and other wet periods. Special design and construction is necessary for community development on this soil.

This soil is suitable for recreation. Erosion and high sand content are the main limitations. Mulching of paths and trails and rotating areas help to reduce erosion and compaction. Capability subclass IIw; woodland ordination 40.

**EdC—Eldridge loamy fine sand, 8 to 15 percent slopes.** This sloping, deep, moderately well drained soil is in long, narrow areas on glacial lake plains. The areas range from 3 to 15 acres.

Typically, the surface layer is brown to dark brown loamy fine sand 7 inches thick. The subsoil is friable loamy fine sand and fine sand 19 inches thick. The upper part is yellowish brown and dark yellowish brown, and the lower part is mottled light olive brown. The substratum extends to a depth of 60 inches or more. It is olive fine sand to a depth of 28 inches and light brownish gray very fine sandy loam at a depth of more than 28 inches.

Included with this soil in mapping are small areas of Hinesburg, Enosburg, and Deerfield soils. The Hinesburg soils are at high positions on the landscape. The Enosburg soils are in depressions. The Deerfield soils are on glacial lake plains. Also included are small areas of soils that have a thinner surface layer than this Eldridge soil, areas of soils that are more than 5 percent coarse material in the surface layer and subsoil or that have thin layers of coarse material, areas of soils that are silty at a depth of more than 40 inches, areas of soils that have a silty surface layer, and areas of soils that have a substratum of silty clay or clay. The Hinesburg soils make up 20 to 30 percent of this map unit, and the other included soils make up 5 to 15 percent.



Permeability is rapid in the surface layer and subsoil and moderately slow in the substratum of this soil. Available water capacity and natural fertility are low. The root zone extends to a depth of 40 inches, and root growth is not impeded. The surface layer and subsoil are strongly acid to slightly acid unless limed. The substratum is strongly acid to neutral. Runoff is medium. Tilth is good. A seasonal high water table is evident from midwinter to midspring. Frost action potential is moderate. The hazard of erosion is moderate.

This soil is used mainly for woodland, pasture, and hay. Small areas are used for recreation or are idle. This soil has good potential for farming, woodland, and some types of wildlife habitat. It has fair potential for recreation and poor potential for community development.

This soil is suitable for hay and silage corn. Soil blowing is a hazard in unvegetated areas, and tillage is delayed in places in the spring. The erosion hazard, low natural fertility, and low available water capacity are main limitations. Fertilizer application helps to improve available water capacity and natural fertility. Contour plowing, no-till planting, and maintaining a cover crop help to reduce erosion and soil blowing.

If properly managed, this soil is well suited to pasture. The erosion hazard is the main limitation. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. Common pasture grasses and legumes on this soil are Empire trefoil and climax timothy.

This soil is suitable for woodland. High sand content and low natural fertility are the main limitations. Eastern white pine and red pine plantations are managed to a small extent on this soil. The dominant native species are northern red oak and eastern white pine.

This soil is limited for most types of community development by slope, a seasonal high water table, slow permeability in the substratum, and erosion in unvegetated areas. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary for community development on this soil.

This soil is suitable for recreation. Compaction, erosion, slope, and high sand content are the main limitations. Mulching of paths and trails and rotating areas help to reduce erosion and compaction. Capability subclass IIIw; woodland ordination 4o.

**EnA—Enosburg loamy fine sand, 0 to 3 percent slopes.** This nearly level, poorly drained, deep soil is in irregularly shaped areas on deltas, old beaches, and terraces. The areas range from 3 to 150 acres.

Typically, the surface layer is very dark gray loamy fine sand 7 inches thick. The substratum is friable grayish brown and light brownish gray loamy fine sand to a depth of 22 inches and is gray very fine sandy loam and silt loam at a depth of more than 22 inches.

Included with this soil in mapping are small areas of very poorly drained Wareham soils in depressions, a few small areas of the Eldridge and Raynham soils on steeper slopes, areas of soils that are less than 16 inches or more than 34 inches to the loamy substratum, and areas of soils that are more than 5 percent coarse fragments in the upper part. The Eldridge and Raynham soils make up 10 to 20 percent of this map unit, and the other included soils make up 5 to 30 percent.

Permeability is rapid in the surface layer and upper part of the substratum and moderately slow in the lower part of the substratum. Available water capacity is low. The root zone extends to a depth of at least 40 inches, but root growth is restricted by a high water table. The surface layer and substratum are strongly acid to neutral unless limed. Runoff is very slow, and ponding is common. Tilth is good, but tillage is delayed in places by wetness. The hazard of erosion is slight. This soil has low natural fertility. A seasonal high water table is evident from midwinter to midspring. Frost action potential is moderate.

This soil is used mainly for hay, pasture, and woodland. A few areas are in corn or are idle. This soil has fair potential for farming and poor potential for woodland. This soil has good potential as a pond site or for woodland wildlife habitat. It has poor potential for urban and recreational uses.

Wetness limits the use of this soil for cultivated crops and hay. Plant species are restricted to those that are water tolerant. Tile drainage is needed. Open ditches on the perimeter of cultivated fields help to lower the seasonal high water table in places. Cool-season vegetables are suitable for this soil. Crops on this soil respond well to lime and fertilizer.

If properly managed, this soil is well suited to pasture. Reducing the high water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, installation of tile drainage and diversion ditches, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. A mixture of Ladino clover and climax timothy is commonly used for pasture on this soil.

This soil is poorly suited to woodland. Excessive wetness and a high water table are the main limitations. Eastern white pine and alders are the dominant species on this soil.

This soil is poorly suited to most urban uses. A high water table, prolonged ponding, and slow permeability are the major limitations. Above-ground sewage disposal fields and tile drains around foundation footings are suitable corrective measures.

This soil is mainly poorly suited to recreation. The high water table is the main limitation. This soil has poor capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become unstable during wet periods. They dry out slowly after rains and in the spring. This soil is suitable for recreational ponds. Capability subclass IIIw; woodland ordination 4w.



**EnB—Enosburg loamy fine sand, 3 to 8 percent slopes.** This gently sloping, poorly drained, deep soil is in irregularly shaped areas on deltas, old beaches, and terraces. The areas range from 3 to 20 acres.

Typically, the surface layer is very dark gray loamy fine sand 7 inches thick. The substratum is friable grayish brown and light brownish gray loamy fine sand to a depth of 22 inches and gray very fine sandy loam and silt loam at a depth of more than 22 inches.

Included with this soil in mapping are small areas of poorly drained Binghamville soils in depressions, a few small areas of Eldridge and Raynham soils on convex slopes, areas of soils that are less than 16 inches or more than 34 inches to the loamy substratum, and areas of soils that are more than 5 percent coarse fragments in the upper part. The Eldridge and Raynham soils make up 20 to 30 percent of this map unit, and the other soils make up 5 to 20 percent.

Permeability is rapid in the surface layer and upper part of the substratum and moderately slow in the lower part of the substratum. Available water capacity is low. The root zone extends to a depth of 40 inches or more, but root growth is restricted by the high water table. The surface layer and subsoil are strongly acid to neutral unless limed. Runoff is slow. Tilth is good, but tillage is delayed in places because of wetness. This soil has low natural fertility. The hazard of erosion is moderate. A seasonal high water table is evident from midwinter to midspring. Frost action potential is moderate.

This soil is used mainly for hay, pasture, and woodland. A few areas are in corn or are idle. This soil has fair potential for farming and poor potential as a pond site or for woodland wildlife habitat. It has poor potential for urban uses and recreation.

This soil is suitable for cultivated crops and hay. Plant species are restricted to those that are water tolerant. Excess wetness and erosion are the main limitations. Tile drainage is needed. Open ditches on the perimeter of cultivated fields help to lower the seasonal high water table. Contour planting and cover crops help to reduce erosion. Crops on this soil respond well to lime and fertilizer. Cool-season vegetables are suitable for this soil.

If properly managed, this soil is well suited to pasture. Lowering the high water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, installation of tile drainage and diversion ditches, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. A mixture of Ladino clover and climax timothy is commonly used for pasture on this soil.

Excessive wetness and a high water table limit the use of this soil for woodland. Eastern white pine and alders are the dominant species on this soil.

A high water table, erosion, and slow permeability are the major limitations for urban uses. Above-ground sewage disposal fields and tile drains around foundation

footings are suitable corrective measures. Because of saturated conditions, this soil is a poor foundation for streets and access roads.

The high water table limits the use of this soil for recreation. Because of the saturated conditions, this soil has poor capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become unstable during wet periods. They dry out slowly after rains and in the spring. This soil is suitable for recreational ponds. Capability subclass IIIw; woodland ordination 4w.

**FaB—Farmington loam, very rocky, 3 to 8 percent slopes.** This gently sloping and undulating, shallow, somewhat excessively drained soil is in convex areas on ridges. Areas range from 5 to 75 acres. Exposures of bedrock are about 100 to 300 feet apart. Commonly the cobbles and stones have been cleared from the surface of this soil and piled up along the edges of the fields to form stone fences and walls.

Typically, the surface layer is dark brown loam 4 inches thick. The subsoil is friable loam 10 inches thick. The upper 5 inches is dark grayish brown, and the lower 5 inches is brown to dark brown. Hard massive bedrock is at a depth of 14 inches.

Included with this soil in mapping are small areas of St. Albans, Georgia, Massena, and Kingsbury soils; areas of moderately deep soils that have bedrock at a depth of 20 to 40 inches; and areas of seep spots and soils with restricted drainage. The included St. Albans and Georgia soils make up 10 to 20 percent of this map unit, and the other included soils make up 15 to 30 percent.

Permeability is moderate in this soil. Available water capacity is low, and natural fertility is medium. Bedrock restricts rooting depth and root growth. Unless limed this soil is strongly acid to slightly acid throughout. The hazard of erosion is moderate. Runoff is medium. Tilth is good, and workability is restricted only by bedrock exposures. Depth to bedrock is less than 20 inches.

This soil is used mainly for hay, pasture, and woodland. A small acreage is used for corn or is idle. The limestone bedrock that underlies some areas of this soil is a source of agricultural limestone, stone for concrete mix, and material for road construction. This soil has good potential for hay and pasture and most recreational uses. This soil has poor potential for most nonfarm uses.

This soil is suitable for hay. Wetness on the face of bedrock exposures in the spring and after heavy rains is a limitation. The hazard of erosion is the major concern of management. A cover of permanent vegetation is suitable for controlling erosion. Crops respond well to lime and fertilizer. If properly managed, cool-season crops can be grown in the included deep pockets of soil as part of an intensive cropping system.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. The low available water capacity and erosion hazard are the major limitations. Planting a cover crop such as rye helps to increase the available

water capacity and reduce erosion. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Bromegrass and orchardgrass are commonly used for pasture.

This soil is suited to trees. The main limitations are shallow depth to bedrock, natural fertility, and low available water capacity. The dominant tree species are sugar maple, eastern white pine, and red pine.

This soil is not suited to intensive community development. Shallow depth to bedrock and bedrock exposures are the main limitations. Capability subclass IIIc; woodland ordination 5d.

**FaC—Farmington loam, very rocky, 8 to 15 percent slopes.** This sloping and rolling, shallow, somewhat excessively drained soil is in convex areas on ridges. Areas range from 5 to 25 acres. Exposures of bedrock are about 100 to 300 feet apart. Commonly the cobbles and stones have been cleared from the surface and piled up along the edges of the fields to form stone fences and walls.

Typically, the surface layer is dark brown loam 4 inches thick. The subsoil is friable loam 10 inches thick. The upper 5 inches is dark grayish brown, and the lower 5 inches is brown to dark brown. Hard massive bedrock is at a depth of 14 inches.

Included with this soil in mapping are small areas of St. Albans and Georgia soils, areas of moderately deep soils that have bedrock at a depth of 20 to 40 inches, and common seep spots and pockets of soils with restricted drainage. The included St. Albans and Georgia soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderate in this soil. Available water capacity is low, and natural fertility is medium. Bedrock restricts rooting depth and root growth. This soil is strongly acid to slightly acid throughout the profile unless limed. Runoff is rapid. Tilth is good, and workability is restricted only by the bedrock exposures. The hazard of erosion is severe. Depth to bedrock is less than 20 inches.

This soil is used mainly for hay, pasture, and woodland. A small acreage is idle. The limestone bedrock that underlies some areas of the soil is a source of agricultural limestone, stone for concrete mix, and material for road construction. This soil has fair potential for hay, pasture, and most recreational uses. This soil has poor potential for most nonfarm uses.

This soil is suitable for hay. Wetness along the face of bedrock exposures is a limitation in the spring and after heavy rains. Erosion is the major concern of management. A cover of permanent vegetation is suitable for controlling erosion. Crops respond well to lime and fertilizer.

If properly managed, this soil is suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. The low available water capacity and severe erosion hazard in unvegetated areas are the major limitations. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures,

deferment of grazing, and use of lime and fertilizer are suitable management practices. Bromegrass and orchardgrass are common pasture grasses.

This soil is suited to trees. The main limitations are shallow depth to bedrock, natural fertility, low available water capacity, and erosion. Using water bars and mulching road banks help control erosion in places. The dominant tree species are sugar maple and eastern white pine.

This soil is not suited to intensive community development. Shallow depth to bedrock, bedrock exposures, slope, and erosion are the main limitations.

This soil is poorly suited to recreation. Shallow depth to bedrock is the main limitation.

Shallow depth to bedrock, natural fertility, and low available water capacity limit the use of this soil for wildlife habitat. Capability subclass IVe; woodland ordination 5d.

**FmC—Farmington-Rock outcrop complex, 6 to 15 percent slopes.** This complex consists of gently sloping and sloping, shallow, somewhat excessively drained soils and Rock outcrop in convex areas on ridges. The soils and Rock outcrop in this complex are so intermingled that it was not practical to separate them in mapping.

Farmington soils make up about 55 percent of this complex. Typically, the surface layer is dark brown loam 4 inches thick. The subsoil is friable loam 10 inches thick. The upper 5 inches is dark grayish brown, and the lower 5 inches is brown to dark brown. Hard massive bedrock is at a depth of 14 inches.

Rock outcrop makes up about 30 percent of this complex. It mainly consists of outcrops of bedrock that are less than 30 feet apart.

Included with this complex in mapping are small areas of St. Albans, Georgia, Massena, and Kingsbury soils; areas of soils that have bedrock at a depth of 20 to 40 inches; areas of soils that are more than 35 percent cobbles and gravel; and common seep spots and pockets of soils with restricted drainage. The included St. Albans and Georgia soils make up 5 to 10 percent of this complex, and the other included soils make up 1 to 5 percent.

Permeability is moderate in this complex. Available water capacity is low, and natural fertility is medium. The shallow depth to bedrock restricts rooting depth and root growth. The Farmington soils are strongly acid to slightly acid throughout the profile. Runoff is medium. The hazard of erosion is moderate. Depth to bedrock is less than 20 inches. Runoff is very rapid on the Rock outcrop part of this complex.

The Farmington soils in this complex are used mainly for sugar maple trees, pasture, and woodland. A moderate acreage is idle. The Rock outcrop is primarily limestone bedrock that underlies some areas of this complex and is a source of agricultural limestone, stone for concrete mix, and material for road construction. The Farmington soils have fair potential for pasture, woodland, and sugar maple trees. They have poor potential for most nonfarm uses. Rock outcrop has poor potential for farm and nonfarm uses.



Because of a severe equipment limitation, bedrock exposures, slope, and erosion hazard, very little, if any, acreage of this complex is in cultivated crops or hay. This complex is, however, a good source of maple sap from sugar maple trees.

If properly managed, the Farmington soils are suited to native pasture. Prevention of overgrazing is the major pasture management concern. Use of equipment is limited by the bedrock outcrops. The low available water capacity, extensive bedrock outcrops, and moderate erosion hazard are the major limitations. The rotation of pastures and deferment of grazing to reduce the erosion hazard are suitable management practices on this soil. Kentucky bluegrass is the native unimproved pasture grass.

This complex is suited to trees. The main limitations are extensive bedrock outcrops, shallow depth to bedrock, natural fertility, and low available water capacity. The dominant tree species are sugar maple, eastern white pine, and red pine.

This complex is not suited to intensive community development. It is limited for most urban uses by shallow depth to bedrock and extensive bedrock outcrops.

This complex is not suited to recreation. Shallow depth to bedrock is the main limitation.

Bedrock outcrops, depth to bedrock, natural fertility, and low available moisture capacity make this soil unsuitable for wildlife habitat. Capability subclass IVE; woodland ordination 5d.

**FmD—Farmington-Rock outcrop complex, 15 to 60 percent slopes.** This complex consists of moderately steep to steep, hilly, shallow, somewhat excessively drained soils and Rock outcrop in convex areas on ridges. The soils and Rock outcrop in this complex are so intermingled that it was not practical to separate them in mapping.

Farmington soils make up about 45 percent of this complex. Typically, the surface layer is dark brown loam 4 inches thick. The subsoil is friable loam 10 inches thick. The upper 5 inches is dark grayish brown, and the lower 5 inches is brown to dark brown. Hard massive bedrock is at a depth of 14 inches.

Rock outcrop makes up about 40 percent of this complex. It consists mainly of exposures of bedrock that are less than 30 feet apart.

Included with this complex in mapping are small areas of St. Albans, Georgia, and Massena soils in less sloping areas between outcrops; areas of soils that have bedrock at a depth of 20 to 40 inches; and common seep spots and pockets of soils with restricted drainage. The included St. Albans soils make up 5 to 10 percent of this complex, and the other included soils make up 1 to 5 percent.

Permeability is moderate in this complex. Available water capacity is low, and natural fertility is medium. The shallow depth to bedrock restricts rooting depth and root growth. This complex is strongly acid to slightly acid throughout. The hazard of erosion is moderate. Runoff is very rapid. Depth to bedrock is less than 20 inches.

The Farmington soils in this complex are used mainly for sugar maple trees, pasture, and woodland. A small acreage is idle. Rock outcrop is primarily limestone bedrock that underlies much of this soil and is a source of agricultural limestone, stone for concrete mix, and material for road construction. This complex has poor potential for pasture. It has fair potential for woodland and maple sap production. It has poor potential for most nonfarm uses. The Rock outcrop in this complex has little potential for farm and nonfarm uses.

Because of the bedrock exposures, steep slopes, equipment limitation, and erosion hazard, this complex is not used for cultivated crops or hay. It is, however, a good source of maple sap from sugar maple trees.

The Farmington soils are suited to limited unimproved pasture on the lower slopes or between bedrock outcrops. Prevention of overgrazing is the major pasture management concern. The low available water capacity, extensive bedrock outcrops, and erosion hazard are the major limitations. The rotation of pastures and deferment of grazing to reduce the erosion hazard are suitable management practices on this complex. Kentucky bluegrass is the native unimproved pasture grass on this complex.

This complex is suited to trees. The main limitations are extensive bedrock outcrops, slope, and erosion. The dominant tree species are sugar maple, eastern white pine, and red pine.

This complex is not suited to intensive community development. It is limited by slope, shallow depth to bedrock, and bedrock exposures. This complex is not suited to recreation. Bedrock outcrops, slope, and shallow depth to bedrock are the major limitations. Capability subclass VIIe; woodland ordination 5d.

**GeA—Georgia stony loam, 0 to 3 percent slopes.** This nearly level, moderately well drained, deep soil is in areas on glacial till slopes. The areas are irregularly shaped and range from 3 to 30 acres. Slopes are slightly convex and are 50 to 600 feet long. Cobbles and stones are cleared off the surface and are commonly piled up along the edges of the fields to form stone fences and walls. Stones on this soil are typically 30 to 100 feet apart.

Typically, the surface layer is very dark grayish brown loam 2 inches thick. The subsoil is 25 inches thick. The upper part is friable, dark yellowish brown loam 4 inches thick, the middle part is light olive brown loam 7 inches thick, and the lower part is mottled, olive brown silt loam 14 inches thick. The substratum is mottled, dark brown and olive brown fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Massena soils in slight depressions and drainageways and St. Albans soils on high mounds or slightly elongated rises; areas of calcareous soils or soils that have bedrock at a depth of less than 40 inches; a few areas of soils that are more than 35 percent gravel and cobbles; and a few areas of soils that have a surface layer of silty clay loam. The included St. Albans and Massena soils make up 25 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.



Permeability is moderate in the surface layer and subsoil and moderately slow or slow in the substratum. Available water capacity is moderate, and the natural fertility is high. A seasonal high water table restricts rooting depth to 30 inches and retards root growth. This soil is medium acid to neutral and is less acid with depth. Runoff is slow. The hazard of erosion is slight. Tilth is good, but planting is delayed in places by the seasonal high water table. A seasonal high water table is evident from early spring to midspring. Frost action potential is high.

This soil is used mainly for hay, pasture, and silage corn. A small acreage is in woodland or is idle. This soil has good potential for cultivated crops, tree production, and water impoundment. It has fair potential for urban uses, recreation, and wildlife habitat.

Because of a seasonal high water table and slow permeability in the substratum, this soil is limited for cultivated crops. A firm layer at a depth of about 27 inches and the seasonal high water table restrict the root zone and inhibit root growth. Wetness is the main limitation. Tile drainage is needed in places. Open ditches on the perimeter of cultivated fields help to reduce the seasonal high water table. Cool-season crops are suitable for this soil. Crops respond well to lime and fertilizer.

This soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are the major pasture management concerns. Wetness is the main limitation. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. Tile drainage and diversion ditches help lower the seasonal high water table. Climax timothy and Ladino clover are the common grasses and legumes used for pasture.

This soil is well suited to trees and tree plantations. The dominant tree species on this soil are white ash, yellow birch, white pine, and red pine.

This soil is limited for many urban purposes by slow permeability, a perched water table, and high frost action potential. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Raised sewage disposal fields and tile drains around foundation footings are suitable corrective measures. Because of high frost action potential, this soil provides a poor foundation for streets and access roads.

This soil is suited to many recreational uses. The main limitations are the perched water table and small stones. Picnic areas and paths and trails dry out slowly after rains and in the spring. Capability subclass IIw; woodland ordination 3o.

**GeB—Georgia stony loam, 3 to 8 percent slopes.** This gently sloping, moderately well drained, deep soil is in slightly convex areas on glacial till slopes. The areas are irregularly shaped and range from 3 to 30 acres. Slopes are 50 to 600 feet long. Cobbles and stones are cleared off

the soil surface and are commonly piled up along the edges of the fields to form stone fences and walls. Stones on this soil are typically 30 to 100 feet apart.

Typically, the surface layer is very dark grayish brown loam 2 inches thick. The subsoil is 25 inches thick. The upper part is friable, dark yellowish brown loam 4 inches thick, the middle part is light olive brown loam 7 inches thick, and the lower part is mottled, olive brown silt loam 14 inches thick. The substratum is mottled, dark brown and olive brown fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Massena soils in slight depressions and drainageways and St. Albans soils on high mounds or slightly elongated rises; areas of calcareous soils or soils that have bedrock at a depth of 40 inches; and a few areas of soils that have a surface layer of silty clay loam. The included St. Albans and Massena soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate in the surface layer and subsoil and moderately slow or slow in the substratum. Available water capacity is moderate, and the natural fertility is high. A seasonal high water table restricts rooting depth to 30 inches and retards root growth. The soil ranges from medium acid to neutral and is less acid with depth. The hazard of erosion is moderate. Runoff is medium. Tilth is good, but planting is delayed in places by the seasonal high water table. A seasonal high water table is evident from early spring to midspring.

This soil is used mainly for hay, pasture, and silage corn. A small acreage is in woodland or is idle. This soil has good potential for cultivated crops, woodland, and water impoundment. It has fair potential for urban uses, recreation, and wildlife habitat.

Wetness, slope, erosion, and a slowly permeable substratum limit the use of this soil for cultivated crops. Tile drainage is needed in places. Open ditches on the perimeter of cultivated fields help to lower the seasonal high water table. Crops on this soil respond well to lime and fertilizer. Contour planting and using cover crops help to reduce the erosion hazard. Cool-season crops are suitable for this soil.

This soil is well suited to pasture. Controlling erosion, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Wetness is the main limitation. Use of proper stocking rates to maintain desirable grasses and legumes, use of a cover crop, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. Tile drainage and diversion ditches help reduce the seasonal high water table. Climax timothy and Ladino clover are the common grasses and legumes used for pasture.

This soil is well suited to trees and tree plantations. A few red pine and white pine plantations are in operation. The dominant tree species on this soil are white ash, yellow birch, and white pine.

This soil is limited for many urban purposes by slow permeability, a perched water table, and high frost action potential. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Raised sewage disposal fields and tile drains around foundation footings are suitable corrective measures. Because of high frost action potential, this soil provides a poor foundation for streets and access roads.

The major limitations for most recreational uses are the perched water table and small stones. Because of the saturated conditions, this soil is limited for camp areas and playgrounds. Picnic areas and paths and trails dry out slowly after rains and in the spring. Capability subclass IIe; woodland ordination 3o.

**GeC—Georgia stony loam, 8 to 15 percent slopes.** This sloping, moderately well drained, deep soil is in slightly convex areas on glacial till slopes. The areas are irregularly shaped and range from 3 to 30 acres. Slopes are 50 to 600 feet long. Cobbles and stones are cleared off the surface and are commonly piled up along the edges of the fields to form stone fences and walls. Stones on this soil are typically 30 to 100 feet apart.

Typically, the surface layer is very dark grayish brown loam 2 inches thick. The subsoil is 25 inches thick. The upper part is friable, dark yellowish brown loam 4 inches thick, the middle part is light olive brown loam 7 inches thick, and the lower part is mottled, olive brown silt loam 14 inches thick. The substratum is mottled, dark brown and olive brown fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Massena soils in slight depressions and drainageways and St. Albans soils on high mounds or slightly elongated rises; areas of calcareous soils or soils that have bedrock at a depth of 40 inches; and a few areas of soils that have a surface layer of silty clay loam. The included St. Albans and Massena soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate in the surface layer and subsoil and moderately slow or slow in the substratum. Available water capacity is moderate, and the natural fertility is high. A seasonal high water table restricts rooting depth to 30 inches and retards root growth. This soil is medium acid to neutral and is less acid with depth. Runoff is medium. Tilth is good, but planting is delayed in places by the seasonal high water table. The hazard of erosion is severe. A seasonal high water table is evident from early spring to midspring.

This soil is used mainly for hay, pasture, and silage corn. A small acreage is in woodland or is idle. This soil has good potential for cultivated crops, woodland, and water impoundment. It has fair potential for urban uses, recreation, and wildlife habitat.

Wetness, slope, erosion, and a slowly permeable substratum limit the use of this soil for cultivated crops. Crops on this soil respond well to lime and fertilizer. Tile

drainage is needed in places. Use of contour planting and cover crops helps to reduce the erosion hazard.

This soil is well suited to pasture. Controlling erosion, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Wetness is the main limitation. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. Tile drainage and diversion ditches help lower the seasonal high water table. Climax timothy and Ladino clover are the common grasses and legumes used for pasture.

This soil is well suited to trees and tree plantations. A few red pine and white pine plantations are in operation. The dominant tree species on this soil are white ash, yellow birch, and white pine.

This soil is limited for many urban purposes by slow permeability, slope, a perched water table, and high frost action potential. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Raised sewage disposal fields and tile drains around foundation footings are suitable corrective measures. Because of high frost action potential, this soil provides a poor foundation for streets and access roads.

The major limitations of this soil for most recreational uses are the perched water table and slope. Capability subclass IIIe; woodland ordination 3o.

**GrB—Georgia extremely stony loam, 0 to 8 percent slopes.** This nearly level to gently sloping, moderately well drained, deep soil is in slightly convex areas on glacial till slopes. The areas are irregularly shaped and range from 5 to 50 acres. Slopes are 50 to 800 feet long. Stones on this soil are typically less than 5 feet apart.

Typically, the surface layer is very dark grayish brown loam 2 inches thick. The subsoil is 25 inches thick. The upper part is friable, dark yellowish brown loam 4 inches thick, the middle part is light olive brown loam 7 inches thick, and the lower part is mottled, olive brown silt loam 14 inches thick. The substratum is mottled, dark brown and olive brown fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Massena soils in slight depressions and drainageways and St. Albans soils and Lordstown loam, rocky, on high mounds or slightly elongated rises; areas of calcareous soils; a few areas of soils that are 35 percent gravel and cobbles; a few areas of soils that have a surface layer of silty clay loam; areas of stony soils; and areas where stones are more than 5 feet apart. The included St. Albans and Massena soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderate in the surface layer and subsoil and moderately slow or slow in the substratum. Available water capacity is moderate, and the natural fertility is high. A seasonal high water table restricts rooting



depth to 30 inches and retards root growth. This soil is medium acid to neutral and is less acid with depth. Runoff is slow to medium, and it is impeded by small hummocks caused by cattle trampling on soft ground between stones and tree throws. Tilth is good, but workability is severely restricted by stones on the surface. A seasonal high water table is evident from early spring to mid-spring.

This soil is used mainly for unimproved pasture and woodland. Some areas are idle. This soil has good potential for woodland and wildlife habitat. It has poor potential for farming, urban uses, recreation, and most types of wildlife habitat.

Stones on the surface, a seasonal high water table, and slow permeability in the substratum limit the use of this soil for cultivated crops. Removal of surface stones helps improve the farming potential of this soil.

This soil is suited to unimproved pasture. Removal of stones on the surface and prevention of overgrazing are major pasture management concerns. Wetness is a major limitation. The rotation of pastures and deferment of grazing are suitable management practices. Diversion ditches on the perimeters of unimproved pastures help lower the seasonal high water table. Kentucky bluegrass is the common native pasture grass.

This soil is well suited to trees and tree plantations. A few red pine and white pine tree plantations are in operation. Stones on the surface limit the use of equipment. The dominant tree species on this soil are white ash, yellow birch, and white pine.

This soil is limited for many urban purposes by stones on the surface, slow permeability, a perched water table, and high frost action potential. Because of high frost action potential, this soil provides a poor foundation for streets and access roads.

The major limitations for most recreational uses are large stones on the surface and the perched water table. Capability subclass VII<sub>s</sub>; woodland ordination 3x.

**GrC—Georgia extremely stony loam, 8 to 15 percent slopes.** This sloping, moderately well drained, deep soil is in slightly convex areas on glacial till slopes. The areas are irregularly shaped and range from 5 to 50 acres. Slopes are 50 to 800 feet long. Stones on this soil are typically less than 5 feet apart.

Typically, the surface layer is very dark grayish brown loam 2 inches thick. The subsoil is 25 inches thick. The upper part is friable, dark yellowish brown loam 4 inches thick, the middle part is light olive brown loam 7 inches thick, and the lower part is mottled, olive brown silt loam 14 inches thick. The substratum is mottled, dark brown and olive brown fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Massena soils in slight depressions and drainageways and St. Albans soils and Lordstown loam, rocky, on high mounds or slightly elongated rises; areas of calcareous soils; a few areas of soils that are 35 percent gravel and cobbles; a few areas of soils that have more sand than this soil; areas of stony soils; and areas where stones are

more than 5 feet apart. The included St. Albans and Massena soils make up 15 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderate in the surface layer and subsoil and moderately slow or slow in the substratum. Available water capacity is moderate, and natural fertility is high. A seasonal high water table restricts rooting depth to 30 inches and retards root growth. This soil is medium acid to neutral and is less acid with depth. Runoff is slow to medium, and it is impeded by small hummocks caused by cattle trampling of soft ground between stones and tree throws. The hazard of erosion is moderate. Tilth is good, but workability is severely restricted by slope and stones on the surface. A seasonal high water table is evident from early spring to mid-spring.

This soil is mainly used for woodland and unimproved pasture. Some areas are idle. The soil has good potential for woodland wildlife habitat and poor potential for most other types of wildlife habitat. Potential is poor for farming, urban uses, and recreation.

Slope, large and small stones on the surface, a seasonal high water table, and a slowly permeable substratum limit the use of this soil for cultivated crops. Equipment is limited by slope and surface stones.

This soil is well suited to unimproved pasture. Wetness, slope, and stones on the surface are the main limitations. Removal of stones from the surface, rotation of pastures, and deferment of grazing are suitable pasture management practices. Diversion ditches on the perimeter of unimproved pastures help lower the seasonal high water table. Kentucky bluegrass is the common native pasture grass.

This soil is well suited to trees and tree plantations. A few red pine and white pine tree plantations are in operation. Slope and surface stones are the main limitations. The dominant tree species on this soil are white ash, yellow birch, and white pine.

This soil is unsuitable for many urban purposes. The main limitations are slope, stones on the surface, slow permeability, a perched water table, and high frost action potential. Because of slope and high frost action potential, this soil provides a poor foundation for streets and access roads.

The major limitations for most recreational elements are slope, large stones on the surface, and the perched water table. Because of the large stones and saturated conditions, this soil is limited for camp areas, playgrounds, picnic areas, and paths and trails. Capability subclass VII<sub>s</sub>; woodland ordination 3x.

**Ha—Hadley silt loam.** This level, well drained, deep soil is in the highest position on flood plains along rivers and creeks. The areas are irregular in shape and range from 2 to 15 acres. This soil is subject to flash floods after heavy, brief rains and prolonged flooding during and after intensive, extended rains.

Typically, the surface layer is brown to dark brown silt loam 8 inches thick. The substratum extends to a depth of



60 inches or more. It is very friable, light olive brown very fine sandy loam to a depth of 32 inches and olive brown silt loam at a depth of more than 32 inches.

Included with this soil in mapping are small areas of Ondawa Variant and Winooski soils, small areas of soils that have distinct mottles within 25 inches of the surface, and areas of soils that have a very fine sandy loam surface layer. The included Winooski soils make up 25 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderate or moderately rapid in this soil. Available water capacity and natural fertility are high. The root zone extends throughout the profile, but root growth is restricted by a seasonal high water table. This soil is slightly acid to neutral throughout the profile unless limed. Runoff is medium. Tilth is good, but tillage is delayed in places because of the seasonal high water table and spring floods. The hazard of erosion is slight. A seasonal high water table is evident from midfall to mid-spring. Frost action potential is high.

This soil is used mostly for silage corn or hay. The remaining acreage is idle. This soil has good potential for farming and wildlife habitat. It has poor potential for most types of community development and other nonfarm uses.

This soil is well suited to cultivated crops and hay. Streambank erosion along the outside curve of streams and wetness in places are the main limitations. Flooding is the major management concern. Open ditches on the perimeter of cultivated fields help to channel away floodwaters. Crops respond well to lime and fertilizer. Cool-season crops are suitable for this soil.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and controlling grazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Open ditches on the perimeter of pastured fields help reduce the seasonal high water table and help channel away floodwater. Common pasture grasses and legumes are orchardgrass and Ladino clover.

This soil is unsuited to most community development purposes. The flood hazard from adjacent rivers and streams and the seasonal high water table make foundation construction impractical. This soil is, however, a good source of topsoil and sanitary landfill cover. Capability class I; woodland ordination 30.

**HbA—Hinesburg loamy fine sand, 0 to 3 percent slopes.** This level to nearly level, well drained soil is on strongly dissected outwash plains and terraces in major stream valleys. Slopes are 100 to 300 feet long. Areas are 3 to 25 acres.

Typically, the surface layer is brown to dark brown loamy fine sand 7 inches thick. The subsoil is 15 inches thick. It is strong brown, very friable loamy fine sand in the upper 3 inches and light yellowish brown and yel-

lowish brown, very friable loamy fine sand in the lower 12 inches. The underlying material to a depth of 60 inches is dark olive gray firm silt loam.

Included with this soil in mapping are small areas of Belgrade, Raynham, Windsor, and Eldridge soils. The Belgrade and Raynham soils are in slightly depressional areas. The Windsor soils are on slight rises. Also included are areas of soils that are more than 5 percent coarse fragments in the surface layer and subsoil and soils that have a surface layer and subsoil of sandy loam or fine sandy loam. The Eldridge and Windsor soils make up about 30 percent of this map unit, and the other included soils make up about 10 to 20 percent.

Permeability is rapid in the surface layer and subsoil and moderately slow in the substratum. This soil has moderate available water capacity and low natural fertility. The root zone extends to the substratum. Tilth is good, but tillage is delayed in the spring and following heavy rains in wet areas. Reaction ranges from strongly acid to neutral in the sandy material. It is slightly acid or neutral in the substratum. Runoff is slow. The hazard of erosion is slight. This soil is subject to soil blowing in unvegetated areas. Frost action potential is moderate.

This soil is mostly used for tilled crops, hay, and pasture. A small acreage is used for woodland, recreation, wildlife habitat, and homesites. This soil has fair potential for tree plantations and good potential for most recreational uses and woodland wildlife habitat. It has good potential for intensive farming and for pasture. It has fair potential for urban use.

This soil is suitable for cultivated crops and hay. Wetness is a limitation in the spring and after heavy rains. This soil can be cultivated throughout a wide range of moisture content. Improving fertility and maintaining cover crops to control soil blowing are major management concerns. Installing tile drainage and interceptor ditches helps to reduce wetness. Crops on this soil respond well to lime and fertilizer. Cool-season vegetables are suitable for this soil.

This soil is well suited to pasture. Wetness in spring, low natural fertility, and soil blowing on cow paths are the main limitations. Establishing and maintaining mixtures of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. Tile drainage and the use of interceptor ditches help to reduce wetness. Native bluegrass, timothy, and red and white clover are commonly used for pasture.

This soil is suited to woodland. Seedling mortality is moderate.

This soil is limited for community development by the frost action potential and slow percolation in the subsoil. Quick seeding and applications of straw help to reduce soil blowing in areas of road construction.

This soil is well suited to recreation. The main limitations are slow percolation in the substratum, compaction,

and soil blowing in unvegetated areas. Rotating areas, mulching paths and trails, and using cover crops on unvegetated areas are common management practices. Capability subclass IIs; woodland ordination 40.

**HbB—Hinesburg loamy fine sand, 3 to 8 percent slopes.** This gently sloping, well drained soil is on dissected outwash plains and terraces in major stream valleys. The areas are 3 to 20 acres. Slopes are 100 to 300 feet long.

Typically, the surface layer is brown to dark brown loamy fine sand 7 inches thick. The subsoil is about 15 inches thick. It is strong brown, very friable loamy fine sand in the upper 3 inches and light yellowish brown and yellowish brown, very friable loamy fine sand in the lower 12 inches. The underlying material to a depth of 60 inches is dark olive gray firm silt loam.

Included with this soil in mapping are small areas of Belgrade, Windsor, and Eldridge soils. The Belgrade soils are in slightly depressional areas, and the Windsor soils are on slight rises. Also included are areas of soils that are more than 5 percent coarse fragments in the surface layer and subsoil and soils that have a surface layer and subsoil of sandy loam or fine sandy loam. The Eldridge and Windsor soils make up about 30 percent of this map unit, and the other included soils make up about 10 to 20 percent.

Permeability is rapid in the surface layer and subsoil and moderately slow in the substratum. This soil has moderate available water capacity. Organic matter content is moderate, and natural fertility is low. The root zone extends to the substratum. Tilth is good. Reaction ranges from strongly acid to neutral in the surface layer and subsoil. It is slightly acid or neutral in the substratum. Runoff is slow. This soil is subject to soil blowing and a slight hazard of erosion in unvegetated areas. It has moderate frost action potential.

This soil is mostly used for tilled crops, hay, and pasture. A small acreage is used for homesites, woodland, recreation, and wildlife habitat. This soil has good potential for intensive farming and pasture. It has fair potential for urban uses. This soil has fair potential for tree plantations and good potential for most recreational uses and woodland wildlife habitat.

This soil is suitable for cultivated crops and hay. Wetness is a limitation in the spring and after heavy rains. This soil can be cultivated throughout a wide range of moisture content. Improving fertility and organic matter content, maintaining cover crops, and contour planting are major management practices. Installing tile drainage and interceptor ditches helps to reduce wetness. Crops grown on this soil respond well to lime and fertilizer. Cool-season vegetables are suitable for this soil.

This soil is well suited to pasture. Wetness in the spring and low natural fertility are the main limitations. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures,

deferment of grazing, and the use of lime and fertilizer are pasture management practices. Tile drainage and the use of interceptor ditches help to reduce wetness. Native bluegrass, timothy, and red and white clover are commonly used for pasture.

This soil is suited to woodland. Mortality of natural seedlings is moderate. Dominant tree species on this soil are red maple, hemlock, and eastern white pine.

This soil is limited for community development by frost action potential and slow percolation in the subsoil. Quick seeding and applications of straw reduce the erosion hazard in areas of road construction.

This soil is well suited to recreation. Compaction and erosion on unvegetated areas are the main limitations. Rotating areas, mulching paths and trails, and using cover crops on unvegetated areas are suitable management practices. Capability subclass IIs; woodland ordination 40.

**HbC—Hinesburg loamy fine sand, 8 to 15 percent slopes.** This sloping, well drained soil is in smooth, convex areas on strongly dissected outwash plains and terraces in major stream valleys. The areas are irregularly shaped and range from 3 to 20 acres. Slopes are 100 to 300 feet long.

Typically, the surface layer is brown to dark brown loamy fine sand 7 inches thick. The subsoil is very friable loamy fine sand 15 inches thick. It is strong brown in the upper 3 inches and light yellowish brown and yellowish brown in the lower 12 inches. The underlying material to a depth of 60 inches is dark olive gray firm silt loam.

Included with this soil in mapping are small areas of Belgrade, Windsor, and Eldridge soils. The Belgrade soils are in slightly depressional areas. The Windsor soils are on slight rises. Also included are areas of soils that are more than 5 percent coarse fragments in the surface layer and subsoil and soils that are sandy loam or fine sandy loam in the surface layer and subsoil. The Belgrade and Windsor soils make up about 25 percent of this map unit, and the other included soils make up about 10 to 15 percent.

Permeability is rapid in the surface layer and subsoil and moderately slow in the substratum. This soil has moderate available water capacity, moderate organic matter content, and low natural fertility. The root zone extends to the substratum. Tilth is good. Reaction ranges from strongly acid to neutral in the surface layer and subsoil. It is slightly acid to neutral in the substratum. Runoff is medium. The hazard of erosion is moderate. This soil is subject to soil blowing in unvegetated areas. Frost action potential is moderate.

This soil is mostly used for hay and pasture. A small acreage is used for homesites, woodland, recreation, and wildlife habitat. This soil has fair potential for intensive farming, pasture, and urban uses. It has fair potential for tree plantations and most recreational uses and good potential for woodland wildlife habitat.

This soil is limited for cultivated crops and hay by wetness in the spring and after heavy rains. This soil can be cultivated throughout a wide range of moisture conditions



without affecting the tilth. Crops on this soil respond well to lime and fertilizer. Improving fertility and organic matter content is the major management concern. Maintaining cover crops and contour planting are major management practices. Installing tile drainage reduces wetness.

This soil is well suited to pasture. Wetness in the spring and low natural fertility are the main limitations. Establishing and maintaining a mixture of grasses and legumes, improving organic matter content, and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable practices of pasture management. Tile drainage helps to reduce wetness. Native bluegrass, timothy, and red and white clover are commonly used for pasture.

This soil is suited to woodland. Seedling mortality is moderate. Dominant tree species on this soil are red maple, hemlock, and eastern white pine.

Frost action potential, erosion, steep slopes, and slow percolation in the subsoil limit the use of this soil for urban development. If roads or streets are built on this soil, quick seeding and applications of straw help to reduce soil blowing and erosion.

This soil is suited to recreation. Compaction, soil blowing, and erosion on unvegetated areas are the main management concerns. Rotating areas, mulching paths and trails, and using cover crops on unvegetated areas are suitable management practices. Capability subclass IIIe; woodland ordination 4o.

**HbD—Hinesburg loamy fine sand, 15 to 25 percent slopes.** This moderately steep, well drained soil is on strongly dissected outwash plains and terraces in major stream valleys. The soil is in irregularly shaped, smooth, convex areas that are 5 to 25 acres. Slopes range from 100 to 200 feet in length.

Typically, the surface layer is brown to dark brown loamy fine sand 7 inches thick. The subsoil is very friable loamy fine sand 15 inches thick. It is strong brown in the upper 3 inches and light yellowish brown and yellowish brown in the lower 12 inches. The underlying material to a depth of 60 inches is dark olive gray firm silt loam.

Included with this soil in mapping are small areas of Eldridge and Windsor soils. The Eldridge soils are in slightly depressional areas. The Windsor soils are on slight or steep rises. Also included are areas of soils that are more than 5 percent coarse fragments in the surface layer and subsoil and soils that have a sandy loam or fine sandy loam surface layer and subsoil. The Eldridge and Windsor soils make up about 30 percent of this map unit, and the other included soils make up about 5 to 15 percent.

Permeability is rapid in the surface layer and the subsoil and moderately slow in the substratum. This soil has moderate available water capacity, moderate organic matter content, and low natural fertility. The root zone extends to the substratum. Tilth is good. Reaction ranges

from strongly acid to neutral in the surface layer and subsoil. It is slightly acid or neutral in the substratum. Runoff is rapid. The hazards of erosion and soil blowing are severe in unvegetated areas. This soil has moderate frost action potential.

This soil is mostly used for woodland, pasture, and wildlife habitat. It has good potential for pasture and poor potential for urban uses. This soil has fair potential for tree plantations and good potential for woodland wildlife habitat. It has poor potential for most other nonfarm uses.

This soil is limited for cultivated crops and hay by erosion and soil blowing. This soil can be cultivated throughout a wide range of moisture content without affecting the tilth. Crops respond well to lime and fertilizer. Improving fertility is a management concern. Maintaining cover crops to control erosion is a major management practice.

This soil is suited to pasture. Low natural fertility and erosion on cow paths are the main limitations. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are practices of pasture management. Native bluegrass, timothy, and red and white clover are commonly used for pasture.

This soil is suited to woodland. Seedling mortality is moderate. Using water bars and mulching road banks help to reduce erosion.

Slopes and slow percolation in the subsoil limit the use of this soil for community development.

This soil is poorly suited to recreational use. Slopes and the hazards of compaction, soil blowing, and erosion on unvegetated areas are the main limitations. Rotating areas, mulching paths and trails, and using cover crops on unvegetated areas are suitable corrective measures. Capability subclass IVe; woodland ordination 4r.

**HbE—Hinesburg loamy fine sand, 25 to 60 percent slopes.** This steep, well drained soil is on strongly dissected, long, narrow outwash plains and terraces in major stream valleys. The soil is in areas that are 5 to 20 acres. Slopes range from 150 to 300 feet in length.

Typically, the surface layer is brown to dark brown loamy fine sand 7 inches thick. The subsoil is very friable loamy fine sand 15 inches thick. It is strong brown in the upper 3 inches and light yellowish brown and yellowish brown in the lower 12 inches. The underlying material to a depth of 60 inches is dark olive gray firm silt loam.

Included with this soil in mapping are small areas of Belgrade, Windsor, and Eldridge soils. The Belgrade soils are in slightly depressional areas. The Windsor soils are on the top of steep rises. Also included are areas of soils that are more than 5 percent coarse fragments in the surface layer and subsoil and soils that have a sandy loam or fine sandy loam surface layer and subsoil. The Eldridge and Windsor soils make up about 25 percent of this mapping unit, and the other included soils make up about 10 to 25 percent.



Permeability is rapid in the surface layer and subsoil and moderately slow in the substratum. This soil has moderate available water capacity, moderate organic matter content, and low natural fertility. The root zone extends to the substratum. Tilth is good. Reaction ranges from strongly acid to neutral in the sandy material. It is slightly acid or neutral in the substratum. Runoff is rapid. This soil is subject to severe hazard of erosion and soil blowing in unvegetated areas. This soil has moderate frost action potential.

This soil is mostly used for woodland. A small acreage is in pasture or is idle. The soil has poor potential for intensive farming, pasture, and urban uses. It has fair potential for tree plantations and good potential for woodland wildlife habitat. It has poor potential for most other nonfarm uses.

This soil is limited for cultivated crops and hay by slope, erosion, and soil blowing. Use of farm machinery is very hazardous because of slope.

This soil is suited to unimproved pasture. Low natural fertility and soil blowing and erosion on cow paths are the primary limitations. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, and deferment of grazing are suitable practices of unimproved pasture management. Native bluegrass, timothy, and red and white clover are commonly used for pasture.

This soil is suited to woodland. Seedling mortality is moderate. Using water bars and mulching roadbanks help to reduce erosion. Dominant tree species are red maple, hemlock, and eastern white pine.

Steep slopes and slow percolation in the subsoil limit the use of this soil for community development and recreation. Capability subclass VIIe; woodland ordination 4r.

**KbA—Kingsbury clay, 0 to 3 percent slopes.** This nearly level, somewhat poorly drained soil is in irregularly shaped areas on lake plains. The areas range from 5 to 200 acres.

Typically, the surface layer is dark grayish brown clay 6 inches thick. The subsurface layer is mottled, grayish brown clay 5 inches thick. The subsoil is mottled, dark grayish brown clay. The substratum extends to a depth of 60 inches. It is yellowish brown clay with light brownish gray, brown, and yellowish brown mottles.

Included with this soil in mapping are small areas of Covington and Scantic soils in depressions and draws and Munson soils at slightly higher elevations. Also included are areas of more sloping soils, Buxton soils on terrace breaks, soils with cobbles and stones on the surface, soils that have a surface layer that is thinner or lighter in color than this Kingsbury soil, soils that have a silty clay loam, clay loam, or silty clay surface layer, and a few areas of soils that have layers of silt loam and loam in the lower part of the subsoil and in the substratum. The Covington and Scantic soils make up about 20 to 30 per-

cent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is slow in this soil. Available water capacity and natural fertility are high. The root zone extends to a depth of 36 inches or more, but root growth is restricted by a perched water table and the clayey texture. Unless limed, this soil is medium acid to neutral in the surface layer and neutral to mildly alkaline in the subsoil and substratum. Runoff is slow. The hazard of erosion is slight. Tilth is poor, and the workability of the soil is difficult because of a high clay content. Depth to bedrock is more than 5 feet. A perched water table is present from late fall to midspring. Shrink-swell potential and frost action potential are high.

This soil is used mainly for hay and pasture. A few areas are in corn for silage; a few are in woodland or are idle. This soil has fair potential for most farm uses and for woodland. It has poor potential for most urban uses and for many recreational uses. This soil has good potential for water impoundment and for woodland wildlife habitat.

If properly managed, this soil is suitable for cultivated crops. Wetness and the high clay content in the subsurface layer are the main limitations. This soil tends to shrink and crack when drying and swell when wet. Crops on this soil respond well to lime and fertilizer.

If properly managed, this soil is suitable for pasture. Establishing and maintaining a mixture of grasses and legumes, controlling grazing, and reducing the water table are the major management needs. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of fertilizer to maintain the natural fertility are suitable management practices. Climax timothy and Empire trefoil are common pasture grasses and legumes on this soil.

This soil is suitable for tree production. Equipment use is limited by slow permeability, high clay content, and wetness. The dominant tree species are white ash, willow, aspen, and red maple.

This soil is suitable as a site for sewage lagoons, but it is limited for most other urban uses by slow permeability, high clay content, shrink-swell potential, frost action potential, and low strength in excavated areas.

This soil is poorly suited to most types of recreation. Slow permeability and a high clay content are the major limitations. The soil is suitable for recreational pond sites. Capability subclass IVw; woodland ordination 3w.

**KbB—Kingsbury clay, 3 to 8 percent slopes.** This gently sloping, somewhat poorly drained soil is in irregularly shaped areas on lake plains. The areas range from 5 to 200 acres.

Typically, the surface layer is dark grayish brown clay 6 inches thick. The subsurface layer is 5 inches thick. It is grayish brown clay and has gray mottles. The subsoil is mottled, dark grayish brown clay 25 inches thick. The substratum extends to a depth of 60 inches. It is yellowish brown clay and has light brownish gray, gray, brown, and yellowish brown mottles.

Included with this soil in mapping are small areas of Covington and Scantic soils in depressions and draws and Munson soils at slightly higher elevations. Also included are areas of more sloping soils, Buxton soils on terrace breaks, soils with cobbles and stones on the surface, soils that have a surface layer that is thinner or lighter in color than this Kingsbury soil, soils that have a silty clay, clay loam, or silty clay loam surface layer, and a few areas of soils that have layers of silt loam and loam in the lower part of the subsoil and in the substratum. The Covington and Scantic soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is slow in this soil. Available water capacity and natural fertility are high. The root zone extends to a depth of at least 36 inches, but root growth is restricted by a perched water table and the clayey texture. Unless limed, this soil is medium acid to neutral in the surface layer and neutral to mildly alkaline in the subsoil and substratum. Runoff is medium. The hazard of erosion is slight to moderate. Tilth is poor, and the workability of the soil is difficult because of a high clay content. Depth to bedrock is more than 5 feet. A perched water table is present from late fall to midspring. Shrink-swell potential and frost action potential are high.

This soil is used mainly for hay and pasture. A few areas are in corn for silage; a few are in woodland or are idle. This soil has fair potential for most farm uses and for wood production. It has poor potential for most urban uses and many recreational uses. This soil has good potential for water impoundment and woodland wildlife habitat.

If properly managed, this soil is suitable for cultivated crops. Wetness, high clay content in the subsurface layer, and slow permeability are the main limitations. This soil tends to shrink and crack when drying and swell when wet. Crops on this soil respond well to lime and fertilizer. Drainage is needed. Maintaining a cover crop, no-till planting, and contour plowing help to reduce erosion.

If properly managed, this soil is suitable for pasture. Establishing and maintaining a mixture of grasses and legumes, controlling grazing, and reducing the water table are the major management needs. Use of proper stocking rates to maintain desirable grasses and legumes, drainage to reduce the water table, rotation of pastures, deferment of grazing, and use of fertilizer to maintain natural fertility are suitable management practices. Climax timothy and Empire trefoil are common pasture grasses and legumes on this soil.

This soil is suitable for tree production. Use of equipment is limited by slow permeability, high clay content, and wetness. The dominant tree species are white ash, willow, aspen, and red maple.

This soil is limited for most urban uses because of a high water table, slow permeability, high clay content, shrink-swell potential, frost action potential, and low strength in excavated areas. Slow permeability and a high clay content limit the use of this soil for recreation. Capability subclass IVw; woodland ordination 3w.

**Le—Limerick silt loam.** This level, poorly drained, deep soil is in areas on flood plains along rivers and streams. The areas are long and narrow or irregularly shaped and are as much as 150 acres. This soil is subject to flash floods after heavy, brief rains and to prolonged flooding during and after intensive, extended rains.

Typically, the surface layer is dark grayish brown silt loam 8 inches thick. The underlying material to a depth of 11 inches is mottled, dark grayish brown silt loam. Between depths of 11 and 60 inches, it is mottled, grayish brown silt loam.

Included with this soil in mapping are small areas of Winooski soils and Rumney Variant soils and small areas of very poorly drained soils that have a mucky surface layer and that are generally shown on the soil map by a spot symbol. The included Rumney Variant soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 25 percent.

Permeability is moderate in this soil. Available water capacity and natural fertility are high. The root zone extends throughout the soil profile, but root growth is restricted by a high water table. This soil is strongly acid to neutral throughout the profile unless limed. Runoff is slow. Streambank erosion is a hazard, especially on the outside curve of a river or stream. Tilth is good, but tillage is delayed by a seasonal high water table and spring floods. A seasonal high water table is evident from mid-winter to late spring. Frost action potential is high.

This soil is used primarily for hay and pasture. A small acreage is used for silage corn, and the rest is wooded or idle (fig. 6). This soil has good potential for farming and wetland wildlife habitat. It has fair potential for woodland and poor potential for most community and other non-farm uses.

This soil is well suited to hay. Streambank erosion, a high water table, flooding, and slow runoff are the main limitations. Open ditches on the perimeter of cultivated fields help lower the seasonal high water table. Crops respond well to lime and fertilizer.

This soil is well suited to pasture. Lowering the seasonal high water table, channeling away floodwaters quickly, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are the major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, open ditches on the perimeter of pastures to lower the seasonal high water table, rotation of pastures, deferment of grazing, and use of lime and fertilizer to offset the acidity and maintain natural fertility are suitable management practices. Common pasture grasses and legumes are Empire trefoil and climax timothy.

Excess wetness limits the use of this soil for trees. Alders, willows, and aspen are the dominant species on this soil.

This soil is unsuited to most types of community development. The flood hazard from adjacent rivers and streams, the seasonal high water table, and slow runoff make building or foundation construction impractical. This



soil is unsuited to recreational use. Capability subclass IIIw; woodland ordination 4w.

**LoB—Lordstown loam, rocky, 3 to 8 percent slopes.** This gently sloping, well drained, moderately deep soil is in irregularly shaped, smooth or slightly convex areas. Slopes range from 50 to 800 feet in length. The areas are 5 to 30 acres.

Typically, the surface layer is friable, brown to dark brown loam about 9 inches thick. The subsoil is friable, brown to dark brown loam about 18 inches thick. Shale bedrock is at a depth of 27 inches.

Included with this soil in mapping are small areas of St. Albans, Farmington, and Georgia soils. The Georgia soils are in very slight depressions and drainageways. Also included are soils that have slopes of less than 3 percent or more than 8 percent, soils that have cobbles and stones on the surface, soils that are more than 35 percent shaly and flaggy materials below a depth of 10 inches, and soils that have bedrock at a depth of less than 20 inches. The included St. Albans and Georgia soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate in this soil. Available water capacity is low, natural fertility is high, and runoff is medium. The soil is medium acid to neutral throughout the profile unless limed. Depth to bedrock is less than 40 inches and restricts the root zone. Rock exposures 300 feet apart or more cover less than 1 percent of the surface of this soil. The hazard of erosion is slight. This soil has good tilth. Organic matter content is low. Frost action potential is moderate.

Most areas of this soil are in pasture or hay. A small acreage is used for silage corn. Farming potential is good for this soil. This soil has poor potential for community development and good potential for grass and trees. This soil has fair potential for most recreational uses. It has good potential for some types of wildlife habitat.

This soil is suitable for silage corn and hay. The main limitations are erosion, low available water capacity, and low organic matter content. Crops on this soil respond well to lime and fertilizer. Using minimum tillage and cover crops and including grasses and legumes in the cropping system help control the erosion hazard. Strip-cropping or contour farming, depending on topography, and no-till planting are suitable management practices. Birdsfoot trefoil, alfalfa, and timothy are the primary hay crops. Cool-season crops are suitable for this soil.

This soil is suited to pasture. Low available water capacity is the primary limitation. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable pasture management practices. Timothy and red or white clover are commonly used for pasture on this soil.

This soil is suited to woodland. It is managed for sugar maple and red and white pine. Low available water

capacity is the primary limitation. If the natural cover is removed during logging, the use of water bars and selective cutting help reduce erosion. Black cherry, sugar maple, and elm are the dominant tree species on this soil.

This soil is limited for many urban purposes by depth to bedrock and by bedrock outcrops. If roads or streets are built on this soil, quick seeding and applications of straw help to reduce the erosion hazard on graded slopes.

This soil is suitable for recreation. Small stones are the primary limitation. Compaction and the erosion hazard are reduced in places by applying mulch on paths and trails and by rotating areas. Capability subclass IIe; woodland ordination 3f.

**LoC—Lordstown loam, rocky, 8 to 15 percent slopes.** This sloping, well drained, moderately deep soil is in irregularly shaped, smooth or convex areas. Slopes range from 50 to 700 feet in length. The areas are 5 to 40 acres. Rock outcrops cover less than 1 percent of the surface area of this soil.

Typically, the surface layer is friable, brown to dark brown loam about 9 inches thick. The subsoil is friable, brown blocky loam about 18 inches thick. Shale bedrock is at a depth of about 27 inches.

Included with this soil in mapping are small areas of the St. Albans, Farmington, and Georgia soils. The Georgia soils are in very slight depressions and drainageways. Also included are soils that have slopes of less than 3 percent or more than 8 percent, soils that have cobbles and stones on the surface, soils that are more than 35 percent shaly and flaggy materials below a depth of 10 inches, and soils that have bedrock at a depth of less than 20 inches. The included St. Albans and Georgia soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate in this soil. Available water capacity is low, natural fertility is high, and runoff is medium. The soil is medium acid to neutral throughout the profile unless limed. Depth to bedrock is less than 40 inches and restricts the root zone. Rock exposures 300 feet apart or more cover less than 1 percent of the surface. This soil has good soil tilth. The hazard of erosion is moderate. Organic matter content is low. Frost action potential is moderate.

Most of this soil is in pasture or hay. A small acreage is used for silage corn. Farming potential is fair for this soil. This soil has poor potential for community development and good potential for grass and trees. This soil has fair potential for most recreational uses. It has good potential for some types of wildlife habitat.

This soil is suitable for hay. The major limitations are erosion, low available water capacity, and low organic matter content. Crops respond well to lime and fertilizer. If cultivated crops are planted, using minimum tillage and cover crops and including grasses and legumes in the cropping system help control the erosion hazard. Strip-cropping or contour farming, depending on topography, and no-till planting are suitable management practices. Birdsfoot trefoil, alfalfa, and timothy are the primary hay crops.

This soil is suited to pasture. Low available water capacity is the primary limitation. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable pasture management practices. Timothy and red or white clover are commonly grown on this soil.

This soil is suited to woodland. It is managed for sugar maple and red and white pine. Slope and erosion are the primary limitations. If the natural cover is removed during logging, the use of water bars and selective cutting help reduce erosion. Black cherry, sugar maple, and elm are the dominant tree species on this soil.

This soil is limited for many urban purposes by slope, depth to bedrock, and bedrock outcrops. If roads or streets are built on this soil, quick seeding and applications of straw help reduce erosion on graded slopes.

This soil is suitable for recreation. Small stones are the primary limitation. Compaction and erosion are reduced in places by applying mulch on paths and trails and by rotating areas. Capability subclass IIIe; woodland ordination 3f.

**LoD—Lordstown loam, rocky, 15 to 25 percent slopes.** This moderately steep, well drained, moderately deep soil is in irregularly shaped, smooth or slightly convex areas. Slopes range from 100 to 400 feet in length. The areas are 5 to 20 acres. Rock outcrops cover less than 1 percent of the surface area of this soil.

Typically, the surface layer is friable, brown to dark brown loam about 9 inches thick. The subsoil is friable, brown blocky loam about 18 inches thick. Shale bedrock is at a depth of 27 inches.

Included with this soil in mapping are small areas of the St. Albans, Farmington, and Georgia soils and Lordstown-Rock outcrop complex. The Georgia soils are in very slight depressions and drainageways. Also included are soils that have slopes of less than 3 percent or more than 8 percent, soils that have cobbles and stones on the surface, soils that are more than 35 percent shaly and flaggy materials below a depth of 10 inches, and soils that have bedrock at a depth of less than 20 inches. The included St. Albans soils and Lordstown-Rock outcrop complex make up 15 to 25 percent of this map unit, and the other included soils make up 5 to 15 percent.

Permeability is moderate in this soil. Available water capacity is low, natural fertility is high, and runoff is rapid. The soil is medium acid to neutral throughout unless limed. Depth to bedrock is less than 40 inches and restricts the root zone. Rock exposures 300 feet apart or more cover less than 1 percent of the surface. This soil has good soil tilth. Organic matter content is low. Frost action potential is moderate.

Most of this soil is in pasture or woodland. A small acreage is used for hay. Farming potential is poor on this soil. This soil has poor potential for community development and recreation. It has fair potential for grass and

good potential for trees. This soil has good potential for woodland wildlife habitat.

This soil is suited to hay. The main limitations are slope, erosion, low available water capacity, and low organic matter content. Crops on this soil respond well to lime and fertilizer. Birdsfoot trefoil, alfalfa, and timothy are the primary hay crops.

This soil is suited to pasture. Slope and low available water capacity are the main limitations. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable pasture management practices. Timothy and red or white clover are commonly grown on this soil.

This soil is suitable for woodland. The soil is managed for sugar maple and red and white pine. Slope and erosion are the primary limitations. If the natural cover is removed during logging, the use of water bars and selective cutting help reduce erosion. Black cherry, sugar maple, and elm are the dominant tree species on this soil.

This soil is unsuited to most urban purposes because of slope, depth to bedrock, and bedrock outcrops.

This soil is poorly suited to recreation. Small stones and slope are the primary limitations. Compaction and the erosion hazard are reduced in places by applying mulch on paths and trails and by rotating areas. Capability subclass IVe; woodland ordination 3r.

**LrC—Lordstown-Rock outcrop complex, 5 to 15 percent slopes.** This complex consists of gently sloping to sloping, well drained, moderately deep soils and Rock outcrop in irregularly shaped, smooth or slightly convex areas that range from 5 to 200 acres. Slopes range from 100 to 1,000 feet in length. The soils and Rock outcrop are so intermingled that it was not practical to map them separately.

Lordstown soils make up about 55 percent of this complex. Typically, they have a surface layer of friable, brown to dark brown loam about 9 inches thick. The subsoil is friable, brown loam 18 inches thick. Shale bedrock is at a depth of 27 inches.

Rock outcrop makes up about 30 percent of this complex. It consists of bare exposures of bedrock that are less than 30 feet apart and that are in a general north-south trend.

Included with this complex in mapping are areas of St. Albans and Georgia soils; soils that have slopes of less than 5 percent or more than 15 percent; areas of soils that have cobbles and stones on the surface; and areas of soils that are more than 35 percent shaly and flaggy material between a depth of 10 inches and bedrock. Also included are soils that have bedrock at a depth of less than 20 inches. The St. Albans and Georgia soils make up 5 to 10 percent of this map unit, and the other included soils make up 1 to 5 percent.

The Lordstown soils in this complex are moderately permeable. Available water capacity is low, and natural



fertility is high. Runoff is medium. Reaction is medium acid to neutral. Depth to bedrock is less than 40 inches and restricts root growth. Tilth is good, and organic matter content is low. Frost action potential is moderate. The hazard of erosion is severe. Runoff is very rapid on the Rock outcrop part of this complex.

Most of this complex is in unimproved pasture or woodland. A small acreage is used for sugar maple trees. This complex has poor potential for most farm and non-farm uses. Potential is fair for grass and trees, and it is poor for most types of wildlife habitat.

This complex is suited to unimproved pasture. Extensive low outcrops of bedrock and low available water capacity are the main limitations. Prevention of overgrazing, rotation of pastures, and deferment of grazing are suitable pasture management practices. Timothy and Kentucky bluegrass are the native pasture grasses on this complex.

This complex is suitable for trees. It is managed for sugar maple, red pine, and white pine. Extensive bedrock outcrops and low available water capacity are the main limitations. If plant cover is removed during logging, use of water bars and selective cutting help to reduce the hazard of erosion. Black cherry, sugar maple, and elm are the dominant tree species on this complex.

This complex is unsuitable for most urban uses. It is limited by the extensive outcrops of bedrock and the moderate depth to bedrock. Quick seeding and applications of straw help to reduce the erosion hazard on graded slopes during the construction of roads and streets.

This complex is unsuitable for most types of recreation. The extensive bedrock exposures and steep slopes are the main limitations. Applying mulch on paths and trails and rotating areas help to reduce the hazards of compaction and erosion.

Extensive bedrock outcrops and slope limit the use of this complex for wildlife habitat. Capability subclass VIe; woodland ordination 3f.

**LrD—Lordstown-Rock outcrop complex, 15 to 25 percent slopes.** This complex consists of moderately steep, well drained, moderately deep soils and Rock outcrop in irregularly shaped, smooth or slightly convex areas that range from 5 to 200 acres. Slopes are 100 to 1,000 feet long. The soils and Rock outcrop are so intermingled that it was not practical to separate them in mapping.

Lordstown soils make up about 50 percent of this complex. Typically, they have a surface layer of friable, brown to dark brown loam about 9 inches thick. The subsoil is friable, brown blocky loam about 18 inches thick. Shale bedrock is at a depth of 27 inches.

Rock outcrop makes up about 35 percent of this complex. It consists of exposures of bedrock less than 30 feet apart that are in a general north-south trend.

Included with this complex in mapping are areas of St. Albans, Farmington, and Georgia soils; soils that have slopes of more than 25 percent or less than 15 percent; soils that have cobbles and stones on the surface; soils

that are more than 35 percent flaggy material at a depth of more than 10 inches; and soils that have bedrock at a depth of less than 20 inches. The included St. Albans and Georgia soils make up 1 to 10 percent of this map unit, and the other included soils make up 1 to 5 percent.

Permeability is moderate in the Lordstown soils of this complex. Available water capacity is low, natural fertility is high, and runoff is medium. The soils are medium acid to neutral throughout the profile. Depth to bedrock is less than 40 inches and restricts the root zone. This soil has good tilth. Organic matter content is low. This soil responds well to lime and fertilizer. Frost action potential is moderate. Runoff is very rapid on the Rock outcrop part of this complex.

Most of this complex is in unimproved pasture or woodland. A small acreage is used for sugar maple trees. This complex has poor potential for most farm and non-farm uses. It has fair potential for trees and poor potential for most types of wildlife habitat.

This complex is suited to unimproved pasture. Extensive bedrock outcrops and slope are the primary limitations. Prevention of overgrazing is the major management concern. Rotation of pastures and deferment of grazing are suitable pasture management practices. Kentucky bluegrass is the native pasture grass on this complex.

This complex is suitable for trees. It is managed for sugar maple and red and white pine. Extensive bedrock outcrops and slope are the primary limitations. If the natural cover is removed during logging, the use of water bars and selective cutting help reduce erosion. Black cherry, sugar maple, and elm are the dominant tree species on this complex.

This complex is not suited to most urban purposes. Slope, depth to bedrock, and extensive bedrock outcrops are the major limitations.

This complex is not suited to recreation. Extensive bedrock exposures and slope are the primary limitations. Compaction and erosion are reduced in places by applying mulch on paths and trails and by rotating areas.

This complex is poorly suited to wildlife habitat. Extensive bedrock outcrops and slope are the major limitations. Capability subclass VIIe; woodland ordination 3r.

**LrE—Lordstown-Rock outcrop complex, 25 to 60 percent slopes.** This complex consists of steep, well drained, moderately deep soils and Rock outcrop in irregularly shaped areas on jagged and convex escarpments. The areas range from 5 to 25 acres. Slopes are 100 to 1,000 feet long. The soils and Rock outcrop are so intermingled that it was not practical to map them separately.

Lordstown soils make up about 45 percent of this complex. Typically, they have a surface layer of friable, brown to dark brown loam about 9 inches thick. The subsoil is friable, brown blocky loam about 18 inches thick. Shale bedrock is at a depth of 27 inches.

Rock outcrop makes up about 45 percent of this complex. It consists of bare areas of exposed bedrock that are less than 30 feet apart and that are generally in a north-south trend.

Included with this complex in mapping are small areas of St. Albans, Farmington, and Georgia soils. The Georgia soils are in very slight depressions and in drainageways. Also included are areas of soils that have slopes of less than 25 percent or more than 60 percent, soils that have cobbles and stones on the surface, soils that are more than 35 percent shaly and flaggy material between a depth of 10 inches and bedrock, and soils that have bedrock at a depth of less than 20 inches. The St. Albans and Georgia soils make up 1 to 10 percent of this map unit, and the other included soils make up 1 to 5 percent.

Permeability is moderate in the Lordstown soils. Available water capacity is low, natural fertility is high, and runoff is medium. The soil is medium acid to neutral throughout the profile. Depth to bedrock is less than 40 inches and restricts the root zone. Tilth is good. Organic matter content is low. Frost action potential is moderate. Runoff is very rapid on the areas of Rock outcrop.

Most of this complex is in woodland. A small acreage of the Lordstown soils is used for sugar maple trees, and a small acreage is used for pasture. The Lordstown soils have fair potential for trees and good potential for most types of wildlife habitat.

This complex is suited to unimproved pasture. Extensive bedrock outcrops are the primary limitations. Prevention of overgrazing is the major management concern. Rotation of pastures and deferment of grazing are suitable unimproved pasture management practices. Timothy and Kentucky bluegrass are the native pasture grasses on this complex.

This complex is suited to woodland. It is managed for sugar maple and red and white pine. Extensive bedrock exposures and slope are the primary limitations. If the natural cover is removed during logging, the use of water bars and selective cutting help reduce erosion. Black cherry, sugar maple, and elm are the dominant tree species on this complex.

This complex is not suited to most urban uses because of slope, depth to bedrock, and extensive bedrock outcrops.

This complex is not suited to recreation. Slope and extensive bedrock exposures are the primary limitations. Capability subclass VIIe; woodland ordination 3r.

**Ly—Lyons stony loam.** This level and slightly concave, poorly drained, deep soil is in rectangular areas on glacial till uplands. Areas are 3 to 25 acres. Stones are commonly 30 to 100 feet apart. Most areas of this soil are in the western part of the county.

Typically, the surface layer is very dark gray loam 9 inches thick. The subsoil is 22 inches thick. The upper part is firm, mottled, gray loam. The middle part is firm, mottled, gray silt loam. The lower part is mottled, grayish brown loam. The substratum is mottled, gray fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Massena and Covington soils and Terric Medisaprists. The Massena soils are at slightly higher elevations, and the Covington soils and Terric Medisaprists are in depres-

sions. Also included are areas where stones are less than 30 feet apart and that are mainly shown on the soil map by a spot symbol. The included Massena soils make up 20 to 30 percent of this map unit, and other included soils make up 15 to 20 percent.

Permeability is moderate or moderately slow in the surface layer and subsoil and slow or very slow in the substratum. Available water capacity and natural fertility are high. The root zone extends to a depth of 31 inches, but root growth is restricted by a perched water table. The soil is slightly acid to neutral in the surface layer and subsoil and neutral to mildly alkaline in the substratum. The hazard of erosion is slight. Runoff is very slow. Tilth is good, but wetness delays planting for so long that it is difficult to grow cultivated crops. A perched water table is evident from late fall to late spring. Ponding occurs on this soil in the spring and after heavy rains because of a lack of suitable natural outlets. This soil receives runoff from Massena soils and other adjacent soils at higher elevations. It warms slowly in the spring and remains moist beneath the surface layer during the entire year. Frost action potential is high.

This soil is used mainly for hay and pasture. Some small areas are used for woodland or wildlife habitat or are idle. This soil has poor potential for cultivated crops, woodland, urban development, recreational uses, and many types of wildlife habitat. It has good potential for sewage lagoons, pond reservoirs, and wetland wildlife habitat.

This soil is limited for cultivated crops by a perched water table and slow permeability in the substratum. Crops respond well to lime and fertilizer. If suitable outlets are available, tile drainage helps to control wetness. Open ditches on the perimeter of cultivated fields help to reduce the perched water table in places.

This soil is suitable for pasture. Lowering the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Wetness is the main limitation. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. If suitable outlets are available, tile drainage and diversion ditches help reduce the perched water table. Climax timothy and red clover are the common grasses and legumes used for pasture.

This soil is poorly suited to trees and tree plantations. The dominant tree species are white ash, alders, yellow birch, and willow.

This soil is limited for many urban purposes by slow permeability and a perched water table. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Because of the saturated conditions and high frost action potential, this soil provides a poor foundation for streets and access roads.

This soil is poorly suited to recreational uses. The major limitation for recreation is the perched water table. Because of the saturated conditions, this soil has poor



capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become unstable during wet periods. They dry out slowly after rains and in the spring. Capability subclass VII<sub>s</sub>; woodland ordination 5w.

**Ma—Marsh.** This unit consists of very poorly drained, level areas bordering Lake Champlain. The areas are covered with shallow water practically the entire year and support water-tolerant marshgrasses and rushes (fig. 7). The areas are irregular in shape and range from 5 to 35 acres. The depth of water varies from 6 inches to several feet.

Generally, the surface layer is marsh. The upper part of the subsurface layer is black, organic material 6 inches thick. The lower part is gray, dark gray, and reddish gray silty clay and clay to a depth of 60 inches.

Included with this unit in mapping are small areas of Carlisle muck and Terric Medisaprists. Carlisle muck makes up 20 to 30 percent of this map unit, and Terric Medisaprists make up 5 to 10 percent.

Permeability is variable in this unit. The root zone extends to a depth of 30 inches. The surface layer is very strongly acid to mildly alkaline. Natural fertility is low.

Marsh has good potential for wetland wildlife habitat, wetland plants, and shallow-water areas. It has poor potential for all other uses because of the high water table. Most of the acreage is used for wetland wildlife habitat or is idle.

Marsh is limited for most uses because of ponding and the unavailability of outlets for drainage. Capability subclass and woodland ordination unassigned.

**MeA—Massena stony loam, 0 to 3 percent slopes.** This nearly level and somewhat poorly drained soil is in irregularly shaped areas that range from 5 to 30 acres. Slopes range from 100 to 350 feet in length. The areas are mainly in the Champlain Valley.

Typically, the surface layer is friable, very dark grayish brown loam about 8 inches thick. The subsoil is a friable, brown and grayish brown, mottled loam and silt loam about 17 inches thick. The substratum is gray and grayish brown, mottled loam to a depth of 60 inches.

Included with this soil in mapping are areas of Georgia and Lyons soils. The Georgia soils are on high mounds or slightly elongated rises. The Lyons soils are in nearly level or depressional areas or are in drainageways. Also included are areas of soils that have a friable substratum; a few areas of soils that are more than 35 percent gravel and cobbles between depths of 10 and 40 inches; a few areas of soils that have a surface layer of fine sandy loam or loam or gravelly loam, gravelly fine sandy loam, or gravelly silt loam; and small areas of silt loam, silty clay loam, clay loam, and sandy clay loam. The Georgia and Lyons soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate in the upper part of this soil and moderately slow to slow in the lower part. This soil has very high natural fertility and medium available water capacity. The root zone extends to a depth of 27

inches, but root growth is restricted by a perched water table. The soil is mainly neutral. The hazard of erosion is slight. Runoff is slow. Tilth is good, but planting is delayed in places in the spring by the perched water table. This soil is wet from late fall to late spring. During the wettest part of the year, the water table is less than 1 foot below the surface and water ponds on the surface of the less sloping areas following heavy or prolonged rains. This soil receives runoff from other adjacent soils that are at higher elevations. It warms slowly in the spring and remains moist beneath the surface layer during most growing seasons. Frost action potential is high.

This soil is used mainly for hay, improved pasture, and silage corn. A small acreage is in woodland or is idle. This soil has fair potential for cultivated crops, trees, and sewage lagoons. It has good potential for some types of recreation and wildlife habitat. It has poor potential for urban development.

Wetness caused by a perched water table and slow permeability limits this soil for cultivated crops. Tile drainage and open ditches on the perimeter of cultivated fields help lower the perched water table. Crops respond well to lime and fertilizer. Cool-season crops are suitable for this soil.

This soil is well suited to pasture. Lowering the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. Tile drainage and diversion ditches help lower the perched water table. Climax timothy and red clover are the common grasses and legumes used for pasture.

This soil is suitable for trees. A few red pine and white pine plantations are in operation. The dominant tree species on this soil are white ash, yellow birch, and white pine.

This soil is limited for most types of community development by slow permeability and a perched water table. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Raised sewage disposal fields and tile drains around foundation footings are suitable corrective measures. Because of a high frost action potential, this soil provides a poor foundation for streets and access roads.

This soil is suitable for recreation. The main limitations are the perched water table and small stones. Capability subclass III<sub>w</sub>; woodland ordination 3w.

**MeB—Massena stony loam, 3 to 8 percent slopes.** This gently sloping and somewhat poorly drained soil is in irregularly shaped areas that range from 5 to 50 acres. Slopes range from 100 to 1,000 feet in length. The areas are mainly in the Champlain Valley.

Typically, the surface layer is friable, very dark grayish brown loam about 8 inches thick. The subsoil is a friable,

brown and grayish brown, mottled loam and silt loam about 17 inches thick. The substratum is a gray and grayish brown, mottled loam to a depth of 60 inches.

Included with this soil in mapping are areas of Georgia and Lyons soils. The Georgia soils are on high mounds or slightly elongated rises. The Lyons soils are in nearly level or depressional areas or are in drainageways. Also included are areas of soils that have a friable substratum; a few areas of soils that are more than 35 percent gravel and cobbles between depths of 10 and 40 inches; a few areas of soils that have a surface layer of fine sandy loam or loam or gravelly loam, gravelly fine sandy loam, or gravelly silt loam; and small areas of silt loam, silty clay loam, clay loam and sandy clay loam. The Georgia soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate in the upper part of this soil and moderately slow to slow in the lower part. This soil has very high natural fertility and medium available water capacity. The root zone extends to a depth of 29 inches, but root growth is restricted by a perched water table. The soil is mainly neutral. The hazard of erosion is moderate. Runoff is slow. Tilth is good, but planting is delayed in the spring by a perched water table. The soil is wet from late fall to late spring. During the wettest part of the year, the water table is less than 1 foot below the soil surface and water ponds on the surface of the less sloping areas following heavy or prolonged rains. This soil receives runoff from other adjacent soils that are at higher elevations. It warms slowly in the spring and remains moist beneath the surface layer during most growing seasons. Frost action potential is high.

This soil is used mainly for hay, improved pasture, and silage corn. A small acreage is in woodland or is idle. This soil has fair potential for cultivated crops, trees, and sewage lagoons. It has good potential for some recreational uses and some types of wildlife habitat. It has poor potential for urban development.

Erosion in unvegetated areas and wetness caused by the perched water table and slow permeability limit this soil for cultivated crops and hay. Tile drainage and open ditches on the perimeter of cultivated fields help reduce wetness and lower the perched water table. No-till planting, contour plowing, and maintaining a cover crop are suitable management practices. Crops on this soil respond well to lime and fertilizer. Cool-season crops are suited to this soil.

This soil is well suited to pasture. Lowering the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and the use of lime and fertilizer are suitable management practices. Tile drainage and diversion ditches help lower the perched water table. Climax timothy and red clover are the common grasses and legumes used for pasture.

This soil is suitable for trees and tree plantations. Wetness and erosion limit the use of equipment. A few red pine and white pine plantations are in operation. Use of water bars and mulching of skid trails help reduce erosion. The dominant tree species on this soil are white ash, yellow birch, and white pine.

Slow permeability and a perched water table limit this soil for community development. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Raised sewage disposal fields and tile drains around foundation footings are suitable corrective measures. Because of a high frost action potential, this soil provides a poor foundation for streets and access roads.

The major limitations for recreation are the perched water table and small stones. Capability subclass IIIw; woodland ordination 3w.

**MnA—Massena extremely stony loam, 0 to 6 percent slopes.** This nearly level to gently sloping, somewhat poorly drained soil is in irregularly shaped areas that range from 5 to 50 acres. Slopes range from 100 to 400 feet in length. Stones on the surface are about 5 feet apart. The areas are mainly in the Champlain Valley.

Typically, the surface layer is friable, very dark grayish brown loam about 8 inches thick. The subsoil is a friable, brown and grayish brown, mottled loam and silt loam about 17 inches thick. The substratum is a gray and grayish brown, mottled loam to a depth of 60 inches.

Included with this soil in mapping are areas of Georgia and Lyons soils. The Georgia soils are on high mounds or slightly elongated rises. The Lyons soils are in nearly level or depressional areas or are in drainageways. Also included are areas of soils that have a friable substratum or soils with a stony or very stony surface layer; few areas of soils that are more than 35 percent gravel and cobbles between depths of 10 and 40 inches; a few areas of soils that have a surface layer of fine sandy loam or loam or gravelly loam, gravelly fine sandy loam, or gravelly silt loam; and small areas of silt loam, silty clay loam, clay loam, and sandy clay loam. The Georgia and Lyons soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderate in the upper part of the soil and moderately slow to slow in the lower part. This soil has very high natural fertility and medium available water capacity. The root zone extends to a depth of 25 inches, but root growth is restricted by the perched water table. The soil is neutral throughout most of the profile. The hazard of erosion is slight. Runoff is slow. Tilth is good, but planting is delayed in places in the spring by the perched water table. This soil is wet from late fall to late spring. During the wettest part of the year, the water table is less than 1 foot below the surface and water ponds on the surface of the less sloping areas following heavy or prolonged rains. This soil receives runoff from other adjacent soils at higher elevations. It warms



slowly in the spring and remains moist beneath the surface layer during most growing seasons. Frost action potential is high.

This soil is used mainly for unimproved pasture and woodland. A small acreage is used for wildlife habitat or is idle. This soil has poor potential for cultivated crops and many recreational uses. It has poor potential for urban development.

Extensive stones on the surface limit this soil for cultivated crops.

This soil is suited to unimproved pasture. Lowering the perched water table and preventing overgrazing are major pasture management concerns. Rotation of pastures and deferment of grazing are suitable management practices. Tile drainage and diversion ditches help lower the perched water table. Kentucky bluegrass is the common unimproved grass on this soil.

This soil is suitable for trees and tree plantations. Stoniness of the surface is the main limitation. A few red pine plantations are in operation. The dominant tree species on this soil are white ash, yellow birch, and white pine.

This soil is limited for most elements of community development by surface stones, slow permeability, and a perched water table. Because of a high frost action potential, this soil provides a poor foundation for streets and access roads.

The major limitations for recreation are the perched water table and large stones. Capability subclass VII<sub>s</sub>; woodland ordination 3x.

**MsA—Missisquoi loamy sand, 0 to 3 percent slopes.** This nearly level, excessively drained, deep soil is on broad terraces and deltas. Slopes are smooth and slightly convex. The areas are rectangular or irregular in shape and are 4 to 30 acres.

Typically, the surface layer is dark brown loamy sand 5 inches thick. The subsoil is brown to strong brown and yellowish brown loamy sand, gravelly sand, and gravelly coarse sand about 30 inches thick. The substratum is light olive brown and grayish brown gravelly coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Windsor, Deerfield, Hinesburg, and Colton soils; small areas of soils with bedrock at a depth of less than 40 inches; areas of wet soils in some slight depressions or near streams; small areas of soils that have a thin surface layer; and areas of soils that have a surface layer of loamy fine sand or gravelly loamy fine sand. Included areas make up 20 to 30 percent of this map unit.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. Organic matter content is low. The root zone extends to a depth of about 35 inches, but root growth is limited in places by a lack of moisture during prolonged dry periods. The hazard of erosion is slight. The soil ranges from strongly acid to neutral unless limed. Runoff is slow. Tilth is good, but the soil tends to be droughty during dry periods. Depth to bedrock is commonly more than 5 feet.

This soil is a major source of sand, gravel, and roadfill, and many gravel and sand pits are within the mapped areas. A large acreage of this soil is farmed or is used for urban development. The soil has good potential for most types of urban development and as a source of roadfill, sand, and gravel. It has fair potential for cultivated crops, hay, pasture, woodland, and recreational uses. It has poor potential for wildlife habitat.

This soil is suited to most cultivated crops and to hay. Increasing organic matter content, maintaining fertility, and controlling soil blowing are the major concerns of management. If the soil is cultivated, minimum tillage, use of cover crops, and heavy manure applications help to reduce soil blowing and improve tilth. This soil can be worked throughout a wide range of moisture conditions without lowering tilth, and it can be worked early in spring and after heavy rains. Truck crops on this soil sometimes lack adequate moisture.

Prevention of overgrazing is the major concern of pasture management. If this soil is overgrazed, it is subject to soil blowing. Use of proper stocking rates to maintain key plant species, rotation of pastures, deferment of grazing, and use of lime and fertilizer are the chief management needs. Orchardgrass is the common pasture grass.

This soil is suited to many tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Other areas have been planted to red pine or Scotch pine and are managed as plantations. Most Scotch pine plantations are managed for Christmas tree production. The chief limitation is low fertility. The dominant species are white or gray birch, red maple, and white pine.

This soil is suitable for most urban uses. However, the rapid permeability of this soil allows wastes to contaminate some shallow wells.

This soil is suited to recreational uses. High sand content and soil blowing are the main limitations. Maintaining vegetative cover is the major management need. Mulching and planting a hardy grass and rotating camp areas are suitable management practices. Capability subclass III<sub>s</sub>; woodland suitability 4s.

**MsB—Missisquoi loamy sand, 3 to 8 percent slopes.** This gently sloping, excessively drained, deep soil is on broad terraces and deltas. Slopes are narrow and generally less than 300 feet long. Areas are rectangular or irregularly shaped and are 3 to 25 acres.

Typically, the surface layer is dark brown loamy sand 5 inches thick. The subsoil is brown to strong brown and yellowish brown loamy sand, gravelly sand, and gravelly coarse sand about 30 inches thick. The substratum is light olive brown and grayish brown gravelly coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Windsor, Hinesburg, Deerfield, and Colton soils; small areas of soils with bedrock at a depth of less than 40 inches; areas of wet soils in some slight depressions or near streams; small areas of soils that have a

thin surface layer; and areas of soils that have a surface layer of loamy fine sand or gravelly loamy fine sand. Included soils make up 20 to 30 percent of this map unit.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. Organic matter content is low. The root zone extends to a depth of about 35 inches, but root growth is restricted in places by a lack of moisture during prolonged dry periods. The soil ranges from strongly acid to neutral unless limed. The hazard of erosion is slight. Runoff is slow. Tilth is good, but the soil tends to be droughty during dry periods. Depth to bedrock is commonly more than 5 feet.

This soil is a major source of sand, gravel, and roadfill, and many gravel and sand pits are within the mapped areas. A large acreage of this soil is farmed or is used for urban development. The soil has good potential for most types of urban development and as a source material for roadfill, sand, and gravel. It has fair potential for cultivated crops, hay, pasture, woodland, and recreation. It has poor potential for wildlife habitat.

This soil is suited to most types of cultivated crops and hay. Increasing organic matter content and fertility and controlling soil blowing are the major concerns of management. If the soil is cultivated, contour plowing, minimum tillage, use of cover crops, and heavy manure applications help to reduce soil blowing and improve tilth. This soil can be worked throughout a wide range of moisture conditions without lowering tilth. It can be worked early in the spring and after heavy rains. Use of the soil for truck crops is limited by drought.

Prevention of overgrazing is a major concern of pasture management. If this soil is overgrazed, it is subject to soil blowing. Use of proper stocking rates to maintain key plant species, rotation of pastures, deferment of grazing, and use of lime and fertilizer are the chief management needs. Orchardgrass is the common pasture grass.

This soil is suited to many tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Other areas have been planted to red pine or Scotch pine. Most Scotch pine plantations are managed for Christmas tree production. The chief limitation is low fertility. The dominant species are white or gray birch, red maple, and white pine.

This soil is suitable for most urban uses. However, the rapid permeability of this soil allows wastes to contaminate some shallow wells. Quick seeding of unvegetated construction sites helps to control soil blowing.

This soil is suited to recreation. A high sand content and soil blowing are the main limitations. Maintaining a vegetative cover is the major management need. Mulching and planting a hardy grass and rotating camp areas are suitable management practices. Capability subclass IIIs; woodland ordination 4s.

**MsC—Missisquoi loamy sand, 8 to 15 percent slopes.** This sloping, excessively drained, deep soil is on broad terraces and deltas. Slopes are generally less than 300 feet long. Areas are irregularly shaped and are 5 to 30 acres.

Typically, the surface layer is dark brown loamy sand 5 inches thick. The subsoil is brown to strong brown and yellowish brown loamy sand, gravelly sand, and gravelly coarse sand about 30 inches thick. The substratum is light olive brown and grayish brown gravelly coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Windsor, Deerfield, Hinesburg, and Colton soils; small areas of soils with bedrock at a depth of less than 40 inches; areas of wet soils in some slight depressions or near streams; small areas of soils that have a thin surface layer; and areas of soils that have a surface layer of loamy fine sand or gravelly loamy fine sand. Included soils make up 10 to 20 percent of this map unit.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. Organic matter content is low. The root zone extends to a depth of about 35 inches, but root growth is restricted in places by a lack of moisture during prolonged dry periods. The soil ranges from strongly acid to neutral unless limed. The hazard of erosion is moderate. Runoff is medium. Tilth is good, but the soil tends to be droughty during dry periods. Depth to bedrock is commonly more than 5 feet.

This soil is a major source of sand, gravel, and roadfill, and many gravel and sand pits are within the mapped areas. A large acreage of this soil is farmed or wooded, and a small acreage is used for urban development. The soil has fair potential for most urban uses and woodland and is a good source of material for roadfill, sand, and gravel. It has poor potential for cultivated crops and fair potential for hay, pasture, and recreation. It has poor potential for wildlife habitat.

This soil is poorly suited to most cultivated crops and hay. Slope and erosion are the main limitations. Reducing the erosion hazard and increasing organic matter content and fertility are the major concerns of management. The hazard of soil blowing is severe in unvegetated areas. If the soil is cultivated, contour plowing, minimum tillage, use of cover crops, and heavy manure applications help to reduce soil blowing and maintain tilth. This soil can be worked throughout a wide range of moisture conditions without lowering tilth. It can be worked easily in the spring and after heavy rains.

Prevention of overgrazing is a major concern in pasture management. If this soil is overgrazed, it is subject to soil blowing. Use of proper stocking rates to maintain key plant species, rotation of pastures, deferment of grazing, and use of lime and fertilizer are the chief management needs. Orchardgrass is the common pasture grass.

This soil is suited to many tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Other areas have been planted to red pine or Scotch pine. Most Scotch pine plantations are managed for Christmas tree production. The chief management concern is controlling erosion on logging roads and skid trails. The dominant species are white or gray birch, red maple, and white pine.



This soil is suitable for most urban uses. Slope and erosion are the main limitations. The rapid permeability of this soil allows wastes to contaminate some shallow wells. Use of a temporary plant cover in unvegetated areas helps to reduce erosion.

This soil is suited to recreation. A high sand content, slope, and soil blowing are the main limitations. Maintaining a vegetative cover is the major management need. Mulching and planting a hardy grass and rotating camp areas are suitable management practices. Capability subclass IVs; woodland ordination 4s.

**MsD—Missisquoi loamy sand, 15 to 25 percent slopes.** This moderately steep, excessively drained, deep soil is on broad terraces and deltas. Slopes are generally less than 300 feet long. Areas are irregularly shaped and range from 4 to 50 acres.

Typically, the surface layer is dark brown loamy sand 5 inches thick. The subsoil is brown to strong brown and yellowish brown loamy sand, gravelly sand, and gravelly coarse sand about 30 inches thick. The substratum is light olive brown and grayish brown gravelly coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Windsor, Hinesburg, Deerfield, and Colton soils; small areas of soils with bedrock at a depth of less than 40 inches; areas of wet soils in some slight depressions or near streams; small areas of soils that have a thin surface layer; and areas of soils that have a surface layer of loamy fine sand or gravelly loamy fine sand. Included soils make up 15 to 25 percent of this map unit.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. Organic matter content is low. The root zone extends to a depth of about 35 inches, but root growth is restricted in places by a lack of moisture during prolonged dry periods. The soil ranges from strongly acid to neutral unless limed. The hazard of erosion is moderate. Runoff is medium. Tilth is good, but the soil tends to be droughty during dry periods. Depth to bedrock is commonly more than 5 feet.

This soil is a major source of sand and gravel, and some gravel and sand pits are within the mapped areas. A large acreage of this soil is wooded, and small areas are in pasture or hay. The soil has poor potential for most urban uses and is a fair source of material for roadfill. It has fair potential for woodland or pasture. It has poor potential for cultivated crops, recreation, and wildlife habitat. Potential is fair for hay.

This soil is very poorly suited to most cultivated crops. Slope and a severe hazard of soil blowing in unvegetated areas are the main limitations. Increasing organic matter content and fertility and controlling soil blowing are the main concerns of management. This soil can be worked early in the spring and after heavy rains.

Prevention of overgrazing is a major concern of pasture management. If this soil is overgrazed, it is subject to soil blowing. Maintenance and renovation of pastures is difficult because of the moderately steep slopes. Use of proper stocking rates to maintain key plant species, rota-

tion of pastures, deferment of grazing, and use of lime and fertilizer are the chief management needs. Orchardgrass is the common pasture grass.

This soil is suited to many tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Other areas are in large stands of northern hardwoods or have been planted to red or Scotch pine. Most Scotch pine plantations are managed for Christmas tree production. The chief management concern is controlling erosion on logging roads and skid trails. The dominant species are white or gray birch, red maple, sugar maple, and white pine.

This soil is limited for most urban uses by slope. Use of a temporary plant cover in unvegetated areas helps control erosion.

This soil is poorly suited to recreation. Slope, high sand content, and soil blowing are the major limitations. Maintaining a vegetative cover is the major management need. Mulching and planting a hardy grass and rotating paths and trails are suitable management practices. Capability subclass VI; woodland ordination 4s.

**MsE—Missisquoi loamy sand, 25 to 60 percent slopes.** This steep, excessively drained, deep soil is on terrace escarpments or gully walls. The areas are irregular in shape and range from 1 to 200 acres.

Typically, the surface layer is dark brown loamy sand 5 inches thick. The subsoil is brown to strong brown and yellowish brown loamy sand, gravelly sand, and gravelly coarse sand about 30 inches thick. The substratum is light olive brown and grayish brown gravelly coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small intermingled areas of Windsor and Colton soils on adjacent slopes, areas of Hinesburg and Deerfield soils on the lower part of many slopes, small areas of soils with bedrock at a depth of less than 40 inches, areas of wet soils in some slight depressions or near streams, small areas of soils that have a thin surface layer, and areas of soils that have a surface layer of loamy fine sand or gravelly loamy fine sand. Included soils make up 20 to 30 percent of this map unit.

Permeability is rapid in this soil. Available water capacity and natural fertility are low. Organic matter content is low. The root zone extends to a depth of about 35 inches, but root growth is restricted in places by lack of moisture during prolonged dry periods. The soil ranges from strongly acid to neutral. The hazard of erosion is moderate. Runoff is medium. Tilth is good, but the soil tends to be droughty during dry periods. Depth to bedrock is commonly more than 5 feet.

This soil is a good source of sand and gravel, and a few gravel and sand pits are within the mapped areas. A large acreage of this soil is wooded, and a small acreage is in pasture. This soil has poor potential for most urban uses and is a poor source of material for roadfill. It has poor potential for cultivated crops, hay, and recreation. It has poor potential for wildlife habitat and fair potential for woodland.

This soil is not suited to most cultivated crops or hay. Steep slopes and soil blowing in unvegetated areas are the major limitations.

Prevention of overgrazing is the major concern of unimproved pasture management. If this soil is overgrazed, it is subject to soil blowing. Slope is the main limitation. Rotation of pastures and deferment of grazing are the chief management needs. Kentucky bluegrass is the common native pasture grass.

This soil is suited to many tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Other areas are in large stands of northern hardwoods and are managed as plantations. The chief management concern is controlling erosion on logging roads and skid trails. Slope is a major limitation. Specialized logging equipment is needed in some areas. The dominant species are white or gray birch, red maple, sugar maple, and white pine.

This soil is limited for most urban uses by slope. This soil is not suited to recreation. Steep slopes, a high sand content, and soil blowing are the major limitations. Capability subclass VII<sub>s</sub>; woodland ordination 4s.

**MuB—Munson silt loam, 3 to 8 percent slopes.** This gently sloping, somewhat poorly drained, deep soil is in irregularly shaped areas on glacial lake plains and terraces. Slopes range from 50 to 200 feet in length. Areas are 3 to 65 acres.

Typically, the surface layer is dark grayish brown silt loam 8 inches thick. The upper part of the subsoil is dark grayish brown, mottled silt loam 6 inches thick. The lower part of the subsoil is dark grayish brown and olive brown, mottled silty clay loam 16 inches thick. The substratum is olive brown, mottled silty clay to a depth of 60 inches.

Included with this soil in mapping are areas of Belgrade, Buxton, Raynham, and Scantic soils. The Belgrade soils are on high mounds or slightly elongated rises. The Buxton soils are on steep, long and narrow slopes. The Raynham and Scantic soils are in slight depressions. Also included are areas of eroded soils; few areas of soils that have sandy loam, fine sandy loam, and silt loam in the subsoil and substratum; areas of soils with a silty clay loam substratum and soils adjacent to glacial till that have gravel, cobbles, and stones on the surface; and areas of soils that have a very fine sandy loam surface layer. The Raynham and Scantic soils make up 20 to 35 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderate to moderately slow in the surface layer and subsoil and slow in the substratum. Available water capacity and natural fertility are high. The root zone is deep, but root growth is restricted by the very firm subsoil. In unlimed areas the soil ranges from medium acid to neutral. Runoff is medium. The hazard of erosion is moderate. Tilth is fair. When this soil is dry, tillage is difficult because of excessive clay content. A seasonal high water table is evident from late fall to midspring. Frost action potential is high, and shrink-swell potential is moderate.

Most of the acreage of this soil is used for hay or pasture. Some areas are used for silage corn, and a few small areas are used for woodland, for wildlife habitat, or are idle. This soil has good potential for farming. It has poor potential for most urban and recreational uses. Potential is good for some types of wildlife habitat.

This soil is suitable for hay and silage corn. Tillage is delayed in the spring by wetness. Wetness and high clay content are the main limitations. Wetness limits the use of equipment and delays the application of weed killers. Tile drainage and open ditches on the perimeter of cultivated fields help to control wetness and reduce the water table. Cool-season crops are suitable for this soil.

If properly managed, this soil is well suited to pasture. Reducing the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Tile drainage and open ditches on the perimeter of pastures help reduce the perched water table. Common pasture grasses and legumes on this soil are Empire trefoil and climax timothy.

This soil is suitable for woodland. A seasonal high water table and high clay content are the main limitations. Eastern white pine, sugar maple, and red spruce are the dominant species on this soil.

This soil is limited for some urban uses by the perched water table from late fall to midspring. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Tile drains around foundation footings help reduce the perched water table.

This soil is poorly suited to recreation. The major limitations are slow permeability and a perched water table. Because of the saturated conditions, this soil has poor capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become flooded and unstable during wet periods. They dry out slowly after rains and in the spring. Capability subclass III<sub>w</sub>; woodland ordination 4w.

**MuC—Munson silt loam, 8 to 15 percent slopes.** This sloping, somewhat poorly drained, deep soil is in irregularly shaped areas on glacial lake plains and terraces. Slopes range from 50 to 200 feet in length. Areas range from 3 to 25 acres.

Typically, the surface layer is dark grayish brown silt loam 8 inches thick. The upper part of the subsoil is dark grayish brown, mottled silt loam 6 inches thick. The lower part of the subsoil is dark grayish brown and olive brown, mottled silty clay loam 16 inches thick. The substratum is olive brown, mottled silty clay to a depth of 60 inches.

Included with this soil in mapping are areas of Belgrade, Buxton, Raynham, and Scantic soils. The Belgrade soils are on high mounds or slightly elongated rises. The Buxton soils are on steep, long and narrow



slopes. The Raynham and Scantic soils are in slight depressions. Also included are areas of eroded soils; few areas of soils that have sandy loam, fine sandy loam, and silt loam in the subsoil and substratum; areas of soils with a silty clay loam substratum and soils adjacent to glacial till that have gravel, cobbles, and stones on the surface; and areas of soils that have a very fine sandy loam surface layer. The Raynham and Scantic soils make up 15 to 25 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate to moderately slow in the surface layer and subsoil and slow in the substratum. Available water capacity and natural fertility are high. The root zone is deep, but root growth is restricted by wetness and the very firm subsoil. The soil ranges from medium acid to neutral unless limed. The hazard of erosion is severe. Runoff is rapid. Tilth is fair. When this soil is dry, tillage is difficult because of excessive clay content. A seasonal high water table is evident from late fall to midspring. Frost action potential is high, and shrink-swell potential is moderate.

Most of the acreage of this soil is used for hay or pasture. A small acreage is used for silage corn, and a small acreage is used for woodland, for wildlife habitat, or is idle. This soil has good potential for farming. It has poor potential for most urban and recreational uses. Potential is good for some types of wildlife habitat.

This soil is suitable for hay and poorly suited to silage corn. Tillage is delayed in the spring by wetness. Wetness, poor workability, and erosion are the main limitations. Wetness limits the use of equipment and delays the application of weed killers. Tile drainage helps to control wetness. Use of cover crop helps to reduce erosion.

If properly managed, this soil is well suited to pasture. The main pasture management concerns are reducing the seasonal high water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Tile drainage and open ditches on the perimeter of pastures help reduce the perched water table in places. Common pasture grasses and legumes on this soil are Empire trefoil and climax timothy.

This soil is suitable for woodland. A seasonal high water table and high clay content are the main limitations. Eastern white pine, sugar maple, and red spruce are the dominant species on this soil.

This soil is limited for most urban uses by slope and the seasonal high water table from late fall to midspring. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Tile drains around foundation footings help reduce the perched water table. Because of the saturated conditions, excessive clay content, and high frost action potential, this soil is limited for construction of streets and access roads. Mulching and

quick seeding of construction sites help reduce the erosion hazard.

This soil is limited for recreational uses by slow permeability, the high water table, and slope. Because of the saturated conditions, this soil has poor capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become unstable during wet periods. They dry out slowly after rains and in the spring. Capability subclass IIIe; woodland ordination 4w.

**Od—Ondawa Variant silt loam.** This level, well drained, deep soil is on the highest position on flood plains. The areas are elongated and range from 2 to 20 acres. This soil is subject to flash floods after heavy, brief rains and prolonged flooding during and after intensive, extended rains.

Typically, the surface layer is dark grayish brown silt loam 7 inches thick. The subsoil is 20 inches thick. It is a friable, dark grayish brown silt loam in the upper 12 inches and friable, dark brown silt loam in the lower 8 inches. The underlying material is dark brown gravelly fine sand to a depth of 60 inches.

Included with this soil in mapping are small areas of Hadley, Podunk Variant, Winooski, and Rumney Variant soils; small areas of poorly drained soils that are mainly shown on the soil map by a spot symbol; and areas of soils that have a very fine sandy loam surface layer. The Podunk Variant soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate in the surface layer and subsoil and moderately rapid to rapid in the underlying material. Natural fertility is high. Available water capacity is moderate. The root zone extends throughout the profile. This soil is medium acid to neutral unless limed. The hazard of erosion is slight. Runoff is medium. Tilth is good.

This soil is used mostly for silage corn or hay. The remaining acreage is idle. This soil has good potential for farming. It is a good source of topsoil and roadfill. It has good potential for some wildlife types of habitat and poor potential for most types of community development and other nonfarm uses.

This soil is well suited to cultivated crops. Streambank erosion, however, is a hazard along the outside bank of meandering streams. Crops respond well to lime and fertilizer. Flooding is the main limitation. Open ditches on the perimeter of cultivated fields help channel away floodwaters. Cool season crops are suitable for this soil.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Common pasture grasses and legumes are orchardgrass and Ladino clover.

This soil is unsuited for most community development purposes. The flood hazard from adjacent rivers and

streams makes building or foundation construction impractical. Capability class I; woodland ordination 40.

**Pa—Peacham stony soils.** These nearly level to depressional, very poorly drained soils are in circular or elongated areas that range from 2 to 20 acres. Slopes are generally less than 1 percent. Areas of this unit consist of either stony, very stony, or extremely stony soils or all of these soils. They are subject to ponding in fall, in spring, and after heavy rains.

Typically, the surface layer is 7 inches thick. It consists of black muck that is fresh and partially decomposed sedges, leaves, twigs, and reeds. The subsoil is friable, dark gray, mottled silt loam 6 inches thick. The substratum extends to a depth of 40 inches or more. It is gray, mottled firm gravelly sandy loam and gravelly loam in the upper part and olive gray very firm gravelly loam in the lower part.

Included with these soils in mapping are areas of Cabot soils on high mounds or slightly elongated rises; a few areas of soils that are more than 35 percent gravel and cobbles between depths of 10 and 40 inches; a few areas of soils that have a surface layer of fine sandy loam, very fine sandy loam, loam, or silt loam; areas of soils that are friable to a depth of more than 40 inches; and areas of soils that are calcareous within 40 inches of the surface. The Cabot soils make up 15 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is high. The root zone generally extends to a depth of 18 inches, but root growth is restricted by a fragipan and a perched water table. These soils are slightly acid to neutral throughout. Runoff is very slow. Tilth is good, but tillage is difficult or delayed by surface or subsoil stones and the perched water table. The perched water table is evident from mid-fall to late spring. The hazard of erosion is slight. Frost action potential is high.

This soil is used mostly for unimproved pasture or woodland. A few small drained areas are used for hay, and a few areas are used for woodland. This soil has good potential for pond reservoir areas and wetland wildlife habitat. It has poor potential for most other uses.

This soil is very poorly suited to hay. Plant species are restricted to those that are water tolerant. Wetness is the main limitation. Tile drainage and open ditches on the perimeter of cultivated fields help reduce the perched water table if suitable outlets are available. Crops on this soil respond well to lime and fertilizer.

If properly managed, this soil is suitable for pasture. Lowering the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. If suitable outlets are available, tile drainage and

open ditches help to lower the water table. Red clover and climax timothy are the common pasture grasses and legumes.

This soil is poorly suited to woodland. Wetness is the major limitation. The dominant species are willow, alders, tamarack, and white-cedar.

This soil is limited for most urban purposes by the perched water table, slow permeability, and high frost action potential. The low position on the landscape makes drainage difficult. Extensive planning and design is needed for urban development on this soil.

This soil is poorly suited to recreation. Wetness is the main limitation. Ponding occurs during the spring on picnic areas and playgrounds. If suitable outlets are available, tile drainage and diversion ditches help lower the perched water table. Capability subclass VIIIs; woodland ordination not assigned.

**PeB—Peru stony fine sandy loam, 3 to 8 percent slopes.** This gently sloping, moderately well drained, deep soil is in rectangular areas on glaciated uplands. Areas range from 5 to 30 acres. Slopes are mainly long and smooth. Stones on the surface are 30 feet apart or more.

Typically, the surface layer is brown to dark brown fine sandy loam 8 inches thick. The subsoil is 9 inches thick. The upper 6 inches is friable, dark yellowish brown fine sandy loam, and the lower 3 inches is friable, mottled, brown to dark brown fine sandy loam. The substratum is mottled, firm, olive brown gravelly fine sandy loam between depths of 17 and 20 inches. It is a fragipan of very firm, mottled, olive gray gravelly fine sandy loam between depths of 20 and 60 inches (fig. 8).

Included with this soil in mapping are areas of Westbury, Cabot, and Stowe soils. The Westbury and Cabot soils are in depressions and on low concave mounds. The Stowe soils have slopes of more than 8 percent and are at higher elevations on the landscape. Also included are areas of soils that are adjacent to areas of water-deposited material and that have a surface layer of silt loam or loamy sand, a few areas that have bedrock within 40 inches of the surface, areas of very stony or extremely stony soils that are shown on the map by a special symbol, and common areas of seep spots. The Westbury soils make up 15 to 20 percent of this map unit, the Stowe soils make up 10 to 20 percent, and the other included soils make up 5 to 10 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 20 inches, but root growth is restricted by a fragipan and a perched water table. This soil is extremely acid to slightly acid in the surface layer unless limed. The subsoil and substratum are strongly acid to neutral. Runoff is medium. The hazard of erosion is slight. Tilth is good, but tillage is difficult or delayed in places by stones on the surface or in the subsoil or by the perched water table. The perched water table is evident from late fall to late spring. Frost action potential is high.



This soil is used mostly for hay, pasture, and silage corn. A moderate acreage is used for recreational development and woodland. The remaining acreage is idle land reverting to woodland. This soil has good potential for farming. It has good potential for woodland and recreational development and poor potential for most other nonfarm uses.

If properly managed, this soil is well suited to cultivated crops and hay. Crops on this soil respond well to lime and fertilizer. Wetness is the main limitation. Tile drainage and open ditches on the perimeter of cultivated fields help lower the perched water table.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable pasture management practices. Tile drainage and open ditches help to lower the water table. Ladino clover and climax timothy are the common pasture grasses and legumes.

This soil is suitable for tree production. The acidity of the surface layer is the main limitation. The soil is managed for eastern white pine, white spruce, and northern white-cedar. Sugar maple, red spruce, and eastern white pine are the dominant tree species.

This soil is limited for most urban purposes by the perched water table, slow permeability of the fragipan, and high frost action potential. Extensive planning and design is needed for urban development on this soil.

This soil is suitable for recreation. Slow permeability is the main limitation. Ponding occurs during the spring on picnic areas and playgrounds. Tile drainage and diversion ditches help lower the perched water table in places. Capability subclass IIw; woodland ordination 3o.

**PeC—Peru stony fine sandy loam, 8 to 15 percent slopes.** This sloping, moderately well drained, deep soil is in rectangular areas on glaciated uplands. Areas range from 4 to 40 acres. Slopes are mainly long and smooth. Stones on the surface are 30 feet apart or more.

Typically, the surface layer is brown to dark brown fine sandy loam 8 inches thick. The subsoil is 9 inches thick. The upper 6 inches is friable, dark yellowish brown fine sandy loam, and the lower 3 inches is friable, mottled, brown to dark brown fine sandy loam. The substratum is mottled, firm, olive brown gravelly fine sandy loam between depths of 17 and 20 inches. It is a fragipan of very firm, mottled, olive gray gravelly fine sandy loam between depths of 20 and 60 inches.

Included with this soil in mapping are areas of Westbury, Cabot, and Stowe soils. The Westbury and Cabot soils are in depressions and on low concave mounds. The Stowe soils have slopes of more than 8 percent and are at higher elevations on the landscape. Also included are areas of soils that are adjacent to areas of water-deposited material and that have a surface layer of silt loam or loamy sand, a few areas that have bedrock within 40 inches of

the surface, areas of very stony or extremely stony soils that are shown on the map by a special symbol, and common areas of seep spots. The Westbury soils make up 20 to 35 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderate above the substratum and slow or very slow in the substratum. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 20 inches, but root growth is restricted by a fragipan and a perched water table. This soil is extremely acid to slightly acid in the surface layer unless limed. The subsoil and substratum are strongly acid to medium acid. Runoff is medium. Tillage is good, but tillage is difficult or delayed in places by stones on the surface or in the subsoil or by a perched water table. The perched water table is evident from late fall to late spring. The hazard of erosion is moderate. Frost action potential is high.

This soil is used mostly for hay and pasture. A moderate acreage is used for woodland. The remaining acreage is idle land reverting to woodland. This soil has good potential for farming and woodland. It has poor potential for most nonfarm uses.

If properly managed, this soil is suited to hay. Crops on this soil respond well to lime and fertilizer. Erosion and wetness are the main limitations. Tile drainage helps to control wetness. Planting a cover crop, plowing on the contour, and no-till planting are management practices that help to reduce erosion.

If properly managed, this soil is suitable for pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable pasture management practices. Tile drainage helps to reduce the perched water table. Ladino clover and climax timothy are the common pasture grasses and legumes.

This soil is suitable for tree production. The erosion hazard is the main limitation. Operating equipment on the contour, mulching skid trails, and using water bars help to reduce erosion. The soil is managed for eastern white pine, white spruce, and northern white-cedar. Sugar maple, red spruce, and eastern white pine are the dominant trees on this soil.

This soil is limited for most urban purposes by slope, slow permeability of the substratum, and high frost action potential. Extensive planning and design is needed for any urban development on this soil. Slope is the main limitation for recreation. Capability subclass IIIe; woodland ordination 3o.

**PeD—Peru stony fine sandy loam, 15 to 25 percent slopes.** This moderately steep, moderately well drained, deep soil is in rectangular areas on glaciated uplands. Areas range from 5 to 20 acres. Slopes are mainly smooth. Stones on the surface are 30 feet apart or more.

Typically, the surface layer is brown to dark brown fine sandy loam 8 inches thick. The subsoil is 9 inches thick. The upper 6 inches is friable, dark yellowish brown fine sandy loam, and the lower 3 inches is friable, mottled, brown to dark brown fine sandy loam. The substratum is mottled, firm, olive brown gravelly fine sandy loam between depths of 17 and 20 inches. It is a fragipan of very firm, mottled, olive gray gravelly fine sandy loam between depths of 20 and 60 inches.

Included with this soil in mapping are areas of Westbury, Cabot, and Stowe soils. The Westbury and Cabot soils are in depressions and on low concave mounds. The Stowe soils have slopes of more than 8 percent and are at higher elevations on the landscape. Also included are areas of soils that are adjacent to areas of water-deposited material and that have a surface layer of silt loam or loamy sand, a few areas that have bedrock within 40 inches of the surface, areas of very stony or extremely stony soils that are shown on the map by a special symbol, and common areas of seep spots. The Stowe soils make up 20 to 30 percent, and the other included soils make up 10 to 15 percent.

Permeability is moderate above the substratum and slow or very slow in the substratum. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 20 inches, but root growth is restricted by a fragipan and a perched water table. This soil is extremely acid or slightly acid in the surface layer unless limed. The subsoil and substratum are strongly acid to medium acid. Runoff is rapid. Tilth is good, but tillage is difficult in places because of moderately steep slopes. The perched water table is evident from late fall to late spring. The hazard of erosion is severe. Frost action potential is high.

This soil is used mostly for pasture and woodland. A small acreage is used for hay. The remaining acreage is idle land reverting to woodland. This soil has good potential for farming and woodland. It has poor potential for most nonfarm uses.

If properly managed, this soil is suited to hay. Crops on this soil respond well to lime and fertilizer. The moderately steep slopes and the erosion hazard in unvegetated areas are the main limitations. Planting on the contour and maintaining a cover crop help reduce the erosion hazard.

If properly managed, this soil is suitable for pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable pasture management practices. Tile drainage is suitable for lowering the perched water table. Ladino clover and climax timothy are common pasture grasses and legumes.

This soil is suitable for woodland. Use of equipment is limited by slope, and the hazard of erosion in unvegetated areas is a major limitation. Farming on the contour and

mulching skid trails are suitable management practices. This soil is managed for eastern white pine, white spruce, and northern white-cedar. The dominant species are sugar maple, red spruce, and eastern white pine.

This soil is limited for most urban purposes by slope, slow permeability of the fragipan, and high frost action potential. Extensive planning and design is needed for urban development on this soil. Slope is the main limitation for most recreational uses. Capability subclass IVe; woodland ordination 3r.

**PrC—Peru extremely stony fine sandy loam, 3 to 15 percent slopes.** This gently sloping to sloping, moderately well drained, deep soil is in rectangular areas on glaciated uplands. Areas range from 3 to 100 acres. Slopes are mainly smooth. Stones on the surface are 2 to 5 feet apart.

Typically, the surface layer is brown to dark brown fine sandy loam 8 inches thick. The subsoil is 9 inches thick. The upper 6 inches is friable, dark yellowish brown fine sandy loam, and the lower 3 inches is friable, mottled, brown to dark brown fine sandy loam. The substratum is mottled, firm, olive brown gravelly fine sandy loam between a depth of 17 and 20 inches. It is a fragipan of very firm, mottled, olive gray gravelly fine sandy loam between a depth of 60 inches and bedrock.

Included with this soil in mapping are areas of Westbury, Cabot, and Stowe soils. The Westbury and Cabot soils are in depressions and on low concave mounds. The Stowe soils have slopes of more than 8 percent and are at higher elevations on the landscape. Also included are areas of soils that are adjacent to areas of water-deposited material and that have a surface layer of silt loam or loamy sand, a few areas that have bedrock within 40 inches of the surface, areas where stones are more than 5 feet apart, and common areas of seep spots. The Westbury and Stowe soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 20 inches, but root growth is restricted by a fragipan and a perched water table. This soil is extremely acid to slightly acid in the surface layer. The subsoil and substratum are strongly acid to medium acid. Runoff is medium. Tilth is good, but tillage is severely restricted by stones on the surface or in the subsoil. A perched water table is evident from late fall to late spring. Frost action potential is high.

This soil is used mostly for unimproved pasture and woodland. A small acreage is used for sugar maple trees. The remaining acreage is idle land reverting to woodland. This soil has good potential for woodland and sugar maple trees. If practical, removal or reduction of surface stones would improve potential for pasture. This soil has poor potential for most nonfarm uses.

This soil is unsuited to cultivated crops and hay. Large surface stones restrict the use of farm machinery.



This soil is suited to unimproved pasture. Removal of surface stones and prevention of overgrazing are the major pasture management concerns. The rotation of pastures and deferment of grazing are suitable pasture management practices. Kentucky bluegrass is the common native unimproved pasture grass on this soil.

This soil is suitable for tree production. The large stones on the surface are the major limitations, and the use of equipment is limited. The soil is managed for eastern white pine, white spruce, and northern white-cedar. Sugar maple, red spruce, and eastern white pine are the dominant trees on this soil.

This soil is limited for most urban uses by large stones on the surface, slow permeability of the fragipan, and high frost action potential. Extensive planning and design is needed for urban development on this soil. Large stones on the surface limit this soil for recreation. Capability subclass VII<sub>s</sub>; woodland ordination 3x.

**PrD—Peru extremely stony fine sandy loam, 15 to 25 percent slopes.** This moderately steep, moderately well drained, deep soil is in rectangular areas on glaciated uplands. Areas range from 4 to 400 acres. Slopes are mainly smooth. Surface stones are 2 to 5 feet apart.

Typically, the surface layer is brown to dark brown fine sandy loam 8 inches thick. The subsoil is 9 inches thick. The upper 6 inches is friable, dark yellowish brown fine sandy loam, and the lower 3 inches is friable, mottled, brown to dark brown fine sandy loam. The substratum is mottled, firm, olive brown gravelly fine sandy loam between depths of 17 and 20 inches. It is a fragipan of very firm, mottled, olive gray gravelly fine sandy loam between depths of 20 and 60 inches.

Included with this soil in mapping are areas of Westbury, Cabot, and Stowe soils. The Westbury and Cabot soils are in depressions and on low concave mounds. The Stowe soils have slopes of more than 8 percent and are at higher elevations on the landscape. Also included are areas of soils that are adjacent to areas of water-deposited material and that have a surface layer of silt loam or loamy sand, a few areas that have bedrock within 40 inches of the surface, areas where stones are more than 5 feet apart, and common areas of seep spots. The Westbury and Stowe soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 20 inches, but root growth is restricted by the fragipan and a perched water table. This soil is extremely acid to slightly acid in the surface layer. The subsoil and substratum are strongly acid to medium acid. Runoff is medium. Tilth is good, but tillage is severely restricted by stones on the surface or in the subsoil. A perched water table is evident from late fall to late spring. Frost action potential is high.

This soil is used mostly for unimproved pasture and woodland. A small acreage is used for sugar maple trees.

The remaining acreage is idle land reverting to woodland. This soil has good potential for woodland and sugar maple trees. If practical, removal of surface stones would improve potential for pasture. This soil has poor potential for most nonfarm uses.

This soil is unsuited to cultivated crops and hay. Large stones on the surface severely restrict the use of farm machinery.

This soil is suited to unimproved pasture. Prevention of overgrazing is the major pasture management concern. The rotation of pastures and deferment of grazing are suitable pasture management practices. Kentucky bluegrass is the common native unimproved pasture grass on this soil.

This soil is suitable for tree production. Large stones on the surface are the main limitation, and the use of equipment is limited. The soil is managed for eastern white pine, white spruce, and northern white-cedar. Sugar maple, red spruce, and eastern white pine are the dominant trees on this soil.

This soil is limited for most urban uses by large stones on the surface, moderately steep slopes, and high frost action potential. Extensive planning and design is needed for urban development on this soil. Large surface stones limit this soil for recreation. Capability subclass VII<sub>s</sub>; woodland ordination 3x.

**Pu—Podunk Variant silt loam.** This level, moderately well drained, deep soil is on flood plains. Areas are irregularly shaped and range from 5 to 20 acres. This soil is subject to flash floods after heavy, brief rains and is subject to prolonged flooding during and after intensive, extended rains.

Typically, the surface layer is very dark grayish brown silt loam 8 inches thick. The subsoil is friable, dark grayish brown silt loam 12 inches thick. The substratum is mottled, grayish brown and gray loamy fine sand to a depth of 60 inches.

Included with this soil in mapping are small areas of Winooski and Rumney Variant soils, soils that are medium textured to a depth of 40 inches or more, soils that have distinct mottles within 15 inches of the surface and soils that have no distinct mottles within 24 inches of the surface, and soils that have a surface layer of very fine sandy loam. The Winooski and Rumney Variant soils make up 20 to 30 percent of this map unit, and the other included soils make up about 20 percent.

Permeability is moderate in the surface layer and subsoil and rapid in the substratum of this soil. Available water capacity is moderate, and natural fertility is high. The root zone extends throughout the profile, but root growth is restricted by a seasonal high water table. Unless limed, this soil is slightly acid to neutral throughout the profile. Runoff is slow. Tilth is good, but tillage is delayed in places by the seasonal high water table and spring floods. A seasonal high water table is evident from late fall to late spring. Frost action potential is moderate.

This soil is used mostly for silage corn, hay, and pasture. The remaining acreage is used for woodland or is

idle. This soil has good potential for farming. It has good potential as a source of topsoil, as cover for sanitary landfills, and for woodland wildlife habitat. It has poor potential for most types of community development and other nonfarm uses.

This soil is well suited to cultivated crops. Streambank erosion and wetness, which restricts the root zone and inhibits root growth, are the main limitations. Crops respond well to lime and fertilizer. Open ditches on the perimeter of cultivated fields help to lower the seasonal high water table in places and help to channel away floodwaters or increase runoff. Cool-season crops are suited to this soil.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Open ditches on the perimeter of pastured fields help lower the seasonal high water table and help channel away floodwaters. Common pasture grasses and legumes are climax timothy and Ladino clover.

This soil is unsuited to most community development purposes. The flood hazard from adjacent rivers and streams, the seasonal high water table, and slow runoff make building or foundation construction impractical. This soil is, however, a good source of topsoil and sanitary landfill cover. This soil is limited for recreational use by flooding. Capability subclass IIw; woodland ordination 3o.

**RaB—Raynham silt loam, 3 to 8 percent slopes.** This gently sloping, poorly drained soil is in areas on lake plains. The areas are irregularly shaped and range from 4 to 40 acres.

Typically, the surface layer is brown to dark brown silt loam 7 inches thick. The subsoil is 10 inches thick. The upper 4 inches is brown silt loam with grayish brown mottles, and the lower 6 inches is dark grayish brown silt loam with light brownish gray mottles. The underlying material extends to a depth of 60 inches. It is grayish brown silt loam with brown to dark brown mottles to a depth of 29 inches and dark grayish brown silt loam with grayish brown mottles at a depth of more than 29 inches.

Included with this soil in mapping are small areas of Belgrade, Binghamville, Birdsall, Eldridge, Munson, and Scantic soils; areas of soils that have coarse textured material within 40 inches of the surface; and small areas of level and sloping Raynham soils. The Belgrade, Eldridge, and Binghamville soils make up 15 to 20 percent of this map unit, and the other included soils make up about 5 to 10 percent.

Permeability is moderately slow in this soil. Available water capacity is high. The root zone extends to a depth of 30 inches, but root growth is restricted by a seasonal high water table. In unlimed areas the surface layer and subsoil are medium acid to neutral. Runoff is medium. Tilth is good, but tillage is delayed in places because of

wetness. This soil has high natural fertility. A seasonal high water table is evident from late winter to late spring. The hazard of erosion is moderate. Frost action potential is high.

Most of the acreage of this soil is used for hay or pasture. Some areas are used for silage corn, and a few are used for woodland. This soil has good potential for farming. It has good potential as a pond site or for wetland wildlife habitat. It has fair potential for woodland and poor potential for most urban and recreational uses.

Wetness is the main limitation of this soil for cultivated crops, hay, and pasture. Crops on this soil respond well to lime and fertilizer. Tile drainage and open ditches on the perimeter of cultivated fields help reduce the seasonal high water table. Cool-season vegetables are suited to this soil.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices.

This soil is suitable for woodland. Excessive wetness and a seasonal high water table are the main limitations. Alders, white pine, and red spruce are the dominant species on this soil.

This soil is limited for many urban purposes by the seasonal high water table during the wet season. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Above-ground sewage disposal fields and tile drains around foundation footings are suitable corrective measures. This soil provides fair to poor foundation for streets and access roads.

This soil is suitable for recreational use. The major limitation is the seasonal high water table. Because of saturated conditions, this soil has poor capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become unstable during wet periods. They dry out slowly after rains and in the spring. Capability subclass IIIw; woodland ordination 4w.

**RoE—Rock outcrop-Woodstock complex, 20 to 60 percent slopes.** This complex consists of moderately steep to very steep, somewhat excessively drained and excessively drained, shallow soils and Rock outcrop in irregularly shaped areas on bedrock ridges and escarpments. The areas range from 5 to 75 acres. Slopes are 100 to 400 feet long. The Rock outcrop and Woodstock soils in this complex are so intermingled that it was not practical to map them separately.

Rock outcrop makes up about 80 percent of this complex. It generally consists of interbedded schist, gneiss, phyllite, and greenstone and is in areas less than 10 feet apart.

Woodstock soils make up about 15 percent of this complex. Typically, they have a surface layer of very dark



grayish brown fine sandy loam 2 inches thick. The subsoil is friable, brown to dark brown gravelly fine sandy loam 10 inches thick. Hard, massive schist bedrock is at a depth of 12 inches.

Included with this complex in mapping are areas of Tunbridge and Stowe soils, areas where the outcrops are more than 10 feet apart, small areas of moderately deep soils, areas of soils that have slopes of less than 20 percent, areas of soils that are more than 35 percent gravel, and common areas that have seep spots and springs. The Tunbridge soils make up 1 to 3 percent of this complex, and the other included soils make up 1 to 2 percent.

Permeability is moderately rapid in the Woodstock soils. Available water capacity is very low, and natural fertility is low. Extensive bedrock outcrop and shallow depth to bedrock restrict rooting depth and root growth. The soil is strongly acid to slightly acid throughout the profile. Runoff is slow. Depth to bedrock is less than 20 inches. Runoff is very rapid on the Rock outcrop part of this complex.

This complex is mainly wooded or idle. A very small acreage is used for recreation or ski trails. This complex has fair potential as a ski area in areas at a high elevation. It has fair potential for recreation. This complex has poor potential for most other uses because of extensive areas of Rock outcrop and steep slopes. Capability subclass VII<sub>s</sub>; woodland ordination 4d.

**Ru—Rumney Variant silt loam.** This level, poorly drained, deep soil is on flood plains. The areas are rectangular or long and narrow and range from 3 to 15 acres. This soil is subject to flash floods after heavy, brief rains and to prolonged flooding during and after intensive, extended rains.

Typically, the surface layer is dark gray silt loam 7 inches thick. The subsoil is 28 inches thick. The upper 3 inches is friable, brown, mottled silt loam. The lower 25 inches is friable, grayish brown, mottled silt loam. The substratum is grayish brown coarse sand to a depth of 60 inches.

Included with this soil in mapping are small areas of Limerick and Podunk Variant soils, small areas of soils that are medium textured to a depth of 40 inches or more or that have a very fine sandy loam surface layer, and small areas of Winooski or Wallkill soils. The included Limerick soils make up 20 to 35 percent of this map unit, and the other included soils make up 15 to 25 percent.

Permeability is moderate in the surface layer and subsoil and rapid in the substratum of this soil. Available water capacity and natural fertility are high. The root zone extends throughout the profile, but root growth is restricted by a seasonal high water table. This soil is strongly acid to neutral throughout the profile unless limed. Runoff is slow. Tilth is good, but tillage is delayed in places by the seasonal high water table and spring floods. A seasonal high water table is evident from mid-fall to late spring. The hazard of erosion is slight. Frost action potential is high.

This soil is used primarily for hay and pasture. A moderate acreage is used for silage corn. A small acreage is wooded or idle. This soil has good potential for farming, excavated pond sites, and wetland wildlife habitat. It has poor potential for most types of community development and other nonfarm uses.

This soil is well suited to hay. Streambank erosion is a hazard, and wetness is the main limitation. Crops respond well to lime and fertilizer. Open ditches on the perimeter of cultivated fields help to reduce the seasonal high water table and help to channel away floodwaters or increase runoff.

If properly managed, this soil is well suited to pasture. Wetness caused by flooding, a seasonal high water table, and slow runoff are the main limitations. The main concerns of pasture management are establishing and maintaining a mixture of grasses and legumes and preventing overgrazing. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Open ditches on the perimeter of pastured fields help to reduce the seasonal high water table and help to channel away floodwaters or increase runoff. Common pasture grasses are Empire trefoil and climax timothy.

Flooding and the seasonal high water table limit this soil for woodland. Alders, willows, and aspen are the dominant tree species on this soil.

This soil is unsuited to most types of community development. The flood hazard from adjacent rivers and streams, the seasonal high water table, and slow runoff make building or foundation construction impractical.

This soil is unsuited to most recreational uses. Flooding and the seasonal high water table are the main limitations. Capability subclass III<sub>w</sub>; woodland ordination 4w.

**SaA—St. Albans slaty loam, 0 to 3 percent slopes.** This nearly level, well drained, deep soil is in slightly convex areas on the top part of glacial till ridges. Areas are roughly square and range from 3 to 30 acres. Very few stones are on the surface of this soil.

Typically, the surface layer is very dark grayish brown slaty loam 7 inches thick. The subsoil is 12 inches thick. The upper 7 inches is friable, dark yellowish brown slaty fine sandy loam. The lower 5 inches is friable, yellowish brown, brown, and very dark grayish brown slaty coarse sandy loam. The substratum is dark brown, brown, and very dark grayish brown slaty coarse sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Lordstown, St. Albans, and Georgia soils; soils that are more than 40 percent coarse fragments in the subsoil and substratum; and soils that have many stones on the surface and that are shown on the soil map by a spot symbol. Also included are areas of soils with a clay loam or silty clay loam substratum. The included Georgia soils make up 25 to 35 percent of this map unit, and the other included soils make up 5 to 10 percent.

Permeability is moderately rapid in this soil. Available water capacity is moderate, and natural fertility is high. The root zone extends to a depth of 30 inches, but root growth is restricted by the shale fragments in the subsoil. The soil is strongly acid to slightly acid unless limed. Runoff is slow. Tilth is good. The hazard of erosion is slight. Frost action potential is moderate.

This soil is used primarily for hay, silage corn, and pasture. A moderate acreage is used for community development, and a small acreage is used for woodland or is idle. This soil has good potential for cultivated crops. It has fair potential for tree production. It has good potential for urban and recreational development and wildlife habitat and poor potential for water poundments.

This soil is suitable for cultivated crops. Crops respond well to lime and fertilizer. The main management need is maintaining proper nutrient and lime levels. Cool-season crops are suited to this soil.

This soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Orchardgrass and Ladino clover are the common grasses and legumes used for pasture.

This soil is well suited to trees and tree plantations. The dominant tree species on this soil are white ash, elm, yellow birch, and white pine.

This soil is well suited to community development. Frost action potential is the main limitation. Capability class I; woodland ordination 4s.

**SaB—St. Albans slaty loam, 3 to 8 percent slopes.** This gently sloping, well drained, deep soil is in convex areas on the top part of glacial till ridges. Areas are rectangular or long and narrow and range from 3 to 40 acres. Very few stones are on the surface.

Typically, the surface layer is very dark grayish brown slaty loam 7 inches thick. The subsoil is 12 inches thick. It is friable, dark yellowish brown slaty fine sandy loam in the upper 7 inches and friable, yellowish brown, brown, and very dark grayish brown slaty coarse sandy loam in the lower 5 inches. The substratum is dark brown, brown, and very dark grayish brown slaty coarse sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Lordstown and Georgia soils; soils that are more than 40 percent coarse fragments in the subsoil and substratum; soils that have a sandier surface layer than this St. Albans soil; small areas with many stones on the surface, which are mainly shown on the map by a spot symbol; and soils with a clay loam or silty clay loam substratum. The Georgia soils make up 20 to 35 percent of this map unit, and the other included soils make up 5 to 15 percent.

Permeability is moderately rapid in this soil. Available water capacity is moderate, and natural fertility is high. Tilth is good. The root zone extends to a depth of 30 inches, but root growth is restricted by shale fragments

in the subsoil. The soil is strongly acid to slightly acid unless limed. Runoff is slow. Tilth is good. The hazard of erosion is slight. Frost action potential is moderate.

This soil is used primarily for hay, silage corn, and pasture. A moderate acreage is used for community development, and a small acreage is used for woodland or is idle. This soil has good potential for cultivated crops. It has fair potential for tree production. It has good potential for urban and recreational development and wildlife habitat.

This soil is suitable for cultivated crops. Erosion is a limitation on the more sloping areas. Therefore, contour plowing and a cover crop are needed. The main management concern is maintaining proper nutrient and lime levels. Crops respond well to lime and fertilizer. Cool-season crops are suited to this soil.

This soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Orchardgrass and Ladino clover are the common grasses and legumes used for pasture.

This soil is well suited to trees and tree plantations. The dominant tree species on this soil are white ash, elm, yellow birch, and white pine.

This soil is well suited to community development. Frost action potential is the main limitation. Capability subclass IIe; woodland ordination 4s.

**SaC—St. Albans slaty loam, 8 to 15 percent slopes.** This sloping, well drained, deep soil is in convex, rectangular areas that range from 3 to 35 acres. Slopes are mainly less than 1,000 feet long. Very few stones are on the surface of this soil.

Typically, the surface layer is very dark grayish brown slaty loam 7 inches thick. The subsoil is 12 inches thick. The upper 7 inches is friable, dark yellowish brown slaty fine sandy loam, and the lower 5 inches is friable, yellowish brown, brown, and very dark grayish brown slaty coarse sandy loam. The substratum is dark brown, brown, and very dark grayish brown slaty coarse sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Lordstown, St. Albans, and Georgia soils; small areas of soils that are more than 40 percent coarse fragments in the subsoil and substratum; small areas with many stones on the surface, which are mainly shown on the soil map by a spot symbol; areas of soils that have a clay loam or silty clay loam substratum; and small areas of soils that have slopes of more than 15 percent. The included Georgia soils make up 20 to 30 percent of this map unit, and the other included soils make up 5 to 15 percent.

Permeability is moderately rapid in this soil. Available water capacity is moderate, and natural fertility is high. The root zone extends to a depth of 30 inches, but root growth is restricted by shale fragments in the subsoil. The soil is strongly acid to slightly acid unless limed. Ru-



noff is medium. Tilth is good. The hazard of erosion is moderate. Frost action potential is moderate.

This soil is used primarily for hay and pasture. A small acreage is used for community development, and a small acreage is used for woodland or is idle. This soil has fair potential for cultivated crops. It has fair potential for woodland, urban and recreational development, and some types of wildlife habitat.

This soil is suitable for cultivated crops. Crops respond well to lime and fertilizer. The main management needs are controlling erosion and maintaining proper nutrient and lime levels. Contour plowing and planting a cover crop help reduce erosion. Cool-season crops are suited to this soil if they are planted on the contour.

This soil is well suited to pasture. Controlling erosion, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Orchardgrass and Ladino clover are the common grasses and legumes used for pasture.

This soil is well suited to trees and tree plantations. The dominant tree species on this soil are white ash, elm, yellow birch, and white pine.

This soil is suited to community development. Slope and frost action potential are the main limitations. Capability subclass IIIe; woodland ordination 4s.

**SbB—St. Albans very stony loam, 2 to 8 percent slopes.** This nearly level to gently sloping, well drained, deep soil is in convex areas on the top part of glacial till ridges. The areas are slightly elongated and range from 5 to 30 acres. Slopes are as much as 500 feet long. Stones on the surface are typically 5 to 30 feet apart.

Typically, the surface layer is very dark grayish brown slaty loam 7 inches thick. The subsoil is 12 inches thick. The upper 7 inches is friable, dark yellowish brown slaty fine sandy loam, and the lower 5 inches is friable, yellowish brown, brown, and very dark grayish brown slaty coarse sandy loam. The substratum is dark brown, brown, and very dark grayish brown slaty coarse sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Lordstown, Georgia, and Massena soils; small areas of soils that are more than 40 percent coarse fragments in the subsoil and substratum; small areas with a few stones on the surface; areas of soils that have slopes of 0 to 2 percent; and areas of soils that have a clay loam or silty clay loam substratum. The Georgia soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderately rapid in this soil. Available water capacity is moderate, and natural fertility is high. The root zone extends to a depth of 30 inches, but root growth is restricted by slate fragments in the subsoil. The soil is strongly acid to slightly acid unless limed. Runoff is slow. Tilth is good, but workability is severely

restricted by surface stones. Frost action potential is moderate.

This soil is used primarily for woodland and pasture. A small acreage is used for community development, and a small acreage is idle. This soil has poor potential for cultivated crops. It has fair potential for woodland and urban and recreational development. It has good potential for some types of wildlife habitat.

This soil is poorly suited to cultivated crops and hay. Stones on the surface are the main limitation, and the use of equipment is restricted.

This soil is well suited to unimproved pasture. Prevention of overgrazing is the major pasture management concern. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, and deferment of grazing are suitable management practices. Orchardgrass, Kentucky bluegrass, and Ladino clover are the common native pasture grasses and legumes on this soil.

This soil is suited to trees and tree plantations. The dominant tree species are white ash, elm, yellow birch, and white pine.

This soil is suited to some types of community development. The primary limitations are large stones on the surface and frost action potential. Capability subclass VI; woodland ordination 4s.

**SbC—St. Albans very stony loam, 8 to 15 percent slopes.** This sloping, well drained, deep soil is in convex areas on the top part of glacial till ridges. The areas are slightly elongated and range from 5 to 30 acres. Slopes are as much as 500 feet long. Stones on the surface are typically 5 to 30 feet apart.

Typically, the surface layer is very dark grayish brown slaty loam 7 inches thick. The subsoil is 12 inches thick. The upper 7 inches is friable, dark yellowish brown slaty fine sandy loam, and the lower 5 inches is friable, yellowish brown, brown, and very dark grayish brown slaty coarse sandy loam. The substratum is dark brown, brown, and very dark grayish brown slaty coarse sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Lordstown and Georgia soils, small areas of soils that are more than 40 percent coarse fragments in the subsoil and substratum, small areas with a few stones on the surface, and areas of soils that have a clay loam or silty clay loam substratum. The Georgia soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderately rapid in this soil. Available water capacity is moderate, and natural fertility is high. The root zone extends to a depth of 30 inches, but root growth is restricted by shale fragments in the subsoil. The soil is strongly acid to slightly acid unless limed. Runoff is slow. Tilth is good, but workability is severely restricted by surface stones. Frost action potential is moderate.

This soil is used primarily for woodland and pasture. A small acreage is used for community development, and a

few areas are idle. This soil has poor potential for cultivated crops. It has fair potential for woodland and urban and recreational development. It has good potential for some types of wildlife habitat.

The main limitations for cultivated crops and hay are surface stones and slope. Use of equipment is severely restricted.

This soil is well suited to unimproved pasture. Prevention of overgrazing is the major pasture management concern. Rotation of pastures and deferment of grazing are suitable management practices. Kentucky bluegrass is the common native pasture grass on this soil.

This soil is suited to trees and tree plantations. The dominant tree species on this soil are white ash, elm, yellow birch, and white pine.

This soil is suited to a few types of community development. The primary limitations are slope, large stones on the surface, and frost action potential. Capability subclass VIs; woodland ordination 4s.

**SbD—St. Albans very stony loam, 15 to 25 percent slopes.** This moderately steep, well drained, deep soil is in convex areas on the top part of glacial till ridges. The areas are roughly square and range from 5 to 40 acres. Stones on the surface are typically 5 to 30 feet apart.

Typically, the surface layer is very dark grayish brown slaty loam 7 inches thick. The subsoil is 12 inches thick. The upper 7 inches is friable, dark yellowish brown slaty fine sandy loam, and the lower 5 inches is friable, yellowish brown, brown, and very dark grayish brown slaty coarse sandy loam. The substratum is dark brown, brown, and very dark grayish brown slaty coarse sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Lordstown and Georgia soils, small areas of soils that are more than 40 percent coarse fragments in the subsoil and substratum, small areas with a few stones on the surface, and areas of soils that have a clay loam or silty clay loam substratum. The Georgia soils make up 20 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderately rapid in this soil. Available water capacity is moderate, and natural fertility is high. The root zone extends to a depth of 30 inches. The soil is strongly acid to slightly acid unless limed. Runoff is slow. Tilth is good, but workability is severely restricted by surface stones. Frost action potential is moderate.

This soil is used primarily for woodland and pasture. A few areas are used for community development, and a few are idle. This soil has poor potential for cultivated crops. If feasible, removal of surface stones will improve potential for pasture. This soil has fair potential for tree production. It has good potential for some types of wildlife habitat.

This soil is unsuitable for silage corn and hay. Slope, large stones on the surface, and erosion are the main limitations.

This soil is well suited to unimproved pasture. Prevention of overgrazing is the major pasture management con-

cern. Rotation of pastures and deferment of grazing are suitable practices. Kentucky bluegrass is the common native pasture grass on this soil.

This soil is suited to trees and tree plantations. The dominant tree species on this soil are white ash, yellow birch, and white pine.

This soil is poorly suited to community development. Slope is the main limitation. Capability subclass VIs; woodland ordination 4s.

**SbE—St. Albans very stony loam, 25 to 60 percent slopes.** This steep and very steep, well drained, deep soil is in convex areas in cuts on the glacial till plain. It is in irregularly shaped areas that range from 5 to 100 acres. Stones on the surface are typically 5 to 30 feet apart.

Typically, the surface layer is very dark grayish brown slaty loam 7 inches thick. The subsoil is 12 inches thick. The upper 7 inches is friable, dark yellowish brown slaty fine sandy loam, and the lower 5 inches is friable, yellowish brown, brown, and very dark grayish brown slaty coarse sandy loam. The substratum is dark brown, brown, and very dark grayish brown slaty coarse sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of Lordstown and Georgia soils, small areas of soils that are more than 40 percent coarse fragments in the subsoil and substratum, and small areas with a few stones on the surface. Included soils make up 15 to 25 percent of this map unit.

Permeability is moderately rapid in this soil. Available water capacity is moderate, and natural fertility is high. The root zone extends to a depth of 30 inches. The soil is strongly acid to slightly acid unless limed. Runoff is slow. Tilth is good. Frost action potential is moderate.

This soil is used primarily for woodland. A few areas are used for pasture. The soil has poor potential for cultivated crops, community development, and most nonfarm uses.

This soil is poorly suited to silage corn and hay. Slope is the main limitation, and use of equipment is restricted by large stones.

This soil is poorly suited to unimproved pasture. Prevention of overgrazing is the major pasture management concern. Rotation of pastures and deferment of grazing are suitable management practices. Kentucky bluegrass is the common native pasture grass on this soil.

This soil is suited to trees and tree plantations. The dominant tree species on this soil are white ash, elm, yellow birch, and white pine. Where slopes are more than 35 percent, use of equipment is limited. Erosion is a major limitation. Using water bars and mulching skid trails help reduce erosion.

This soil is not suited to community development. Slope is the main limitation. Capability subclass VIIs; woodland ordination 4s.

**ScA—Scantic silt loam, 0 to 3 percent slopes.** This nearly level, poorly drained, deep soil is in irregularly shaped areas on glacial lake plains. Slopes range from 50 to 500 feet in length. The areas range from 2 to 60 acres.



This soil has windthrow mounds in wooded areas and has an uneven surface caused by cattle trampling in areas of permanent pasture.

Typically, the surface layer is friable, dark grayish brown silt loam about 8 inches thick. The subsoil is firm, mottled, dark grayish brown and grayish brown silty clay loam and silty clay about 19 inches thick. The substratum is firm, mottled, grayish brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are areas of Munson, Raynham, Livingston, and Covington soils. The Munson and Raynham soils are high mounds or slightly elongated rises. The Livingston soils are in depressional areas and drainageways. Also included are areas of soils that are poorly drained and are silt loam or very fine sandy loam to a depth of more than 40 inches and a few areas of soils that have a surface layer of silty clay loam or silty clay. The Raynham soils make up 20 to 35 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderate and moderately slow in the upper part of the soil and moderately slow and slow in the lower part. This soil has high natural fertility and high available water capacity. The root zone extends to a depth of about 20 inches, and root growth is restricted by the firm clay subsoil and a perched water table. The soil is strongly acid to medium acid in the surface layer and subsoil and medium acid to neutral in the substratum. The hazard of erosion is slight. Runoff is slow. Tilth is fair, and tillage is difficult when the soil is dry. A perched water table is evident from midfall to late spring. Frost action potential is high, and shrink-swell potential is moderate.

Most of this soil is used for hay and pasture. A small acreage is in woodland or silage corn or is idle. This soil has fair potential for farming. It has fair potential for wildlife habitat. This soil has poor potential for most urban and recreational uses.

Wetness and high clay content limit this soil for hay and silage corn. Tillage is delayed in the spring and after heavy rains by wetness or ponding. Equipment bogs down when this soil is wet. After heavy summer rains this soil has poor capacity to support farm equipment, and the application of weed killers is delayed. If suitable outlets are available, tile drainage is suitable. Open ditches on the perimeter of cultivated fields help reduce the perched water table in places. This soil is poorly suited to cool-season crops because of wetness.

If properly managed, this soil is suitable for pasture. Lowering the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. If suitable outlets are available, tile drainage and open ditches on the perimeter of pastures help reduce the perched water table in places. Common pasture grasses

and legumes on this soil are Empire trefoil and climax timothy.

This soil is poorly suited to woodland. A perched water table and high clay content are the main limitations. Alders, eastern white pine, and balsam fir are the dominant species on this soil.

This soil is limited for most urban uses from midfall to late spring by the perched water table and high clay content. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Tile drains around foundation footings help reduce the perched water table. Because of the saturated conditions, excessive clay content, and high frost action potential, this soil is limited for construction of streets and access roads.

This soil is poorly suited to most recreational uses. The major limitations for most recreational elements are the perched water table and slow permeability. Because of saturated conditions, this soil has poor capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become ponded and unstable during wet periods. They dry out slowly after rains and in the spring. Capability subclass IVw; woodland ordination 5w.

**ScB—Scantic silt loam, 3 to 8 percent slopes.** This gently sloping, poorly drained, deep soil is in irregularly shaped areas on glacial lake plains. Slopes are 50 to 350 feet long. The areas range from 5 to 40 acres. This soil has windthrow mounds in wooded areas and has an uneven surface caused by cattle trampling in areas of permanent pasture.

Typically, the surface layer is friable, dark grayish brown silt loam about 8 inches thick. The subsoil is firm, mottled, dark grayish brown and grayish brown silty clay loam and silty clay about 19 inches thick. The substratum is firm, mottled, grayish brown silty clay to a depth of 60 inches or more.

Included with this soil in mapping are areas of Munson, Binghamville, Enosburg, Raynham, and Covington soils. The Munson and Raynham soils are on high mounds or slightly elongated rises. The Covington, Binghamville, and Enosburg soils are in depressional areas and drainageways. Also included are areas of soils that are poorly drained and that are silt loam or very fine sandy loam to a depth of more than 40 inches and a few areas of soils that have a surface layer of silty clay loam or silty clay. The Binghamville soils make up 20 to 30 percent of this map unit, and the other soils make up 10 to 20 percent.

Permeability is moderate and moderately slow in the upper part of this soil and moderately slow and slow in the lower part. This soil has high natural fertility and high available water capacity. The root zone extends to a depth of about 20 inches, and root growth is restricted by the firm clay subsoil and a perched water table. The soil is strongly acid to medium acid in the surface layer and subsoil and medium acid to neutral in the substratum. Runoff is slow. Tilth is fair. When this soil is dry, tillage is

difficult because of the high clay content. The hazard of erosion is moderate. A perched water table is evident from midfall to late spring. Frost action potential is high, and shrink-swell potential is moderate.

This soil has fair potential for farming, and a large acreage is used for hay and pasture. It has fair potential for wildlife habitat. A small acreage is in woodland or is idle. This soil has poor potential for most urban and recreational uses.

A seasonal high table and high clay content limit this soil for hay and silage corn. Tillage is delayed in the spring and after heavy rains by wetness. Equipment bogs down when this soil is wet. After heavy summer rains this soil has poor capacity to support farm equipment, and the application of weed killers is delayed. Erosion is a limitation in unvegetated areas. Drainage and open ditches on the perimeter of cultivated fields help lower the water table. Contour planting and using cover crops help reduce the erosion hazard in places.

If properly managed, this soil is suitable for pasture. Lowering the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Tile drainage and open ditches on the perimeter of pastures help lower the perched water table. Common pasture grasses and legumes on this soil are Empire trefoil and climax timothy.

This soil is poorly suited to woodland. A perched water table and high clay content are the main limitations. Alders, eastern white pine, balsam fir, and white spruce are the dominant species on this soil.

This soil is limited for most urban purposes from midfall to late spring by the perched water table and slow permeability. Septic tank disposal fields are commonly saturated during the spring and other wet periods. Special design and construction is necessary to prevent water from seeping into basements and other excavations. Tile drains around foundation footings help reduce the perched water table. Because of the saturated conditions, excessive clay, and high frost action potential, this soil is limited for construction of streets and access roads.

This soil is limited for most recreational uses by the perched water table, slow permeability, and slope. Because of saturated conditions, this soil has poor capacity to support foot and vehicular traffic. Parking areas, athletic fields, and playgrounds become unstable during wet periods. They dry out slowly in the spring and after prolonged periods of rain. Capability subclass IVw; woodland ordination 5w.

**StB—Stowe stony fine sandy loam, 3 to 8 percent slopes.** This gently sloping, well drained, deep soil is in convex areas on glaciated uplands. The areas are roughly rectangular and range from 4 to 20 acres. Cobbles and stones are cleared off the surface and piled up along the edges of fields to form stone fences and walls. Surface stones on this soil are typically 30 to 100 feet apart.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is 21 inches thick. The upper 10 inches is friable, dark yellowish brown fine sandy loam. The lower 11 inches is friable, light olive brown and olive fine sandy loam. The substratum is a fragipan of very firm, olive fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Tunbridge, Peru, and Westbury soils. The Tunbridge soils are mainly at the higher positions on the landscape, and the Peru and Westbury soils are mainly at the lower positions. Also included are areas of soils that are mottled at a depth of less than 24 inches, are nearly level, and are in depressions and natural draws; a few areas of soils that are more than 35 percent gravel and cobbles; a few areas of soils that have a fragipan at a depth of less than 16 inches or more than 33 inches; a few areas of soils that have bedrock at a depth of less than 40 inches; and a few areas of soils that are more stony than this Stowe soil and that are indicated on the map by a spot symbol. The Tunbridge and Peru soils make up 25 to 30 percent of this map unit, and the other included soils make up 15 to 25 percent.

Permeability is moderately rapid above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 29 inches, but root growth is restricted by the fragipan. This soil is medium acid to slightly acid unless limed. Runoff is slow. Tilth is good, but tillage is difficult in places because of stones on the surface or in the subsoil. The hazard of erosion is moderate. A perched water table is evident from late fall to midspring. Frost action potential is moderate.

This soil is used mostly for silage corn, hay, pasture, woodland, and some types of community development. This soil has good potential for water impoundment, woodland, recreation, and wildlife habitat. This soil has fair potential for many types of community development.

If properly managed, this soil is well suited to cultivated crops and hay. Erosion is the main limitation. If this soil is cultivated, minimum tillage, use of a cover crop, and heavy manure applications help maintain tilth and reduce erosion. Crops on this soil respond well to lime and fertilizer.

If properly managed, this soil is suitable for pasture. Reducing erosion, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Orchardgrass and Ladino clover are the common pasture grasses and legumes on this soil.

This soil is suitable for woodland. Erosion is the main limitation. The soil is managed for eastern white pine, Norway spruce, and red pine. The dominant trees on this soil are sugar maple, beech, and eastern white pine.



This soil is suitable for community development. The perched water table, slow permeability, and frost action potential are the main limitations. Tile drainage and above-ground septic systems are suitable for this soil. Extensive planning and design is needed for urban development on this soil.

This soil is suitable for most recreational uses. Slope and slow permeability are the main limitations. Capability subclass IIe; woodland ordination 3o.

**StC—Stowe stony fine sandy loam, 8 to 15 percent slopes.** This sloping, well drained and moderately well drained, deep soil is in convex areas on glaciated uplands. The areas are roughly rectangular and range from 4 to 20 acres. Cobbles and stones are cleared off the surface and piled up along the edges of the fields to form stone fences and walls. Surface stones on this soil are typically 30 to 100 feet apart.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is 21 inches thick. The upper 10 inches friable, dark yellowish brown fine sandy loam. The lower 11 inches is friable, light olive brown and olive fine sandy loam. The substratum is a fragipan of olive very firm fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Tunbridge, Peru, and Westbury soils. The Tunbridge soils are mainly on the higher parts of the landscape, and the Peru and Westbury soils are mainly on the lower parts. Also included are areas of soils that have mottles at a depth of less than 24 inches, are more nearly level, are slightly depressional, and are in draws; a few areas of soils that are more than 35 percent gravel and cobbles; areas of soils that have a fragipan at a depth of less than 16 inches or more than 33 inches; a few areas that have bedrock at a depth of less than 40 inches; and a few areas that have more stones on the surface than this Stowe soil and that are indicated on the map with a spot symbol. The Tunbridge and Peru soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderately rapid above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 29 inches, but root growth is restricted by the fragipan. This soil is medium acid to slightly acid unless limed. Runoff is medium. Tilth is good, but tillage is difficult in places because of surface or subsurface stones. The hazard of erosion is moderate. A perched water table is evident from late fall to midspring. Frost action potential is moderate.

This soil is used mostly for hay, pasture, and woodland. It has good potential for farming, woodland, recreation, and some types of wildlife habitat. This soil has fair potential for many types of community development.

If properly managed, this soil is well suited to hay. Crops on this soil respond well to lime and fertilizer. Erosion is the main limitation. If this soil is cultivated, minimum tillage, use of a cover crop, and heavy manure applications help maintain tilth and reduce erosion.

If properly managed, this soil is suitable for pasture. Reducing erosion, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Orchardgrass and Ladino clover are the common pasture grasses and legumes on this soil.

This soil is suitable for woodland. Erosion is the main limitation. Using water bars and mulching skid trails help reduce erosion. The soil is managed for eastern white pine, Norway spruce, and red pine. The dominant trees are sugar maple, beech, and eastern white pine.

This soil is suitable for community development. Slope, frost action potential, and slow permeability are the main limitations. Tile drainage and above-ground septic systems are suitable for this soil. Quick seeding of construction sites helps reduce the erosion hazard. Extensive planning and design is needed for urban development on this soil.

This soil is suitable for many recreational uses. Slope and slow permeability are the main limitations. Capability subclass IIIe; woodland ordination 3o.

**StD—Stowe stony fine sandy loam, 15 to 25 percent slopes.** This moderately steep, well drained, deep soil is in convex areas on glaciated uplands. The areas are roughly rectangular and range from 4 to 15 acres. Cobbles and stones are cleared off the surface and piled up along the edges of the fields to form stone fences and walls. Surface stones on this soil are typically 30 to 100 feet apart.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is 21 inches thick. The upper 10 inches friable, dark yellowish brown fine sandy loam. The lower 11 inches is friable, light olive brown and olive fine sandy loam. The substratum is a fragipan of olive very firm fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Tunbridge, Peru, and Westbury soils. The Tunbridge soils are mainly on the higher parts of the landscape, and the Peru and Westbury soils are mainly on the lower parts. Also included are areas of soils that have mottles at a depth of less than 24 inches, are more nearly level, are slightly depressional, and are in draws; a few areas of soils that are more than 35 percent gravel and cobbles; areas of soils that have a fragipan at a depth of less than 16 inches or more than 33 inches; a few areas that have bedrock at a depth of less than 40 inches; and a few areas that have more stones on the surface than this Stowe soil and that are indicated on the map with a spot symbol. The Tunbridge and Peru soils make up 20 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderately rapid above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 29 inches, but

root growth is restricted by the fragipan. This soil is medium acid to slightly acid unless limed. Runoff is rapid. Tillage is good. The hazard of erosion is severe. A perched water table is evident from late fall to midspring. Frost action potential is moderate.

This soil is used mostly for pasture and woodland. It has fair potential for pasture, woodland, and some types of wildlife habitat. This soil has poor potential for most types of community development.

This soil is limited for hay by slope and the hazard of erosion.

This soil is suitable for unimproved pasture. Reducing erosion and preventing overgrazing are major pasture management concerns. Rotation of pastures and deferment of grazing are suitable management practices. Kentucky bluegrass is the common unimproved grass on this soil.

This soil is suitable for woodland. Erosion is the main limitation, and the use of equipment is restricted. Using water bars and mulching skid trails help reduce erosion. The soil is managed for eastern white pine, Norway spruce, and red pine. The dominant trees are sugar maple, beech, and eastern white pine.

This soil is poorly suited to community development. Slope is the main limitation. Capability subclass IVe; woodland ordination 3r.

**SwC—Stowe extremely stony fine sandy loam, 5 to 15 percent slopes.** This gently sloping to sloping, well drained and moderately well drained, deep soil is in convex areas on glaciated uplands. The areas are roughly rectangular and range from 5 to 40 acres. Surface stones on this soil are typically 2 to 5 feet apart.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is 21 inches thick. The upper 10 inches is friable, dark yellowish brown fine sandy loam. The lower 11 inches is friable, light olive brown and olive fine sandy loam. The substratum is a fragipan of olive very firm fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Tunbridge, Peru, and Westbury soils. The Tunbridge soils are mainly on the higher parts of the landscape, and the Peru and Westbury soils are mainly on the lower parts. Also included are areas of soils that have mottles at a depth of less than 24 inches, are more nearly level, are slightly depressional, and are in draws; a few areas of soils that are more than 35 percent gravel and cobbles; areas of soils that have a fragipan at a depth of less than 16 inches or more than 33 inches; a few areas that have bedrock at a depth of less than 40 inches; and a few areas that have more stones on the surface than this Stowe soil and that are indicated on the map with a spot symbol. The Tunbridge and Peru soils make up 25 to 35 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderately rapid above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is medium. The

root zone generally extends to a depth of 29 inches, but root growth is restricted by the fragipan. This soil is medium acid to slightly acid unless limed. Runoff is medium. Tillage is good, but tillage is severely restricted by stones on the surface or in the subsoil. The hazard of erosion is moderate. A perched water table is evident from late fall to midspring. Frost action potential is moderate.

This soil is used mainly for unimproved pasture and woodland. It has good potential for sugar maple trees, woodland, and some types of wildlife habitat. This soil has poor potential for many types of community development and other nonfarm uses.

This soil is unsuited to cultivated crops and hay. The use of equipment is limited by stones on the surface.

This soil is poorly suited to unimproved pasture. Rotation of pastures and deferment of grazing are suitable management practices. Kentucky bluegrass is the common native species on this soil.

This soil is suitable for tree production. Surface stones and erosion are the major limitations. Using water bars and mulching trails help to reduce erosion in places. The use of equipment is limited by stones on the surface. The soil is managed for eastern white pine, Norway spruce, and red pine. The dominant trees on this soil are sugar maple, beech, and eastern white pine.

This soil is unsuitable for community development. Stones are the main limitation. Construction of roads and streets is limited by slope and frost action potential. Extensive planning and design is needed for urban development on this soil.

This soil is very poorly suited to most recreational uses. Large stones and slope are the main limitations. Capability subclass VIIe; woodland ordination 3x.

**SwD—Stowe extremely stony fine sandy loam, 15 to 25 percent slopes.** This moderately steep, well drained, deep soil is in convex areas on glaciated uplands. The areas are roughly rectangular and range from 5 to 100 acres. Slopes are 900 feet long. Surface stones on this soil are typically 2 to 5 feet apart.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is 21 inches thick. The upper 10 inches is friable, dark yellowish brown fine sandy loam. The lower 11 inches is friable, light olive brown and olive fine sandy loam. The substratum is a fragipan of olive very firm fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Tunbridge and Peru soils. The Tunbridge soils are mainly on the higher parts of the landscape, and the Peru soils are mainly on the lower parts. Also included are areas of soils that have mottles at a depth of less than 24 inches, are more nearly level, are slightly depressional, and are in draws; small areas of stony or very stony soils; a few areas of soils that are more than 35 percent gravel and cobbles; areas of soils that have a fragipan at a depth of less than 16 inches or more than 33 inches; a few areas that have bedrock at a depth of less than 40 inches; and a few areas that have more stones on the surface than this



Stowe soil and that are indicated on the map with a spot symbol. The Tunbridge and Peru soils make up 25 to 35 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is moderately rapid above the fragipan and slow or very slow in the fragipan. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 29 inches, but root growth is restricted by the fragipan. This soil is medium acid to slightly acid. The hazard of erosion is moderate. Runoff is rapid. Tilth is good, but tillage is hazardous because of slope and is severely restricted by stones on the surface or in the subsoil. A perched water table is evident from late fall to midspring. Frost action potential is moderate.

This soil is used mostly for woodland and some unimproved pasture. It has good potential for ski areas, woodland, sugar maple trees, and some types of wildlife habitat. This soil has poor potential for many types of community development and other nonfarm uses.

This soil is unsuited to cultivated crops and hay. Equipment is limited by stones on the surface and by slope. Maple sap is extracted from sugar maple trees on a small acreage of this soil.

This soil is poorly suited to unimproved pasture. Reducing erosion and preventing overgrazing are major unimproved pasture management concerns. Rotation of pastures and deferment of grazing are suitable management practices. Kentucky bluegrass is the common native pasture grass on this soil.

This soil is suitable for tree production. Surface stones and erosion are the major limitations. Using water bars and mulching skid trails help reduce erosion in places. Use of equipment is limited by surface stones. The soil is managed for eastern white pine, Norway spruce, and red pine. The dominant trees on this soil are sugar maple, beech, and eastern white pine.

This soil is unsuitable for community development. It is limited for most types of community development by slope and surface stones.

This soil is suitable for woodland wildlife habitat. It is poorly suited to most other types of wildlife habitat. Capability subclass VIIIs; woodland ordination 3x.

**SyE—Stowe stony soils, 25 to 60 percent slopes.** This steep, well drained, deep soil is in convex areas on glacial till ridges or stream valley walls. The areas are long and narrow and irregularly shaped and range from 5 to 150 acres. Slopes are about 900 feet long. Surface stones on this soil are typically 2 to 5 feet apart.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is 21 inches thick. The upper 10 inches is friable, dark yellowish brown fine sandy loam. The lower 11 inches is friable, light olive brown and olive fine sandy loam. The substratum is a fragipan of olive very firm fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Tunbridge and Peru soils. The Tunbridge soils are mainly on

the higher parts of the landscape, and the Peru soils are mainly on the lower parts. Also included are areas of soils that have mottles at a depth of less than 24 inches, are more nearly level, are slightly depressional, and are in draws; a few areas of soils that are more than 35 percent gravel and cobbles; and small areas of soils that are very stony. The Tunbridge soils make up 25 percent of this map unit, and the other included soils make up 5 to 15 percent.

Permeability is moderately rapid above the substratum and slow or very slow in the substratum. Available water capacity is moderate. Natural fertility is medium. The root zone generally extends to a depth of 44 inches, but root growth is restricted by the substratum. This soil is medium acid to slightly acid. Runoff is rapid. Tilth is good, but tillage is hazardous because of slope. The hazard of erosion is severe. A perched water table is evident from late fall to midspring. Frost action potential is moderate.

This soil is used mostly for woodland and some unimproved pasture. It has good potential for ski areas, tree production, sugar maple trees, and woodland wildlife habitat. This soil has poor potential for community development and most other nonfarm uses.

This soil is unsuited to cultivated crops and hay. Use of equipment is limited by slope. Maple sap is extracted from sugar maple trees on a small acreage of this soil.

This soil is suitable for unimproved pasture. Reducing erosion and preventing overgrazing are major management concerns. Slope is the main limitation. Rotation of pastures and deferment of grazing are suitable management practices. Kentucky bluegrass is the common unimproved pasture grass on this soil.

This soil is suitable for tree production. Slope and erosion are the major limitations. Using water bars and mulching skid trails help reduce erosion in places. The soil is managed for eastern white pine, Norway spruce, and red pine. The dominant native trees on this soil are sugar maple, beech, and eastern white pine.

This soil is unsuitable for community development. Slope is the main limitation. Capability subclass VIIIs; woodland ordination 3x.

**Tm—Terric Medisapristis.** These level, very poorly drained, moderately deep organic soils are in concave areas in bogs. The areas are irregularly shaped and range from 2 to 12 acres.

Generally, these soils have an organic layer of very dark brown to very dark gray muck about 24 inches thick. The organic layer is underlain by a mineral layer of dark gray to gray fine sandy loam to silty clay loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of Carlisle muck and Peacham and Lyons soils. Also included are small areas of mineral soils that are silt loam to clay at a depth of less than 16 inches. Carlisle muck makes up about 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderately rapid in the organic layer and moderate to very slow in the mineral layer. Available water capacity, natural fertility, and organic matter content are high. The root zone extends to a depth of about 21 inches. Reaction ranges from extremely acid to neutral. Runoff is very slow. A seasonal high water table is apparent from late summer to late spring. These soils are flooded frequently from midfall to midspring. Shrink-swell potential and frost action potential are high.

These soils have good potential for wetland wildlife habitat and for excavated water impoundments. Most of the acreage is used for these purposes or is idle. These soils have fair potential for woodland, and little acreage is wooded. These soils have poor potential for most farm and nonfarm uses because of frequent flooding, the seasonal high water table, and a lack of suitable outlets for drainage. Capability subclass Vw; woodland ordination not assigned.

**TwB—Tunbridge-Woodstock fine sandy loams, very rocky, 3 to 8 percent slopes.** This complex consists of gently sloping to sloping, well drained to somewhat excessively drained soils on upland hills, ridges, and mountaintops. Areas are convex and concave, are rectangular, and range from 5 to 20 acres. About 2 to 10 percent of this complex is covered by areas of Rock outcrop 100 to 300 feet apart. Slopes are smooth and broken. The soils in this complex are in such an intricate pattern that it was not practical to map them separately.

Tunbridge soils make up about 55 percent of this complex. Typically, they have a surface layer 10 inches thick. The upper 7 inches is brown fine sandy loam, and the lower 3 inches is gray loam. The subsoil is 15 inches thick. The upper 5 inches is friable, dark yellowish brown loam, and the lower 10 inches is friable, brown to dark brown loam. Hard, massive schist bedrock is at a depth of 25 inches.

Woodstock soils make up about 25 percent of this complex. Typically, they have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is friable, brown to dark brown gravelly fine sandy loam 10 inches thick. Hard, massive schist bedrock is at a depth of 12 inches.

Included with this complex in mapping are small areas of Peru, Stowe, Westbury, Cabot, and Peacham soils; areas where bedrock exposures are less than 100 feet apart; areas of soils that are more than 35 percent gravel and coarse textured material in the surface layer and subsoil; common areas of seep spots; and areas where stones have been removed from the surface. Included areas make up about 10 percent of this complex.

Permeability is mainly moderately rapid in this complex. Available water capacity is low, and runoff is medium. Depth to bedrock restricts root growth. It ranges from 20 to 40 inches in the Tunbridge soils and from 8 to 20 inches in the Woodstock soils. The hazard of erosion is slight. Tilth is good. Natural fertility and organic matter content are low. Crops on this complex respond well to lime and fertilizer, but drought is a hazard during dry periods.

Most of this complex is in pasture or woodland. A small acreage is farmed. The complex has poor potential for community development and fair to good potential for recreation. The Tunbridge soils have good potential for openland wildlife habitat, and potential is poor to fair for most other types of wildlife habitat. The Tunbridge soils have good potential for farming, woodland, and grasses. The Woodstock soils have fair potential for farming, woodland, and grasses.

The Woodstock soils are suited to intensive farming and poorly suited to extensive farming; extensive bedrock outcrops and shallow depth to bedrock are the main limitations. Some areas of the Tunbridge soils between bedrock outcrops are well suited to intensive farming. The major limitations of the complex for farming are low available water capacity, low natural fertility, and low organic matter content. Crops respond well to lime and fertilizer. If the soils are cultivated, including grasses and legumes in the cropping system and using minimum tillage and cover crops help to control erosion. Strip-cropping or contour farming, depending on topography, and no-till planting are suitable management practices. Cool-season crops are suited to these soils. The main hay crops on these soils are birdsfoot trefoil, alfalfa, and timothy.

The Tunbridge soils are suited to pasture. Low available water capacity and bedrock exposures are the primary limitations. The Woodstock soils are poorly suited to pasture. The main limitation is bedrock outcrops. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable pasture management practices. Timothy and red or white clover are commonly used for pasture on this complex.

This complex is suited to woodland. The soils of this complex are managed for sugar maple and red and white pine. Low natural fertility and low available water capacity are the primary limitations. If the natural cover is removed during logging, using water bars and selective cutting help reduce erosion. Dominant tree species on this complex are sugar maple, beech, and eastern white pine.

This complex is limited for many urban purposes by depth to bedrock and by bedrock outcrops. If roads or streets are built on this complex, quick seeding and applying straw help reduce erosion on graded slopes.

This complex is suitable for recreation. Bedrock outcrops are the primary limitation. Compaction and erosion are reduced by applying mulch on paths and trails and by rotating areas. Much of the complex is well suited to skiing. Fertilizing, liming, and seeding of hardy grasses and legumes help keep trails open and prevent erosion. Common diversion ditches across ski trails prevent gullyng and help hold fertilizer and new seedlings on the steeper slopes. Capability subclass IIe; woodland ordination 3o Tunbridge, 4d Woodstock.



**TwC—Tunbridge-Woodstock fine sandy loams, very rocky, 8 to 15 percent slopes.** This complex consists of sloping, well drained to somewhat excessively drained soils on upland hills, ridges, and mountaintops. Areas are convex and concave, are rectangular, and range from 3 to 30 acres. About 2 to 10 percent of this complex is covered by areas of Rock outcrop 100 to 300 feet apart. Slopes are smooth and broken. The soils in this complex are in such an intricate pattern that it was not practical to map them separately.

Tunbridge soils make up about 55 percent of this complex. Typically, they have a surface layer 10 inches thick. The upper 7 inches is brown fine sandy loam, and the lower 3 inches is gray loam. The subsoil is 15 inches thick. The upper 5 inches is friable, dark yellowish brown loam, and the lower 10 inches is friable, brown to dark brown loam. Hard, massive schist bedrock is at a depth of 25 inches.

Woodstock soils make up about 25 percent of this complex. Typically, they have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is friable, brown to dark brown gravelly fine sandy loam 10 inches thick. Hard, massive schist bedrock is at a depth of 12 inches.

Included with this complex in mapping are small areas of Peru, Stowe, Westbury, Cabot, and Peacham soils; areas where bedrock exposures are less than 100 feet apart; areas of soils that are more than 35 percent gravel and coarse textured material in the surface layer and subsoil; and common areas of seep spots. Included areas make up about 10 percent of this complex.

Permeability is mainly moderately rapid in this complex. Available water capacity is low, and runoff is medium. Depth to bedrock restricts root growth. It ranges from 20 to 40 inches in the Tunbridge soils and from 8 to 20 inches in the Woodstock soils. Tilth is good. Natural fertility and organic matter content are low. Crops on this complex respond well to lime and fertilizer, but drought is a hazard during dry periods.

Most of this complex is in pasture or woodland. A small acreage is farmed. The complex has poor potential for community development and fair to good potential for recreation. The Tunbridge soils have good potential for openland wildlife habitat, and potential is poor for most other types of wildlife habitat. The Tunbridge soils have good potential for farming, woodland, and grasses. The Woodstock soils have fair potential for farming, woodland, and grasses.

The Woodstock soils are suited to intensive farming and poorly suited to extensive farming; extensive bedrock outcrops and shallow depth to bedrock are the main limitations. Some areas of the Tunbridge soils between bedrock outcrops are well suited to intensive farming. The major limitations of the complex for farming are low available water capacity, low natural fertility, and low organic matter content. Crops respond well to lime and fertilizer. If the soils are cultivated, including grasses and legumes in the cropping system and using minimum til-

lage and cover crops help to control erosion. Strip-cropping or contour farming, depending on topography, and no-till planting are suitable management practices. Cool-season crops are suited to these soils. The main hay crops on these soils are birdsfoot trefoil, alfalfa, and timothy.

Tunbridge soils are suited to pasture. Low available water capacity and bedrock exposures are the primary limitations. The Woodstock soils are poorly suited to pasture. The main limitation is bedrock outcrops. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable pasture management practices. Timothy and red or white clover are commonly used for pasture on this complex.

This complex is suited to woodland. The soils are managed for sugar maple and red and white pine. Low natural fertility and a low available water capacity are the primary limitations. If the natural cover is removed during logging, using water bars and selective cutting help reduce erosion. Dominant tree species on this complex are sugar maple, beech, and eastern white pine.

This complex is limited for many urban purposes by slope, depth to bedrock, and bedrock outcrops. If roads or streets are built on this complex, quick seeding and applying straw help to reduce erosion on graded slopes.

This complex is suitable for recreation. Bedrock outcrops are the primary limitation. Compaction and erosion are reduced by applying mulch on paths and trails and by rotating areas. Much of this complex is well suited to skiing. Fertilizing, liming, and seeding of hardy grasses and legumes keep trails open and prevent erosion. Common diversion ditches across ski trails prevent gullying and help hold fertilizer and new seedlings on the steeper slopes. Capability subclass IVE; woodland ordination 30 Tunbridge, 4d Woodstock.

**TwD—Tunbridge-Woodstock fine sandy loams, very rocky, 15 to 25 percent slopes.** This complex consists of moderately steep, well drained to somewhat excessively drained soils on hills, ridges, and mountaintops. Areas are convex and concave, are rectangular, and range from 5 to 30 acres. About 2 to 10 percent of this complex is covered by areas of Rock outcrop 100 to 300 feet apart. Slopes are smooth and broken. The soils in this complex are in such an intricate pattern that it was not practical to map them separately.

Tunbridge soils make up 45 percent of this complex. Typically, they have a surface layer 10 inches thick. The upper 7 inches is brown fine sandy loam, and the lower 3 inches is gray loam. The subsoil is 15 inches thick. The upper 5 inches is friable, dark yellowish brown loam, and the lower 10 inches is friable, brown to dark brown loam. Hard, massive schist bedrock is at a depth of 25 inches.

Woodstock soils make up about 35 percent of this complex. Typically, they have a surface layer of very dark

grayish brown fine sandy loam 2 inches thick. The subsoil is friable, brown to dark brown gravelly fine sandy loam 10 inches thick. Hard, massive schist bedrock is at a depth of 12 inches.

Included with this complex in mapping are small areas of Peru, Stowe, Westbury, Cabot, and Peacham soils; areas where bedrock exposures are less than 100 feet apart; areas of soils that are more than 35 percent gravel and coarse textured material in the surface layer and subsoil; and common areas of seep spots. Included areas make up about 10 percent of this complex.

Permeability is mainly moderately rapid in this complex. Available water capacity is low, and runoff is medium. Depth to bedrock restricts root growth. It ranges from 20 to 40 inches in the Tunbridge soils and from 8 to 20 inches in the Woodstock soils. Tilth is good. Natural fertility and organic matter content are low. Crops on this complex respond well to lime and fertilizer, but drought is a hazard during dry periods.

Most of this complex is in pasture or woodland. Farming potential is fair for Tunbridge soils and poor for Woodstock soils. This complex has poor potential for community development. Tunbridge soils have good potential for woodland and grasses. Woodstock soils have fair potential for woodland and grasses. This complex has good potential for skiing and poor potential for most other recreational uses. Tunbridge soils have fair potential for openland wildlife habitat. Potential is fair to poor for other types of wildlife habitat.

This complex is poorly suited to intensive farming. Slope, erosion, and bedrock outcrops are the main limitations. The complex is poorly suited to hay. Low available water capacity, low natural fertility, and low organic matter content are the main limitations. Crops respond well to lime and fertilizer. Birdsfoot trefoil, alfalfa, and timothy are the primary hay crops.

The Tunbridge soils are suited to pasture. Low available water capacity and bedrock exposures are the primary limitations. The Woodstock soils are poorly suited to pasture. Bedrock exposures are the main limitations. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable pasture management practices. Timothy and red or white clover are commonly used for pasture on this complex.

This complex is suited to woodland. The soils are managed for sugar maple and red and white pine. Use of equipment is limited by slope and bedrock exposures. Low natural fertility and low available water capacity are the primary limitations. If the natural cover is removed during logging, using water bars and selective cutting help reduce erosion. Dominant tree species on this complex are sugar maple, beech, and eastern white pine.

This complex is limited for many urban purposes by slope, depth to bedrock, and bedrock outcrops.

This complex is poorly suited to most types of recreation. Bedrock outcrops are the primary limitation. Compaction and the erosion hazard are reduced in places by applying mulch on paths and trails and by rotating areas. Much of this complex is well suited to skiing. Fertilizing, liming, and seeding of hardy grasses and legumes keep trails open and prevent erosion. Common diversion ditches across ski trails prevent gullying and help hold fertilizer and new seedlings on the steeper slopes. Capability subclass IVE; woodland ordination 3r Tunbridge, 4d Woodstock.

**Wa—Wallkill silt loam.** This level or depressional, very poorly drained, deep soil is in irregularly shaped areas that range from 7 to 35 acres. The areas are in that part of the flood plain farthest away from the streams and against the valley walls. They are most extensive along the major streams in the county. Flooding is common on this soil.

Typically, the surface layer is friable, dark grayish brown silt loam about 7 inches thick. The subsoil is friable, olive gray silt loam about 7 inches thick. The substratum is friable, black muck to a depth of 45 inches. Below this is a muck layer of firm, gray silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Rumney Variant, Birdsall, and Carlisle soils and Terric Medisaprists. The Rumney Variant and Birdsall soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 25 percent.

Permeability is moderate in the upper part of this soil, rapid in the upper part of the substratum, and very slow in the lower part of the substratum. Available water capacity and natural fertility are high. The root zone extends to a depth of 45 inches, but root growth is restricted by a high water table. The soil ranges from medium acid to neutral unless limed. The hazard of erosion is slight. Runoff is very slow or ponded. Tilth is good, but tillage is very difficult because of continuous wetness. The water table is at or above the surface most of the year. Frost action potential is high.

This soil is mostly idle, but a small acreage is used for unimproved pasture. The soil has good potential for wetland wildlife habitat and as a pond reservoir site. It has poor potential for most other farm and nonfarm uses.

This soil is poorly suited to cultivated crops. The high water table and ponding are the major limitations. Drainage systems are difficult to install because of a lack of suitable outlets. This soil is limited for pasture by the high water table and flooding. Drainage is difficult because of a lack of suitable outlets. Red clover and climax timothy are the primary pasture varieties.

This soil is unsuited to merchantable woodland. The high water table is the primary limitation. Eastern white pine, alders, and red maple are the dominant tree species.

This soil is unsuitable for urban development. The primary limitations are the high water table and high frost action potential. Lack of suitable outlets makes drainage difficult.



This soil is well suited to wetland wildlife habitat. Capability subclass IIIw; woodland ordination 4w.

**Wh—Wareham loamy fine sand.** This level, poorly drained soil is in irregularly shaped areas. The areas range from 3 to 80 acres. This soil has small windthrow mounds in wooded areas.

Typically the surface layer is very friable, very dark brown loamy fine sand 9 inches thick. The subsoil is a very friable, grayish brown, mottled fine sand 6 inches thick. The substratum is loose, grayish brown and dark grayish brown, mottled fine sand to a depth of 60 inches.

Included with this soil in mapping are small areas of Au Gres, Enosburg, and Binghamville soils. The Au Gres and Enosburg soils are on high mounds or slightly elongated rises. The Binghamville soils are in more depressional areas. Also included are a few areas of soils that have a surface layer of sand, fine sand, loamy sand, or sandy loam and few areas of soils that are more than 5 percent but less than 60 percent gravel and cobbles between depths of 10 and 40 inches. The Au Gres and Enosburg soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is rapid, and available water capacity and natural fertility are low. The root zone extends to a depth of 15 inches, but root growth is restricted by a high water table. The surface layer is strongly acid to slightly acid, and the subsoil is slightly acid. Runoff is slow. Tilth is good, but tillage is very difficult because of continuous wetness. A high water table is evident from early fall to late spring. The hazard of erosion is slight. Frost action potential is moderate.

This soil is used primarily for pasture and woodland. A moderate acreage is idle. A few areas are cultivated. This soil has fair potential for tree production. It is a fair source of sand, but excavations fill with water. This soil has a poor potential for farming. It has poor potential for most nonfarm uses because of wetness.

This soil is limited for cultivated crops by the high water table and by wetness after prolonged rains. Hay crops on this soil respond well to lime and fertilizer. Installation of tile drainage and use of diversion ditches on the perimeter of fields help reduce the water table if suitable outlets can be obtained.

This soil is suitable for pasture. The high water table is the major limitation. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are management concerns. Installation of tile drainage helps reduce the water table if suitable outlets are available. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Red clover and climax timothy are commonly used for pasture on this soil.

This soil is suitable for tree production. The major limitation is the high water table. Eastern white pine is the primary plantation tree. The dominant native species are eastern white pine, red maple, white spruce, and gray birch.

This soil is poorly suited to community development. The main limitations are the seasonal high water table and frost action potential. Lack of suitable outlets makes drainage difficult.

This soil is suitable as a site for excavated recreational ponds. It is poorly suited to most recreational uses. The seasonal high water table is the main limitation. Capability subclass IVw; woodland ordination 4w.

**WrA—Westbury stony fine sandy loam, 0 to 3 percent slopes.** This nearly level, somewhat poorly drained, deep soil is in roughly rectangular areas near the bottom of glacial till slopes and above the flood plain and terraces. Areas range from 2 to 50 acres. Cobbles and stones are cleared off the surface and piled along the edges of fields to form stone fences or walls. Surface stones on this soil are typically 30 to 100 feet apart.

Typically, the surface layer is very dark brown fine sandy loam 6 inches thick. The subsoil is 14 inches thick. The upper 5 inches is mottled, brown to dark brown fine sandy loam, and the lower 9 inches is mottled, light olive brown fine sandy loam. The substratum is a fragipan of very firm, mottled, gray fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Peru, Stowe, and Cabot soils. The Cabot soils are in depressions. The Peru and Stowe soils are on high mounds or slightly elongated rises. Also included are small areas of soils that have a high silt and clay content, areas where stones are less than 30 feet apart and that are shown on the map by a special symbol, and areas of soils that have bedrock at a depth of less than 40 inches. The Peru and Cabot soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. This soil has a high natural fertility and moderate available water capacity. The fragipan restricts plant rooting depth to about 20 inches, and root growth is restricted by a perched water table. The soil ranges from medium acid to neutral. Runoff is very slow. Tilth is good, but planting is difficult or delayed by surface or subsurface stones and a perched water table. The perched water table is evident from late fall to late spring. Frost action potential is moderate. The hazard of erosion is slight.

This soil is used primarily for hay and improved pasture. Silage corn is grown on some drained areas, and other areas are wooded or idle. This soil has good potential for sewage lagoons. It has moderate potential for recreational use. This soil has poor potential for most other farm and nonfarm uses.

If properly managed, this soil is suitable for cultivated crops and hay. Crops on this soil respond well to lime and fertilizer. Wetness is the main limitation. Tile drainage and open ditches on the perimeter of cultivated fields help lower the perched water table if suitable outlets are available.

If properly managed, this soil is suitable for pasture. Lowering the perched water table, establishing and main-

taining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Lowering the perched water table through the use of tile drainage and open ditches is a suitable management practice. Red clover and climax timothy are the common pasture grasses and legumes.

This soil is suitable for tree production. Wetness limits the use of equipment. The soil is managed for eastern white pine, white spruce, and northern white-cedar. Alders, spruce, and red maple are the dominant trees on this soil.

This soil is limited for most urban purposes by the perched water table, slow permeability of the fragipan, and high frost action potential. Extensive planning and design is needed for urban development on this soil.

Wetness limits this soil for most recreational uses, and ponding is a hazard in the spring on picnic areas and playgrounds. Tile drainage and diversion ditches help lower the perched water table in places. Small stones on the surface limit use for playgrounds. Capability subclass IIIw; woodland ordination 4w.

**WrB—Westbury stony fine sandy loam, 3 to 8 percent slopes.** This gently sloping, somewhat poorly drained, deep soil is in concave areas on lower glacial till slopes above the flood plain and terraces. Slopes are long and smooth. Cobbles and stones are cleared off the surface and piled along the edges of fields to form stone fences or walls. Surface stones on this soil are typically 30 to 100 feet apart. The areas range from 3 to 1000 acres.

Typically the surface layer is very dark brown fine sandy loam 6 inches thick. The subsoil is 14 inches thick. The upper 5 inches is mottled, brown to dark brown fine sandy loam, and the lower 9 inches is mottled, light olive brown fine sandy loam. The substratum is a fragipan of very firm, mottled, gray fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Peru, Stowe, and Cabot soils. The Cabot soils are in depressions. The Peru and Stowe soils are on high mounds or slightly elongated rises. Also included are small areas of soils that have a high silt and clay content, areas where stones are less than 30 feet apart and that are shown on the map by a special symbol, and areas of soils that have bedrock at a depth of less than 40 inches. The Peru and Cabot soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. This soil has a high natural fertility and moderate available water capacity. The fragipan restricts plant rooting depth to about 20 inches, and root growth is restricted by a perched water table. The soil ranges from medium acid to neutral. Runoff is slow. Tilt is good, but planting is difficult or delayed by surface or subsurface stones and the perched water table. The perched water table is evident from late fall to late

spring. Frost action potential is moderate. The hazard of erosion is slight.

This soil is used primarily for hay and improved pasture. Silage corn is grown on some drained areas, and other areas are wooded or idle. This soil has fair potential for sewage lagoons. It has moderate potential for recreational use. It has poor potential for most other farm and nonfarm uses.

If properly managed, this soil is suitable for cultivated crops and hay. Crops on this soil respond well to lime and fertilizer. Wetness is the main limitation. Tile drainage and open ditches on the perimeter of cultivated fields help lower the perched water table.

If properly managed, this soil is suitable for pasture. Lowering the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Lowering the perched water table through the use of tile drainage and open ditches is a suitable practice. Red clover and climax timothy are the common pasture grasses and legumes.

This soil is suitable for tree production. Wetness limits the use of equipment. The soil is managed for eastern white pine, white spruce, northern white cedar. Alders, red spruce, and red maple are the dominant trees on this soil.

This soil is limited for most urban purposes by the perched water table, slow permeability of the fragipan, and frost action potential. Extensive planning and design is needed for urban development on this soil.

Wetness limits this soil for most recreational uses. Tile drainage and diversion ditches help lower the perched water table in places. Slope is the main limitation for playgrounds. Capability subclass IIIw; woodland ordination 4w.

**WrC—Westbury stony fine sandy loam, 8 to 15 percent slopes.** This sloping, somewhat poorly drained, deep soil is in roughly rectangular areas on lower glacial till slopes above the flood plain and terraces. Slopes are less than 100 feet long. Cobbles and stones are cleared off the surface and piled along the edges of fields to form stone fences or walls. Surface stones on this soil are typically 30 to 100 feet apart. The areas range from 3 to 30 acres.

Typically, the surface layer is very dark brown fine sandy loam 6 inches thick. The subsoil is 14 inches thick. The upper 5 inches is mottled, brown to dark brown fine sandy loam. The lower 9 inches is mottled, light olive brown fine sandy loam. The substratum is a fragipan of very firm, mottled, gray fine sandy loam to a depth of 60 inches.

Included with this soil in mapping are areas of Peru, Stowe, and Cabot soils. The Cabot soils are in depressions. The Peru and Stowe soils are on high mounds or slightly elongated rises. Also included are small areas of soils that have a high silt and clay content, areas where



stones are less than 30 feet apart and that are shown on the map by a special symbol, and areas of soils that have bedrock at a depth of less than 40 inches. The Peru and Stowe soils make up 15 to 35 percent of this map unit, and the other included soils make up 10 to 15 percent.

Permeability is moderate above the fragipan and slow or very slow in the fragipan. This soil has high natural fertility and moderate available water capacity. The fragipan restricts plant rooting depth to about 20 inches, and root growth is restricted by a perched water table. The soil ranges from medium acid to neutral. Runoff is medium. Tilth is good. A perched water table is evident from late fall to late spring. Frost action potential is moderate. The hazard of erosion is moderate.

This soil is used primarily for hay and improved pasture. Silage corn is grown on a few drained areas on lower slopes. Small areas are wooded or idle. The soil has fair potential for recreational use. It has poor potential for most other farm and nonfarm uses.

If properly managed, this soil is suitable for hay. It is poorly suited to cultivated crops. The main limitations are wetness, slow permeability of the fragipan, slope, and erosion in unvegetated areas. Tillage is difficult. Tile drainage is suitable for this soil. If corn is planted, using a cover crop, no-till planting, and contour plowing helps to reduce erosion. Crops on this soil respond well to lime and fertilizer.

If properly managed, this soil is suitable for pasture. Lowering the perched water table, establishing and maintaining a mixture of grasses and legumes, and preventing overgrazing are major pasture management concerns. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Lowering the perched water table through the use of tile drainage is a suitable practice. Red clover and climax timothy are the common pasture grasses and legumes.

This soil is suitable for tree production. Wetness and erosion limit the use of equipment. The soil is managed for eastern white pine, white spruce, and northern white-cedar. Use of mulch on skid trails helps reduce erosion. Alders, red spruce, and red maple are the dominant trees on this soil.

This soil is limited for most urban purposes by slope, erosion, slow permeability of the fragipan, and frost action potential. Extensive planning and design is needed for urban development on this soil.

Wetness and slope limit this soil for most recreational uses. Tile drainage helps lower the perched water table in places. Slope limits use for playgrounds. Capability subclass IVe; woodland ordination 4w.

**WsA—Windsor loamy fine sand, 0 to 3 percent slopes.** This nearly level, excessively drained soil is on broad terraces and deltas. Slopes are smooth and slightly convex and are as much as 1,000 feet long. The areas are rectangular or irregular in shape and range from 2 to 200 acres.

Typically, the surface layer of this soil is dark brown loamy fine sand about 10 inches thick. The subsoil is brown to dark brown and yellowish brown, very friable to loose loamy fine sand about 17 inches thick. The substratum is light olive brown and brown fine sand to a depth of at least 5 feet (fig. 9).

Included with this soil in mapping are small intermingled areas of Missisquoi, Deerfield, Hinesburg, and Eldridge soils and small areas with bedrock at a depth of less than 40 inches. Included areas make up 15 to 35 percent of this map unit.

Permeability is rapid in this soil, and available water capacity is low. Runoff is very slow. Tilth is good, but the soil tends to be droughty during dry years. The subsoil has low shrink-swell potential and low frost action potential. The root zone extends to a depth of about 40 inches. The surface layer and subsoil are commonly strongly acid in unlimed areas. The hazard of erosion is slight. Depth to bedrock is commonly more than 5 feet.

Most of this soil is farmed or is used for urban development. The soil has fair potential for most cultivated crops. It has a good potential for most types of urban development, especially schools and athletic fields. This soil has a fair potential for hay, pasture, and woodland.

This soil is suited to most cultivated crops and hay. Low organic matter content, low fertility, and acidity are the main limitations. Controlling soil blowing is a major concern of management. If the soil is cultivated, minimum tillage, use of cover crops, and heavy manure applications help to reduce soil blowing and improve tilth. This soil can be tilled throughout a wide range of moisture conditions without destroying tilth. It can be worked early in the spring and after heavy rains. Truck crops on this soil sometimes lack adequate moisture.

Overgrazing is a major concern in pasture management. If this soil is overgrazed, it is susceptible to soil blowing. Use of proper stocking rates to maintain key plant species, rotation of pastures, deferment of grazing, and use of lime and fertilizer are the chief management needs. Orchardgrass is the common pasture grass.

This soil is suited to many tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Other areas have been planted to red or Scotch pine and are managed as plantations. Most Scotch pine plantations are managed for Christmas tree production. The main limitation is low fertility. The dominant species are white or gray birch, red maple, and white pine.

This soil is suitable for most urban uses. However, the rapid permeability of this soil allows wastes to contaminate some shallow wells.

This soil is suited to recreational use. High sand content and soil blowing are the main limitations. Maintaining a vegetative cover is the major management need. Mulching and planting a hardy grass and rotating camp areas are suitable management practices. Capability subclass IIIs; woodland ordination 5s.

**WsB—Windsor loamy fine sand, 3 to 8 percent slopes.** This gently sloping, excessively drained soil is in smooth and slightly convex areas on broad terraces and deltas. Slopes are generally less than 300 feet long. The areas are rectangular or irregular in shape and range from 2 to 20 acres.

Typically, the surface layer is dark brown loamy fine sand about 10 inches thick. The subsoil is brown to dark brown and yellowish brown, very friable to loose loamy fine sand about 17 inches thick. The substratum is light olive brown and brown fine sand to a depth of at least 5 feet.

Included with this soil in mapping are small intermingled areas of Missisquoi, Deerfield, Hinesburg, and Eldridge soils and small areas with bedrock at a depth of less than 40 inches. Included areas make up 15 to 35 percent of this map unit.

Permeability is rapid in this soil, and available water capacity is low. Runoff is slow. Tilth is good, but the soil tends to be droughty. The subsoil has low shrink-swell potential and low frost action potential. The root zone extends to a depth of about 40 inches. The surface layer and subsoil are commonly strongly acid in unlimed areas. Depth to bedrock is commonly more than 5 feet. The hazard of erosion is slight.

Most areas of this soil are farmed or wooded. Some are used for urban development. The soil has good potential for most cultivated crops. It has a good potential for most types of urban development, especially local streets and roads. This soil has a fair potential for hay, pasture, and woodland.

This soil is suited to most cultivated crops and hay. Low organic matter content, low fertility, and acidity are the main limitations. Controlling soil blowing is a major concern of management. If the soil is cultivated, minimum tillage, use of cover crops, and heavy manure applications help to reduce soil blowing and improve tilth. This soil can be worked throughout a wide range of moisture conditions without destroying tilth. It can be worked early in the spring and after heavy rains. Truck crops on this soil sometimes lack moisture.

Overgrazing is a major concern in pasture management. If this soil is overgrazed, it is susceptible to soil blowing. Use of proper stocking rates to maintain key plant species, rotation of pastures, deferment of grazing, and use of lime and fertilizer are the chief management needs. Orchardgrass is the common pasture grass.

This soil is suited to many tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Other areas have been planted to red or Scotch pine and are managed as plantations. Most Scotch pine plantations are managed for Christmas tree production. The chief limitations are low fertility and erosion. The dominant species are white or gray birch, red maple, and white pine.

This soil is suitable for some urban uses. However, the rapid permeability of this soil allows wastes to contaminate some shallow wells.

This soil is suited to recreational use. High sand content and soil blowing are the main limitations. Maintaining a vegetative cover is the major management need. Mulching and planting a hardy grass and rotating camp areas are suitable management practices. Capability subclass IIIs; woodland ordination 5s.

**WsC—Windsor loamy fine sand, 8 to 15 percent slopes.** This sloping, excessively drained soil is in smooth and slightly convex areas on broad terraces and deltas. Slopes are as much as 300 feet long. The areas are nearly oval and range from 2 to 50 acres.

Typically, the surface layer is dark brown loamy fine sand about 10 inches thick. The subsoil is brown to dark brown and yellowish brown, very friable to loose loamy fine sand about 17 inches thick. The substratum is light olive brown and brown fine sand to a depth of at least 5 feet.

Included with this soil in mapping are small intermingled areas of Missisquoi, Deerfield, Hinesburg, and Eldridge soils and small areas with bedrock at a depth of less than 40 inches. The Missisquoi soils make up 20 to 30 percent of this map unit, and the other included soils make up 15 to 20 percent.

Permeability is rapid in this soil, and available water capacity is low. Runoff is medium. Tilth is good, but the soil tends to be droughty during dry years. The subsoil has low shrink-swell potential and low frost action potential. The root zone extends to a depth of about 40 inches. The surface layer and subsoil are commonly strongly acid in unlimed areas. Depth to bedrock is commonly more than 5 feet. The hazard of erosion is moderate.

Most areas of this soil are farmed or wooded. A small acreage is used for urban development or as a source of sand or roadfill. The soil has good potential as a source of sand or roadfill. It has fair potential for most types of urban development, recreational uses, and woodland. It has poor potential for wildlife habitat and cultivated crops.

This soil is suited to hay. Low organic matter content, low fertility, and acidity are the major limitations. Controlling erosion and soil blowing is a major concern of management. If the soil is cultivated, contour planting, minimum tillage, use of cover crops, and heavy manure applications help to reduce erosion and soil blowing and improve tilth. This soil can be worked throughout a wide range of moisture conditions without destroying tilth. It can be worked early in the spring and after heavy rains.

Overgrazing is a major concern of pasture management. If this soil is overgrazed, it is susceptible to soil blowing and erosion. Use of proper stocking rates to maintain key plant species, rotation of pastures, deferment of grazing, and use of lime and fertilizer are the chief management needs. Orchardgrass is the common pasture grass.

This soil is suited to some tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Other areas have been planted to red or Scotch pine and are managed as plantations. Most Scotch pine plantations are managed for Christmas tree produc-



tion. The chief limitation is low fertility. Use of equipment is limited by slope. Using water bars and mulching road banks help reduce erosion. The dominant tree species are white or gray birch, red maple, and white pine.

The main limitations for urban use are seepage, slope, low strength, and high sand content. The rapid permeability of this soil allows wastes to contaminate some shallow wells.

This soil is suitable for recreation. High sand content, soil blowing, and erosion are the main limitations. Maintaining a vegetative cover is the major management need. Mulching and planting a hardy grass and rotating camp areas are suitable management practices. Capability subclass IVs; woodland ordination 5s.

**WsD—Windsor loamy fine sand, 15 to 25 percent slopes.** This moderately steep, excessively drained soil is in slightly convex areas on terrace edges and valley slopes. Slopes are short. The areas are irregular in shape and range from 2 to 50 acres.

Typically, the surface layer is dark brown loamy fine sand about 10 inches thick. The subsoil is brown to dark brown and yellowish brown, very friable to loose loamy fine sand about 17 inches thick. The substratum is light olive brown and brown fine sand to a depth of at least 5 feet.

Included with this soil in mapping are small intermingled areas of Missisquoi, Deerfield, and Hinesburg soils and small areas with bedrock at a depth of less than 40 inches. The Missisquoi soils make up 15 to 30 percent of this map unit, and the other included soils make up 10 to 20 percent.

Permeability is rapid in this soil, and available water capacity is low. Runoff is medium. Tilth is good, but the soil tends to be droughty during dry years. The subsoil has low shrink-swell potential and low frost action potential. The root zone extends to a depth of about 40 inches. The surface layer and subsoil are commonly strongly acid in unlimed areas. Depth to bedrock is commonly more than 5 feet. The hazard of erosion is moderate.

Most areas of this soil are wooded, but some are used for pasture or hay. The soil has poor potential for most cultivated crops, most types of urban development, and wildlife habitat. This soil has fair potential for hay, pasture, and woodland.

This soil is not suited to most cultivated crops and is poorly suited to hay. Slope, erosion, low organic matter content, low fertility, and acidity are the major limitations. Controlling soil blowing is a major concern of management. This soil can be worked early in the spring and after heavy rains.

Overgrazing is a major concern in pasture management. If this soil is overgrazed, it is susceptible to soil blowing and erosion. Use of proper stocking rates to maintain key plant species, rotation of pastures, deferment of grazing, and use of lime and fertilizer are the chief management needs. Orchardgrass is the common pasture grass.

This soil is suited to some tree species. Many areas have reverted from idle land to a mixed white pine-gray

birch stand. Other areas have been planted to red or Scotch pine and are managed as plantations. Most Scotch pine plantations are managed for Christmas tree production. The main limitation is low fertility. Use of equipment is limited by slope and erosion. Using water bars and mulching roadbanks help reduce erosion. The dominant tree species are white or gray birch, red maple, and white pine.

The main limitations for most urban uses are seepage, slope, low strength, and high sand content.

This soil is poorly suited to recreation. Steep slope, high sand content, soil blowing, and erosion are the main limitations. Maintaining a vegetative cover is the major management need. Mulching and planting a hardy grass and rotating paths and trails are suitable management practices. Capability subclass VI; woodland ordination 5s.

**WsE—Windsor loamy fine sand, 25 to 60 percent slopes.** This steep, excessively drained soil is on terrace escarpments and valley slopes. Slopes are less than 200 feet long and are slightly convex on the upper part and slightly concave on the lower part. The areas are mainly long and narrow and range from 10 to 200 acres.

Typically, the surface layer is dark brown loamy fine sand about 10 inches thick. The subsoil is brown to dark brown and yellowish brown, very friable to loose loamy fine sand about 17 inches thick. The substratum is light olive brown and brown fine sand to a depth of at least 5 feet.

Included with this soil in mapping are small intermingled areas of Missisquoi and Hinesburg soils, small areas of eroded soils, and small areas with bedrock at a depth of less than 40 inches. The Missisquoi soils make 10 to 25 percent of this map unit, and the other inclusions make up 5 to 15 percent.

Permeability is rapid in this soil, and available water capacity is low. Runoff is medium. Tilth is good, but the soil tends to be droughty during dry years. The subsoil has low shrink-swell potential and low frost action potential. The root zone extends to a depth of about 40 inches. The surface layer and subsoil are commonly strongly acid in unlimed areas. Depth to bedrock is commonly more than 5 feet. The hazard of erosion is severe.

Most of this soil is wooded or is used for pasture. The soil has poor potential for most farm and nonfarm uses. It has good potential as a source of sand.

This soil is not suited to most cultivated crops and hay. Steep slopes and erosion are the main limitations. Use of equipment is hazardous.

This soil is suited to unimproved pasture. Overgrazing is a major concern. If this soil is overgrazed, it is susceptible to soil blowing. Rotation of pastures and deferment of grazing help reduce erosion and soil blowing on cow paths. Orchardgrass is the common native pasture grass.

This soil is suited to some tree species. Many areas have reverted from idle land to a mixed white pine-gray birch stand. Small areas have been planted to red or Scotch pine and are managed as plantations. Most Scotch

pine plantations are managed for Christmas tree production. The main limitation is low fertility, and the use of equipment is limited. Using water bars and mulching roadbanks help reduce erosion. The dominant tree species are white or gray birch, red maple, and white pine.

This soil is limited for most urban uses by slope, seepage, low strength, and high sand content.

This soil is very poorly suited to recreation. Steep slopes, high sand content, soil blowing, and erosion are the main limitations. Capability subclass VII<sub>s</sub>; woodland ordination 5s.

**Wt—Winooski silt loam.** This level, moderately well drained, deep soil is on flood plains. The areas are irregularly shaped and range from 6 to 40 acres. This soil is subject to flash floods after heavy, brief rains and to prolonged flooding during and after intensive, extended rains.

Typically, the surface layer is dark grayish brown silt loam 8 inches thick. The subsoil is friable, brown to dark brown silt loam 8 inches thick. The underlying material is friable, mottled, and dark grayish brown to a depth of 60 inches. It is silt loam to a depth of 33 inches and very fine sandy loam at a depth of more than 33 inches.

Included with this soil in mapping are small areas of Podunk Variant and Limerick soils, small areas of soils that have distinct mottles within 15 inches of the surface, and areas of soils that have a very fine sandy loam surface layer. The Podunk Variant soils make up 15 to 30 percent of this map unit, and the other included soils make 10 to 20 percent.

Permeability is moderate, and available water capacity and natural fertility are high. The root zone extends throughout the profile, but root growth is restricted by a seasonal high water table. This soil is slightly acid to neutral unless limed. Runoff is slow. Tilth is good, but tillage is delayed in places by the seasonal high water table and spring floods. The seasonal high water table is evident from midwinter to midspring. Frost action potential is high.

This soil is used mostly for silage corn, hay, and pasture. The remaining acreage is used for woodland or is idle. This soil has good potential for farming. It has good potential as a source of topsoil, as a cover for sanitary landfills, and for some types of wildlife habitat. It has poor potential for most types of community development and other nonfarm uses.

This soil is very well suited to cultivated crops. Stream-bank erosion, flooding, the seasonal high water table, and slow runoff are the main limitations. Crops respond well to lime and fertilizer. Open ditches on the perimeter of cultivated fields help reduce the seasonal high water table and help channel away floodwaters or increase runoff. Cool-season crops are suited to this soil.

If properly managed, this soil is well suited to pasture. Establishing and maintaining a mixture of grasses and legumes and preventing overgrazing are major pasture management concerns. Open ditches on the perimeter of pastures help reduce the seasonal high water table and

help channel away floodwaters. Use of proper stocking rates to maintain desirable grasses and legumes, rotation of pastures, deferment of grazing, and use of lime and fertilizer are suitable management practices. Common pasture grasses and legumes are climax timothy and Ladino clover.

This soil is unsuited to most community development purposes. The flood hazard from adjacent rivers and streams, the seasonal high water table, and slow runoff make building or foundation construction impractical. This soil is, however, a good source of topsoil and sanitary landfill cover.

This soil is limited for recreational use by flooding. Capability subclass II<sub>w</sub>; woodland ordination 3o.

**WxC—Woodstock-Rock outcrop complex, 8 to 15 percent slopes.** This complex consists of sloping and rolling, shallow, somewhat excessively drained and excessively drained soils and Rock outcrop in irregularly shaped areas on bedrock ridges. The areas range from 5 to 100 acres. The soils and Rock outcrop in this complex are in such an intricate pattern that it was not practical to map them separately.

Woodstock soils make up about 60 percent of this complex. Typically, they have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is friable, brown to dark brown gravelly fine sandy loam 10 inches thick. Hard, massive schist bedrock is at a depth of 12 inches.

Rock outcrop makes up about 30 percent of this complex. It consists of exposures of bedrock about 10 to 100 feet apart in a general north-south trend.

Included with this complex in mapping are areas of Tunbridge and Stowe soils, areas where bedrock exposures are more than 100 feet apart, small areas of moderately deep soils, areas of soils that have slopes of less than 8 percent, and areas of soils that are more than 35 percent gravel. The Tunbridge soils make up 1 to 8 percent of this complex, and the other included soils make up 1 to 2 percent.

Permeability is moderately rapid in the Woodstock soils. Available water capacity is very low, and natural fertility is low. Extensive bedrock exposures and shallow depth to bedrock restrict plant rooting depth and root growth. The soil is strongly acid to slightly acid throughout the profile. Runoff is slow. Tilth is good, but workability is severely restricted by extensive bedrock exposures. Depth to bedrock is less than 20 inches. The hazard of erosion is moderate. Runoff is rapid on the Rock outcrop part of this complex.

The Woodstock soils are used mainly for woodland. A very small acreage is used for unimproved pasture or is idle land reverting to woodland. This complex has fair potential for woodland and most recreational uses. Potential is poor for most other uses.

This complex is unsuitable for cultivated crops or hay. Bedrock exposures and low available water capacity are the major limitations.



This complex is poorly suited to unimproved pasture. Kentucky bluegrass is the native unimproved pasture grass on the Woodstock soils.

The Woodstock soils are suited to trees. The major limitations are shallow depth to bedrock, extensive bedrock exposures, low natural fertility, and low available water capacity. The dominant trees on the Woodstock soils are eastern white pine, balsam fir, and sugar maple.

This complex is not suited to intensive community development. Shallow depth to bedrock and extensive bedrock exposures are the major limitations.

This complex is suited to some forms of recreation. Exposures of bedrock and shallow depth to bedrock are the main limitations. Some areas are suitable for skiing.

This complex is limited for wildlife habitat by extensive bedrock exposures, depth to bedrock, low natural fertility, and low available water capacity. Capability subclass VIIi; woodland ordination 4d.

**WxD—Woodstock-Rock outcrop complex, 15 to 25 percent slopes.** This consists of moderately steep and hilly, shallow, somewhat excessively drained and excessively drained soils and Rock outcrop in irregularly shaped areas on bedrock ridges. The areas range from 5 to 150 acres. The soils and Rock outcrop in this complex are in such an intricate pattern that it was not practical to map them separately.

Woodstock soils make up about 50 percent of this complex. Typically, they have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is friable, brown to dark brown gravelly fine sandy loam 10 inches thick. Hard, massive schist bedrock is at a depth of 12 inches.

Rock outcrop makes up about 40 percent of this complex. It consists of exposures of bedrock about 10 to 100 feet apart in a general north-south trend.

Included with this complex in mapping are areas of Tunbridge and Stowe soils, areas where bedrock exposures are more than 100 feet apart, small areas of moderately deep soils, areas of soils that have slopes of less than 8 percent, and areas of soils that are more than 35 percent gravel. The Tunbridge soils make up 1 to 8 percent of this complex, and the other included soils make up 1 to 2 percent.

Permeability is moderately rapid in the Woodstock soils. Available water capacity is very low, and natural fertility is low. Extensive bedrock exposures and shallow depth to bedrock restrict plant rooting depth and root growth. The soil is strongly acid to slightly acid throughout the profile. Runoff is medium. Tilth is good, but workability is severely restricted by extensive bedrock exposures. Depth to bedrock is less than 20 inches. The hazard of erosion is severe. Runoff is rapid on the Rock outcrop part of this complex.

The Woodstock soils are used mainly for woodland. A small acreage is idle land reverting to woodland. This complex has fair potential for woodland. It has poor potential for most recreational uses. Potential is poor for most other uses.

This complex is not suited to cultivated crops or hay. Bedrock exposures, slope, low available water capacity, and erosion are the major limitations.

The Woodstock soils are suited to trees. The major limitations are shallow depth to bedrock, extensive bedrock exposures, low natural fertility, and low available water capacity. The dominant trees are eastern white pine, balsam fir, and sugar maple.

This complex is not suited to intensive community development. It is limited for most urban uses by slope, shallow depth to bedrock, and extensive bedrock exposures.

This complex is not suited to recreation. Extensive bedrock exposures and shallow depth to bedrock are the main limitations. Some areas are suitable for skiing.

Extensive bedrock exposures, depth to bedrock, low natural fertility, and low available water capacity limit this complex for wildlife habitat. Capability subclass VIIiw; woodland ordination 4d.

**WxE—Woodstock-Rock outcrop complex, 25 to 60 percent slopes.** This complex consists of steep, shallow, somewhat excessively drained and excessively drained soils and Rock outcrop in irregularly shaped areas on bedrock ridges. The areas range from 15 to 300 acres. The soils and Rock outcrop in this complex are in such an intricate pattern that it was not practical to map them separately.

Woodstock soils make up about 40 percent of this complex. Typically, they have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is friable, brown to dark brown gravelly fine sandy loam 10 inches thick. Hard, massive schist bedrock is at a depth of 12 inches.

Rock outcrop makes up about 50 percent of this complex. It consists of exposures of bedrock about 10 to 100 feet apart in a general north-south trend.

Included with this complex in mapping are areas of Tunbridge and Stowe soils, areas where bedrock exposures are more than 100 feet apart, small areas of moderately deep soils, areas of soils that have slopes of less than 8 percent, areas of soils that are more than 35 percent gravel, and common areas of seep spots and springs. The Tunbridge soils make up 1 to 8 percent of this complex, and the other included soils make up 1 to 2 percent.

Permeability is moderately rapid in the Woodstock soils. Available water capacity is very low, and natural fertility is low. Extensive bedrock exposures and shallow depth to bedrock restrict plant rooting depth and root growth. The soil is strongly acid to slightly acid throughout the profile. Runoff is slow. Tilth is good, but workability is severely restricted by extensive bedrock exposures. Depth to bedrock is less than 20 inches. The hazard of erosion is severe. Runoff is rapid on the Rock outcrop part of this complex.

The Woodstock soils are used mainly for woodland. This complex has poor potential for woodland and for most recreational uses. Potential is poor for most other uses.

This complex is not suitable for farming. Slope, bedrock exposures, and low available water capacity are the main limitations.

The Woodstock soils are suited to trees. The major limitations are steep slopes, shallow depth to bedrock, and extensive bedrock exposures. The dominant trees are eastern white pine, balsam fir, and sugar maple.

This complex is not suited to intensive community development. It is limited for most urban uses by steep slopes, shallow depth to bedrock, and extensive bedrock exposures.

This complex is not suited to recreation. Slope, bedrock exposures, and erosion in unvegetated areas are the main limitations. Maintaining a vegetative cover and mulching ski trails help reduce the erosion hazard. Some areas are suitable for skiing.

This complex is very poorly suited to wildlife habitat. Slope, extensive bedrock exposures, depth to bedrock, low natural fertility, and low available water capacity are the main limitations. Capability subclass VIIe; woodland ordination 4d.

## 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, rangeland, and 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

DONALD MCFEETERS, county extension agent, agriculture, helped prepare this section.

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; 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.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

The main crops in Franklin County are corn for silage and forage crops. Small grains and other summer annuals, small fruits and vegetables, and some corn for grain are also grown. Forage crops include alfalfa, red clover, timothy, alsike, red-top, brome grass, and Ladino clover.

Use and management of the soils vary somewhat in the different parts of the county. The major management concerns are slope, wetness, low fertility, and stoniness in some areas. Management is needed to control erosion, provide drainage, maintain organic matter content, improve or maintain tilth, and increase fertility.

Practices that help control erosion are growing cover crops, strip cropping, growing grasses or legumes in rotation, grassing waterways, planting trees and shrubs to act as windbreaks for certain kinds of soils that are subject to soil blowing, constructing diversions and ditches to intercept runoff from adjacent slopes, regulating grazing to maintain cover, and using minimum tillage, particularly on short slopes. Applying lime and fertilizer as needed according to the soil test results is helpful.



Many of the soils in the county need improved drainage for optimum crop production. On wet soils tillage operations are delayed because farm machinery often bogs down. Drainage can be improved by constructing open ditches, smoothing the land, and installing tile. Shallow waterways can be used to remove surface water from depressions in fields.

### 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 6. 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 counties 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 6.

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 6 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 landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to 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 two levels: capability class and subclass. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

*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 III 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 of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

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

In class I there are no subclasses because the soils of this class have few limitations. Class V 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 is indicated in table 7. 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 class or subclass is identified in the description of each soil mapping unit in the section "Soil maps for detailed planning."

## Woodland management and productivity

SAMUEL T. HUDSON, JR., county forester, Franklin and Grand Isle Counties, helped prepare this section.

Franklin County has 218,295 acres of merchantable forest. This acreage represents approximately 50 percent of the total land area of the county. The merchantable woodland in the county is in two major geographic areas: the Champlain Valley and the foothills of the Green Mountains. The Champlain Valley makes up about 70 percent of the woodland, and the Green Mountains about 30 percent.

The major tree species in the Champlain Valley are red oak, basswood, elm, ash, soft maple, white pine, hemlock, and northern white-cedar. The management units are generally small.

The major tree species on the foothills of the Green Mountains are soft maple, sugar maple, white birch, yellow birch, beech, ash, basswood, elm, white pine, red spruce, and hemlock. The areas are generally large, and absentee ownership is common.

According to the 1974 utilization data compiled by the Vermont Department of Forests and Parks, 5.6 million board feet of timber and 1,914 cords of hardwood and softwood were harvested in the county. The bulk of the harvested timber is shipped to Canada and to mills in areas adjacent to Franklin County.

Table 8 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. 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; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: *x*, *w*, *t*, *d*, *c*, *s*, *f*, and *r*.

In table 8 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 merchantable or *important 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 a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Important trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

*Trees to plant* are those that are suitable for commercial wood production and that are suited to the soils.

## Engineering

RICHARD GALLO, State conservation engineer, Soil Conservation Service, helped prepare this section.

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, commu-



nity planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

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 horizon 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 9 shows, for each kind of soil, the degree and kind of limitations for building site development; table 10, for sanitary facilities; and table 12, for water management. Table 11 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 9. 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, and open ditches. 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 soil horizons 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 9 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 9 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 10 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 installed or the size of the absorption field can be increased 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 matter 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 10 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 fill 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 horizons, 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 surrounding 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 11 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 ce-

ment 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 A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 15 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon 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 11 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 15.

*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 horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap 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 12 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 seepage 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 12 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 Missisquoi and Lamoille Rivers, Lake Champlain, small streams such as the Black river, and 22 ponds and reservoirs provide boating and fishing opportunities in Franklin County. Pike, trout, bass, and perch are some of the common species of fish.

Franklin County has five private and two State camping areas. These areas provide vacationers and local residents with more than 500 campsites. Golfing facilities are available at three courses in the county.

Opportunities for hunting are available. Waterfowl and small game, such as partridge, rabbit, hare, geese, and many species of duck, are abundant in the western and central parts. White-tail deer and black bear are hunted in the eastern part in large wooded areas in the foothills of the Green Mountains.

Some types of recreation in summer are hiking, biking, horseback riding, picnicking, softball, and tennis. Recreational activities in winter include ice fishing, ice skating, hockey, snowmobiling, and cross-country skiing.

The soils of the survey area are rated in table 13 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 13 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 10, and interpretations for dwellings without basements and for local roads and streets, given in table 9.



*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

GEORGE O'SHEA, manager, Missisquoi National Wildlife Refuge, United States Department of the Interior, helped prepare this section.

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.

If 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 14, 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, wheat, and oats.

*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, brome grass, 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, goldenrod, and beggarweed.

*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, apple, hawthorn, dogwood, hickory, and blueberry. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are 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 properties 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, 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, 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 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 wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

*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 many thousands of 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 test data, and data obtained from physical and chemical laboratory analyses of soils.

## Engineering properties

Table 15 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 15 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 15 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) (2) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (1).

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-matter 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, MH, 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 15. Also in table 15 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.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterburg limits extend a marginal amount across clas-

sification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

## Physical and chemical properties

Table 16 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.

*Risk of corrosion* pertains to 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 acidi-

ty, 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.

*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 17 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 17 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. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

*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 tempera-



ture 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.

## 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."

### Au Gres series

The Au Gres series consists of sandy, mixed, frigid Entic Haplaquods. The soils are deep and somewhat poorly drained. They have an A horizon of very dark grayish brown loamy fine sand and gray fine sand; a B horizon of dark brown and yellowish brown, mottled fine sand; and a C horizon of light olive brown, mottled fine sand. They formed in water-deposited sand and gravel derived from large amounts of quartz and schist. The soils are in areas throughout the county. Slopes range from 0 to 6 percent but are dominantly 0 to 3 percent. The Au Gres soils in Franklin County are a taxadjunct because the soil temperature is mesic.

The Au Gres soils formed in the same kind of material as the associated Windsor, Deerfield, and Wareham soils. Au Gres soils are better drained than Wareham soils but are not so well drained as the Deerfield and Windsor soils.

Typical pedon of Au Gres loamy fine sand, 0 to 6 percent slopes, in a cornfield in the town of Swanton, about 100 feet east of the county road and 3,000 feet south of the Central Vermont Railway:

- Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) loamy fine sand; moderate fine and medium granular structure; very friable; common fine and very fine roots; strongly acid; abrupt wavy boundary.
- A2—9 to 12 inches, gray (10YR 5/1) fine sand; common medium distinct light gray (10YR 7/1) mottles; very weak fine angular blocky structure; very friable; common very fine roots; strongly acid; abrupt wavy boundary.

B21hr—12 to 16 inches, dark brown (7.5YR 3/2) fine sand; common medium distinct dark grayish brown (10YR 4/2) and yellowish red (5YR 4/8) mottles; very weak very fine granular structure; very friable; few very fine roots; dark reddish brown (5YR 3/2) ortstein chunks 2 to 8 mm; slightly acid; abrupt smooth boundary.

B22ir—16 to 25 inches, yellowish brown (10YR 5/6) fine sand; common medium distinct dark red (2.5YR 3/6) and reddish brown (5YR 4/4 and 5/4) mottles; single grained; very friable; very few roots; neutral; gradual smooth boundary.

C—25 to 60 inches, light olive brown (2.5Y 5/4) fine sand; many large distinct yellowish brown (10YR 5/6) and brown to dark brown (7.5YR 4/4) mottles; single grained; loose; no roots; neutral.

The solum thickness ranges from 20 to 48 inches. The content of the coarse fragments, consisting of gravel and cobbles, is less than 10 percent. The content of ortstein chunks within the B21ir horizon ranges from 0 to 20 percent. Reaction of the solum ranges from strongly acid to neutral.

The Ap horizon has hue of 10YR to 7.5YR, value of 2 or 3, and chroma of 1 or 2. The A2 horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It contains distinct or prominent mottles. The A horizon is loamy fine sand or loamy sand.

The upper part of the B horizon has hue of 7.5YR and 10YR, value of 3 to 5, and chroma of 2 to 6. The lower part of the B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6. The lower part of the B horizon is loamy fine sand or sand. Reaction ranges from medium acid to neutral.

The C horizon has hue of 2.5Y or 5Y, value of 5 to 7, and chroma of 1 to 4. It ranges from loamy fine sand to sand. Reaction ranges from medium acid to neutral.

### Belgrade series

The Belgrade series consists of coarse-silty, mixed, mesic Aquic Dystric Eutrochrepts. The soils are deep and moderately well drained. They have an A horizon of brown to dark brown silt loam; a B horizon of dark grayish brown to olive gray, mottled silt loam; and a C horizon of dark grayish brown to dark brown, mottled silt loam. They formed in water-deposited material along major streams in areas throughout the county. Slopes range from 2 to 15 percent but are dominantly 2 to 8 percent.

The Belgrade soils are near the Munson, Raynham, and Eldridge soils. They have less clay in the subsoil and are better drained than the Munson soils, are better drained than Raynham soils, and have a finer textured solum than Eldridge soils.

Typical pedon of Belgrade silt loam, 8 to 15 percent slopes, in a pasture about 2 miles southeast of Binghamville and 400 feet south of the Goose Pond Road:

Ap—0 to 5 inches, brown to dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable; common very fine roots; strongly acid; abrupt smooth boundary.

B21—5 to 7 inches, dark yellowish brown (10YR 4/4) silt loam; moderate medium granular structure; friable; common very fine roots; strongly acid; clear wavy boundary.

B22g—7 to 12 inches, dark grayish brown (2.5Y 4/2) silt loam; common fine faint olive brown (2.5Y 4/4) mottles; moderate very fine subangular blocky structure; friable; common very fine roots; medium acid; clear wavy boundary.

B23g—12 to 15 inches, olive gray (5Y 5/2) very fine sandy loam; many medium distinct dark grayish brown (2.5Y 4/2) and strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; friable; common very fine roots; medium acid; clear wavy boundary.

B3g—15 to 22 inches, dark grayish brown (2.5Y 4/2) silt loam; common medium distinct dark brown (10YR 3/3) mottles; strong fine suban-



gular blocky structure; friable; few very fine roots; medium acid; gradual wavy boundary.

C1g—22 to 30 inches, dark grayish brown (2.5Y 4/2) silt loam; many fine distinct gray (5Y 5/1) mottles; strong coarse angular blocky structure; friable; very few very fine roots; slightly acid; gradual wavy boundary.

C2—30 to 60 inches, brown to dark brown (10YR 4/3) silt loam; many fine distinct gray (5Y 5/1) and olive (5Y 5/3) mottles; moderate fine angular blocky structure; friable; neutral.

The thickness of the solum ranges from 20 to 30 inches. Distinct mottles are at a depth of 12 to 20 inches. Reaction is strongly acid to medium acid in the solum and slightly acid to neutral in the substratum.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The upper part of the B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 6. The lower part of the B horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. Mottles in the lower part are distinct to prominent. The B horizon ranges from very fine sandy loam to silt loam.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. Mottles in the C horizon are distinct or prominent. The C horizon is very fine sandy loam or silt loam.

### Binghamville series

The Binghamville series consists of coarse-silty, mixed, nonacid, mesic Typic Haplaquepts. The soils are deep and poorly drained. They have an A horizon of very dark grayish brown silt loam, a B horizon of grayish brown and olive gray silt loam, and a C horizon of gray and dark grayish brown silt loam. These soils formed in silty sediments that were deposited in old glacial lakes. The soils are in the Champlain Valley and on the foothills of the Green Mountains. Slopes are dominantly less than 1 percent.

Binghamville soils are associated with Raynham, Munson, Birdsall, Belgrade, and Scantic soils. They are not so well drained as Belgrade and Raynham soils. They are better drained than Birdsall soils and are coarser textured than Munson and Scantic soils.

Typical pedon of Binghamville silt loam, in the town of Swanton, 1-1/2 miles south of the village of Swanton and 150 yards in a field on the east side of town road No. 21:

Ap—0 to 11 inches, very dark grayish brown (10YR 3/2) silt loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; many roots; neutral; abrupt smooth boundary.

B21g—11 to 20 inches, grayish brown (2.5Y 5/2) silt loam; common fine distinct dark yellowish brown (10YR 4/6) mottles and few fine distinct gray (10YR 5/1) mottles; moderate fine angular blocky structure; friable; few roots; slightly acid; abrupt wavy boundary.

B22g—20 to 27 inches, olive gray (5Y 5/2) silt loam; few fine faint light brownish gray (2.5Y 6/2) mottles and common medium faint brown (10YR 5/3) mottles; weak very fine granular structure; very friable; few roots; slightly acid; abrupt wavy boundary.

C1g—27 to 45 inches, gray (5Y 5/1) silt loam; common medium faint grayish brown (2.5Y 5/2) mottles; weak thin platy structure; firm; neutral; gradual irregular boundary.

C2g—45 to 60 inches, dark grayish brown (10YR 4/2) silt loam; few fine faint gray (10YR 5/1); weak thin platy structure; firm; neutral.

Depth to bedrock or clayey layers is more than 40 inches. Coarse fragments make up 1 to 2 percent of the solum. Solum reaction is medium acid to neutral.

The A horizon has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 or 2. It is silt loam, silt, or very fine sandy loam. Structure is weak or moderate, fine or medium granular.

The B horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 or 2. Mottles are faint to prominent. The B horizon is silt loam, silt, or very fine sandy loam. Structure is weak or moderate, very fine to medium granular, angular blocky, or subangular blocky.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 or 2. Mottles are faint to prominent. The C horizon is silt loam, silt, or very fine sandy loam. In some pedons it is silty clay loam. Structure is weak, very thin to medium platy.

### Birdsall series

The Birdsall series consists of coarse-silty, mixed, nonacid, mesic Typic Humaquepts. The soils are deep and very poorly drained. They have an A horizon of very dark brown and black muck over very dark brown silt loam; a B horizon of mottled dark gray silt loam and mottled very fine sandy loam; and a C horizon of mottled dark gray silt loam. They formed in lacustrine deposits of very fine sand and silt. The soils are in depressions on terraces and old lake plains throughout the county. Slopes are less than 1 percent. The Birdsall soils in Franklin County are a taxadjunct because the muck layer is 3 inches thicker than that defined in the range for the series.

The Birdsall soils are near Raynham, Binghamville, and Scantic soils. They are not so well drained as these soils. The Birdsall soils are near Carlisle soils and have a thinner layer of muck on the surface.

Typical pedon of Birdsall silt loam in a pasture in the town of Highgate, about 2 miles north of Highgate Center:

O1—11 to 8 inches, very dark brown (10YR 2/2) fibrous muck; moderate fine granular structure; friable; many roots; neutral; clear smooth boundary.

O2—8 inches to 0, black (5YR 2/1) muck; strong fine granular structure; friable; many roots; neutral; clear smooth boundary.

A1—0 to 5 inches, very dark brown (10YR 2/2) silt loam; moderate medium angular blocky structure; firm; many roots; neutral; abrupt wavy boundary.

B21g—5 to 8 inches, dark gray (5Y 4/1) silt loam; common fine faint dark grayish brown (2.5Y 4/2) mottles; weak coarse angular blocky structure; firm; common roots; neutral; abrupt wavy boundary.

B22g—8 to 21 inches, gray (N 5/0) very fine sandy loam; common medium distinct olive (5Y 4/3) mottles; massive; firm; few roots; neutral; clear wavy boundary.

Cg—21 to 60 inches, dark gray (5Y 4/1) silt loam; many coarse distinct olive (5Y 4/3) mottles; massive; firm; no roots; neutral.

The mineral horizons to a depth of 40 inches or more are silt loam or very fine sandy loam. Some pedons have thin layers of contrasting textures. Reaction ranges from medium acid to neutral in all horizons. Muck layers as much as 11 inches thick are on the surface.

The A horizon has value of 1 or 2 and chroma of 1 or 2.

The B horizon is neutral. It has hue of 7.5YR to 5Y, value of 3 or 4, and chroma of 0 to 2.

The C horizon is neutral. It has hue of 5Y to 10YR, value of 1 to 6, and chroma of 1 or 2. It is very fine sandy loam or silt loam.

### Buxton series

The Buxton series consists of fine, mixed, mesic Aquic Dystric Eutrochrepts. The soils are deep and moderately well drained. They have an Ap horizon of dark brown silt loam; a B2 horizon of strong brown silt loam over an A'2 horizon of light brownish gray silt loam; a B' horizon of



grayish brown and gray silty clay loam and silty clay; and a C horizon of mottled, varved, grayish brown silty clay and olive brown fine sand. The soils formed in silty and clayey marine or lacustrine sediments. They are in valleys throughout the county. Slopes range from 8 to 45 percent but are dominantly 15 to 25 percent.

The Buxton soils are associated with Munson, Scantic, Belgrade, and Raynham soils. The Buxton soils are better drained than the Munson and Scantic soils and have more clay in the subsoil and substratum than the Belgrade and Raynham soils.

Typical pedon of Buxton silt loam, 15 to 25 percent slopes, on the west side of Fletcher town road No. 1, about 2/10 mile southwest of the village of Fletcher:

- Ap—0 to 9 inches, dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable; many roots; medium acid; abrupt smooth boundary.
- B2—9 to 12 inches, strong brown (7.5YR 5/8) silt loam; weak very fine granular structure; friable; common roots; medium acid; abrupt irregular boundary.
- A2—12 to 16 inches, light brownish gray (2.5Y 6/2) silt loam; weak thin platy structure; friable; common roots; medium acid; abrupt smooth boundary.
- B2t—16 to 19 inches, grayish brown (10YR 5/2) silty clay loam; few fine prominent light olive brown (2.5Y 5/6) and few faint olive gray (5Y 4/2) mottles; weak fine angular blocky structure; firm; gray (5Y 5/1) ped faces; thin patchy clay films on faces of peds; common roots; slightly acid; abrupt wavy boundary.
- B3t—19 to 31 inches, gray (5Y 5/1) silty clay; common medium distinct dark yellowish brown (10YR 4/4) mottles and few fine distinct yellowish brown (10YR 5/4) mottles; moderate very fine subangular blocky structure; very firm; gray (N 5/0) ped faces; moderately thick clay films in pores; few roots; neutral; abrupt smooth boundary.
- IIC—31 to 60 inches, grayish brown (2.5Y 5/2) silty clay and olive brown (2.5Y 4/4) fine sand (varving); few fine faint olive (5Y 4/3) mottles within the varved sands; strong very fine subangular blocky structure in clay fraction and weak very fine granular structure in the sands; firm (silty clays), very friable (fine sands); gray (5Y 5/1) ped faces; moderately thick discontinuous clay films in pores; neutral.

The solum thickness ranges from 24 to 50 inches. Coarse fragment content is less than 5 percent. Depth to mottling ranges from 15 to 24 inches. Reaction ranges from very strongly acid to neutral throughout the solum.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 or 3. It is silt loam or very fine sandy loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 8. It is silt loam in the upper part and silty clay loam and silty clay in the lower part. Prominent to distinct mottles are between depths of 15 and 24 inches. Few to common clay films occur below a depth of 15 inches.

The C horizon has hue of 10YR and 2.5Y, value of 4 to 6, and chroma of 2 to 4. Mottles are faint to prominent. The C horizon ranges from silty clay to fine sand. It is very fine subangular blocky in the clay fraction and fine granular in the sands. Common clay films are present.

## Cabot series

The Cabot series consists of coarse-loamy, mixed, frigid Typic Fragiaquepts. The soils are deep and somewhat poorly drained. They have an A horizon of very dark grayish brown fine sandy loam; a B horizon of very dark grayish brown, dark grayish brown, and grayish brown fine sandy loam and gravelly fine sandy loam; and a Cx

horizon of olive gray gravelly fine sandy loam. They have a fragipan in the substratum and stones throughout the profile. The soils are stony or extremely stony and formed in glacial till of Wisconsin age that is derived mainly from schistose rock. Areas are mainly on foothills and mountains east of the Champlain Valley. Slopes range from 0 to 8 percent but are dominantly 0 to 3 percent.

The Cabot soils are near Stowe, Peru, Peacham, Tunbridge, and Woodstock soils. Cabot soils are not so well drained as Stowe and Peru soils, are better drained than Peacham soils, and are deeper to bedrock than Tunbridge and Woodstock soils.

Typical pedon of Cabot fine sandy loam in an area of Cabot extremely stony fine sandy loam, 0 to 3 percent slopes, in a pasture 5 miles north of East Fairfield, 4 miles northeast of Fairfield Center, 200 feet south of the Lapland Road:

- A1—0 to 7 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many medium roots; 10 percent coarse fragments; medium acid; abrupt wavy boundary.
- B21g—7 to 10 inches, very dark grayish brown (10YR 3/2) fine sandy loam; many coarse distinct brown to dark brown (10YR 4/3) mottles; weak fine granular structure; friable; common fine roots; 10 percent coarse fragments; slightly acid; abrupt wavy boundary.
- B22g—10 to 13 inches, dark grayish brown (10YR 4/2) gravelly fine sandy loam; many coarse faint dark grayish brown (2.5Y 4/2) mottles; moderate fine granular structure; friable; few fine roots; 20 percent coarse fragments; slightly acid; clear wavy boundary.
- B23g—13 to 16 inches, grayish brown (2.5Y 5/2) gravelly fine sandy loam; many coarse distinct olive brown (2.5Y 4/4) mottles; moderate fine granular structure; firm; few fine roots; 20 percent coarse fragments; slightly acid; abrupt smooth boundary.
- Cxg—16 to 60 inches, olive gray (5Y 4/2) gravelly fine sandy loam; many coarse distinct grayish brown (2.5Y 5/2) and yellowish brown (10YR 5/6) mottles; strong medium platy structure; very firm; no roots; 25 percent coarse fragments; medium acid.

The depth to the fragipan ranges from 12 to 24 inches. Depth to mottling is less than 10 inches. The coarse fragment content ranges from 5 to 35 percent throughout the solum and generally increases with depth. The coarse fragments consist mainly of gravel, channers, cobbles, and stones of micaceous schist, quartzite, and phyllite. Reaction ranges from medium acid to neutral throughout the profile.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3. A few pedons have an A2 horizon.

The B horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 or 2. Mottles in the B horizon are faint to prominent. The B horizon is mainly fine sandy loam but is also silt loam, loam, gravelly loam, and gravelly fine sandy loam.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 4. Mottles, where present, are faint, distinct, or prominent. The C horizon is mainly fine sandy loam but is also very fine sandy loam, loam, silt loam, or gravelly phases of these textures. The C horizon has medium platy structure, or it is massive. It is firm to extremely firm.

## Carlisle series

The Carlisle series consists of euic, mesic Typic Medisapristis. The soils are deep, very poorly drained, and organic and have black, highly decomposed sapric material underlain by dominantly dark reddish brown, highly decomposed sapric material. They formed in bogs derived primarily from woody organic deposits. They are in bogs within lake plains, outwash plains, till plains, and

moraines. These soils are throughout the county but are prevalent in the Champlain Valley. Slopes are less than 1 percent.

Carlisle soils formed in the same kind of material as the associated Terric Medisapristis but have a thicker muck layer. Carlisle soils are also associated with Wareham and Peacham soils, which do not have thick muck layers.

Typical pedon of Carlisle muck in the town of St. Albans, about 3 miles west of the city of St. Albans:

- Oa1—0 to 2 inches, black (N 2/0) muck (sapric material), very dark gray (10YR 3/1) when rubbed; about 30 percent fiber, about 5 percent rubbed; weak fine granular structure; nonsticky; many very fine live roots; white (10YR 8/1) in sodium pyrophosphate; slightly acid (pH 6.2 in 0.01 M calcium chloride); abrupt smooth boundary.
- Oa2—2 to 8 inches, dark reddish brown (5YR 3/2) muck (sapric material), broken and rubbed; about 15 percent fiber, 8 percent rubbed; moderate coarse angular blocky structure; nonsticky; few very fine live roots; white (10YR 8/2) in sodium pyrophosphate; slightly acid (pH 6.2 in 0.01 M calcium chloride); clear wavy boundary.
- Oa3—8 to 23 inches, dark reddish brown (5YR 2/2) muck (sapric material), broken and rubbed; about 25 percent fiber, 12 percent rubbed; massive parting to moderate very coarse angular blocky structure; nonsticky, white (10YR 8/2) in sodium pyrophosphate; slightly acid (pH 6.4 in 0.01 M calcium chloride); gradual wavy boundary.
- Oa4—23 to 44 inches, dark reddish brown (5YR 2/2) muck (sapric material), broken and rubbed; about 30 percent fiber, 12 percent rubbed; massive parting to moderate very coarse angular blocky structure; nonsticky; light gray (10YR 7/2) in sodium pyrophosphate; medium acid (pH 6.0 in 0.01 M calcium chloride); clear wavy boundary.
- Oa5—44 to 60 inches, very dark brown (10YR 2/2) muck (sapric material), broken and rubbed; about 15 percent fiber, 5 percent rubbed; massive; nonsticky; light gray (10YR 7/2) in sodium pyrophosphate; medium acid (pH 6.0 in 0.01 M calcium chloride); clear wavy boundary.

The thickness of the organic deposits is more than 51 inches. Woody fragments of twigs, branches, logs, or stumps are throughout the profile in most pedons and make up 15 to 30 percent of the volume in some pedons. Fragments range in size from 1/4 inch to 1-1/4 inches in diameter. Reaction ranges from very strongly acid to mildly alkaline throughout the profile.

The surface tiers have hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 0 or 1. They are dominantly sapric material and are 30 percent fiber and about 5 percent rubbed.

The subsurface tiers have hue of 5YR to 10YR, value of 2 or 3, and chroma of 0 to 2. They are dominantly sapric material and are 15 to 30 percent fiber and 5 to 12 percent rubbed. The structure is weak or moderate granular or blocky or massive.

## Colton series

The Colton series consists of sandy-skeletal, mixed, frigid Typic Haplorthods. The soils are deep and excessively drained. They have an A horizon of dark brown gravelly loamy sand; a B horizon of yellowish red, reddish yellow, and brownish yellow gravelly loamy sand and gravelly sand; and a C horizon of dark yellowish brown gravelly sand. These soils are nearly level to steep. They formed in water-deposited sands and gravel high in content of quartz, schist, and phyllite. They formed on old beaches, terraces, or kames in the Champlain Valley and along the western edge of the Green Mountains. Slopes range from 2 to 60 percent but are dominantly 15 to 25 percent.

The Colton soils are near Missisquoi, Windsor, Deerfield, and Stowe soils. They have more coarse fragments than the Missisquoi and Windsor soils, are better drained than the Deerfield soils, and do not have the fragipan typical of the Stowe soils.

Typical pedon of Colton gravelly loamy sand, 2 to 8 percent slopes, in an idle field about 2 miles southwest of East Fairfield and 1,000 feet east of Lapland Road:

- Ap—0 to 7 inches, dark brown (7.5YR 3/2) gravelly loamy sand; weak very fine granular structure; very friable; many roots; 20 percent coarse fragments; strongly acid; abrupt wavy boundary.
- B21ir—7 to 9 inches, yellowish red (5YR 5/8) gravelly loamy sand; weak very fine granular structure; very friable; many roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.
- B22ir—9 to 13 inches, yellowish red (5YR 4/6) gravelly loamy sand; weak very fine granular structure; very friable; many roots; 30 percent coarse fragments; medium acid; clear wavy boundary.
- B23—13 to 19 inches, reddish yellow (7.5YR 6/8) gravelly sand; single grained; loose; common roots; 30 percent coarse fragments; strongly acid; abrupt wavy boundary.
- B24—19 to 25 inches, brownish yellow (10YR 6/6) gravelly sand; single grained; loose; few roots; 40 percent coarse fragments; medium acid; clear wavy boundary.
- C—25 to 60 inches, dark yellowish brown (10YR 4/4) gravelly sand; single grained; loose; no roots; 45 percent coarse fragments; medium acid.

The solum thickness ranges from 18 to 30 inches. Coarse fragments are mainly gravel and cobblestones and make up 10 to 55 percent of the solum and 35 to 70 percent of the C horizon. The profile is strongly acid or medium acid.

The A1 or Ap horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 2 to 4. The A2 horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The B horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 2 to 8. The Bh horizon, where present, has hue of 5YR or 7.5YR, values of 2 or 3, and chroma of 1 or 2. The B horizon is generally gravelly loamy sand and gravelly sand but includes gravelly fine sandy loam in some profiles. Structure is weak very fine granular and single grained.

The C horizon has hue of 2.5Y or 10YR, value of 3 to 6, and chroma of 2 to 6. It ranges from gravelly fine sand to very gravelly coarse sand.

## Copake series

The Copake series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Dystric Eutrochrepts. The soils are deep and somewhat excessively drained. They have an Ap horizon of very dark grayish brown fine sandy loam, a B horizon of dark brown sandy loam and dark yellowish brown gravelly sandy loam, and a C horizon of dark brown and very dark grayish brown gravelly coarse sand and gravelly sand. The soils formed in gravelly, water-deposited material. They are in the Champlain Valley. Slopes range from 2 to 8 percent. The Copake soils in Franklin County are a taxadjunct because the upper part of the solum is more than 40 percent fine and coarse sand.

The Copake soils are near St. Albans soils. They have more gravel in the C horizon than the St. Albans soils.

Typical pedon of Copake fine sandy loam, 2 to 8 percent slopes, in a roadcut 2-1/4 miles northwest of the city of St. Albans, on the north side of Newton Road, 200 feet west of the railroad tracks:



Ap—0 to 8 inches, very dark grayish brown (10YR 3/2) fine sandy loam; strong medium granular structure; friable; many very fine and fine roots; 10 percent coarse fragments; neutral; abrupt smooth boundary.

B21—8 to 16 inches, brown to dark brown (7.5YR 4/4) sandy loam; moderate medium angular blocky structure; friable; many very fine and fine roots; 15 percent coarse fragments; neutral; clear wavy boundary.

B22—16 to 21 inches, dark yellowish brown (10YR 3/4) gravelly sandy loam; weak medium angular blocky structure; very friable; common very fine and fine roots; 20 percent coarse fragments; neutral; clear wavy boundary.

IIC1—21 to 36 inches, dark brown (7.5YR 3/2) gravelly coarse sand; weak coarse angular blocky structure parting to moderate fine granular structure; very friable; common very fine and fine roots; 50 percent coarse fragments; neutral; abrupt wavy boundary.

IIIC2—36 to 60 inches, very dark grayish brown (10YR 3/2) gravelly sand; single grained; loose; few very fine and fine roots; 20 percent coarse fragments; neutral.

Thickness of the solum ranges from 20 to 36 inches. Depth to carbonates is more than 40 inches. Coarse fragments make up less than 30 percent of the solum and 20 to 60 percent of the IIC horizon. Reaction ranges from medium acid to neutral.

The Ap horizon ranges from very dark grayish brown (10YR 3/2) to dark yellowish brown (10YR 4/4).

The B horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 3 to 6. It ranges from fine sandy loam to sandy loam and their gravelly analogues. It has loose to friable consistence.

The IIC and IIIC horizons have hue of 7.5YR to 5Y, value of 3 to 5, and chroma of 2 to 4. They are gravelly loamy sand to very gravelly coarse sand.

## Covington series

The Covington series consists of very fine, illitic, mesic Mollic Ochraqualfs. The soils are deep and poorly drained. They have an A horizon of very dark brown clay; a B horizon of olive gray and gray, mottled clay; and a C horizon of gray and grayish brown clay. The soils formed in waterlaid deposits of clay. They are mainly level and are in the western part of the county on old lake plains near Lake Champlain. Slopes are less than 2 percent.

The Covington soils are near Kingsbury, Scantic, and Massena soils. They are not so well drained as the Kingsbury soils and are finer textured than the Massena and Scantic soils.

Typical pedon of Covington clay 150 feet in a hayfield on the east side of Vermont Route 36, 1,000 feet from St. Albans and Fairfield town lines in the town of St. Albans:

Ap—0 to 6 inches, very dark brown (10YR 2/2) clay; moderate fine granular structure; friable; many roots; neutral; abrupt smooth boundary.

B21g—6 to 19 inches, gray (5Y 5/1) clay; many medium prominent light olive brown (2.5Y 5/4) mottles; moderate fine angular blocky structure; friable; common roots; neutral; abrupt smooth boundary.

B22tg—19 to 27 inches, olive gray (5Y 5/2) clay; many medium prominent yellowish brown (10YR 5/4) and brown (7.5YR 5/4) mottles; strong medium angular blocky structure; firm; brown to dark brown (7.5YR 4/2) ped coatings; common roots; neutral; clear smooth boundary.

C1g—27 to 32 inches, gray (5Y 5/1) clay; many fine prominent dark yellowish brown (10YR 4/4) mottles; moderate fine angular blocky structure; friable; very few roots; neutral; clear boundary.

C2g—32 to 60 inches, grayish brown (10YR 5/2) and brown to dark brown (10YR 4/3) clay; weak fine angular blocky structure; friable; no roots; mildly alkaline; strong effervescence.

Depth to carbonates is 32 to more than 40 inches. Thickness of the solum ranges from 20 to 30 inches. Reaction ranges from strongly acid to neutral in the A horizon, strongly acid to mildly alkaline in the B horizon, and neutral to moderately alkaline in the C horizon.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 or 2. The structure is commonly fine to medium angular blocky.

The C horizon has matrix colors similar to the B horizon. The structure is commonly fine to medium angular blocky.

## Deerfield series

The Deerfield series consists of mixed, mesic Aquic Udipsamments. The soils are deep, nearly level to sloping, moderately well drained, and coarse textured. They are on deltas, beaches, and stream terraces. These soils are high in content of quartz and schist. They are mainly on large sand plains near the major streams in the county.

Deerfield soils are near Windsor, Missisquoi, and Au Gres soils. They are not so well drained as the Windsor and Missisquoi soils. They are better drained than Au Gres soils.

Typical pedon of Deerfield loamy fine sand, 0 to 8 percent slopes, in a pasture in the town of Sheldon, 0.7 mile east of Sheldon Junction on Route 105, 100 yards south of the railroad tracks:

Ap—0 to 8 inches, very dark grayish brown (10YR 3/2) loamy fine sand, pale brown (10YR 6/3) dry; moderate medium granular structure; very friable; many roots; less than 5 percent coarse fragments; neutral; abrupt wavy boundary.

B2—8 to 13 inches, yellowish brown (10YR 5/6) sand; few fine distinct dark reddish brown (5YR 3/3) mottles; single grained; loose; common roots; less than 5 percent coarse fragments; slightly acid; clear smooth boundary.

B3—13 to 18 inches, light olive brown (2.5Y 5/4) sand; few fine distinct dark brown (10YR 4/3) mottles; single grained; loose; few roots; less than 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

C1—18 to 28 inches, olive (5Y 5/4) fine sand; few fine distinct very dark grayish brown (10YR 3/2) mottles; massive; friable; no roots; less than 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

C2—28 to 60 inches, olive (5Y 5/4) sand; few fine distinct very dark grayish brown (10YR 3/2) mottles; massive; very friable; no roots; less than 5 percent coarse fragments; strongly acid.

The solum ranges in thickness from 15 to 27 inches. Mottling occurs at a depth of 8 to 23 inches. The profile is less than 5 percent coarse fragments at a depth of less than 30 inches and is as much as 15 percent coarse fragments at a depth of more than 30 inches.

The Ap horizon has hue of 10YR or 7.5YR, value of 2 to 4, and chroma of 1 to 3.

The B horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 to 6. Mottles are distinct to prominent in this horizon. The B horizon is loamy sand, loamy fine sand, fine sand, and sand.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. Mottles with chroma of 2 or less are distinct or prominent. The C horizon is loamy fine sand to sand. Below a depth of 30 inches it is gravelly sand or gravelly coarse sand in some pedons. In most places the C horizon is less than 35 percent gravel.

## Eldridge series

The Eldridge series consists of sandy over loamy, mixed, nonacid, mesic Aquic Udorthents. The soils are

deep and moderately well drained. They have an A horizon of brown to dark brown loamy fine sand; a B horizon of mottled, yellowish brown, dark yellowish brown, and light olive brown fine sand; and a C horizon of olive and light brownish gray fine sand and very fine sandy loam. The soils are level to sloping. They are derived from shallow, sandy deposits of outwash of eolian origin underlain by finer textured estaurine or lacustrine sediment. Slopes range from 0 to 15 percent.

Eldridge soils are adjacent to Raynham, Belgrade, Deerfield, and Hinesburg soils. They are coarser textured in the surface layer and subsoil than the Raynham and Belgrade soils. They are finer textured in the substratum than the Deerfield soils and are not so well drained as the Hinesburg soils.

Typical pedon of Eldridge loamy fine sand, 8 to 15 percent slopes, in a hayfield in the town of Georgia, about 1.25 miles southwest of Georgia Center and 150 feet north of Town Road 28:

Ap—0 to 7 inches, brown to dark brown (10YR 4/3) loamy fine sand; weak fine granular structure; friable; medium acid; abrupt smooth boundary.

B21—7 to 12 inches, yellowish brown (10YR 5/4) loamy fine sand; weak fine granular structure; friable; neutral; abrupt wavy boundary.

B22—12 to 20 inches, dark yellowish brown (10YR 4/4) fine sand; weak fine granular structure; friable; neutral; clear wavy boundary.

B23—20 to 26 inches, light olive brown (2.5Y 5/4) fine sand; few fine distinct yellowish brown (10YR 5/6) mottles; single grained; loose; neutral; gradual wavy boundary.

C1—26 to 28 inches, olive (5Y 5/3) fine sand; common medium distinct gray (5Y 6/1) and yellowish brown (10YR 5/6) mottles; single grained; loose; neutral; clear broken boundary.

IIC2—28 to 60 inches, light brownish gray (2.5Y 6/2) very fine sandy loam; coatings of brown to dark brown (10YR 4/3); weak medium platy structure; friable; slightly acid.

Thickness of solum ranges from 14 to 28 inches. Depth to the contrasting finer textured material ranges from 16 to 28 inches. Coarse fragments make up less than 5 percent, by volume, of the solum. Reaction ranges from strongly acid to neutral throughout the profile.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. It ranges from loamy fine sand to sand. The structure is weak fine granular or the horizon is single grained. The lower part of the B horizon is mottled.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. The C1 horizon is fine sand to sand. The IIC horizon is silt loam or very fine sandy loam.

## Enosburg series

The Enosburg series consists of sandy over loamy, mixed, nonacid, frigid Mollic Haplaquents. The soils are deep and poorly drained. They have an A horizon of very dark gray loamy fine sand and a C horizon of grayish brown, light brownish gray, and gray, mottled loamy fine sand, very fine sandy loam, and silt loam. The soils are nearly level to gently sloping and are derived from beach or eolian sands underlain by estaurine or lacustrine loamy textured sediment. These soils are on deltas, old beaches, and terraces in the major stream valleys of the county. Slopes range from 0 to 8 percent but are dominantly 0 to 3 percent.

The Enosburg soils are adjacent to Eldridge, Raynham, and Wareham soils. They are more sandy in the upper part of the soil than the Raynham soils. They are not so well drained as the Eldridge soils and have finer textured material in the lower part of the profile than the Wareham soils.

Typical pedon of Enosburg loamy fine sand, 0 to 3 percent slopes, in a hayfield in the town of Swanton, about 2 miles south of the village of Swanton and 200 feet east of the county road:

Ap—0 to 7 inches, very dark gray (10YR 3/1) loamy fine sand; weak fine granular structure; friable; many roots; neutral; abrupt smooth boundary.

C1g—7 to 16 inches, grayish brown (2.5Y 5/2) loamy fine sand; common fine distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; common roots; neutral; clear smooth boundary.

C2g—16 to 22 inches, light brownish gray (2.5Y 6/2) loamy fine sand; common fine distinct olive brown (2.5Y 4/4) mottles; weak medium platy to weak fine granular structure; friable; common roots; neutral; clear smooth boundary.

IIC3g—22 to 26 inches, gray (5Y 5/1) very fine sandy loam; common fine distinct yellowish red (5YR 5/8) and light olive brown (2.5Y 5/4) mottles; weak medium platy structure; friable; few roots; neutral; clear smooth boundary.

IIC4g—26 to 60 inches, gray (5Y 5/1) silt loam; many fine and medium prominent olive brown (2.5Y 4/4) and strong brown (7.5YR 5/8) mottles; weak medium platy structure; friable; few roots; neutral.

Depth to contrasting finer textured material ranges from 16 to 34 inches. Coarse fragments make less than 10 percent, by volume, of the profile. Reaction ranges from strongly acid to neutral in the sandy horizons and slightly acid to neutral in the loamy horizons.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The upper part of the C horizon has hue of 2.5Y, value of 4 to 6, and chroma of 1 or 2. It ranges from coarse sand to fine sand. Mottles are distinct or prominent.

The lower part of the C horizon is neutral or has hue of 5Y, value of 4 to 5, and chroma of 0 or 1. It is silt, silt loam, very fine sandy loam, or silty clay loam and is less than 35 percent clay. Mottles are distinct or prominent.

## Farmington series

The Farmington series consists of loamy, mixed, mesic Lithic Eutrochrepts. The soils are shallow and somewhat excessively drained. They have an A horizon of brown loam and a B horizon of dark grayish brown and brown to dark brown loam. Below this is massive limestone or marble bedrock. These soils formed in glacial till containing a large amount of limestone, marble, and shale. They are in scattered areas in the Champlain Valley. Slopes range from 3 to 60 percent but are dominantly 15 to 60 percent.

The Farmington soils are near well drained St. Albans soils, moderately well drained Georgia soils, and somewhat poorly drained Kingsbury and Massena soils. The Farmington soils have bedrock at a shallower depth than these soils, and they have a much lower clay content than the Kingsbury soils.

Typical pedon of Farmington loam, in an area of Farmington loam, very rocky, 3 to 8 percent slopes, in a pasture about 1.5 miles north northeast of St. Albans Bay and 2,200 feet west of the Kellogg Road:



A1—0 to 4 inches, dark brown (7.5YR 3/2) loam; moderate medium granular structure; friable; many very fine roots; slightly acid; clear smooth boundary.

B21—4 to 9 inches, dark grayish brown (10YR 4/2) loam; moderate fine subangular blocky structure; friable; many very fine roots; slightly acid; abrupt wavy boundary.

B22—9 to 14 inches; brown to dark brown (7.5YR 4/4) loam; moderate fine subangular blocky structure; friable; common very fine roots; neutral; abrupt irregular boundary.

R—14 inches; massive limestone bedrock.

Thickness of the solum and depth to bedrock range from 10 to 20 inches. The solum is less than 5 percent to 35 percent coarse fragments. Reaction ranges from strongly acid to neutral throughout the profile.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. It is sandy loam to silt loam.

The B horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 6. It is fine sandy loam to silt loam. Structure is weak fine granular to moderate fine subangular blocky.

The underlying bedrock is marble, limestone, or shaly limestone.

## Georgia series

The Georgia series consists of coarse-loamy, mixed, mesic Aquic Dystric Eutrochrepts. The soils are deep and moderately well drained. They have an A horizon of very dark grayish brown loam; a B horizon of dark yellowish brown, light olive brown, and olive brown loam; and a C horizon of dark brown and olive brown mottled fine sandy loam. They formed in glacial till derived mainly from limestone and calcareous shale. These soils are stony and extremely stony and formed in glaciated uplands in the western portion of Franklin County. Slopes range from 0 to 15 percent but are dominantly 3 to 8 percent.

Georgia soils are adjacent to Massena, St. Albans, and Lordstown soils. They are better drained than the Massena soils and are not so well drained as the Lordstown and St. Albans soils. They are deeper to bedrock than the Lordstown soils.

Typical pedon of Georgia loam in an area of Georgia stony loam, 0 to 3 percent slopes, in a hayfield in the town of Franklin, about 1/2 mile east of Morses Line and 2,300 feet north of Vermont Route 235:

A1—0 to 2 inches, very dark grayish brown (10YR 3/2) loam; strong fine granular structure; friable; many fine and very fine roots; 5 percent coarse fragments; neutral; abrupt smooth boundary.

B21—2 to 6 inches, dark yellowish brown (10YR 4/4) loam; moderate fine subangular blocky structure; friable; many fine and very fine roots; 5 percent coarse fragments; slightly acid; clear wavy boundary.

B22—6 to 13 inches, light olive brown (2.5Y 5/4) loam; moderate coarse subangular blocky structure; friable; common very fine roots; 10 percent coarse fragments; slightly acid; abrupt wavy boundary.

B23—13 to 17 inches, olive brown (2.5Y 4/4) silt loam; many large distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common very fine roots; 10 percent coarse fragments; slightly acid; abrupt wavy boundary.

B3—17 to 22 inches, olive brown (2.5Y 4/4) silt loam; common medium distinct grayish brown (2.5Y 5/2) and pale olive (5Y 6/3) mottles; weak medium subangular blocky structure; friable; few very fine roots; 10 percent coarse fragments; slightly acid; clear wavy boundary.

C1—22 to 43 inches, dark brown (10YR 4/3) fine sandy loam; common medium distinct light olive brown (2.5Y 5/4) mottles; massive; firm; few very fine roots; 10 percent coarse fragments; slightly acid; gradual wavy boundary.

C2—43 to 60 inches, olive brown (2.5Y 4/4) fine sandy loam; few medium faint light olive brown (2.5Y 5/4) mottles; weak medium platy structure; firm; no roots; 15 percent coarse fragments; neutral.

Thickness of the solum ranges from 16 to 32 inches. Coarse fragments make up 5 to 35 percent of the profile. Reaction ranges from medium acid to neutral, and the soil is less acid with depth.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is silt loam or loam or gravelly analogues.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 4. It is fine sandy loam or loam or gravelly analogues.

## Hadley series

The Hadley series consists of coarse-silty, mixed, nonacid, mesic Typic Udifluvents. The soils are deep and well drained. They have an Ap horizon of brown to dark brown silt loam and a C horizon of light olive brown and olive brown very fine sandy loam and silt loam. They formed in alluvial deposits consisting mainly of very fine sand and silt. These soils are mostly along the major rivers and creeks in the county. Slopes range from 0 to 2 percent but are dominantly less than 1 percent.

Hadley soils formed in the same kind of material as the associated Winooski and Limerick soils but are better drained. They are associated with the Ondawa Variant soils, which are coarser textured in the surface layer and subsoil.

Typical pedon of Hadley silt loam in a hayfield in the town of Fairfax, 3.4 miles east of the village of Fairfax, along the north bank of the Lamoille River:

Ap—0 to 8 inches, brown to dark brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many medium roots; neutral; gradual wavy boundary.

C1—8 to 32 inches, light olive brown (2.5Y 5/4) very fine sandy loam; weak very fine granular structure; very friable; many fine roots; neutral; gradual wavy boundary.

C2—32 to 60 inches, olive brown (2.5Y 4/4) silt loam; massive; friable; common very fine roots in the upper portion; neutral.

Thickness and number of subsurface horizons correspond closely to the thickness and variability of the alluvial deposits. Reaction ranges from very strongly acid to neutral, but some subsurface horizons are medium acid to neutral.

The Ap horizon has hue of 10YR to 5Y, value of 3 or 4, and chroma of 2 to 4. It is silt loam to very fine sandy loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 to 4. It is silt loam to very fine sand to a depth of 40 inches and silt loam to sand at a depth of more than 40 inches.

## Hinesburg series

The Hinesburg series consists of sandy over loamy, mixed, nonacid, mesic Typic Udorthents. The soils are deep and well drained. They have an Ap horizon of brown to dark brown loamy fine sand; a B horizon of strong brown, light yellowish brown, and yellowish brown loamy fine sand; and a C horizon of dark olive gray silt loam. They formed in sandy material that is underlain by medium textured material. The soils are on deltas, beaches, and terraces throughout the county but are mostly in the larger stream valleys. Slopes range from 0 to 60 percent but are dominantly 15 to 25 percent.

The Hinesburg soils are adjacent to Belgrade, Eldridge, and Windsor soils. They are better drained than the Belgrade and Eldridge soils, are coarser textured in the surface layer and subsoil than the Belgrade soils, and have a silty substratum that the Windsor soils do not have.

Typical pedon of Hinesburg loamy fine sand, 8 to 15 percent slopes, in an idle field about 4/5 mile northeast of Fairfax Falls and 125 feet south of the Shephardson Hollow Road:

- Ap—0 to 7 inches, brown to dark brown (7.5YR 4/2) loamy fine sand; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.
- B21lr—7 to 10 inches, strong brown (7.5R 5/6) loamy fine sand; weak fine granular structure; very friable; common roots; slightly acid; clear wavy boundary.
- B22—10 to 18 inches, light yellowish brown (10YR 6/4) loamy fine sand; massive; very friable; few roots; slightly acid; clear wavy boundary.
- B23—18 to 22 inches, yellowish brown (10YR 5/4) loamy fine sand; massive; very friable; few roots; medium acid; abrupt wavy boundary.
- IIC—22 to 60 inches, dark olive gray (5Y 3/2) silt loam; weak medium platy structure; firm; no roots; medium acid.

Thickness of the solum ranges from 16 to 28 inches. Depth to medium textured material ranges from 18 to 36 inches. Reaction ranges from medium acid to neutral throughout the profile.

The A horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 6. It is dominantly loamy fine sand but is loamy sand, fine sand, and sand in places.

The C horizon has hue of 2.5Y or 5Y, value of 3 to 5, and chroma of 1 to 4. The IIC horizon is dominantly silt loam or very fine sandy loam but is silty clay loam in some pedons.

### Kingsbury series

The Kingsbury series consists of very fine, illitic, mesic Aeric Ochraqualfs. The soils are deep and somewhat poorly drained. They have an Ap horizon of dark grayish brown clay; a B horizon of dark grayish brown, mottled clay; and a C horizon of yellowish brown, mottled clay. These soils are level to sloping and formed in waterlaid deposits of clay. They are on lake plains in the western portion of the Champlain Valley. Slopes range from 0 to 8 percent but are dominantly 0 to 3 percent.

The Kingsbury soils are near Covington, Scantic, and Munson soils. They are better drained and have a lower organic matter content in the surface layer than the Covington soils. They have a higher clay content than the Scantic or Munson soils.

Typical pedon of Kingsbury clay, 0 to 3 percent slopes, 100 feet in a hayfield, 250 feet west of Dunsmore Road in the town of St. Albans:

- Ap—0 to 6 inches, dark grayish brown (10YR 4/2) clay, light brownish gray (2.5Y 6/2) dry; moderate medium granular structure; firm; many very fine and fine roots; neutral; abrupt smooth boundary.
- A2—6 to 11 inches, grayish brown (2.5Y 5/2) clay; common fine distinct gray (5Y 5/1) mottles; strong fine and medium angular blocky structure; firm; common very fine and fine roots; neutral; clear wavy boundary.
- B21tg—11 to 22 inches, dark grayish brown (10YR 4/2) clay; few fine distinct grayish brown (2.5Y 5/2) and brown to dark brown (7.5YR

4/2) mottles; strong fine and very fine angular blocky structure; firm; common very fine roots; thin patchy clay films on ped faces; neutral; clear wavy boundary.

B22g—22 to 36 inches, dark grayish brown (10YR 4/2) clay; common fine distinct brown to dark brown (7.5YR 4/2 and 7.5YR 4/4) mottles; strong very fine and fine angular blocky structure; firm; few very fine roots; clay films on ped faces; neutral; abrupt smooth boundary.

C—36 to 60 inches, yellowish brown (10YR 5/6) clay; many medium distinct light brownish gray (2.5Y 6/2), brown (10YR 5/3), and yellowish brown (10YR 5/4) mottles; moderate medium angular blocky structure; firm; no roots; calcareous; very slightly effervescent with cold dilute hydrochloric acid; mildly alkaline.

The thickness of the solum ranges from 20 to 36 inches. Depth to carbonates ranges from 34 to 60 inches. A chroma of 2 or less is dominant between depths of 6 and 30 inches. Reaction ranges from medium acid to neutral in the solum and from neutral to mildly alkaline in the C horizon.

The A horizon has hue of 10YR to 5Y, value of 2 to 5, and chroma of 1 to 3. It is silt loam, very fine sandy loam, or silty clay.

The B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. It is prominently or distinctly mottled.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6. It is distinctly or prominently mottled.

### Limerick series

The Limerick series consists of coarse-silty, mixed, nonacid, mesic Typic Fluvaquents. The soils are deep and poorly drained. They have an A horizon of dark grayish brown silt loam and a C horizon of dark grayish brown and grayish brown, mottled silt loam. They formed in recent alluvial deposits that are dominantly silt and very fine sand. They are on flood plains along the major stream in the county. Slopes are less than 1 percent.

The Limerick soils are adjacent to Winooski, Hadley, Wallkill, Ondowa Variant, Podunk Variant, and Rumney Variant soils. Limerick soils are not so well drained as Winooski and Hadley soils, do not have the thick organic layer within 40 inches of the surface that is typical of the Wallkill soils, and are finer textured in the upper 40 inches of the profile than the Ondowa Variant, Podunk Variant, and Rumney Variant soils. The Limerick soils are associated with Raynham soils but are subject to more flooding and more soil accumulation on the surface.

Typical pedon of Limerick silt loam in a hayfield along Black Creek, about 2-1/2 miles southeast of East Fairfield:

- Ap—0 to 8 inches, dark grayish brown (10YR 4/2) silt loam; weak fine subangular blocky structure; friable; many very fine roots; neutral; abrupt smooth boundary.
- C1g—8 to 11 inches, dark grayish brown (2.5Y 4/2) silt loam; distinct dark yellowish brown (10YR 4/4) mottles; weak thin platy structure; friable; few very fine roots; neutral; abrupt wavy boundary.
- C2g—11 to 18 inches, grayish brown (2.5Y 5/2) silt loam; distinct brown to dark brown (7.5YR 4/4) and dark yellowish brown (10YR 4/4) mottles; weak thin platy structure; friable; few very fine roots; neutral; gradual irregular boundary.
- C3g—18 to 60 inches, grayish brown (2.5Y 5/2) silt loam; distinct brown to dark brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; no roots; neutral.

Texture to a depth of 40 inches is dominantly silt loam but includes very fine sandy loam. Lenses of coarser material are in many pedons.



Coarse fragments are generally absent or make up at most 2 or 3 percent of the profile. Reaction is generally slightly acid to neutral throughout the profile, but in some pedons it is strongly acid.

The A horizon has value of 3 or 4 and chroma of 2 or 3. It is silt loam or very fine sandy loam. Structure is weak or moderate, fine or medium granular or subangular blocky.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. Mottles are faint to prominent. Structure is mainly weak granular or platy but includes massive and blocky. Varves of contrasting color, texture, or reaction are quite common in this horizon.

## Lordstown series

The Lordstown series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. The soils are moderately deep and well drained. They have an A horizon of brown to dark brown loam and a B horizon of brown to dark brown loam. Below this is shale bedrock. These soils formed in glacial till derived from shale and slate. They are on low, rounded and elongated hills in the Champlain Valley. Slopes range from 3 to 60 percent but are dominantly 5 to 15 percent.

Lordstown soils are near Farmington, St. Albans, Georgia, Massena, and Kingsbury soils. Lordstown soils are deeper than Farmington soils, have a lower clay content throughout than Kingsbury soils, and are shallower than St. Albans, Georgia, and Massena soils. Farmington soils are better drained than Georgia and Massena soils.

Typical pedon of Lordstown loam, rocky, 3 to 8 percent slopes, in a pasture 1,000 feet north of Lapan Bay and east of the swamp in the town of St. Albans:

- Ap—0 to 9 inches, brown to dark brown (10YR 4/3) loam, very pale brown (10YR 7/3) dry; strong medium granular structure; friable; many fine and very fine roots; 10 percent coarse fragments; medium acid; abrupt wavy boundary.
- B21—9 to 17 inches, brown (10YR 5/3) loam, very pale brown (10YR 7/3) dry; moderate very fine and fine subangular blocky structure; friable; common very fine roots; 10 percent coarse fragments; medium acid; gradual wavy boundary.
- B22—17 to 27 inches, brown to dark brown (10YR 4/3) fine sandy loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure; friable; few very fine roots; 15 percent coarse fragments; medium acid; abrupt wavy boundary.
- R—27 inches, shale bedrock.

Thickness of the solum ranges from 20 to 30 inches. Depth to bedrock ranges from 20 to 40 inches. Coarse fragments make up 5 to 35 percent of the profile and increase with depth. Reaction ranges from strongly acid to medium acid throughout the profile.

The A horizon has hue of 10YR to 2.5Y, value of 2 to 4, and chroma of 2 or 3. It is loam or silt loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. It is loam, silt loam, or fine sandy loam.

The C horizon, if present, has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 2 or 3. It is fine sandy loam to silt loam. Structure is weak platy, or the horizon is massive.

## Lyons series

The Lyons series consists of fine-loamy, mixed, mesic Mollic Haplaquepts. The soils are deep and poorly drained. They have an A horizon of very dark gray loam, a B horizon of gray and grayish brown loam and silt loam, and a C horizon of mottled, gray fine sandy loam. Lord-

stown soils formed in glacial till. They are mainly in areas in the western part of the county. Slopes range from 0 to 2 percent.

Lyons soils are near Massena, Covington, and Carlisle soils. Lyons soils differ from Massena soils in being gray throughout the profile. They are coarser textured throughout the profile than Covington soils. They differ from the Carlisle soils in having mineral material throughout the profile.

Typical pedon of Lyons stony loam in a hayfield, about 1-1/4 miles west-northwest of St. Albans City, 450 feet south of Central Vermont Railway, and 250 feet east of fence row:

- Ap—0 to 9 inches, very dark gray (10YR 3/1) loam; strong very fine and fine angular blocky structure; firm; many very fine and fine roots; neutral; abrupt wavy boundary.
- B21g—9 to 13 inches, gray (5Y 5/1) loam; few fine prominent brown to dark brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few very fine roots; neutral; clear wavy boundary.
- B22g—13 to 20 inches, gray (5Y 5/1) silt loam; many medium prominent yellowish brown (10YR 5/6) mottles; moderate medium and coarse subangular blocky structure; firm; few very fine roots; neutral; clear wavy boundary.
- B3g—20 to 31 inches, grayish brown (2.5Y 5/2) loam; common medium prominent gray (5Y 5/1) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; very few very fine roots; neutral; gradual wavy boundary.
- IICg—31 to 60 inches, gray (5Y 5/1) fine sandy loam; many medium distinct grayish brown (2.5Y 5/2) and dark yellowish brown (10YR 4/4) mottles; weak thick platy structure parting to moderate fine subangular blocky; firm; moderately alkaline.

Thickness of the solum ranges from 20 to 40 inches. Depth to carbonates ranges from 30 to 40 inches. Coarse fragments make up 5 to 15 percent of the profile. Reaction ranges from medium acid to neutral in the solum.

The A horizon has value of 2 or 3 and chroma of 0 to 2. It is fine sandy loam to light silty clay loam.

The Bg horizon has hue of 5YR to 5Y, value of 4 to 6, chroma of 1 or 2, and prominent or distinct mottles. It is fine sandy loam to silty clay loam. Structure is weak or moderate subangular blocky or prismatic.

The C horizon has hue of 5YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is fine sandy loam, loam, or silt loam. Mottles are prominent or distinct.

## Massena series

The Massena series consists of coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts. The soils are deep, stony, and somewhat poorly drained to poorly drained. They have an A horizon of very dark grayish brown loam; a B horizon of mottled, brown loam and grayish brown silt loam; and a C horizon of mottled, gray and grayish brown loam. Massena soils formed in glacial till derived from siliceous rocks mixed with variable amounts of limestone. The soils are level to gently sloping and are on till plains mainly in the Champlain Valley. Slopes range from 0 to 8 percent but are dominantly 0 to 3 percent.

Massena soils are associated with Georgia, St. Albans, Cabot, and Farmington soils. Massena soils are not so well drained as Georgia and St. Albans soils, do not have the fragipan typical of the Cabot soils, and are deeper to bedrock than the Farmington soils.

Typical pedon of Massena loam in an area of Massena stony loam, 3 to 8 percent slopes, in a hayfield 1.5 miles south of St. Albans, 2,000 feet east of U.S. Route 7, in the town of St. Albans:

- Ap—0 to 8 inches, very dark grayish brown (10YR 3/2) loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; slightly sticky and slightly plastic; many very fine roots; 5 percent coarse fragments; neutral; abrupt smooth boundary.
- B2—8 to 15 inches, brown (10YR 5/3) loam; common medium faint yellowish brown (10YR 5/4 and 10YR 5/6) mottles; moderate fine subangular structure; friable; slightly sticky and slightly plastic; clay; common very fine roots; 10 percent coarse fragments; neutral; abrupt wavy boundary.
- B3g—15 to 25 inches, grayish brown (2.5Y 5/2) silt loam; many moderate distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm; nonsticky and nonplastic; few very fine roots; 15 percent coarse fragments; slightly acid; gradual wavy boundary.
- C1g—25 to 41 inches, gray (5Y 5/1) loam; many moderate distinct light olive brown (2.5Y 5/4) mottles; moderate medium to thick platy structure; firm; slightly sticky and slightly plastic; no roots; 15 percent coarse fragments; neutral; abrupt wavy boundary.
- C2g—41 to 60 inches, grayish brown (2.5Y 5/2) loam; common medium distinct yellowish brown (10YR 5/4) mottles; moderate thick platy structure; firm; slightly sticky and slightly plastic; no roots; 15 percent coarse fragments; moderately alkaline; calcareous; strongly effervescent.

Thickness of solum ranges from 28 to 36 inches. Coarse fragments make up less than 5 percent to 35 percent of the solum. Reaction ranges from medium acid to neutral in the solum and neutral to moderately alkaline in the substratum.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It is fine sandy loam, loam, or silt loam or gravelly phases of these textures.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 4. It is fine sandy loam, very fine sandy loam, or loam or gravelly phases of these textures.

## Missisquoi series

The Missisquoi series consists of sandy, mixed, frigid Entic Haplorthods. The soils are deep and excessively drained. The A horizon is dark brown loamy sand. The upper part of the B horizon is brown loamy sand. The lower part of the B horizon is yellowish brown gravelly coarse sand. The C horizon is light olive brown and grayish brown gravelly coarse sand. Missisquoi soils formed in coarse textured material on old lake beaches, deltas, terraces, and kames. They are in areas throughout the county. Slopes range from 0 to 60 percent but are mainly less than 25 percent.

Missisquoi soils are associated with Au Gres, Deerfield, Hadley, Ondawa Variant, Podunk Variant, Windsor, and Winooski soils. The Missisquoi soils are better drained than the Au Gres soils, and they have a spodic horizon that the other associated soils do not have.

Typical pedon of Missisquoi loamy sand, 0 to 3 percent slopes, in the town of Bakersfield, in a gravel pit 2-1/2 miles east of Bakersfield on town road No. 33:

- Ap—0 to 5 inches, dark brown (10YR 3/3) loamy sand; weak medium granular structure; very friable; common roots; 5 percent gravel; slightly acid; abrupt smooth boundary.

B21ir—5 to 12 inches, brown (7.5YR 4/4) loamy sand; weak fine granular structure; very friable; few roots; 10 percent gravel; slightly acid; abrupt wavy boundary.

B22—12 to 15 inches, strong brown (7.5YR 5/6) gravelly sand; single grained; loose; few roots; 15 percent gravel; medium acid; abrupt wavy boundary.

B23—15 to 35 inches, yellowish brown (10YR 5/6) gravelly coarse sand; single grained; loose; few roots; 15 percent gravel; slightly acid; abrupt wavy boundary.

C1—35 to 46 inches, light olive brown (2.5Y 5/4) gravelly coarse sand; single grained; loose; 20 percent gravel; slightly acid; gradual irregular boundary.

C2—46 to 60 inches, grayish brown (2.5Y 5/2) gravelly coarse sand; single grained; loose; 20 percent gravel; slightly acid.

The content of gravel ranges from about 5 to 20 percent in the solum, and the content of gravel and cobbles in the substratum ranges from 15 to 35 percent, with individual subhorizons ranging to 50 percent gravel and cobbles. Reaction ranges from strongly acid to slightly acid in the solum and slightly acid to neutral in the C horizon. Some pedons are mildly alkaline in the lower part of the C horizon.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 2 to 4. The A2 horizon, where present, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2. The A horizon is loamy fine sand, loamy sand, sandy loam, or fine sandy loam and their gravelly analogues. Structure is weak to moderate medium granular.

The B horizon has hue of 5YR to 2.5Y, value of 3 to 5, and chroma of 3 to 6. It is coarse sand or loamy sand to loamy fine sand and their gravelly analogues. Structure is weak, very fine or fine granular, or the horizon is single grained. Consistence is very friable to loose.

The C horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 2 to 8. It is typically gravelly coarse sand but includes strata of coarse sand to loamy fine sand. Consistence is very friable or loose.

## Munson series

The Munson series consists of coarse-silty over clayey, mixed, nonacid, mesic Aeric Haplaquepts. The soils are deep and somewhat poorly drained. They have an A horizon of dark grayish brown silt loam; a B horizon of dark grayish brown, mottled silt loam and silty clay loam; and a C horizon of olive brown silty clay. They formed in waterlaid deposits of coarse silts over clays. These soils are on glacial lake plains and terraces throughout the county. Slopes range from 3 to 15 percent but are dominantly 3 to 8 percent.

The Munson soils are adjacent to Buxton, Scantic, Raynham, and Westbury soils. They are not so well drained as the Buxton soils and are better drained than the Scantic soils. They have more clay in the substratum than the Raynham soils and are finer textured throughout than the Westbury soils.

Typical pedon of Munson silt loam, 3 to 8 percent slopes, 150 feet in a hayfield, 150 feet west of Huntville Road, 75 feet south of cellar hole in the town of Fairfax:

Ap—0 to 8 inches, dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many fine roots; slightly acid; abrupt smooth boundary.

B21—8 to 11 inches, dark grayish brown (2.5Y 4/2) silt loam; many medium distinct olive gray (5Y 5/2) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; common fine roots; slightly acid; clear smooth boundary.

B22—11 to 14 inches, dark grayish brown (2.5Y 4/2) silt loam; common medium distinct yellowish brown (10YR 5/4) and brown to dark brown (10YR 4/3) mottles; moderate fine and medium angular blocky structure; firm; common fine roots; medium acid; abrupt smooth boundary.



IIB23g—14 to 23 inches, dark grayish brown (2.5Y 4/2) silty clay loam; common medium distinct olive gray (5Y 5/2) mottles and few medium prominent yellowish brown (10YR 5/6) mottles; grayish brown (2.5Y 5/2) films on ped faces and pores; moderate coarse angular blocky structure; firm; few fine roots; slightly acid; gradual wavy boundary.

IIB3g—23 to 30 inches, olive brown (2.5Y 4/4) silty clay loam; few medium distinct brown to dark brown (7.5YR 4/4) mottles; gray (5Y 5/1) films on ped faces and pores; strong thin and medium platy structure; very firm; few fine roots; slightly acid; gradual wavy boundary.

IIC—30 to 40 inches, olive brown (2.5Y 4/4) silty clay; few medium distinct brown to dark brown (7.5YR 4/2) mottles; olive gray (5Y 5/2) ped faces; moderate thin and medium platy structure; very firm; very few fine roots; neutral.

The thickness of the solum ranges from 22 to 30 inches. The depth to bedrock, glacial till, or other coarse textured material is more than 40 inches and is generally more than 60 inches. Coarse fragments make up less than 2 percent of the profile, by volume. Reaction in the upper part of the profile is medium acid to slightly acid. In the lower part reaction is slightly acid to neutral.

The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. A chroma of 2 or less and higher chroma mottles are dominant in the matrix of most of the subsurface horizons to a depth of 30 inches. The B horizon is silt loam in the upper part and silty clay loam in the lower part.

The IIC horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 4. Varving is common in the lower part.

## Ondawa Variant

The Ondawa Variant consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Dystrachrepts. The soils are deep and well drained. They have an A horizon of dark grayish brown silt loam, a B horizon of dark grayish brown and dark brown silt loam, and a C horizon of gravelly fine sand. These soils formed in recent alluvium. They are nearly level and are on flood plains near many of the streams in the county, and the larger areas are near the major streams. Slopes are 0 to 1 percent.

The Ondawa Variant soils are adjacent to Hadley, Winooski, Limerick, Podunk Variant, and Rumney Variant soils. Ondawa Variant soils have a coarser textured substratum at a depth of less than 40 inches than the Hadley, Winooski, and Limerick soils. They are better drained than the Podunk Variant and Rumney Variant soils.

Typical pedon of Ondawa Variant silt loam, 300 feet in a hayfield on the flood plain of the Trout River, in the town of Montgomery, about 350 feet south of the Longley Bridge:

Ap—0 to 7 inches, dark grayish brown (10YR 4/2) silt loam, moderate medium granular structure; friable; many fine roots; medium acid; clear smooth boundary.

B21—7 to 19 inches, dark grayish brown (2.5Y 4/2) silt loam; massive; friable; common very fine roots; slightly acid; gradual wavy boundary.

B22—19 to 27 inches, dark brown (10YR 3/3) silt loam; massive; friable; few very fine roots; medium acid; abrupt wavy boundary.

IIC—27 to 60 inches, dark brown (10YR 3/3) gravelly fine sand; single grained; loose; no roots; medium acid.

The thickness of the solum and depth to the contrasting material range from 20 to 40 inches. Coarse fragments make up less than 5 percent of the upper part of the profile and as much as 35 percent of the lower part. The reaction of the profile ranges from medium acid to neutral.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 4.

The B horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. Structure is massive or weak fine granular.

IIC horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 2 to 4.

## Peacham series

The Peacham series consists of coarse-loamy, mixed, frigid Humic Fragiagquepts. The soils are deep and very poorly drained. They have an O2 horizon of black muck; a B horizon of black to olive gray, mottled silt loam; and a Cx horizon of gray to light olive gray, mottled gravelly loam. They have pebbles, cobbles, and stones throughout the profile. Peacham soils formed in glacial till derived mainly from mica schist. They are slightly depressional or level and are on the Green Mountains and their foothills. Slopes range from 0 to 2 percent.

Peacham soils are associated with Peru, Westbury, Cabot, Birdsall, and Wareham soils. Peacham soils are not so well drained as Peru, Westbury, and Cabot soils and have a thicker, darker surface layer. They have pebbles, cobbles, and stones, which the Birdsall and Wareham soils do not have.

Typical pedon of Peacham muck in an area of Peacham stony soils, in the town of Berkshire, about 2 miles east of Berkshire Center:

O2—7 inches to 0, black (10YR 2/1) muck; moderate very fine and fine granular structure; friable; many roots; slightly acid; abrupt wavy boundary.

Bg—0 to 6 inches, dark gray (5Y 4/1) silt loam; few fine and medium distinct grayish brown (2.5Y 5/2) mottles; massive; friable; common roots; 10 percent coarse fragments; neutral; abrupt wavy boundary.

C1xg—6 to 11 inches, gray (5Y 5/1) gravelly sandy loam; common medium distinct olive brown (2.5Y 4/4) mottles; massive; firm; few roots; 20 percent coarse fragments; neutral; abrupt wavy boundary.

C2xg—11 to 18 inches, gray (5Y 5/1) gravelly loam; many medium and large distinct olive brown (2.5Y 4/4) mottles; massive; very firm; no roots; 20 percent coarse fragments; neutral; abrupt wavy boundary.

C3xg—18 to 60 inches, olive gray (5Y 5/2) gravelly loam; massive; firm; 30 percent coarse fragments; neutral.

Depth to the fragipan ranges from 9 to 16 inches. Coarse fragments make up less than 1 percent to 30 percent of the profile. Reaction ranges from slightly acid to neutral.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2.

The C horizon is neutral or has hue of 2.5Y or 5Y, value of 4 to 5, and chroma of 1 or 2. It ranges from fine sandy loam to silt loam or gravelly phases of these textures. Consistence is firm or very firm.

## Peru series

The Peru series consists of coarse-loamy, mixed, frigid Aquic Fragiorthods. The soils are deep, moderately well drained, and stony and extremely stony. The A horizon is brown to dark brown fine sandy loam; the B horizon is dark yellowish brown and sandy to dark brown, mottled

fine sandy loam; and the Cx horizon is olive gray fine sandy loam. These soils formed in glacial till derived from quartzite, phyllite, and schistose rocks. Peru soils are on the Green Mountains and foothills. Slopes range from 3 to 25 percent but are dominantly 3 to 15 percent.

The Peru soils are adjacent to the Stowe, Tunbridge, Woodstock, and Westbury soils. They are deeper to bedrock than the Tunbridge and Woodstock soils. They differ from the Stowe soils in having mottles in the subsoil. They differ from the Westbury soils in not having mottles in the upper part of the subsoil.

Typical pedon of Peru fine sandy loam in an area of Peru stony fine sandy loam, 8 to 15 percent slopes, in a hayfield in the town of Fairfield, about 3.5 miles southwest of East Fairfield:

- Ap—0 to 8 inches, brown to dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine roots; 8 percent coarse fragments; slightly acid; abrupt wavy boundary.
- B21r—8 to 14 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak fine granular structure; friable; common fine roots; 5 percent coarse fragments; slightly acid; clear wavy boundary.
- B22ir—14 to 17 inches, brown to dark brown (10YR 4/3) fine sandy loam; few medium distinct grayish brown (2.5Y 5/2) mottles; weak fine granular structure; friable; few fine roots; 10 percent coarse fragments; medium acid; clear wavy boundary.
- C1—17 to 20 inches, olive brown (2.5Y 4/4) gravelly fine sandy loam; common medium distinct grayish brown (2.5Y 5/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; 15 percent coarse fragments; medium acid; abrupt smooth boundary.
- C2xg—20 to 60 inches, olive gray (5Y 5/2) gravelly fine sandy loam; common medium distinct light olive brown (2.5Y 5/4) mottles; weak thick platy structure; very firm; no roots; strongly acid.

Depth to the fragipan is commonly 18 to 24 inches but ranges from 18 to 30 inches. Coarse fragments make up 5 to 30 percent of the profile. Reaction of the solum and underlying till ranges from very strongly acid to medium acid unless the soil has been limed. The profile is sandy loam, fine sandy loam, or loam or their gravelly or channery analogues.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3.

The B horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 6. The redder and darker colors are in the upper part of the B horizon. The lower part of the B horizon has distinct or prominent mottles.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. Structure is medium subangular blocky or weak thick platy.

## Podunk Variant

The Podunk Variant consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluvaquent Dystrochrepts. The soils are deep and moderately well drained. They have an A horizon of very dark grayish brown silt loam, a B horizon of dark grayish brown silt loam, and a C horizon of mottled, grayish brown and gray loamy fine sand. The soils formed in recent alluvium derived mainly from gneiss, schist, granite, and quartzite. The areas are mainly on flood plains adjacent to major streams. Slopes are 0 to 1 percent.

Podunk Variant soils are associated with Ondawa Variant, Limerick, and Walkill soils. They have a coarser textured substratum than the Winooski soils; have distinct mottles between depths of 15 and 24 inches, which the

Ondawa Variant soils do not have; and do not have mottles in the upper part, which are typical in the Limerick and Walkill soils.

Typical pedon of Podunk Variant silt loam, in a pasture about 2.4 miles north of St. Albans Bay, 2,000 feet west of Kellogg Road, and 125 feet west of Stevens Brook:

- A1—0 to 8 inches, very dark grayish brown (10YR 3/2) silt loam, moderate fine angular blocky structure; friable; many very fine roots; neutral; gradual wavy boundary.
- B21—8 to 15 inches, dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; common very fine roots; neutral, clear wavy boundary.
- B22—15 to 20 inches, dark grayish brown (2.5Y 4/2) silt loam; common fine distinct brown to dark brown (10YR 4/3) mottles; weak medium subangular blocky structure grading to massive; friable; few very fine roots; neutral; abrupt wavy boundary.
- IIC1g—20 to 26 inches, grayish brown (2.5Y 5/2) loamy fine sand; common medium prominent brown to dark brown (7.5YR 4/4) mottles; massive; loose; few very fine roots; neutral; gradual irregular boundary.
- IIC2g—26 to 60 inches, gray (5Y 5/1) loamy fine sand; many medium prominent brown to dark brown (10YR 4/3 and 7.5YR 4/4) mottles; massive; loose; very few very fine roots in upper part, no roots in lower part; neutral.

Solum thickness ranges from 20 to 40 inches. Reaction ranges from very strongly acid to neutral throughout the profile.

The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is silt loam or fine sandy loam.

The IIC horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 to 4. It is commonly loamy fine sand but is coarser in some pedons. The horizon is massive or single grained. Mottles are distinct or prominent.

## Raynham series

The Raynham series consists of coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts. The soils are deep and poorly drained. The Ap horizon is brown to dark brown silt loam. The B horizon is brown and dark grayish brown silt loam and has grayish brown and light brownish gray mottles. The C horizon is grayish brown and dark grayish brown silt loam and has brown to dark brown and grayish brown mottles. These soils formed in silty lacustrine sediments on lake plains throughout the county. Slopes range from 3 to 8 percent.

The Raynham soils are near Belgrade, Binghamville, Birdsall, Eldridge, Munson, and Scantic soils. Raynham soils are not so well drained as Belgrade and Eldridge soils, are finer textured in the upper part than Eldridge soils, are browner than Binghamville soils, are better drained than Birdsall soils and do not have the organic surface layer typical of those soils, have a lower clay content than Scantic soils, and are not so well drained as Munson soils and have a lower clay content.

Typical pedon of Raynham silt loam, 3 to 8 percent slopes, in a hayfield about 2 miles south of Binghamville, 1 1/2 miles west of Cambridge, and 1,800 feet north of the Lamoille River:

- Ap—0 to 7 inches, brown to dark brown (10YR 4/3) silt loam; moderate very fine angular blocky structure; friable; many very fine roots; neutral; abrupt smooth boundary.



B21—7 to 11 inches, brown (10YR 5/3) silt loam; common medium faint grayish brown (2.5Y 5/2) mottles; moderate fine and medium angular blocky structure; friable; common very fine roots; medium acid; abrupt wavy boundary.

B22g—11 to 17 inches, dark grayish brown (2.5Y 4/2) silt loam; many medium distinct light brownish gray (2.5Y 6/2) mottles; strong medium angular blocky structure; friable; common very fine roots; medium acid; abrupt wavy boundary.

Clg—17 to 29 inches, grayish brown (2.5Y 5/2) silt loam; many medium distinct brown to dark brown (10YR 4/3 and 7.5YR 4/4) mottles; weak medium angular blocky structure; firm; few very fine roots; medium acid; abrupt wavy boundary.

C2g—29 to 60 inches, dark grayish brown (2.5Y 4/2) silt loam, thin lenses of loamy fine sand; common medium faint grayish brown (2.5Y 5/2) mottles; massive; friable; medium acid in upper part, slightly acid in lower part.

The solum ranges from 16 to 30 inches thick. Reaction is medium acid to neutral throughout the profile.

The Ap horizon has value of 3 or 4 and chroma of 2 or 3. It has fine angular blocky or medium granular structure.

The B21 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The B22 horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 or 3. The B horizon is dominantly silt loam but is very fine sandy loam in some pedons. It has weak, medium, angular blocky structure. Consistence is mainly friable but is firm in some pedons.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 or 2. Mottles are faint to prominent. This horizon is dominantly silt loam but is very fine sandy loam in some pedons. Structure is angular blocky, or the horizon is platy to massive. Some pedons have varves that vary in color.

## Rumney Variant

The Rumney Variant consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Fluvaquents. The soils are deep and poorly drained. They have an A horizon of mottled, dark gray silt loam; a B horizon of brown and grayish brown, mottled silt loam; and a C horizon of grayish brown coarse sand. Rumney Variant soils formed in recent alluvium derived mainly from granite, gneiss, schist, and quartzite. They are mainly on flood plains along major streams. Slopes are 0 to 1 percent.

Rumney Variant soils are adjacent to Limerick, Podunk Variant, and Wallkill soils. They are more sandy in the upper part of the profile than the Limerick soils, are wetter than the Podunk Variant soils, and are not so wet as Wallkill soils and do not have the organic layer typical of those soils.

Typical pedon of Rumney Variant silt loam, in a pasture along Black Creek, about 2 1/2 miles southeast of East Fairfield:

Ap—0 to 7 inches, dark gray (5Y 4/1) silt loam; few fine distinct olive brown (2.5Y 4/4) mottles in root channels; weak fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

B21—7 to 10 inches, brown (10YR 5/3) silt loam; few fine faint grayish brown (10YR 5/2) and olive brown (2.5Y 4/4) mottles; massive parting to weak thin platy structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

B22g—10 to 35 inches, grayish brown (10YR 5/2) silt loam; common medium distinct light olive brown (2.5Y 5/4) mottles; massive parting to weak thin platy structure; friable; no roots; slightly acid; abrupt smooth boundary.

IICg—35 to 60 inches, grayish brown (2.5Y 5/2) coarse sand; single grained; loose; no roots; slightly acid.

The solum is 30 to 36 inches thick and is underlain by coarse textured soil material. Depth to bedrock is more than 5 feet. Reaction ranges from strongly acid to neutral throughout the profile.

A1 or Ap horizon has hue of 10YR to 5Y, value of 3 or 4, and chroma of 1 or 2.

The B horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 or 3. It is silt loam or very fine sandy loam. Mottles are faint to prominent.

The IIC horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 or 2. It is loamy fine sand or coarser textured material. Mottles are faint to prominent.

## St. Albans series

The St. Albans series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. The soils are deep and well drained. The Ap horizon is very dark grayish brown slaty loam. The B horizon is dark yellowish brown, yellowish brown, brown, and very dark grayish brown slaty fine sandy loam and slaty coarse sandy loam. The C horizon is dark brown, brown, and very dark grayish brown slaty coarse sandy loam. The soils formed in glacial till or poorly sorted glaciofluvium derived from dark slates and shales and thin calcareous interbeds. These soils are on bedrock controlled ridges in the Champlain Valley. Slopes range from 0 to 60 percent but are dominantly 3 to 8 percent.

The St. Albans soils are adjacent to Georgia, Massena, Farmington, Copake, and Lordstown soils. They are better drained than the Georgia and Massena soils, are deeper to bedrock than the Farmington and Lordstown soils, and have fewer coarse fragments in the substratum than the Copake soils.

Typical pedon of St. Albans slaty loam, 3 to 8 percent slopes, in a pasture in the town of St. Albans, approximately 0.64 mile south of St. Albans Point Cemetery on Maquam Road, and approximately 80 feet south of Maquam Road:

Ap—0 to 7 inches, very dark grayish brown (2.5Y 3/2) slaty loam; strong fine and medium granular structure; friable; many roots; 15 percent coarse fragments; slightly acid; clear smooth boundary.

B21—7 to 14 inches, dark yellowish brown (10YR 4/4) slaty fine sandy loam; moderate medium granular structure; friable; common roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.

B22—14 to 19 inches, mixed yellowish brown (10YR 5/6), brown (10YR 4/3), and very dark grayish brown (10YR 3/2) slaty coarse sandy loam; weak fine granular structure; friable; common roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.

C1—19 to 31 inches, dark brown (10YR 3/3) and very dark grayish brown (10YR 3/2) slaty coarse sandy loam; massive; friable; few roots; 30 percent coarse fragments; strongly acid; gradual wavy boundary.

C2—31 to 60 inches, very dark grayish brown (10YR 3/2), brown (10YR 4/3), and olive brown (2.5Y 4/4) slaty coarse sandy loam; massive; friable; no roots; 30 percent coarse fragments; strongly acid.

The thickness of the solum ranges from 15 to 30 inches. Depth to fragmental or clayey soil material or to bedrock is more than 5 feet. The volume of slaty or shaly coarse fragments ranges from 20 to 35 percent in the control section. Reaction throughout the profile ranges from strongly acid to slightly acid.

The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 or 3. A broken A2 horizon is in some pedons. It has hue of 10YR or 2.5Y, value is 4 or 5, and chroma of 1 or 2. The A horizon is sandy loam, fine sandy loam, and loam and their slaty analogues.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. The lower part has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 6. The B horizon ranges from slaty coarse sandy loam to slaty fine sandy loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4. Pockets of slaty sand are in the lower part of the C horizon in some pedons.

### Scantic series

The Scantic series consists of fine, illitic, nonacid, mesic Typic Haplaquepts. The soils are deep and poorly drained. The Ap horizon is dark grayish brown silt loam. The B horizon is mottled, olive gray and dark grayish brown silt loam, silty clay loam, and silty clay. The C horizon is mottled, gray silty clay. These soils are level to gently sloping and formed in silty lacustrine sediments over clayey marine sediments. They are mainly in the central part of the county. Slopes range from 0 to 8 percent but are dominantly 0 to 3 percent.

Scantic soils are near Munson, Raynham, Westbury, and Cabot soils. They are not so well drained as the Munson soils, contain more clay throughout than the Raynham soils, and do not have gravel, cobbles, and stones typical of the Westbury and Cabot soils.

Typical pedon of Scantic silt loam, 0 to 3 percent slopes, in the town of St. Albans, about 2 miles southwest of St. Albans City:

- Ap—0 to 8 inches, dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; strong very fine and fine angular blocky structure; firm; slightly sticky and slightly plastic; many very fine and fine roots; neutral; abrupt wavy boundary.
- B21g—8 to 14 inches, dark grayish brown (2.5Y 4/2) silt loam; moderate medium distinct dark yellowish brown (10YR 4/4) and grayish brown (2.5Y 5/2) mottles; strong very fine and medium subangular blocky structure; firm; sticky and plastic; common very fine roots; neutral; clear wavy boundary.
- B22g—14 to 21 inches, grayish brown (2.5Y 5/2) silty clay loam; many moderate distinct light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; sticky and plastic; common very fine roots; neutral; clear wavy boundary.
- B23g—21 to 27 inches, grayish brown (10YR 5/2) silty clay; common medium distinct yellowish brown (10YR 5/4) and brown to dark brown (10YR 4/3) mottles; moderate coarse subangular blocky structure; firm; sticky and plastic; few very fine roots; neutral; gradual wavy boundary.
- Cg—27 to 60 inches, grayish brown (10YR 5/2) silty clay; many medium distinct brown to dark brown (7.5YR 4/2) mottles; moderate medium subangular blocky structure; firm; sticky and plastic; very few very fine roots; neutral.

Thickness of solum ranges from 25 to 32 inches. Reaction of the profile ranges from medium acid to neutral.

The A horizon has hue of 10YR or 5Y, value of 4 or 5, chroma of 1 or 2.

The B horizon has hue of 2.5Y and 5Y, value of 4 or 5, and chroma of 1 or 2. The upper part is silt loam or silty clay loam. The lower part is silty clay loam or silty clay.

The C horizon has hue of 2.5Y to 5Y, value of 4 or 5, and chroma of 1 or 2. It is silty clay loam or silty clay.

### Stowe series

The Stowe series consists of coarse-loamy, mixed, frigid Entic Fragiorthods. The soils are deep and well drained. The Ap horizon is very dark grayish brown fine sandy loam. The B horizon is dark yellowish brown and light olive brown fine sandy loam. The C horizon is olive fine sandy loam. These gently sloping to steep soils formed in glacial till derived mainly from schistose rocks. The soils are on the Green Mountains, their foothills, and the eastern hill sections of the county. Slopes range from 3 to 60 percent but are dominantly 25 to 60 percent.

The Stowe soils are adjacent to Woodstock, Tunbridge, Peru, Westbury, and Cabot soils. They are deeper to bedrock than the Woodstock and Tunbridge soils and are better drained than the Peru, Westbury, and Cabot soils.

Typical pedon of Stowe fine sandy loam in an area of Stowe stony fine sandy loam, 3 to 8 percent slopes, in a hayfield in the town of Richford, about 2 miles southeast of East Richford:

- Ap—0 to 8 inches, very dark grayish brown (10YR 3/2) fine sandy loam; moderate fine and medium granular structure; friable; many roots; 10 percent coarse fragments; medium acid; abrupt smooth boundary.
- B21ir—8 to 18 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure parting to weak fine granular; friable; common roots; 5 percent coarse fragments; medium acid; abrupt wavy boundary.
- B22—18 to 26 inches, light olive brown (2.5Y 5/4) fine sandy loam; weak medium subangular blocky structure; friable; common roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.
- C1—26 to 29 inches, olive (5Y 5/3) fine sandy loam; weak fine subangular blocky structure; friable; few roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.
- C2x—29 to 60 inches, olive (5Y 3/3) fine sandy loam; many coarse distinct dark grayish brown (2.5Y 4/2) mottles; moderate medium and thick platy structure; very firm, brittle; no roots; 15 percent coarse fragments; neutral.

Depth to the fragipan ranges from 16 to 33 inches. Coarse fragments make up 5 to 35 percent of the profile, and reaction ranges from very strongly acid to neutral. Depth to bedrock is more than 5 feet.

The A1 or Ap horizon has value of 2 to 4 and chroma of 1 to 3. The A2 horizon, where present, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 to 3.

The upper part of the B horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 6. The lower part has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. The B horizon is dominantly fine sandy loam or loam or gravelly or channery phases of these textures.

The C and Cx horizons have hue of 2.5Y to 5Y, value of 4 or 5, and chroma of 2 or 3. The C horizon ranges from sandy loam to loam or gravelly or channery phases of these textures. Consistence of the Cx horizon is firm or very firm.

### Terric Medisaprists

Terric Medisaprists consist of very poorly drained, moderately deep organic soils. They formed in well decomposed organic deposits of mostly woody origin underlain by water-deposited loamy to clayey sediments. These soils are in bogs, along small drainageways, and at the bottom of terrace breaks. Slopes range from 0 to 1 percent.

Terric Medisaprists commonly are near Carlisle, Peacham, and Lyons soils.



Because of the variability of these soils, a typical pedon is not given. Thickness of the organic layer ranges from 16 to 51 inches. Depth to bedrock is more than 5 feet. The soils are extremely acid to neutral.

The organic layer has hue of 5YR, to 5Y, value of 2 or 3, and chroma of 0 to 2. It consists dominantly of sapric material, but thin layers of hemic or fribic material are in some pedons.

The mineral horizon has hue of 2.5Y or 5Y, value of 2 to 5, and chroma of 0 to 2. It ranges from fine sandy loam to clay and is very friable to firm.

### Tunbridge series

The Tunbridge series consists of coarse-loamy, mixed, frigid Entic Haplorthods. The soils are moderately deep and well drained. The A1 horizon is brown fine sandy loam. The A2 horizon is gray loam. The B horizon is dark yellowish brown to brown to dark brown loam. Tunbridge soils formed in glacial till consisting mostly of schist, gneiss, and mica. They are mainly on the Green Mountains and foothills east of Champlain Valley. Slopes range from 3 to 25 percent but are dominantly 8 to 15 percent.

Tunbridge soils are near Peru, Stowe, and Woodstock soils. They are deeper to bedrock than Woodstock soils and do not have the fragipan typical of the Stowe and Peru soils.

Typical pedon of Tunbridge fine sandy loam in an area of Tunbridge-Woodstock fine sandy loams, very rocky, 8 to 15 percent slopes, in a pasture in the town of Enosburg on the east side of Vermont Route 108, about 1 1/2 miles south of Enosburg Falls:

- A1—0 to 7 inches, brown (10YR 5/3) fine sandy loam; moderate fine granular structure; friable; many roots; strongly acid; clear wavy boundary.
- A2—7 to 10 inches, gray (10YR 5/1) loam; moderate fine granular structure; friable; many roots; strongly acid; abrupt wavy boundary.
- B21r—10 to 15 inches, dark yellowish brown (10YR 4/4) loam; weak fine granular structure; friable; common roots; strongly acid; clear smooth boundary.
- B22r—15 to 18 inches, brown (7.5YR 5/4) loam, weak medium granular structure; friable; few roots; strongly acid; clear wavy boundary.
- B23—18 to 25 inches, brown to dark brown (7.5YR 4/4) loam; weak medium granular structure; friable; few roots; strongly acid; abrupt smooth boundary.
- R—25 inches, hard massive schist bedrock.

Thickness of the solum generally coincides with the depth to bedrock but does not exceed 30 inches. Depth to bedrock ranges from 20 to 40 inches. Coarse fragments make up 0 to 30 percent of the profile. Reaction is strongly acid to slightly acid throughout.

The A1 or Ap horizon has hue of 7.5YR to 10YR, value of 3 to 5, and chroma of 1 to 3. The A2 horizon, where present, has hue of 10YR, value of 2 to 5, and chroma of 1 to 3.

The B horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 to 6. The redder colors are in the upper part of the B horizon. The B horizon is loam, fine sandy loam, and sandy loam and their gravelly analogues.

Where present, the C horizon has hue of 2.5Y or 5Y, value of 3 or 4, and chroma of 2 to 4.

### Wallkill series

The Wallkill series consists of fine-loamy, mixed, nonacid, mesic Thapto-Histic Fluvaquents. The soils are deep and very poorly drained. The A horizon is dark grayish brown, mottled silt loam. The B horizon is olive gray, mottled silt loam. The C horizon is black muck over gray silty clay loam. The soils formed in alluvial material deposited over organic material. They are depressional and occupy that portion of the flood plain farthest away from the streams. They are in areas throughout the county. Slopes are 0 to 1 percent.

Wallkill soils formed in the same kind of material as Rumney Variant, Limerick, Carlisle, and Birdsall soils and Terric Medisaprists. Wallkill soils are not so well drained as Rumney Variant and Limerick soils. Wallkill soils have a mineral surface layer over muck, and Birdsall and Carlisle soils and Terric Medisaprists have a muck layer over mineral soil material.

Typical pedon of Wallkill silt loam in an idle field in the town of Fletcher, on the flood plain of Black Creek, about 100 feet west of Vermont Route 108 and 3/4 mile north of the county line:

- O1—1 inch to 0, litter of cattails.
- Al—0 to 7 inches, dark grayish brown (2.5Y 4/2) silt loam; common medium faint olive gray (5Y 4/2) mottles; massive; friable; many very fine roots; slightly acid; abrupt wavy boundary.
- Bg—7 to 14 inches, olive gray (5Y 5/2) silt loam; few fine faint dark grayish brown (2.5Y 4/2) mottles; massive; friable; many very fine roots; slightly acid; abrupt wavy boundary.
- IIOa—14 to 45 inches, black (5YR 2/1) muck (sapric material), broken face and rubbed; about 20 percent fibers, about 5 percent rubbed; weak medium angular blocky structure; friable; common very fine roots; slightly acid; abrupt wavy boundary.
- IIICg—45 to 60 inches, gray (5Y 5/1) silty clay loam; massive; firm; no roots; neutral.

Thickness of the mineral soil over the organic soil material ranges from 14 to 40 inches. The organic layer beneath the mineral soil is at least 20 inches thick. Reaction ranges from strongly acid to neutral throughout the profile.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. It is fine sandy loam to silt loam.

The B horizon has hue of 5YR to 5Y, value of 4 or 5, and chroma of 1 or 2. It is loam, silt loam, or fine sandy loam.

The IIO horizon has hue of 5YR to 10YR, value of 1 or 2, and chroma of 1 or 2.

### Wareham series

The Wareham series consists of mixed, mesic Mollic Psammaquents. The soils are deep and poorly drained. The A horizon is very dark brown loamy fine sand. The B and C horizons are dark grayish brown and grayish brown, mottled fine sand. These soils formed on glaciofluvial outwash plains, deltas, and high stream terraces. Areas are throughout the county, and the largest areas are in the towns of Swanton and Highgate. Slopes are 0 to 1 percent. Wareham soils in Franklin County are a tax-adjunct because their reaction is higher than that defined in the range for the series.

Wareham soils are near Windsor and Au Gres soils. They are not so well drained as the Windsor and Au Gres soils.

Typical pedon of Wareham loamy fine sand in a cornfield in the town of Swanton, about 2 miles south of the village of Swanton, and 200 feet east of the county road:

- Ap—0 to 9 inches, very dark brown (10YR 2/2) loamy fine sand; weak fine granular structure; very friable; many very fine roots; slightly acid; clear wavy boundary.
- B2g—9 to 15 inches, grayish brown (2.5Y 5/2) fine sand; many medium prominent reddish brown (5YR 4/4) and light olive brown (2.5Y 5/4) mottles; massive; very friable; few very fine roots; slightly acid; clear smooth boundary.
- C1g—15 to 28 inches, grayish brown (2.5Y 5/2) fine sand; common medium prominent brown to dark brown (7.5YR 4/2) and strong brown (7.5YR 5/8) mottles; massive; loose; no roots; slightly acid; clear wavy boundary.
- C2g—28 to 32 inches, grayish brown (2.5Y 5/2) fine sand; many large prominent yellowish red (5YR 4/6) mottles; single grained; loose; no roots; slightly acid; abrupt smooth boundary.
- C3g—32 to 60 inches, dark grayish brown (2.5Y 4/2) fine sand; common medium distinct brown to dark brown (7.5YR 4/4) mottles; single grained; loose; no roots; neutral.

Gravel makes up 0 to 15 percent of the profile, but a few pedons are 35 to 75 percent gravel in the lower layers. In unlimed areas reaction ranges from extremely acid to neutral throughout the profile.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is loamy sand, loamy fine sand, or sand.

The B and C horizons have hue of 2.5Y and 5Y, value of 4 or 5, and chroma of 0 to 3. They range from loamy fine sand to coarse sand.

## Westbury series

The Westbury series consists of coarse-loamy, mixed, frigid Typic Fragiagquods. The soils are deep and somewhat poorly drained. The Ap horizon is very dark brown fine sandy loam. The B horizon is brown to dark brown and light olive brown, mottled fine sandy loam. The Cx horizon is gray, mottled fine sandy loam. These soils formed in acid glacial till derived from quartzite, phyllite, and schistose rock. Westbury soils are on the Green Mountains and the foothills of the county. Slopes range from 0 to 15 percent but are dominantly 3 to 8 percent.

The Westbury soils are adjacent to Woodstock, Tunbridge, Stowe, Peru, and Cabot soils. They are deeper to bedrock than the Woodstock and Tunbridge soils. They differ from the Stowe and Peru soils because they are mottled in the upper part of the subsoil. They have a brighter colored subsoil than the Cabot soils and are better drained.

Typical pedon of Westbury fine sandy loam in an area of Westbury stony fine sandy loam, 3 to 8 percent slopes, in an idle field in the town of Richford, about 3 miles east-northeast of Stevens Mills:

- Ap—0 to 6 inches, very dark brown (10YR 2/2) fine sandy loam; moderate fine and medium granular structure; friable; many very fine and fine roots; medium acid; abrupt wavy boundary.
- B21ir—6 to 11 inches, brown to dark brown (10YR 4/3) fine sandy loam; common medium faint dark yellowish brown (10YR 4/4) mottles; weak fine and medium subangular blocky structure; friable; common very fine and fine roots, medium acid; clear wavy boundary.

B22—11 to 20 inches, light olive brown (2.5Y 5/4) fine sandy loam; common medium distinct olive (5Y 5/3) and brown to dark brown (7.5YR 4/4) mottles; weak fine and medium subangular blocky structure; firm; common very fine and fine roots; medium acid; abrupt wavy boundary.

Cx—20 to 60 inches, gray (5Y 5/1) fine sandy loam; many medium prominent yellowish brown (10YR 5/4) and brown to dark brown (7.5YR 4/4) mottles; weak thick platy structure; very firm; no roots; medium acid in upper part grading to slightly acid in lower part.

Thickness of the solum ranges from 17 to 37 inches. Depth to the fragipan commonly ranges from 12 to 24 inches but in some places is slightly deeper.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2. Reaction ranges from medium acid to extremely acid.

The B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is fine sandy loam, sandy loam, and silt loam. Mottles are faint or distinct. Reaction ranges from medium acid to extremely acid.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 1 to 4. It is fine sandy loam, sandy loam, and silt loam and their gravelly or channery analogues. Reaction ranges from strongly acid to neutral. Consistence is firm to very firm.

## Windsor series

The Windsor series consists of mixed, mesic Typic Udipsamments. The soils are deep and excessively drained. They have an Ap horizon of dark brown loamy fine sand, a B horizon of brown to dark brown and yellowish brown loamy fine sand, and a C horizon of light olive brown fine sand. These soils formed on beaches, deltas, and terraces. They are throughout the county, and the major areas are near large rivers and streams. Slopes range from 0 to 60 percent but are dominantly 3 to 8 percent.

Windsor soils are associated with Deerfield, Au Gres, Wareham, Munson, Raynham, and Colton soils. They are better drained than the Deerfield, Au Gres, and Wareham soils, are coarser textured than the Munson and Raynham soils, and are finer textured than the Colton soils.

Typical pedon of Windsor loamy fine sand, 0 to 3 percent slopes, in a hayfield about 3/4 mile south of Binghamville and 250 feet east of the road:

- Ap—0 to 10 inches, dark brown (10YR 3/3) loamy fine sand; moderate fine and medium granular structure; very friable; many very fine and fine roots; strongly acid, abrupt smooth boundary.
- B21ir—10 to 17 inches, brown to dark brown (7.5YR 4/4) loamy fine sand; weak fine granular structure; very friable; common very fine roots; strongly acid; gradual smooth boundary.
- B22—17 to 27 inches, yellowish brown (10YR 5/6) loamy fine sand; very weak very fine granular structure; loose; common very fine roots; medium acid; gradual smooth boundary.
- C1—27 to 38 inches, light olive brown (2.5Y 5/4) fine sand; single grained; loose; few very fine roots; slightly acid; abrupt broken boundary.
- C2—38 to 60 inches, brown (10YR 5/3) fine sand; single grained; loose; no roots; slightly acid; horizon has a salt and pepper effect, the colors of individual sand grains.

The depth to bedrock is more than 5 feet. In unlimed areas reaction ranges from very strongly acid to slightly acid throughout the profile.

The A1 or Ap horizon has value of 2 or 3 and chroma of 2 or 3. They are loamy fine sand or loamy sand. In a few pedons in wooded areas, there is an A2 horizon with colors of 10YR 5/1 to 2.5Y 6/2.

The upper part of the B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The lower part generally has hue of 10YR or



2.5Y, value of 5 or 6, and chroma of 3 to 6. The B horizon is loamy fine sand, fine sand, or sand.

The C horizon has hue of 10YR to 5Y, value of 5 or 6, and chroma of 2 to 4. It is fine sand or sand. Thin strata of gravelly sand are below a depth of 18 inches in some pedons.

### Winooski series

The Winooski series consists of coarse silty, mixed, nonacid, mesic Aquic Udifluvents. The soils are deep and moderately well drained. They have an Ap horizon of dark grayish brown silt loam, a B horizon of brown to dark brown silt loam, and a C horizon of dark grayish brown, mottled silt loam and very fine sandy loam. They formed in recent alluvial deposits of very fine sands and silts. These soils are adjacent to streams throughout the county. Slopes are 0 to 1 percent.

Winooski soils are associated with Hadley, Limerick, Ondawa Variant, Podunk Variant, Rumney Variant, and Belgrade soils. Winooski soils are not so well drained as Hadley soils and are better drained than Limerick soils. They are finer textured in the upper 40 inches than Ondawa Variant, Podunk Variant, and Rumney Variant soils. Winooski soils are subject to flooding, and Belgrade soils are not.

Typical pedon of Winooski silt loam in a hayfield along the Missisquoi River, about 310 feet west of Vermont Route 118, in the village of East Berkshire:

Ap—0 to 8 inches, dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

B2—8 to 16 inches, brown to dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

C1g—16 to 24 inches, dark grayish brown (2.5Y 4/2) silt loam; common fine prominent yellowish red (5YR 5/6) and olive gray (5Y 5/2) mottles; massive; friable; common very fine roots; neutral; clear wavy boundary.

C2g—24 to 33 inches, dark grayish brown (2.5Y 4/2) silt loam; common fine distinct olive gray (5Y 5/2) mottles and some dark horizontal bands; massive; friable; few very fine roots; slightly acid; clear wavy boundary.

C3g—33 to 60 inches, dark grayish brown (2.5Y 4/2) very fine sandy loam; few medium distinct olive gray (5Y 5/2) mottles and some dark horizontal bands; massive; friable, slightly acid.

Dominant texture to a depth of 40 inches is silt loam or very fine sandy loam. Below 40 inches, the texture ranges from silt loam to very fine sand or coarser textured material. Content of coarse fragments ranges from 0 to 5 percent. Reaction ranges from very strongly acid to neutral throughout the profile.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 or 3.

The B horizon, where present, has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 2 to 4.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 6. There are darker colored bands in some pedons. Mottles are prominent or distinct. The C horizon is silt loam or very fine sandy loam and in some profiles has thin lenses of coarser textured material.

### Woodstock series

The Woodstock series consists of loamy, mixed, frigid Entic Lithic Haplorthods. The soils are excessively

drained or somewhat excessively drained. They have an A1 horizon of very dark grayish brown fine sandy loam and a B horizon of dark brown or brown fine sandy loam or gravelly fine sandy loam. Below this is bedrock. They formed in glacial till of mostly schist, gneiss, and mica. The Woodstock soils are on the Green Mountains and the foothills of the Green Mountains east of the Champlain Valley. Slopes range from 8 to 60 percent but are dominantly 25 to 60 percent.

Woodstock soils are near Tunbridge, Stowe, Peru, Cabot, and Farmington soils. Woodstock soils are shallower to bedrock than Tunbridge soils, do not have the fragipan typical of Stowe and Peru soils, and are better drained than Cabot and Peru soils. Woodstock soils have a B2 horizon, which the Farmington soils do not have.

Typical pedon of Woodstock fine sandy loam in an area of Tunbridge-Woodstock fine sandy loams, very rocky, 15 to 25 percent slopes, in a pasture in the town of St. Albans, 500 feet south of Route 36, about 2 miles east-southeast of St. Albans City:

A1—0 to 2 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

B21ir—2 to 9 inches, dark brown (10YR 3/3) gravelly fine sandy loam; moderate fine and medium granular structure; friable; common very fine roots; 30 percent coarse fragments; strongly acid; gradual wavy boundary.

B22ir—9 to 12 inches, brown to dark brown (10YR 4/3) gravelly fine sandy loam; moderate fine and medium granular structure; friable; common very fine roots; 35 percent coarse fragments; strongly acid; abrupt wavy boundary.

R—12 inches, schist bedrock.

Thickness of solum and depth to bedrock range from 10 to 20 inches. Coarse fragments make up 10 to 35 percent of the profile. Reaction ranges from strongly acid to slightly acid throughout the soil.

The A1 or Ap horizon has hue of 7.5YR to 10YR, value of 3 to 5, and chroma of 1 to 3. The A2 horizon, where present, is 10YR 6/1, 5YR 4/2, or N 5/0.

The upper part of the B horizon has hue of 5YR to 10YR and value and chroma of 3 or 4. The lower part has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 3 to 6. The B horizon is fine sandy loam or gravelly or channery fine sandy loam.

## 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" (5).

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 18, 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*, meaning 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 substratum, 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.

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## Glossary

- ABC soil.** A soil having an A, a B, and a C horizon.
- AC soil.** A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.
- Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.
- 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.
- Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.
- Area reclaim.** An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.
- Association, soil.** A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping unit.
- 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

- Base saturation.** The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity.
- Bedding planes.** Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.
- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Bench terrace.** A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.
- Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.
- 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 exposed.



**Bottom land.** The normal flood plain of a stream, subject to frequent flooding.

**Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.

**Calcareous soil.** A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

**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.

**Catena.** A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

**Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity.** The total amount of exchangeable 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.

**Catsteps.** Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

**Channery soil.** A soil, that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

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

**Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

**Climax vegetation.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Coarse fragments.** Mineral or rock particles up to 3 inches (2 millimeters to 7.5 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.

**Contour stripcropping (or contour farming).** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

**Corrosive.** High risk of corrosion to uncoated steel or deterioration of concrete.

**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 earthmoving equipment. The soil sloughs easily.

**Deferred grazing.** A delay in grazing until range plants have reached a specified stage of growth. Grazing is deferred in order to increase the vigor of forage and to allow desirable plants to produce seed. Contrasts with continuous grazing and rotation grazing.

**Delta.** An alluvial deposit, commonly triangular in shape, formed largely beneath water and deposited at the mouth of a river or stream.

**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 during the growing season that most mesophytic 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 commonly 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.”

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**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.

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

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

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

**Excess fines.** Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

**Fast intake.** The rapid movement of water into the soil.

**Favorable.** Favorable soil features for the specified use.

**Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**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.

**Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

**Fine textured (heavy textured) soil.** Sandy clay, silty clay, and clay.

**First bottom.** The normal flood plain of a stream, subject to frequent or occasional flooding.

**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.

**Forage.** Plant material used as feed by domestic animals. Forage can be grazed or cut for hay.

**Forb.** Any herbaceous plant not a grass or a sedge.

**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.

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

**Glacial drift** (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the assorted and unassorted 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.

**Glaciolacustrine deposits.** Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes by water originating mainly from the melting of glacial ice. Many are interbedded or laminated.

**Gleyed soil.** A soil having one or more neutral gray horizons as a result of waterlogging and lack of oxygen. The term “gleyed” also designates gray horizons and horizons having yellow and gray mottles as a result of intermittent waterlogging.

**Graded stripcropping.** Growing crops in strips that grade toward a protected waterway.

**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.

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

**Green manure** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

**Ground water** (geology). Water filling all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

**Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Habitat.** The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

**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 differ 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.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Kame** (geology). An irregular, short ridge or hill of stratified glacial drift.

**Lacustrine deposit** (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Large stones.** Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

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

**Light textured soil.** Sand and loamy sand.

**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.

**Low strength.** Inadequate strength for supporting loads.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**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.

**Moderately fine textured (moderately heavy textured) soil.** Clay loam, sandy clay loam, and silty clay loam.

**Moraine** (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Types are terminal, lateral, medial, and ground.

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

**Muck.** Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 percent.

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

**Narrow-base terrace.** A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

**Neutral soil.** A soil having a pH value between 6.6 and 7.3.

**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.

**Pan.** A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

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

**Peat.** Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**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.

**Percs slowly.** The slow movement of water through the soil adversely affecting the specified use.

**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.

**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.

**Polypedon.** A volume of soil having properties within the limits of a soil series, the lowest and most homogeneous category of soil taxonomy. A "soil individual."

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

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

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

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

	pH
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

- Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Soil scientists regard as soil only the part of the regolith that is modified by organisms and other soil-building forces. Most engineers describe the whole regolith, even to a great depth, as "soil."
- Relief.** The elevations or inequalities of a land surface, considered collectively.
- Residuum (residual soil material).** Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.
- Rill.** A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.
- Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.
- Rooting depth.** Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.
- Root zone.** The part of the soil that can be penetrated by plant roots.
- 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 millimeter 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.
- Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.
- Seepage.** The rapid movement of water through the soil. Seepage adversely affects the specified use.
- Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon.
- 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.
- Shale.** Sedimentary rock formed by the hardening of a clay deposit.
- Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.
- 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.
- Silica.** A combination of silicon and oxygen. The mineral form is called quartz.
- Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.
- 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.
- Slow 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.
- Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.005 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).
- Solodized soil.** A formerly alkali (sodic) soil that has been leached so that it has become acid and has a thick, gray upper layer over an acid, blocky B horizon. The resulting soil may be termed a Soloth.
- 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.
- Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.
- 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.
- Stripcropping.** Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.
- Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).
- Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.
- Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.
- Substratum.** The part of the soil below the solum.
- Subsurface layer.** Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.
- Surface soil.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."
- 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.
- Terminal moraine.** A belt of thick glacial drift that generally marks the termination of important glacial advances.
- Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.
- Terrace (geologic).** An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.
- Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*,



*silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer.** Otherwise suitable soil material too thin for the specified use.

**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.

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

**Trace elements.** The chemical elements in soils, in only extremely small amounts, essential to plant growth. Examples are zinc, cobalt, manganese, copper, and iron.

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

**Valley fill.** In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams emerging from hills or mountains and spreading sediments onto the lowland as a series of adjacent alluvial fans.

**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.

**Varve.** A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within 1 year; specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

**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.

**Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.





## **Illustrations**

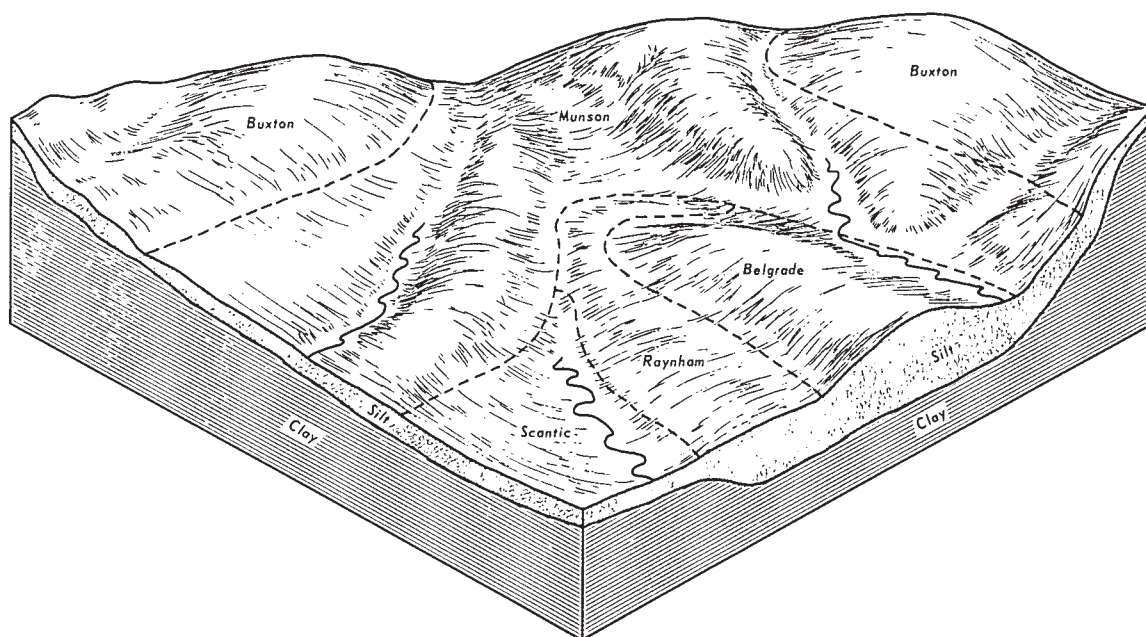


Figure 1.—Typical pattern of soils and parent material in the Munson-Buxton-Belgrade unit.

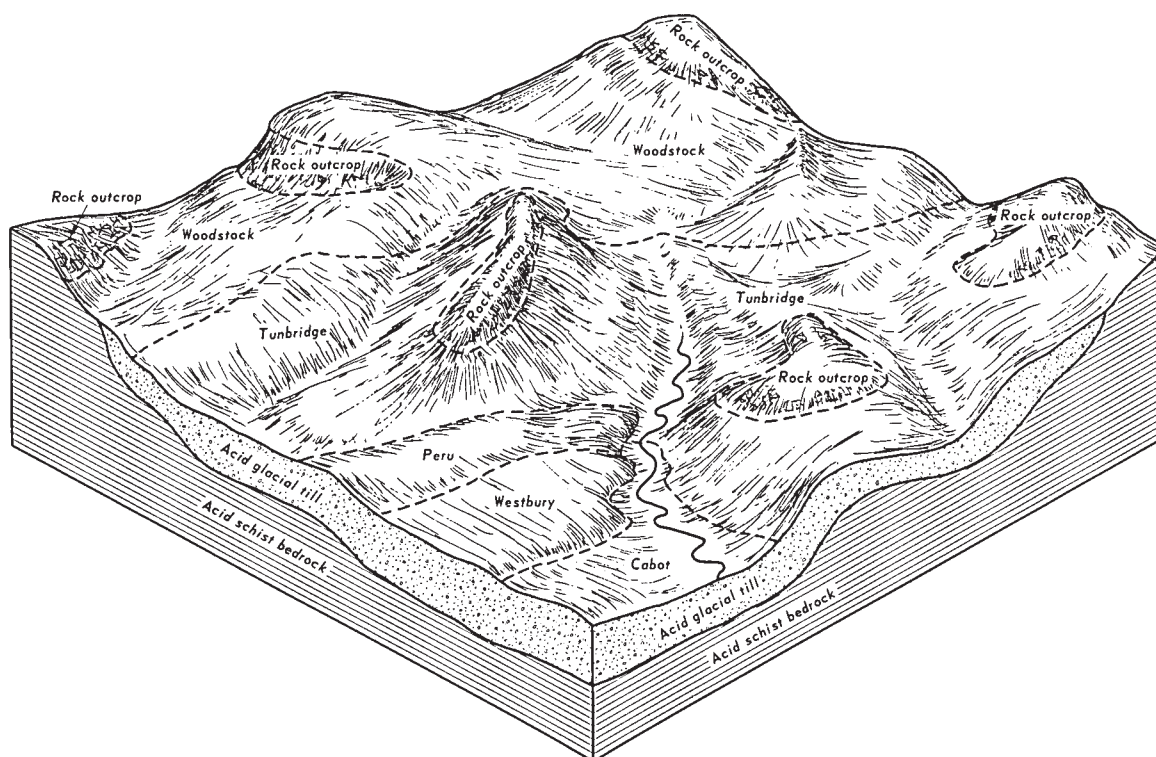


Figure 2.—Typical pattern of soils and parent material in the Woodstock-Tunbridge-Rock outcrop unit.



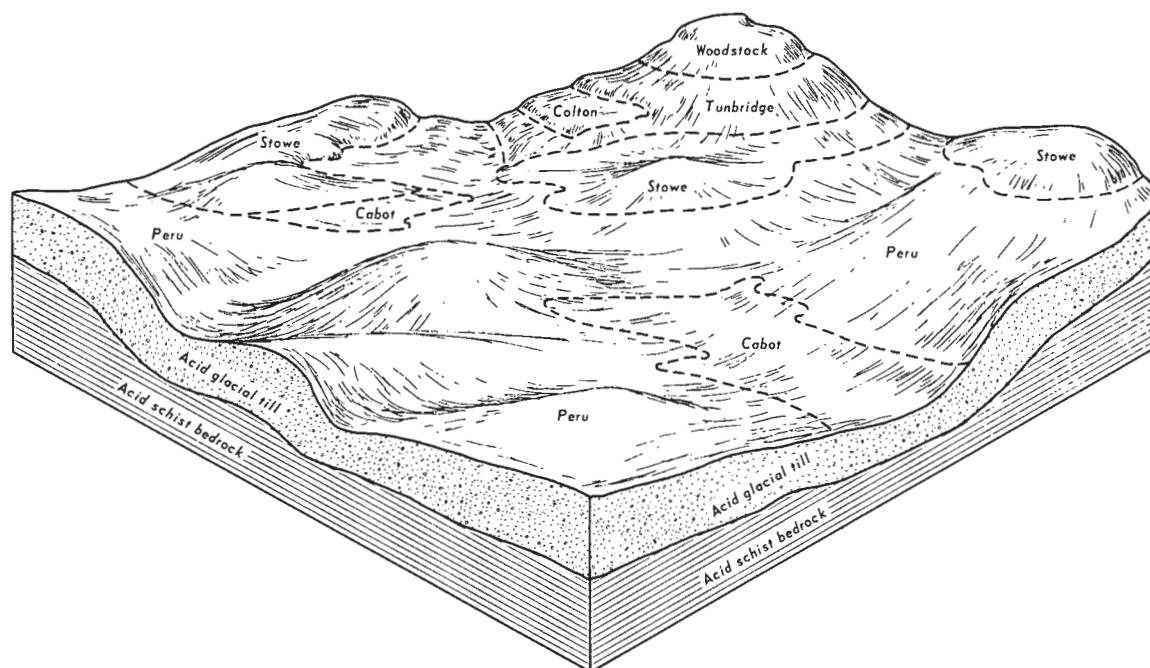


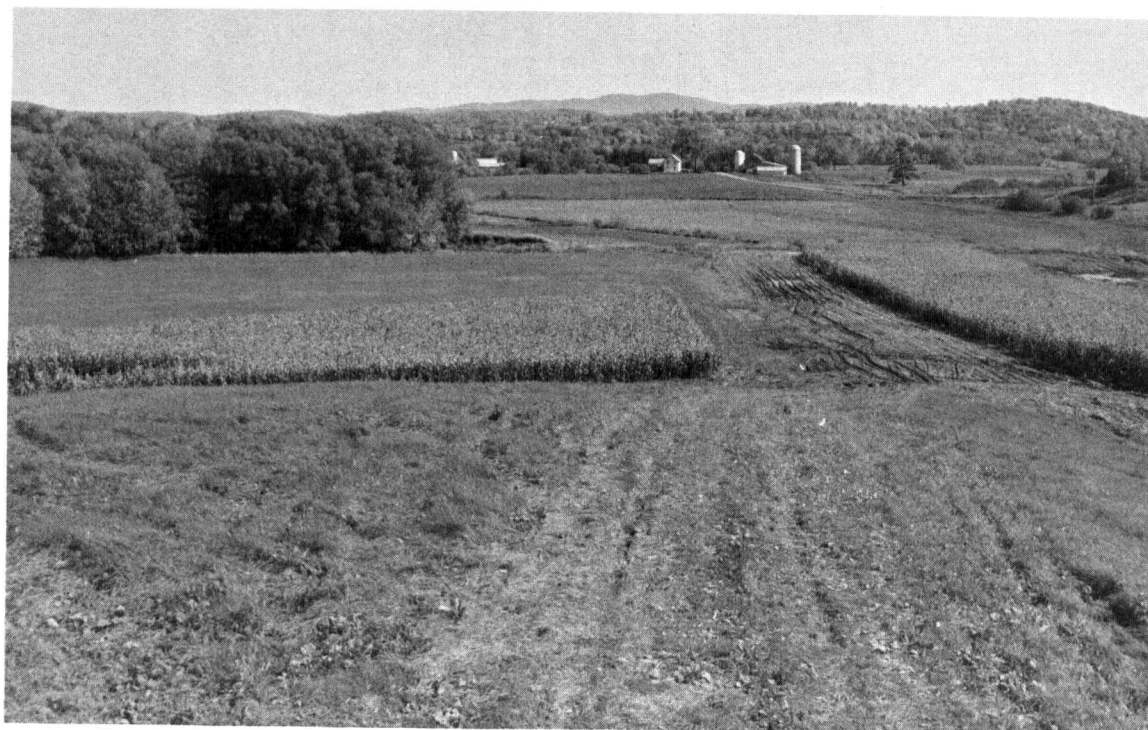
Figure 3.—Typical pattern of soils and parent material in the Peru-Stowe unit.



Figure 4.—An area of unimproved pasture on Cabot extremely stony fine sandy loam, 0 to 3 percent slopes.



*Figure 5.*—An excavated pond in Cabot extremely stony fine sandy loam, 0 to 3 percent slopes.

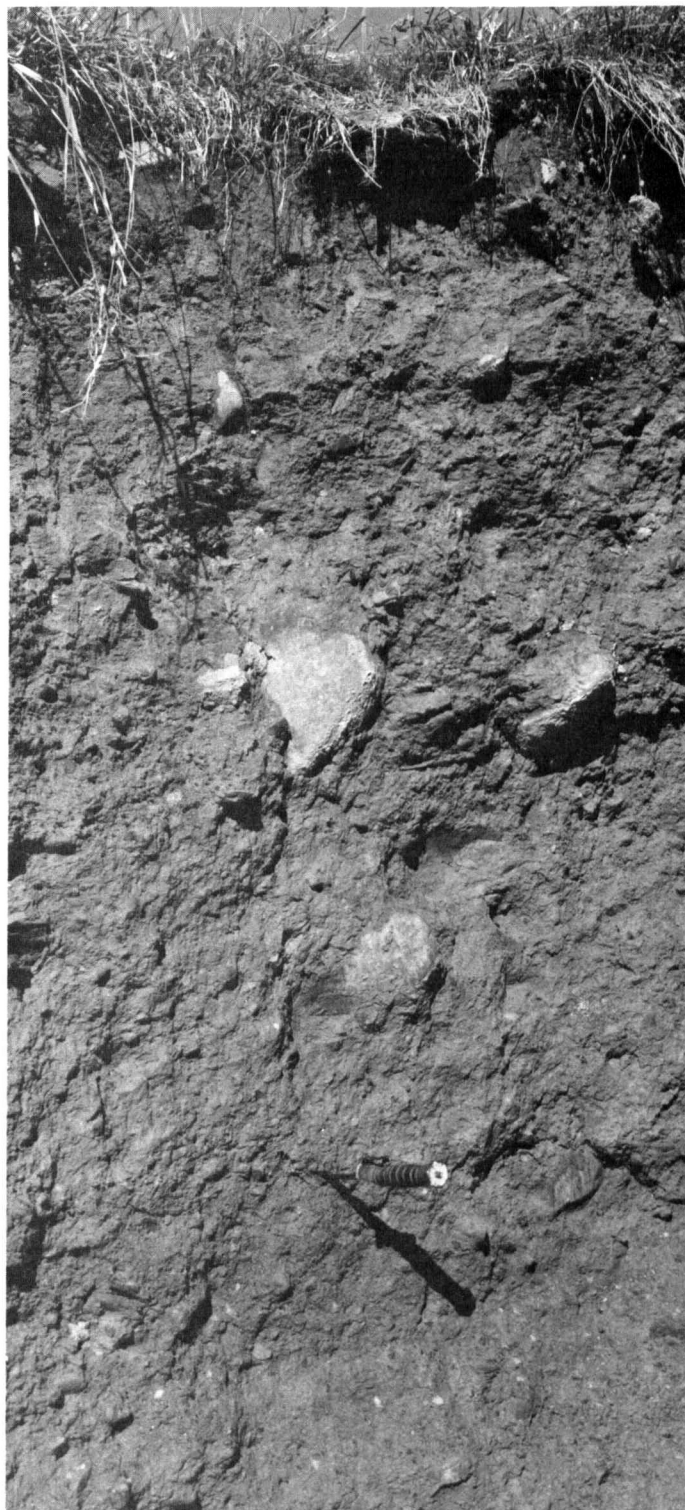


*Figure 6.*—Silage corn on Limerick silt loam.





*Figure 7.—An area of Marsh.*



*Figure 8.*—Profile of Peru stony fine sandy loam, 3 to 8 percent slopes.



*Figure 9.*—Profile of Windsor loamy fine sand, 0 to 3 percent slopes.



## Tables

## SOIL SURVEY

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature <sup>1</sup>						Precipitation <sup>1</sup>				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days <sup>2</sup>	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
	<u>F</u>	<u>F</u>	<u>F</u>	<u>F</u>	<u>F</u>	<u>Units</u>	<u>In</u>	<u>In</u>	<u>In</u>		<u>In</u>
January----	26.3	6.9	15.7	51	-25	20	1.98	1.08	2.70	5	12.2
February---	27.7	7.2	17.5	48	-23	0	1.74	1.06	2.34	5	14.0
March-----	39.0	20.5	29.8	61	-9	12	1.87	.93	2.63	4	8.6
April-----	52.7	33.2	43.0	77	15	134	2.70	1.62	3.66	7	2.5
May-----	65.6	45.4	55.5	85	30	481	3.15	1.75	4.28	7	.1
June-----	76.3	56.3	66.3	91	40	789	3.51	2.17	4.70	8	.0
July-----	80.4	61.3	70.9	92	48	958	3.69	2.58	4.71	8	.0
August-----	78.3	59.8	69.1	90	45	902	3.96	2.23	5.37	8	.0
September--	70.7	52.6	61.7	86	32	651	2.54	1.46	3.41	6	.0
October----	58.8	42.7	50.8	78	24	343	2.70	1.35	3.79	6	.2
November---	44.8	32.1	38.5	66	12	67	2.88	1.58	3.92	7	4.4
December---	31.7	17.7	23.5	56	-12	52	2.53	1.31	3.52	6	19.4
Year-----	54.4	36.3	45.2	92	-27	4,409	33.25	30.38	36.96	77	61.4

<sup>1</sup>Recorded in the period 1956-74 at St. Albans, Vt.

<sup>2</sup>A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 F).



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TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature <sup>1</sup>		
	24 F or lower	28 F or lower	32 F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 21	May 1	May 10
5 years in 10 later than--	April 11	April 22	May 2
First freezing temperature in fall:			
1 year in 10 earlier than--	October 26	October 8	September 26
2 years in 10 earlier than--	October 31	October 14	October 2
5 years in 10 earlier than--	November 8	October 26	October 13

<sup>1</sup>Recorded in the period 1956-74  
at St. Albans, Vt.

## SOIL SURVEY

TABLE 3.--GROWING SEASON LENGTH

Probability	Daily minimum temperature during growing season <sup>1</sup>		
	Higher than 24 F	Higher than 28 F	Higher than 32 F
	<u>Days</u>	<u>Days</u>	<u>Days</u>
9 years in 10	188	160	141
8 years in 10	196	169	148
5 years in 10	210	186	162
2 years in 10	223	203	176
1 year in 10	231	211	184

<sup>1</sup>Recorded in the period 1956-74  
at St. Albans, Vt.



TABLE 4.--POTENTIALS AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP FOR SPECIFIED USES

Map unit	Extent of area	Cultivated farm crops	Specialty crops	Woodland	Urban uses	Intensive recreation areas	Extensive recreation areas
	<u>Pct</u>						
1. Limerick-Rumney-Winooski	3	Good-----	Good-----	Fair: wetness.	Poor: flooding, wetness.	Fair: flooding.	Fair: flooding.
2. Farmington-Lordstown-Rock outcrop	6	Poor: depth to bedrock, rock outcrops, slope.	Poor: depth to bedrock, rock outcrops, slope.	Fair: equipment limitations, droughty.	Poor: rock outcrops, depth to bedrock, slope.	Poor: rock outcrops, slope.	Good.
3. Georgia-St. Albans	4	Good-----	Good-----	Good-----	Fair: seasonal high water table.	Good-----	Good.
4. Massena-Lyons	6	Fair: wetness, high water table, stones.	Fair: wetness, high water table, stones.	Fair: wetness.	Poor: wetness, high water table.	Poor: wetness.	Poor: wetness.
5. Au Gres-Enosburg-Wareham	3	Poor: wetness, high water table.	Poor: wetness, high water table.	Poor: wetness, high water table.	Poor: high water table, wetness.	Poor: wetness.	Poor: wetness.
6. Munson-Buxton-Belgrade	5	Good-----	Fair: clay content.	Good-----	Poor: low strength, wetness.	Fair: low stability, compaction.	Fair: low stability, compaction.
7. Scantic-Raynham-Binghamville	6	Fair: wetness, slow permeability.	Fair: wetness, slow permeability.	Poor: wetness.	Poor: wetness, low strength.	Poor: wetness, low stability.	Poor: wetness, low stability.
8. Kingsbury-Covington	1	Fair: clay content, wetness.	Fair: clay content, wetness.	Fair: clay content.	Poor: clay content, slow permeability, low strength.	Poor: low stability, wetness.	Poor: low stability, wetness.
9. Windsor-Missisquoi	8	Good to fair: droughty.	Good to fair: droughty.	Fair: droughty.	Good-----	Good-----	Good.
10. Carlisle-Terric Medisaprists	4	Poor: ponding, wetness.	Poor: ponding, wetness.	Poor: ponding, wetness.	Poor: ponding, wetness.	Poor: ponding, wetness.	Fair: ponding, wetness.
11. Woodstock-Tunbridge-Rock outcrop	29	Poor: rock outcrops, slope.	Poor: rock outcrops, slope.	Fair: equipment limitations.	Poor: rock outcrops, slope, depth to bedrock.	Poor: rock outcrops, slope.	Good.
12. Peru-Stowe	15	Good-----	Good-----	Good-----	Fair to poor: hardpan, slope.	Good-----	Good.
13. Cabot-Westbury	10	Fair to poor: wetness, slow permeability, stones.	Poor: wetness, slow permeability, stones.	Fair: wetness.	Poor: hardpan, high water table, wetness.	Poor: wetness, slow permeability.	Fair: wetness, slow permeability.

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AuA	Au Gres loamy fine sand, 0 to 6 percent slopes-----	4,576	1.1
BeB	Belgrade silt loam, 2 to 8 percent slopes-----	2,011	0.5
BeC	Belgrade silt loam, 8 to 15 percent slopes-----	880	0.2
Bg	Binghamville silt loam-----	4,823	1.1
Br	Birdsall silt loam-----	2,418	0.6
BxC	Buxton silt loam, 8 to 15 percent slopes-----	1,583	0.4
BxD	Buxton silt loam, 15 to 25 percent slopes-----	3,223	0.8
BxE	Buxton silt loam, 25 to 45 percent slopes-----	762	0.2
CaA	Cabot stony fine sandy loam, 0 to 3 percent slopes-----	2,262	0.5
CaB	Cabot stony fine sandy loam, 3 to 8 percent slopes-----	1,829	0.4
CbA	Cabot extremely stony fine sandy loam, 0 to 3 percent slopes-----	4,006	0.9
CbB	Cabot extremely stony fine sandy loam, 3 to 15 percent slopes-----	19,990	4.7
Ce	Carlisle muck-----	6,092	1.4
CoB	Colton gravelly loamy sand, 2 to 8 percent slopes-----	845	0.2
CoC	Colton gravelly loamy sand, 8 to 15 percent slopes-----	889	0.2
CoD	Colton gravelly loamy sand, 15 to 25 percent slopes-----	1,060	0.3
CoE	Colton gravelly loamy sand, 25 to 60 percent slopes-----	544	0.1
CpB	Copake fine sandy loam, 2 to 8 percent slopes-----	1,558	0.4
Cv	Covington clay-----	2,474	0.6
DeB	Deerfield loamy fine sand, 0 to 8 percent slopes-----	2,599	0.6
DeC	Deerfield loamy fine sand, 8 to 15 percent slopes-----	704	0.2
EdA	Eldridge loamy fine sand, 0 to 3 percent slopes-----	967	0.2
EdB	Eldridge loamy fine sand, 3 to 8 percent slopes-----	998	0.2
EdC	Eldridge loamy fine sand, 8 to 15 percent slopes-----	978	0.2
EnA	Enosburg loamy fine sand, 0 to 3 percent slopes-----	2,327	0.6
EnB	Enosburg loamy fine sand, 3 to 8 percent slopes-----	942	0.2
FaB	Farmington loam, very rocky, 3 to 8 percent slopes-----	1,661	0.4
FaC	Farmington loam, very rocky, 8 to 15 percent slopes-----	2,751	0.7
FmC	Farmington-Rock outcrop complex, 6 to 15 percent slopes-----	4,783	1.1
FmD	Farmington-Rock outcrop complex, 15 to 60 percent slopes-----	6,233	1.5
GeA	Georgia stony loam, 0 to 3 percent slopes-----	2,600	0.6
GeB	Georgia stony loam, 3 to 8 percent slopes-----	4,930	1.2
GeC	Georgia stony loam, 8 to 15 percent slopes-----	1,097	0.3
GrB	Georgia extremely stony loam, 0 to 8 percent slopes-----	767	0.2
GrC	Georgia extremely stony loam, 8 to 15 percent slopes-----	366	0.1
Ha	Hadley silt loam-----	1,161	0.3
HbA	Hinesburg loamy fine sand, 0 to 3 percent slopes-----	355	0.1
HbB	Hinesburg loamy fine sand, 3 to 8 percent slopes-----	179	(1)
HbC	Hinesburg loamy fine sand, 8 to 15 percent slopes-----	157	(1)
HbD	Hinesburg loamy fine sand, 15 to 25 percent slopes-----	576	0.1
HbE	Hinesburg loamy fine sand, 25 to 60 percent slopes-----	341	0.1
KbA	Kingsbury clay, 0 to 3 percent slopes-----	2,699	0.6
KbB	Kingsbury clay, 3 to 8 percent slopes-----	407	0.1
Le	Limerick silt loam-----	5,930	1.4
LoB	Lordstown loam, rocky, 3 to 8 percent slopes-----	1,311	0.3
LoC	Lordstown loam, rocky, 8 to 15 percent slopes-----	1,354	0.3
LoD	Lordstown loam, rocky, 15 to 25 percent slopes-----	431	0.1
LrC	Lordstown-Rock outcrop complex, 5 to 15 percent slopes-----	2,963	0.7
LrD	Lordstown-Rock outcrop complex, 15 to 25 percent slopes-----	1,991	0.5
LrE	Lordstown-Rock outcrop complex, 25 to 60 percent slopes-----	1,443	0.3
Ly	Lyons stony loam-----	2,844	0.7
Ma	Marsh-----	2,400	0.6
MeA	Massena stony loam, 0 to 3 percent slopes-----	12,065	2.9
MeB	Massena stony loam, 3 to 8 percent slopes-----	4,282	1.0
MnA	Massena extremely stony loam, 0 to 6 percent slopes-----	5,325	1.3
MsA	Missisquoi loamy sand, 0 to 3 percent slopes-----	2,021	0.5
MsB	Missisquoi loamy sand, 3 to 8 percent slopes-----	4,225	1.0
MsC	Missisquoi loamy sand, 8 to 15 percent slopes-----	2,957	0.7
MsD	Missisquoi loamy sand, 15 to 25 percent slopes-----	1,743	0.4
MsE	Missisquoi loamy sand, 25 to 60 percent slopes-----	1,093	0.3
MuB	Munson silt loam, 3 to 8 percent slopes-----	9,531	2.3
MuC	Munson silt loam, 8 to 15 percent slopes-----	3,724	0.9
Od	Ondawa Variant silt loam-----	939	0.2
Pa	Peacham stony soils-----	2,411	0.6
PeB	Peru stony fine sandy loam, 3 to 8 percent slopes-----	8,076	1.9
PeC	Peru stony fine sandy loam, 8 to 15 percent slopes-----	8,685	2.1
PeD	Peru stony fine sandy loam, 15 to 25 percent slopes-----	1,184	0.3
PrC	Peru extremely stony fine sandy loam, 3 to 15 percent slopes-----	19,236	4.6
PrD	Peru extremely stony fine sandy loam, 15 to 25 percent slopes-----	10,585	2.5
Pu	Podunk Variant silt loam-----	1,316	0.3

See footnote at end of table.



TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
RaB	Raynham silt loam, 3 to 8 percent slopes-----	5,393	1.3
RoE	Rock outcrop-Woodstock complex, 20 to 60 percent slopes-----	1,576	0.4
Ru	Rumney Variant silt loam-----	3,838	0.9
SaA	St. Albans slaty loam, 0 to 3 percent slopes-----	599	0.1
SaB	St. Albans slaty loam, 3 to 8 percent slopes-----	2,676	0.6
SaC	St. Albans slaty loam, 8 to 15 percent slopes-----	1,901	0.5
SbB	St. Albans very stony loam, 2 to 8 percent slopes-----	595	0.1
SbC	St. Albans very stony loam, 8 to 15 percent slopes-----	347	0.1
SbD	St. Albans very stony loam, 15 to 25 percent slopes-----	598	0.1
SbE	St. Albans very stony loam, 25 to 60 percent slopes-----	278	0.1
ScA	Scantic silt loam, 0 to 3 percent slopes-----	12,972	3.1
ScB	Scantic silt loam, 3 to 8 percent slopes-----	1,743	0.4
StB	Stowe stony fine sandy loam, 3 to 8 percent slopes-----	646	0.2
StC	Stowe stony fine sandy loam, 8 to 15 percent slopes-----	838	0.2
StD	Stowe stony fine sandy loam, 15 to 25 percent slopes-----	848	0.2
SwC	Stowe extremely stony fine sandy loam, 5 to 15 percent slopes-----	712	0.2
SwD	Stowe extremely stony fine sandy loam, 15 to 25 percent slopes-----	3,317	0.8
SyE	Stowe stony soils, 25 to 60 percent slopes-----	4,514	1.1
Tm	Terric Medisaprists-----	4,118	1.0
TwB	Tunbridge-Woodstock fine sandy loams, very rocky, 3 to 8 percent slopes-----	5,101	1.2
TwC	Tunbridge-Woodstock fine sandy loams, very rocky, 8 to 15 percent slopes-----	8,781	2.1
TwD	Tunbridge-Woodstock fine sandy loams, very rocky, 15 to 25 percent slopes-----	2,992	0.7
Wa	Wallkill silt loam-----	400	0.1
Wh	Wareham loamy fine sandy-----	2,917	0.7
WrA	Westbury stony fine sandy loam, 0 to 3 percent slopes-----	2,073	0.5
WrB	Westbury stony fine sandy loam, 3 to 8 percent slopes-----	7,768	1.8
WrC	Westbury stony fine sandy loam, 8 to 15 percent slopes-----	2,208	0.5
WsA	Windsor loamy fine sand, 0 to 3 percent slopes-----	2,973	0.7
WsB	Windsor loamy fine sand, 3 to 8 percent slopes-----	3,689	0.9
WsC	Windsor loamy fine sand, 8 to 15 percent slopes-----	2,460	0.6
WsD	Windsor loamy fine sand, 15 to 25 percent slopes-----	1,632	0.4
WsE	Windsor loamy fine sand, 25 to 60 percent slopes-----	2,874	0.7
Wt	Winooski silt loam-----	1,469	0.3
WxC	Woodstock-Rock outcrop complex, 8 to 15 percent slopes-----	21,624	5.1
WxD	Woodstock-Rock outcrop complex, 15 to 25 percent slopes-----	38,054	8.9
WxE	Woodstock-Rock outcrop complex, 25 to 60 percent slopes-----	44,768	10.5
	Total-----	421,760	100.0

<sup>1</sup>Less than 0.1 percent.

TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management in 1976. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Corn silage	Alfalfa hay	Grass-legume hay	Pasture
	<u>Ton</u>	<u>Ton</u>	<u>Ton</u>	<u>AUM<sup>1</sup></u>
AuA----- Au Gres	10	---	2.2	---
BeB----- Belgrade	24	4.5	4.0	8.5
BeC----- Belgrade	22	4.0	3.5	7.7
Bg----- Binghamville	18	---	3.5	6.5
Br----- Birdsall	---	---	---	---
BxC----- Buxton	20	3.5	3.5	6.5
BxD----- Buxton	18	3.0	3.0	5.5
BxE----- Buxton	---	---	---	---
CaA----- Cabot	14	---	3.5	6.5
CaB----- Cabot	16	---	4.0	7.5
CbA----- Cabot	---	---	---	---
CbB----- Cabot	---	---	---	---
Ce----- Carlisle	---	---	---	---
CoB----- Colton	12	2.5	2.0	5.0
CoC----- Colton	---	2.5	2.0	5.0
CoD----- Colton	---	---	---	---
CoE----- Colton	---	---	---	---
CpB----- Copake	24	5.0	5.0	9.5
Cv----- Covington	15	---	---	5.5
DeB----- Deerfield	16	3.5	3.0	6.5
DeC----- Deerfield	14	3.0	2.5	5.5

See footnote at end of table.



TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Alfalfa hay	Grass-legume hay	Pasture
	<u>Ton</u>	<u>Ton</u>	<u>Ton</u>	<u>AUM<sup>1</sup></u>
EdA, EdB----- Eldridge	16	4.0	3.5	8.0
EdC----- Eldridge	14	3.5	3.0	8.0
EnA, EnB----- Enosburg	18	---	3.0	6.0
FaB----- Farmington	14	---	3.5	6.5
FaC----- Farmington	---	---	3.0	5.5
FmC----- Farmington	---	---	---	---
FmD----- Farmington	---	---	---	---
GeA----- Georgia	24	5.0	4.0	9.0
GeB----- Georgia	24	5.0	4.0	9.0
GeC----- Georgia	22	5.0	4.0	9.0
GrB, GrC----- Georgia	---	---	---	---
Ha----- Hadley	28	4.5	---	---
HbA, HbB----- Hinesburg	16	4.0	3.5	7
HbC----- Hinesburg	14	4.0	3.5	7
HbD----- Hinesburg	12	3.5	3.0	6
HbE----- Hinesburg	---	---	---	---
KbA, KbB----- Kingsbury	16	4.5	4.0	6.5
Le----- Limerick	20	---	3.5	6.5
LoB----- Lordstown	17	3.5	3.0	6.5
LoC----- Lordstown	17	3.5	3.0	6.5
LoD----- Lordstown	16	3.0	3.0	5.5
LrC----- Lordstown	---	---	---	---
LrD----- Lordstown	---	---	---	---

See footnote at end of table.

TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Alfalfa hay	Grass-legume hay	Pasture
	<u>Ton</u>	<u>Ton</u>	<u>Ton</u>	<u>AUM<sup>1</sup></u>
LrE----- Lordstown	---	---	---	---
Ly----- Lyons	18	---	3.0	5.5
Ma----- Marsh	---	---	---	---
MeA----- Massena	22	4.0	3.0	6.5
MeB----- Massena	22	4.0	3.0	6.5
MnA----- Massena	---	---	---	---
MsA, MsB----- Missisquoi	12	3.0	2.5	5.0
MsC----- Missisquoi	10	3.0	2.5	4.5
MsD----- Missisquoi	---	3.0	2.5	3.5
MsE----- Missisquoi	---	---	---	---
MuB----- Munson	22	---	3.5	6.5
MuC----- Munson	20	---	3.5	6.5
Od----- Ondawa Variant	26	4.5	4.0	8.5
Pa----- Peacham	---	---	---	---
PeB----- Peru	20	4.0	4.0	8.0
PeC----- Peru	18	4.0	4.0	8.0
PeD----- Peru	16	3.5	3.5	7.0
PrC, PrD----- Peru	---	---	---	---
Pu----- Podunk Variant	24	4.0	4.0	8.5
RaB----- Raynham	18	---	3.5	6.5
RoE----- Rock outcrop	---	---	---	---
Ru----- Rumney Variant	20	3.5	4.0	6.5
SaA----- St. Albans	24	5.0	4.0	9.0
SaB----- St. Albans	24	5.0	4.0	9.0

See footnote at end of table.



TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Alfalfa hay	Grass-legume hay	Pasture
	<u>Ton</u>	<u>Ton</u>	<u>Ton</u>	<u>AUM<sup>1</sup></u>
SaC----- St. Albans	22	5.0	4.0	9.0
SbB, SbC, SbD----- St. Albans	---	---	---	---
SbE----- St. Albans	---	---	---	---
ScA, ScB----- Scantic	16	---	3.0	6.0
StB----- Stowe	20	4.0	---	8.0
StC----- Stowe	18	4.0	---	8.0
StD----- Stowe	16	3.5	---	7.0
SwC, SwD, SyE----- Stowe	---	---	---	---
Tm----- Terric Medisaprists	---	---	---	---
TwB----- Tunbridge	18	---	---	6.5
TwC----- Tunbridge	16	---	---	6.4
TwD----- Tunbridge	---	---	---	---
Wa----- Wallkill	20	---	3.5	6.5
Wh----- Wareham	16	---	2.5	5.5
WrA----- Westbury	16	3.0	3.0	5.5
WrB----- Westbury	16	3.0	3.0	5.5
WrC----- Westbury	14	3.0	3.0	5.5
WsA, WsB----- Windsor	14	3.0	2.5	5.5
WsC----- Windsor	12	3.0	2.5	5.5
WsD----- Windsor	---	2.5	2.0	5.0
WsE----- Windsor	---	---	---	---
Wt----- Winooski	26	4.5	4.0	8.5
WxC----- Woodstock	---	---	---	---
WxD----- Woodstock	---	---	---	---

See footnote at end of table.

## SOIL SURVEY

TABLE 6.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Alfalfa hay	Grass-legume hay	Pasture
	<u>Ton</u>	<u>Ton</u>	<u>Ton</u>	<u>AUM</u> <sup>1</sup>
WxE----- Woodstock	---	---	---	---

<sup>1</sup>Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.



TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

[Marsh and Terric Medisaprists areas are excluded.  
Absence of an entry means no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
I	2,699	---	---	---
II	46,397	14,664	26,668	5,065
III	91,173	20,219	58,513	12,441
IV	41,927	10,790	27,788	3,349
V	---	---	---	4,006
VI	32,062	20,712	2,418	8,932
VII	200,984	54,776	6,092	140,116
VIII	---	---	---	---

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Important trees	Site index	
AuA----- Au Gres	3s	Slight	Slight	Severe	Slight	Quaking aspen----- Bigtooth aspen----- Balsam fir----- Paper birch----- Sugar maple----- Red maple----- Eastern hemlock-----	60 --- --- --- --- --- ---	White spruce, white pine.
BeB----- Belgrade	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Red pine----- Northern red oak---- White spruce-----	75 75 62 65	Eastern white pine, red pine, European larch, white spruce.
BeC----- Belgrade	3r	Moderate	Slight	Slight	Slight	Eastern white pine-- Red pine----- Northern red oak---- White spruce-----	75 75 62 65	Eastern white pine, red pine, European larch, white spruce.
Bg----- Binghamville	4w	Slight	Severe	Severe	Severe	Eastern white pine-- White spruce----- Red spruce-----	65 55 45	Eastern white pine, white spruce, northern white-cedar.
Br----- Birdsall	5w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple-----	50 50	Eastern white pine, white spruce, northern white-cedar.
BxC----- Buxton	4r	Moderate	Moderate	Slight	Slight	Eastern white pine--	65	Eastern white pine, white spruce.
BxD, BxE----- Buxton	4r	Severe	Severe	Slight	Slight	Eastern white pine--	65	Eastern white pine, white spruce.
CaA, CaB----- Cabot	4w	Slight	Severe	Severe	Severe	Sugar maple----- White spruce----- Balsam fir----- Red spruce-----	56 60 56 47	Eastern white pine, white spruce, northern white-cedar.
CbA, CbB----- Cabot	4x	Slight	Severe	Severe	Severe	Sugar maple----- White spruce----- Balsam fir----- Red spruce-----	56 60 56 47	Eastern white pine, white spruce, northern white-cedar.
Ce----- Carlisle	4w	Slight	Severe	Severe	Severe	Red maple----- White ash----- Green ash----- Black cherry----- Swamp white oak----- Silver maple-----	46 --- --- --- --- ---	Northern white-cedar, eastern white pine.
CoB, CoC----- Colton	4s	Slight	Slight	Severe	Slight	Eastern white pine-- Red pine----- Red spruce----- Sugar maple-----	62 52 39 61	Eastern white pine, red pine.
CoD----- Colton	4s	Slight	Moderate	Severe	Slight	Eastern white pine-- Red pine----- Red spruce----- Sugar maple-----	62 52 39 61	Eastern white pine, red pine.
CoE----- Colton	4s	Moderate	Severe	Severe	Slight	Eastern white pine-- Red pine----- Red spruce----- Sugar maple-----	62 52 39 61	Eastern white pine, red pine.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Important trees	Site index	
CpB----- Copake	4o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple-----	65 60 55	Eastern white pine, Austrian pine, European larch, Norway spruce.
Cv----- Covington	5w	Slight	Severe	Severe	Severe	Eastern white pine-- Balsam fir----- White ash----- Sugar maple----- White spruce-----	55 60 67 49 60	White spruce, northern white-cedar.
DeB, DeC----- Deerfield	4s	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak----	65 55	Eastern white pine, red pine, European larch.
EdA, EdB, EdC----- Eldridge	4o	Slight	Slight	Moderate	Slight	Eastern white pine-- Northern red oak----	65 60	Eastern white pine, red pine.
EnA, EnB----- Enosburg	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Northern red oak---- Sugar maple-----	65 60 50	Eastern white pine, white spruce.
FaB, FaC----- Farmington	5d	Slight	Slight	Severe	Moderate	Sugar maple----- Northern red oak---- Eastern white pine--	50 50 55	Eastern white pine, red pine, European larch.
<sup>1</sup> FmC: Farmington-----	5d	Slight	Slight	Severe	Moderate	Sugar maple----- Northern red oak---- Eastern white pine--	50 50 55	Eastern white pine, red pine, European larch.
Rock outcrop.								
<sup>1</sup> FmD: Farmington-----	5d	Severe	Severe	Severe	Moderate	Sugar maple----- Northern red oak---- Eastern white pine--	50 50 55	Eastern white pine, red pine, European larch.
Rock outcrop.								
GeA, GeB, GeC----- Georgia	3o	Slight	Slight	Slight	Slight	Sugar maple----- Northern red oak----	65 70	Eastern white pine, red pine, Norway spruce.
GrB, GrC----- Georgia	3x	Slight	Moderate	Slight	Slight	Sugar maple----- Northern red oak----	65 70	Eastern white pine, red pine, Norway spruce.
Ha----- Hadley	3o	Slight	Slight	Slight	Slight	Eastern white pine--	70	Eastern white pine, red pine, black walnut, European larch.
HbA, HbB, HbC----- Hinesburg	4o	Slight	Slight	Moderate	Slight	Eastern white pine-- Northern red oak----	65 60	Eastern white pine, red pine.
HbD----- Hinesburg	4r	Moderate	Moderate	Moderate	Slight	Eastern white pine-- Northern red oak----	65 60	Eastern white pine, red pine.
HbE----- Hinesburg	4r	Severe	Severe	Moderate	Slight	Eastern white pine-- Northern red oak----	65 60	Eastern white pine, red pine.
KbA, KbB----- Kingsbury	3w	Slight	Moderate	Slight	Moderate	Sugar maple----- Balsam fir----- Eastern white pine-- White ash-----	50 60 55 67	Eastern white pine, Norway spruce, white spruce.

See footnote at end of table.



TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Important trees	Site index	
Le----- Limerick	4w	Slight	Severe	Severe	Severe	Eastern white pine--	65	Eastern white pine, white spruce, northern white-cedar.
LoB, LoC----- Lordstown	3f	Slight	Slight	Moderate	Slight	Northern red oak----	60	Eastern white pine, European larch, black cherry, red pine, Norway spruce.
						Sugar maple-----	73	
						White ash-----	75	
LoD----- Lordstown	3r	Slight	Moderate	Moderate	Slight	Northern red oak----	60	Eastern white pine, European larch, black cherry, red pine, Norway spruce.
						Sugar maple-----	73	
						White ash-----	75	
<sup>1</sup> LrC: Lordstown-----	3f	Slight	Slight	Moderate	Slight	Northern red oak----	60	Eastern white pine, European larch, black cherry, red pine, Norway spruce.
						Sugar maple-----	73	
						White ash-----	75	
Rock outcrop.								
<sup>1</sup> LrD: Lordstown-----	3r	Slight	Moderate	Moderate	Slight	Northern red oak----	60	Eastern white pine, European larch, black cherry, red pine, Norway spruce.
						Sugar maple-----	73	
						White ash-----	75	
Rock outcrop.								
<sup>1</sup> LrE: Lordstown-----	3r	Moderate	Severe	Moderate	Slight	Northern red oak----	60	Eastern white pine, European larch, black cherry, red pine, Norway spruce.
						Sugar maple-----	73	
						White ash-----	75	
Rock outcrop.								
Ly----- Lyons	5w	Slight	Severe	Severe	Severe	Red maple-----	60	Northern white-cedar.
MeA, MeB----- Massena	3w	Slight	Moderate	Moderate	Moderate	Eastern white pine--	65	Eastern white pine, white spruce, northern white-cedar.
						Northern red oak----	60	
						Red maple-----	75	
MnA----- Massena	3x	Slight	Moderate	Moderate	Moderate	Eastern white pine--	65	Eastern white pine, white spruce, northern white-cedar.
						Northern red oak----	60	
						Red maple-----	75	
MsA, MsB, MsC----- Missisquoi	4s	Slight	Slight	Severe	Slight	Eastern white pine--	65	Eastern white pine, red pine.
						Red pine-----	61	
						Sugar maple-----	55	
MsD----- Missisquoi	4s	Slight	Moderate	Severe	Slight	Eastern white pine--	65	Eastern white pine, red pine.
						Red pine-----	61	
						Sugar maple-----	55	
MsE----- Missisquoi	4s	Moderate	Severe	Severe	Slight	Eastern white pine--	65	Eastern white pine, red pine.
						Red pine-----	61	
						Sugar maple-----	55	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Important trees	Site index	
MuB----- Munson	4w	Slight	Moderate	Moderate	Moderate	Sugar maple----- White spruce----- Red spruce----- Eastern white pine--	56 55 45 65	Eastern white pine, white spruce, northern white-cedar.
MuC----- Munson	4w	Moderate	Moderate	Moderate	Moderate	Sugar maple----- White spruce----- Red spruce----- Eastern white pine--	56 55 45 65	Eastern white pine, white spruce, northern white-cedar.
Od----- Ondawa Variant	4o	Slight	Slight	Slight	Slight	Eastern white pine--	60	Eastern white pine, red pine.
PeB, PeC----- Peru	3o	Slight	Slight	Slight	Slight	Sugar maple----- Northern red oak---- Eastern white pine-- Red spruce-----	57 70 71 45	Eastern white pine, red pine, white spruce, European larch.
PeD----- Peru	3r	Slight	Moderate	Slight	Slight	Sugar maple----- Northern red oak---- Eastern white pine-- Red spruce-----	57 70 71 45	Eastern white pine, red pine, white spruce, European larch.
PrC, PrD----- Peru	3x	Slight	Moderate	Slight	Slight	Sugar maple----- Northern red oak---- Eastern white pine-- Red spruce-----	57 70 71 45	Eastern white pine, red pine, white spruce, European larch.
Pu----- Podunk Variant	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Red pine-----	75 75	Eastern white pine, red pine.
RaB----- Raynham	4w	Slight	Severe	Severe	Severe	Eastern white pine-- White spruce----- Red spruce-----	65 55 45	Eastern white pine, white spruce, northern white-cedar.
<sup>1</sup> RoE: Rock outcrop.								
Woodstock-----	4d	Moderate	Severe	Severe	Moderate	Red pine----- White spruce----- Balsam fir----- Red spruce-----	60 58 58 41	Eastern white pine, white spruce, balsam fir.
Ru----- Rumney Variant	4w	Slight	Severe	Severe	Severe	Eastern white pine--	59	Eastern white pine, northern white-cedar.
SaA, SaB, SaC----- St. Albans	4s	Slight	Slight	Slight	Slight	Sugar maple----- Eastern white pine-- Red pine----- White spruce----- Red spruce-----	55 69 65 47 42	Red pine, eastern white pine, white spruce.
SbB, SbC----- St. Albans	4s	Slight	Slight	Slight	Slight	Sugar maple----- Eastern white pine-- Red pine-----	55 69 65	Red pine, eastern white pine, white spruce.
SbD----- St. Albans	4s	Slight	Moderate	Slight	Slight	Sugar maple----- Eastern white pine-- Red pine-----	55 69 65	Red pine, eastern white pine, white spruce.
SbE----- St. Albans	4s	Moderate	Severe	Slight	Slight	Sugar maple----- Eastern white pine-- Red pine-----	55 69 65	Red pine, eastern white pine, white spruce.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Important trees	Site index	
ScA, ScB----- Scantic	5w	Slight	Severe	Severe	Severe	Eastern white pine-- White spruce----- Balsam fir----- White ash-----	55 60 60 67	White spruce, northern white-cedar, eastern white pine, tamarack, balsam fir, black spruce, red spruce.
StB, StC----- Stowe	3o	Slight	Slight	Slight	Slight	Red pine----- Eastern white pine-- Sugar maple-----	67 66 75	Red pine, eastern white pine, Norway spruce.
StD----- Stowe	3r	Slight	Moderate	Slight	Slight	Red pine----- Eastern white pine-- Sugar maple-----	67 66 75	Red pine, eastern white pine, Norway spruce.
SwC----- Stowe	3x	Slight	Moderate	Slight	Slight	Red pine----- Eastern white pine-- Sugar maple-----	67 66 79	Red pine, eastern white pine, Norway spruce.
SwD----- Stowe	3x	Slight	Moderate	Slight	Slight	Red pine----- Eastern white pine-- Sugar maple-----	67 66 65	Red pine, eastern white pine, Norway spruce.
<sup>1</sup> SyE----- Stowe	3x	Moderate	Severe	Slight	Slight	Red pine----- Eastern white pine-- Sugar maple-----	67 66 65	Red pine, eastern white pine, Norway spruce.
<sup>1</sup> TwB, <sup>1</sup> TwC: Tunbridge-----	3o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- Red spruce-----	70 75 55	Eastern white pine, white spruce, red spruce.
Woodstock-----	4d	Slight	Slight	Severe	Moderate	Red pine----- White spruce----- Balsam fir----- Red spruce-----	60 58 58 41	Eastern white pine, white spruce, balsam fir.
<sup>1</sup> TwD: Tunbridge-----	3r	Slight	Moderate	Slight	Slight	Northern red oak---- Eastern white pine-- Red spruce-----	70 75 55	Eastern white pine, white spruce, red spruce.
Woodstock-----	4d	Slight	Moderate	Severe	Moderate	Red pine----- White spruce----- Balsam fir----- Red spruce-----	60 58 58 41	Eastern white pine, white spruce, balsam fir.
Wa----- Wallkill	4w	Slight	Severe	Severe	Severe	Pin oak----- Red maple-----	80 65	Northern white-cedar.
Wh----- Wareham	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple----- Red spruce-----	65 65 45	Eastern white pine.
WrA, WrB, WrC----- Westbury	4w	Slight	Moderate	Moderate	Moderate	Northern red oak---- Sugar maple-----	60 60	Eastern white pine, white spruce, Norway spruce.
WsA, WsB, WsC----- Windsor	5s	Slight	Slight	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine----- Sugar maple-----	57 52 61 55	Eastern white pine, red pine.
WsD----- Windsor	5s	Slight	Moderate	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine----- Sugar maple-----	57 52 61 55	Eastern white pine, red pine.

See footnote at end of table.



TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Important trees	Site index	
WsE----- Windsor	5s	Moderate	Severe	Severe	Slight	Eastern white pine-- Northern red oak---- Red pine----- Sugar maple-----	57 52 61 55	Eastern white pine, red pine.
Wt----- Winooski	3o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- White spruce----- Sugar maple-----	70 75 70 65	Eastern white pine, red pine, European larch.
<sup>1</sup> WxC: Woodstock-----	4d	Slight	Slight	Severe	Moderate	Red pine----- White spruce----- Balsam fir----- Red spruce-----	60 58 58 41	Eastern white pine, white spruce, balsam fir.
Rock outcrop.								
<sup>1</sup> WxD: Woodstock-----	4d	Slight	Moderate	Severe	Moderate	Red pine----- White spruce----- Balsam fir----- Red spruce-----	60 58 58 41	Eastern white pine, white spruce, balsam fir.
Rock outcrop.								
<sup>1</sup> WxE: Woodstock-----	4d	Moderate	Severe	Severe	Moderate	Red pine----- White spruce----- Balsam fir----- Red spruce-----	60 58 58 41	Eastern white pine, white spruce, balsam fir.
Rock outcrop.								

<sup>1</sup> See map unit description for the composition and behavior of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AuA----- Au Gres	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.
BeB----- Belgrade	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
BeC----- Belgrade	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action.	Moderate: slope.
Bg----- Binghamville	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Br----- Birdsall	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action, corrosive.	Severe: wetness, frost action.	Severe: wetness.
BxC----- Buxton	Severe: too clayey, wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: frost action, low strength.	Moderate: slope, wetness.
BxD, BxE----- Buxton	Severe: slope, too clayey, wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: slope, frost action, low strength.	Severe: slope.
CaA, CaB----- Cabot	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
CbA----- Cabot	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, frost action.	Severe: wetness, large stones.
CbB----- Cabot	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, large stones.	Severe: slope, wetness, large stones.	Severe: wetness, frost action.	Severe: wetness, large stones.
Ce----- Carlisle	Severe: floods, wetness, cutbanks cave.	Severe: wetness, low strength, floods.	Severe: wetness, low strength, floods.	Severe: wetness, low strength, floods.	Severe: excess humus, wetness, floods.	Severe: excess humus, wetness, floods.
CoB----- Colton	Severe: small stones.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: small stones, droughty.
CoC----- Colton	Severe: small stones.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty.
CoD, CoE----- Colton	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CpB----- Copake	Slight-----	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
Cv----- Covington	Severe: wetness, cutbanks cave.	Severe: wetness, shrink-swell, low strength.	Severe: wetness, shrink-swell, low strength.	Severe: wetness, shrink-swell, low strength.	Severe: wetness, low strength, shrink-swell.	Severe: wetness, too clayey.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
DeB----- Deerfield	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: frost action.	Severe: too sandy.
DeC----- Deerfield	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Moderate: slope, frost action.	Severe: too sandy.
EdA, EdB----- Eldridge	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, frost action.	Moderate: too sandy.
EdC----- Eldridge	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Moderate: slope, low strength, frost action.	Moderate: slope, too sandy.
EnA, EnB----- Enosburg	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, too sandy.
FaB----- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
FaC----- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
<sup>1</sup> FmC: Farmington-----	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
<sup>1</sup> FmD: Farmington-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Rock outcrop.						
GeA, GeB----- Georgia	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
GeC----- Georgia	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action.	Moderate: slope.
GrB----- Georgia	Severe: large stones, wetness.	Severe: large stones, frost action.	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: frost action.	Severe: large stones.
GrC----- Georgia	Severe: large stones, wetness.	Severe: large stones, frost action.	Severe: large stones, wetness.	Severe: slope, large stones, wetness.	Severe: frost action.	Severe: large stones.
Ha----- Hadley	Severe: floods.	Severe: floods, frost action.	Severe: floods, frost action.	Severe: floods, frost action.	Severe: floods, frost action.	Moderate: floods.
HbA----- Hinesburg	Slight-----	Moderate: frost action.	Moderate: low strength.	Moderate: frost action.	Moderate: frost action.	Moderate: too sandy.
HbB----- Hinesburg	Slight-----	Moderate: frost action.	Moderate: low strength.	Moderate: slope, frost action.	Moderate: frost action.	Moderate: too sandy.

See footnote at end of table.



TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HbC----- Hinesburg	Moderate: slope.	Moderate: slope, frost action.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, too sandy.
HbD, HbE----- Hinesburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
KbA, KbB----- Kingsbury	Severe: wetness, too clayey.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: frost action, low strength.	Severe: too clayey.
Le----- Limerick	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
LoB----- Lordstown	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Moderate: depth to rock, small stones.
LoC----- Lordstown	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Moderate: slope, depth to rock, small stones.
LoD----- Lordstown	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
<sup>1</sup> LrC: Lordstown-----	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Moderate: slope, depth to rock, small stones.
Rock outcrop.						
<sup>1</sup> LrD, <sup>1</sup> LrE: Lordstown-----	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
Ly----- Lyons	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Ma. Marsh						
MeA, MeB----- Massena	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: frost action.	Moderate: wetness.
MnA----- Massena	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: frost action, large stones.	Severe: wetness, large stones.
MsA----- Missisquoi	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Severe: too sandy, droughty.
MsB----- Missisquoi	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Severe: too sandy, droughty.
MsC----- Missisquoi	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: too sandy, droughty.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MsD, MsE----- Missisquoi	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, too sandy, droughty.
MuB----- Munson	Severe: wetness, cutbanks cave.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: frost action.	Moderate: wetness.
MuC----- Munson	Severe: wetness, cutbanks cave.	Severe: wetness, frost action.	Severe: wetness.	Severe: slope, wetness, frost action.	Severe: frost action.	Moderate: wetness.
Od----- Ondawa Variant	Severe: floods, cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
<sup>1</sup> Pa----- Peacham	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: wetness, frost action.	Severe: wetness, large stones.
PeB----- Peru	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
PeC----- Peru	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: slope.
PeD----- Peru	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PrC----- Peru	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: slope.	Severe: frost action.	Severe: large stones.
PrD----- Peru	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pu----- Podunk Variant	Severe: floods, cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
RaB----- Raynham	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: frost action, wetness.	Moderate: wetness.
<sup>1</sup> RoE: Rock outcrop.						
Woodstock-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Ru----- Rumney Variant	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
SaA----- St. Albans	Slight-----	Moderate: frost action.	Slight-----	Moderate: frost action.	Moderate: frost action.	Moderate: small stones.
SaB----- St. Albans	Slight-----	Moderate: frost action.	Slight-----	Moderate: slope, frost action.	Moderate: frost action.	Moderate: small stones.
SaC----- St. Albans	Moderate: slope.	Moderate: slope, frost action.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, small stones.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SbB----- St. Albans	Moderate: large stones.	Moderate: large stones, frost action.	Moderate: large stones.	Moderate: slope, large stones, frost action.	Moderate: frost action.	Severe: large stones.
SbC----- St. Albans	Moderate: slope, large stones.	Moderate: slope, large stones, frost action.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action.	Severe: large stones.
SbD, SbE----- St. Albans	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, large stones.
ScA, ScB----- Scantic	Severe: wetness, too clayey.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, low strength, frost action.	Severe: wetness.
StB----- Stowe	Severe: wetness.	Moderate: frost action.	Severe: wetness.	Moderate: slope, frost action.	Moderate: frost action.	Slight.
StC----- Stowe	Severe: wetness.	Moderate: slope, frost action.	Severe: wetness.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
StD----- Stowe	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Severe: slope.
SwC----- Stowe	Severe: large stones, wetness.	Severe: large stones.	Severe: wetness, large stones.	Severe: slope, large stones.	Moderate: slope, frost action.	Severe: large stones.
SwD, <sup>1</sup> SyE----- Stowe	Severe: slope, large stones, wetness.	Severe: slope, large stones.	Severe: slope, wetness, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
Tm. Terric Medisaprists						
<sup>1</sup> TWB: Tunbridge-----	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: frost action, depth to rock.	Moderate: depth to rock.
Woodstock-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
<sup>1</sup> TWC: Tunbridge-----	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, frost action.	Moderate: slope, depth to rock.
Woodstock-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
<sup>1</sup> TWD: Tunbridge-----	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Woodstock-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Wa----- Wallkill	Severe: wetness, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness.

See footnote at end of table.



TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Wh----- Wareham	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.
WrA, WrB----- Westbury	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: frost action.	Moderate: wetness.
WrC----- Westbury	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: slope.	Moderate: frost action.	Moderate: wetness.
WsA----- Windsor	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Severe: too sandy, droughty.
WsB----- Windsor	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Severe: too sandy, droughty.
WsC----- Windsor	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: too sandy, droughty.
WsD, WsE----- Windsor	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, too sandy, droughty.
Wt----- Winooski	Severe: floods.	Severe: floods, frost action.	Severe: floods.	Severe: floods, frost action.	Severe: floods, frost action.	Moderate: floods.
<sup>1</sup> WxC: Woodstock----- Rock outcrop.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
<sup>1</sup> WxD, <sup>1</sup> WxE: Woodstock----- Rock outcrop.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.

<sup>1</sup> See map unit description for the composition and behavior of the map unit.

TABLE 10.--SANITARY FACILITIES

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AuA----- Au Gres	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness.
BeB----- Belgrade	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Good.
BeC----- Belgrade	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: slope.
Bg----- Binghamville	Severe: wetness, percs slowly.	Slight-----	Severe: wetness.	Severe: wetness.	Poor: wetness.
Br----- Birdsall	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
BxC----- Buxton	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope, thin layer.
BxD----- Buxton	Severe: slope, percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: slope, wetness.	Poor: slope.
BxE----- Buxton	Severe: slope, percs slowly, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope, wetness.	Poor: slope.
CaA----- Cabot	Severe: percs slowly, wetness.	Moderate: small stones.	Severe: wetness.	Severe: wetness.	Poor: wetness, thin layer, area reclaim.
CaB----- Cabot	Severe: percs slowly, wetness.	Moderate: slope, small stones.	Severe: wetness.	Severe: wetness.	Poor: wetness, thin layer, area reclaim.
CbA----- Cabot	Severe: percs slowly, wetness, large stones.	Severe: large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones, area reclaim.
CbB----- Cabot	Severe: percs slowly, wetness, large stones.	Severe: slope, large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones, area reclaim.
Ce----- Carlisle	Severe: floods, wetness.	Severe: wetness, excess humus, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness, hard to pack.
CoB----- Colton	Slight-----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CoC----- Colton	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe; seepage.	Poor: small stones.
CoD----- Colton	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope, small stones.
CoE----- Colton	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
CpB----- Copake	Slight-----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer.
Cv----- Covington	Severe: percs slowly, wetness.	Slight-----	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, wetness, hard to pack.
DeB----- Deerfield	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: thin layer, area reclaim.
DeC----- Deerfield	Severe: wetness.	Severe: slope, seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: thin layer, area reclaim.
EdA, EdB----- Eldridge	Severe: percs slowly, wetness.	Severe: wetness, seepage.	Moderate: wetness.	Severe: wetness.	Fair: too sandy.
EdC----- Eldridge	Severe: percs slowly, wetness.	Severe: slope, wetness, seepage.	Moderate: wetness.	Severe: wetness.	Fair: slope, too sandy.
EnA, EnB----- Enosburg	Severe: percs slowly, wetness.	Severe: wetness, seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
FaB----- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight-----	Poor: thin layer, area reclaim.
FaC----- Farmington	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Poor: thin layer, area reclaim.
<sup>1</sup> FmC: Farmington-----	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Poor: thin layer, area reclaim.
Rock outcrop.					
<sup>1</sup> FmD: Farmington-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Rock outcrop.					

See footnote at end of table.



TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
GeA----- Georgia	Severe: percs slowly, wetness.	Slight-----	Severe: wetness.	Severe: wetness.	Good.
GeB----- Georgia	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Good.
GeC----- Georgia	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope.
GrB----- Georgia	Severe: large stones, percs slowly, wetness.	Severe: large stones.	Severe: large stones, wetness.	Severe: wetness.	Poor: large stones.
GrC----- Georgia	Severe: large stones, percs slowly, wetness.	Severe: slope, large stones.	Severe: large stones, wetness.	Severe: wetness.	Poor: large stones.
Ha----- Hadley	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Good.
HbA----- Hinesburg	Severe: percs slowly.	Slight-----	Slight-----	Slight-----	Fair: too sandy, thin layer.
HbB----- Hinesburg	Severe: percs slowly.	Moderate: slope.	Slight-----	Slight-----	Fair: too sandy, thin layer.
HbC----- Hinesburg	Severe: percs slowly.	Severe: slope.	Slight-----	Moderate: slope.	Fair: slope, too sandy, thin layer.
HbD----- Hinesburg	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
HbE----- Hinesburg	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
KbA----- Kingsbury	Severe: percs slowly, wetness.	Slight-----	Severe: wetness.	Severe: wetness.	Poor: too clayey.
KbB----- Kingsbury	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: too clayey.
Le----- Limerick	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: floods, wetness.
LoB----- Lordstown	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight-----	Fair: small stones, thin layer.
LoC----- Lordstown	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Fair: small stones, thin layer.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LoD----- Lordstown	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope.
<sup>1</sup> LrC: Lordstown-----  Rock outcrop.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Fair: small stones, thin layer.
<sup>1</sup> LrD: Lordstown-----  Rock outcrop.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope.
<sup>1</sup> LrE: Lordstown-----  Rock outcrop.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.
Ly----- Lyons	Severe: wetness, percs slowly.	Slight-----	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ma. Marsh					
MeA, MeB----- Massena	Severe: percs slowly, wetness.	Moderate: small stones.	Severe: wetness.	Severe: wetness.	Fair: small stones.
MnA----- Massena	Severe: percs slowly, wetness, large stones.	Severe: large stones.	Severe: wetness.	Severe: wetness.	Fair: large stones.
MsA, MsB----- Missisquoi	Slight-----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
MsC----- Missisquoi	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, too sandy.
MsD----- Missisquoi	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope.
MsE----- Missisquoi	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope.
MuB----- Munson	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: too clayey.
MuC----- Munson	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope, too clayey.
Od----- Ondawa Variant	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Fair: thin layer.

See footnote at end of table.

## SOIL SURVEY

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
<sup>1</sup> Pa----- Peacham	Severe: large stones, wetness, percs slowly.	Moderate: large stones.	Severe: large stones, wetness.	Severe: wetness.	Poor: large stones, wetness, area reclaim.
PeB----- Peru	Severe: percs slowly.	Moderate: small stones.	Severe: wetness.	Severe: wetness.	Fair: small stones.
PeC----- Peru	Severe: percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: small stones.
PeD----- Peru	Severe: slope.	Severe: slope.	Severe: wetness.	Severe: slope.	Poor: slope.
PrC----- Peru	Severe: percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: large stones.
PrD----- Peru	Severe: slope.	Severe: slope.	Severe: wetness.	Severe: slope.	Poor: slope.
Pu----- Podunk Variant	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Good.
RaB----- Raynham	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
<sup>1</sup> RoE: Rock outcrop.					
Woodstock-----	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Ru----- Rumney Variant	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
SaA, SaB----- St. Albans	Slight-----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
SaC----- St. Albans	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope.
SbB----- St. Albans	Moderate: large stones.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: large stones.
SbC----- St. Albans	Moderate: slope, large stones.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, large stones.
SbD----- St. Albans	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope.
SbE----- St. Albans	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope.
ScA----- Scantic	Severe: percs slowly, wetness.	Slight-----	Severe: wetness.	Severe: wetness.	Poor: wetness, too clayey.

See footnote at end of table.



TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ScB----- Scantic	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness, too clayey.
StB----- Stowe	Severe: percs slowly.	Moderate: slope, seepage.	Moderate: wetness.	Slight-----	Good.
StC----- Stowe	Severe: percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: slope.	Fair: slope.
StD----- Stowe	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope, wetness.	Severe: slope.	Poor: slope.
SwC----- Stowe	Severe: percs slowly, large stones.	Severe: slope.	Severe: wetness, large stones.	Severe: wetness.	Poor: large stones.
SwD----- Stowe	Severe: slope, percs slowly, large stones.	Severe: slope.	Severe: wetness, large stones.	Severe: slope, wetness.	Poor: slope, large stones.
<sup>1</sup> SyE----- Stowe	Severe: slope, percs slowly, large stones.	Severe: slope.	Severe: slope, wetness, large stones.	Severe: slope, wetness.	Poor: slope, large stones.
Tm. Terric Medisaprists					
<sup>1</sup> TwB: Tunbridge-----	Severe: depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Fair: thin layer.
Woodstock-----	Severe: depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
<sup>1</sup> TwC: Tunbridge-----	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Fair: slope, thin layer.
Woodstock-----	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
<sup>1</sup> TwD: Tunbridge-----	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer.
Woodstock-----	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Wa----- Wallkill	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
Wh----- Wareham	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.

See footnote at end of table.

## SOIL SURVEY

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WRA----- Westbury	Severe: wetness, percs slowly.	Slight-----	Severe: wetness.	Severe: wetness.	Fair: small stones.
WRB----- Westbury	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: small stones.
WRC----- Westbury	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: small stones.
WSA, WsB----- Windsor	Slight-----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
WSC----- Windsor	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Poor: too sandy.
WSD----- Windsor	Severe: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: slope, seepage.	Poor: slope, too sandy.
WSE----- Windsor	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope, too sandy.
WT----- Winooski	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Good.
<sup>1</sup> WxC: Woodstock-----  Rock outcrop.	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
<sup>1</sup> WxD: Woodstock-----  Rock outcrop.	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
<sup>1</sup> WxE: Woodstock-----  Rock outcrop.	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.

<sup>1</sup> See map unit description for the composition and behavior of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry means soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AuA----- Au Gres	Poor: wetness.	Good-----	Unsuited: excess fines.	Poor: too sandy.
BeB----- Belgrade	Poor: frost action.	Unsuited-----	Unsuited-----	Good.
BeC----- Belgrade	Poor: frost action.	Unsuited-----	Unsuited-----	Fair: slope.
Bg----- Binghamville	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Br----- Birdsall	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
BxC----- Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, too clayey.
BxD----- Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
BxE----- Buxton	Poor: slope, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
CaA, CaB----- Cabot	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, small stones, area reclaim.
CbA, CbB----- Cabot	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones, wetness, area reclaim.
Ce----- Carlisle	Poor: frost action, low strength.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness, excess humus.
CoB, CoC----- Colton	Good-----	Fair-----	Good-----	Poor: small stones.
CoD----- Colton	Fair: slope.	Fair-----	Good-----	Poor: slope, small stones.
CoE----- Colton	Poor: slope.	Fair-----	Good-----	Poor: slope, small stones.
CpB----- Copake	Good-----	Good-----	Good-----	Fair: small stones, thin layer.
Cv----- Covington	Poor: wetness, shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, too clayey.
DeB, DeC----- Deerfield	Fair: frost action.	Good-----	Unsuited: excess fines.	Poor: too sandy.



TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
EdA, EdB----- Eldridge	Fair: low strength, frost action.	Unsuited: thin layer, excess fines.	Unsuited: excess fines.	Fair: too sandy.
EdC----- Eldridge	Fair: low strength, frost action.	Unsuited: thin layer, excess fines.	Unsuited: excess fines.	Fair: slope, too sandy.
EnA, EnB----- Enosburg	Poor: wetness.	Poor: thin layer.	Unsuited: excess fines.	Poor: too sandy, wetness.
FaB, FaC----- Farmington	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: thin layer.	Poor: area reclaim.
<sup>1</sup> FmC: Farmington-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: thin layer.	Poor: area reclaim.
Rock outcrop.				
<sup>1</sup> FmD: Farmington-----	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: thin layer.	Poor: slope, area reclaim.
Rock outcrop.				
GeA, GeB----- Georgia	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: small stones.
GeC----- Georgia	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, small stones.
GrB, GrC----- Georgia	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
Ha----- Hadley	Poor: frost action.	Poor: excess fines.	Unsuited: excess fines.	Good.
HbA, HbB, HbC----- Hinesburg	Fair: frost action, low strength.	Unsuited: thin layer, excess fines.	Unsuited: excess fines.	Poor: too sandy.
HbD----- Hinesburg	Fair: slope, frost action, low strength.	Unsuited: thin layer, excess fines.	Unsuited: excess fines.	Poor: slope, too sandy.
HbE----- Hinesburg	Poor: slope.	Unsuited: thin layer, excess fines.	Unsuited: excess fines.	Poor: slope, too sandy.
KbA, KbB----- Kingsbury	Poor: frost action, low strength.	Unsuited-----	Unsuited-----	Poor: too clayey.
Le----- Limerick	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
LoB, LoC----- Lordstown	Poor: thin layer.	Unsuited: excess fines.	Poor: excess fines.	Poor: small stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
LoD----- Lordstown	Poor: thin layer.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, small stones.
<sup>1</sup> LrC: Lordstown----- Rock outcrop.	Poor: thin layer.	Unsuited: excess fines.	Poor: excess fines.	Poor: small stones.
<sup>1</sup> LrD: Lordstown----- Rock outcrop.	Poor: thin layer.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, small stones.
<sup>1</sup> LrE: Lordstown----- Rock outcrop.	Poor: slope, thin layer.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, small stones.
Ly----- Lyons	Poor: wetness, frost action.	Unsuited-----	Unsuited-----	Poor: wetness.
Ma. Marsh				
MeA, MeB----- Massena	Fair: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
MnA----- Massena	Fair: wetness, large stones.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
MsA, MsB, MsC----- Missisquoi	Good-----	Good-----	Good-----	Poor: area reclaim, too sandy.
MsD----- Missisquoi	Fair: slope.	Good-----	Good-----	Poor: slope, area reclaim, too sandy.
MsE----- Missisquoi	Poor: slope.	Good-----	Good-----	Poor: slope, area reclaim, too sandy.
MuB----- Munson	Poor: frost action, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
MuC----- Munson	Poor: frost action, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
Od----- Ondawa Variant	Good-----	Fair: excess fines.	Unsuited: excess fines.	Good.
<sup>1</sup> Pa----- Peacham	Poor: large stones, wetness, frost action.	Unsuited: large stones, excess fines.	Unsuited: large stones, excess fines.	Poor: large stones, wetness.
PeB, PeC----- Peru	Poor: frost action.	Unsuited-----	Unsuited-----	Fair: small stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
PeD----- Peru	Poor: frost action.	Unsuited-----	Unsuited-----	Poor: slope.
PrC----- Peru	Poor: frost action.	Unsuited-----	Unsuited-----	Poor: large stones.
PrD----- Peru	Poor: frost action.	Unsuited-----	Unsuited-----	Poor: slope.
Pu----- Podunk Variant	Fair: frost action.	Fair: excess fines.	Unsuited: excess fines.	Good.
RaB----- Raynham	Poor: frost action, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
<sup>1</sup> RoE: Rock outcrop.				
Woodstock-----	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, area reclaim.
Ru----- Rumney Variant	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: wetness.
SaA, SaB, SaC----- St. Albans	Fair: frost action.	Poor: excess fines.	Poor: excess fines.	Poor: small stones.
SbB, SbC----- St. Albans	Fair: frost action.	Poor: excess fines.	Poor: excess fines.	Poor: large stones.
SbD----- St. Albans	Fair: slope, frost action.	Poor: excess fines.	Poor: excess fines.	Poor: slope, large stones.
SbE----- St. Albans		Poor: excess fines.	Poor: excess fines.	Poor: slope, large stones.
ScA, ScB----- Scantic	Poor: frost action, wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
StB----- Stowe	Fair: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: small stones.
StC----- Stowe	Fair: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, small stones.
StD----- Stowe	Fair: slope, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
SwC----- Stowe	Fair: frost action, large stones.	Unsuited: excess fines, large stones.	Unsuited: excess fines, large stones.	Poor: large stones.
SwD----- Stowe	Fair: slope, frost action.	Unsuited: excess fines, large stones.	Unsuited: excess fines, large stones.	Poor: slope.
<sup>1</sup> SyE----- Stowe	Poor: slope.	Unsuited: excess fines, large stones.	Unsuited: excess fines, large stones.	Poor: slope.
Tm. Terric Medisaprists				

See footnote at end of table.



TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
<sup>1</sup> TwB: Tunbridge-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Woodstock-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: area reclaim.
<sup>1</sup> TwC: Tunbridge-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
Woodstock-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: area reclaim.
<sup>1</sup> TwD: Tunbridge-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Woodstock-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, area reclaim.
Wa----- Wallkill	Poor: low strength, frost action, excess humus.	Unsuited: excess fines, excess humus.	Unsuited: excess fines, excess humus.	Poor: wetness.
Wh----- Wareham	Poor: wetness.	Fair: excess fines.	Unsuited-----	Poor: wetness, too sandy.
WrA, WrB, WrC----- Westbury	Fair: wetness.	Unsuited-----	Unsuited-----	Poor: small stones.
WsA, WsB, WsC----- Windsor	Good-----	Good-----	Poor: excess fines.	Poor: too sandy.
WsD----- Windsor	Fair: slope.	Good-----	Poor: excess fines.	Poor: slope, too sandy.
WsE----- Windsor	Poor: slope.	Good-----	Poor: excess fines.	Poor: slope, too sandy.
Wt----- Winooski	Poor: frost action.	Poor: excess fines.	Unsuited: excess fines.	Good.
<sup>1</sup> WxC: Woodstock-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: area reclaim.
Rock outcrop.				
<sup>1</sup> WxD: Woodstock-----	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, area reclaim.
Rock outcrop.				

See footnote at end of table.

## SOIL SURVEY

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
<sup>1</sup> WxE: Woodstock-----	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, area reclaim.
Rock outcrop.				

<sup>1</sup> See map unit description for the composition and behavior of the map unit.

TABLE 12.--WATER MANAGEMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. Absence of an entry means soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
AuA----- Au Gres	Seepage-----	Seepage, piping.	Favorable-----	Cutbanks cave	Too sandy, wetness, soil blowing.	Droughty, wetness.
BeB, BeC----- Belgrade	Slope-----	Piping, erodes easily, low strength.	Deep to water	Wetness-----	Slope, wetness, erodes easily.	Slope, wetness, erodes easily.
Bg----- Binghamville	Favorable-----	Erodes easily, piping, low strength.	Favorable-----	Wetness, percs slowly.	Wetness, erodes easily, percs slowly.	Wetness, erodes easily, percs slowly.
Br----- Birdsall	Favorable-----	Wetness, piping.	Slow refill----	Poor outlets----	Not needed----	Wetness, rooting depth, erodes easily.
BxC, BxD, BxE----- Buxton	Percs slowly, wetness.	Piping, erodes easily.	Slow refill----	Percs slowly----	Percs slowly, erodes easily.	Percs slowly, erodes easily.
CaA, CaB----- Cabot	Slope-----	Favorable-----	Slope-----	Slope, percs slowly, poor outlets.	Slope, wetness, rooting depth.	Slope, wetness, rooting depth.
CbA, CbB----- Cabot	Slope-----	Large stones, piping.	Slope, large stones.	Slope, percs slowly, poor outlets.	Wetness, large stones, rooting depth.	Slope, wetness, large stones.
Ce----- Carlisle	Seepage-----	Low strength----	Favorable-----	Wetness, cutbanks cave.	Not needed----	Not needed.
CoB, CoC, CoD, CoE----- Colton	Seepage-----	Seepage, piping.	No water-----	Not needed----	Complex slope, piping.	Droughty, slope.
CpB----- Copake	Seepage, slope.	Seepage, piping.	No water-----	Not needed----	Erodes easily, slope.	Erodes easily, slope.
Cv----- Covington	Favorable-----	Hard to pack, low strength, shrink-swell.	Slow refill----	Wetness, percs slowly.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
DeB, DeC----- Deerfield	Slope, seepage.	Seepage, piping.	Deep to water, cutbanks cave.	Slope, cutbanks cave.	Slope, too sandy.	Slope.
EdA, EdB, EdC----- Eldridge	Slope, seepage.	Piping, low strength.	Deep to water	Cutbanks cave	Slope, too sandy.	Slope, wetness.
EnA, EnB----- Enosburg	Slope-----	Piping-----	Favorable-----	Poor outlets, cutbanks cave.	Too sandy, poor outlets.	Wetness.
FaB, FaC----- Farmington	Slope, depth to rock.	Depth to rock, no water.	Depth to rock	Not needed----	Slope, depth to rock.	Slope, rooting depth.
<sup>1</sup> FmC, <sup>1</sup> FmD: Farmington-----	Slope, depth to rock.	Depth to rock, no water.	Depth to rock	Not needed----	Slope, depth to rock.	Slope, rooting depth.
Rock outcrop.						
GeA, GeB, GeC----- Georgia	Slope-----	Favorable-----	Slow refill, deep to water.	Percs slowly----	Favorable-----	Slope.
GrB, GrC----- Georgia	Slope-----	Large stones----	Slow refill, deep to water, large stones.	Percs slowly----	Large stones----	Slope, large stones.

See footnote at end of table.



TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Ha----- Hadley	Seepage-----	Piping, seepage.	No water-----	Not needed-----	Not needed-----	Not needed.
HbA, HbB, HbC, HbD, HbE----- Hinesburg	Slope, seepage.	Piping, low strength.	Deep to water	Not needed-----	Slope, too sandy.	Slope.
KbA, KbB----- Kingsbury	Favorable-----	Low strength---	Deep to water	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Le----- Limerick	Seepage-----	Piping, low strength.	Favorable-----	Wetness, floods.	Not needed-----	Wetness.
LoB, LoC, LoD----- Lordstown	Depth to rock, slope, seepage.	Piping, low strength.	Deep to water	Not needed-----	Depth to rock, rooting depth, slope.	Droughty, slope.
<sup>1</sup> LrC, <sup>1</sup> LrD, <sup>1</sup> LrE: Lordstown-----	Depth to rock, slope, seepage.	Piping, low strength.	Deep to water	Not needed-----	Depth to rock, rooting depth, slope.	Droughty, slope.
Rock outcrop.						
Ly----- Lyons	Favorable-----	Favorable-----	Favorable-----	Wetness, percs slowly, poor outlets.	Not needed-----	Not needed.
Ma. Marsh						
MeA, MeB----- Massena	Slope-----	Favorable-----	Deep to water	Wetness, percs slowly, slope.	Wetness, percs slowly.	Wetness, percs slowly, slope.
MnA----- Massena	Slope-----	Large stones---	Deep to water, large stones.	Wetness, percs slowly, slope.	Wetness, large stones.	Wetness, percs slowly, large stones.
MsA, MsB, MsC, MsD, MsE----- Missisquoi	Seepage-----	Seepage, piping.	No water-----	Not needed-----	Slope, too sandy.	Slope, droughty.
MuB, MuC----- Munson	Slope-----	Low strength, piping, hard to pack.	Slope-----	Slope, wetness, percs slowly.	Wetness, percs slowly, piping.	Slope, wetness, percs slowly.
Od----- Ondawa Variant	Seepage-----	Piping, seepage.	No water-----	Not needed-----	Not needed-----	Not needed.
<sup>1</sup> Pa----- Peacham	Favorable-----	Piping, large stones.	Large stones---	Poor outlets, percs slowly, wetness.	Large stones, wetness, poor outlets.	Large stones, wetness, rooting depth.
PeB, PeC, PeD----- Peru	Slope-----	Favorable-----	Deep to water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, slope.
PrC, PrD----- Peru	Slope, large stones.	Large stones---	Deep to water, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.
Pu----- Podunk Variant	Seepage-----	Piping, seepage.	Deep to water	Poor outlets, floods.	Not needed-----	Not needed.
RaB----- Raynham	Favorable-----	Piping, low strength, erodes easily.	Favorable-----	Wetness, percs slowly.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
<sup>1</sup> RoE: Rock outcrop.						

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
<sup>1</sup> RoE: Woodstock-----	Slope, depth to rock, seepage.	Thin layer, seepage, piping.	Depth to rock, no water.	Not needed-----	Slope, depth to rock, rooting depth.	Slope, depth to rock, rooting depth.
Ru----- Rumney Variant	Seepage-----	Piping, seepage.	Favorable-----	Wetness, floods, poor outlets.	Not needed-----	Not needed.
SaA, SaB, SaC----- St. Albans	Slope, seepage.	Seepage-----	No water-----	Not needed-----	Slope-----	Slope.
SbB, SbC, SbD, SbE----- St. Albans	Slope, seepage.	Large stones, seepage.	No water-----	Not needed-----	Slope, large stones.	Slope, large stones.
ScA, ScB----- Scantic	Favorable-----	Low strength, compressible, hard to pack.	Slow refill-----	Wetness, percs slowly.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
StB, StC, StD----- Stowe	Slope-----	Low strength, piping.	No water-----	Not needed-----	Erodes easily, percs slowly.	Slope, percs slowly, erodes easily.
SwC, SwD, <sup>1</sup> SyE----- Stowe	Slope-----	Large stones, piping.	No water-----	Not needed-----	Large stones, percs slowly, erodes easily.	Large stones, percs slowly, erodes easily.
Tm. Terric Medisaprists						
<sup>1</sup> TwB, <sup>1</sup> TwC, <sup>1</sup> TwD: Tunbridge-----	Slope, depth to rock, seepage.	Thin layer, piping.	No water-----	Not needed-----	Slope, depth to rock.	Slope.
Woodstock-----	Slope, depth to rock, seepage.	Thin layer, seepage, piping.	Depth to rock, no water.	Not needed-----	Slope, depth to rock, rooting depth.	Slope, depth to rock, rooting depth.
Wa----- Walkill	Seepage-----	Low strength-----	Favorable-----	Wetness, poor outlets.	Not needed-----	Wetness.
Wh----- Wareham	Seepage-----	Piping, seepage.	Favorable-----	Cutbanks cave, wetness, poor outlets.	Piping, wetness, too sandy.	Wetness.
WrA, WrB, WrC----- Westbury	Slope-----	Favorable-----	Favorable-----	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
WsA, WsB, WsC, WsD, WsE----- Windsor	Seepage, slope.	Seepage, piping.	No water-----	Not needed-----	Piping, slope, too sandy.	Droughty, slope.
Wt----- Winooski	Seepage-----	Piping, erodes easily.	Deep to water	Floods, poor outlets.	Not needed-----	Not needed.
<sup>1</sup> WxC, <sup>1</sup> WxD, <sup>1</sup> WxE: Woodstock-----	Slope, depth to rock, seepage.	Thin layer, seepage, piping.	Depth to rock, no water.	Not needed-----	Slope, depth to rock, rooting depth.	Slope, depth to rock, rooting depth.
Rock outcrop.						

<sup>1</sup> See map unit description for the composition and behavior of the map unit.

TABLE 13.--RECREATIONAL DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AuA----- Au Gres	Severe: wetness.	Severe: soil blowing.	Severe: wetness, too sandy, soil blowing.	Severe: soil blowing.	Severe: too sandy.
BeB----- Belgrade	Slight-----	Slight-----	Moderate: slope, wetness.	Slight-----	Slight.
BeC----- Belgrade	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.
Bg----- Binghamville	Severe: wetness.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Br----- Birdsall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BxC----- Buxton	Severe: percs slowly.	Moderate: slope, wetness.	Severe: slope, percs slowly.	Slight-----	Moderate: slope, wetness.
BxD----- Buxton	Severe: slope, percs slowly.	Severe: slope.	Severe: slope, percs slowly.	Moderate: slope.	Severe: slope.
BxE----- Buxton	Severe: slope, percs slowly.	Severe: slope.	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.
CaA, CaB----- Cabot	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, percs slowly, small stones.	Severe: wetness.	Severe: wetness.
CbA----- Cabot	Severe: wetness, percs slowly, large stones.	Severe: wetness.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.
CbB----- Cabot	Severe: wetness, percs slowly, large stones.	Severe: wetness.	Severe: slope, wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.
Ce----- Carlisle	Severe: wetness, excess humus, floods.	Severe: wetness, excess humus.	Severe: wetness, excess humus, floods.	Severe: wetness, excess humus.	Severe: excess humus, wetness, floods.
CoB----- Colton	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Moderate: small stones, droughty.
CoC----- Colton	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Moderate: small stones.	Moderate: small stones, droughty.
CoD----- Colton	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: small stones.	Severe: slope.



TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CoE----- Colton	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
CpB----- Copake	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
Cv----- Covington	Severe: wetness, percs slowly.	Severe: wetness, too clayey.	Severe: wetness, percs slowly, too clayey.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
DeB----- Deerfield	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Severe: too sandy.
DeC----- Deerfield	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Severe: too sandy.
EdA----- Eldridge	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
EdB----- Eldridge	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: too sandy.
EdC----- Eldridge	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: slope, too sandy.
EnA, EnB----- Enosburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, too sandy.
FaB----- Farmington	Slight-----	Slight-----	Severe: depth to rock.	Slight-----	Severe: depth to rock.
FaC----- Farmington	Moderate: slope.	Moderate: slope.	Severe: slope, depth to rock.	Slight-----	Severe: depth to rock.
<sup>1</sup> FmC: Farmington-----  Rock outcrop.	Moderate: slope.	Moderate: slope.	Severe: slope, depth to rock.	Slight-----	Severe: depth to rock.
<sup>1</sup> FmD: Farmington-----  Rock outcrop.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
GeA----- Georgia	Slight-----	Slight-----	Moderate: percs slowly, small stones.	Slight-----	Slight.
GeB----- Georgia	Slight-----	Slight-----	Moderate: slope, percs slowly, small stones.	Slight-----	Slight.
GeC----- Georgia	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.
GrB----- Georgia	Severe: large stones.	Moderate: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.

See footnote at end of table.

## SOIL SURVEY

TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GrC----- Georgia	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
Ha----- Hadley	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight-----	Moderate: floods.
HbA----- Hinesburg	Moderate: too sandy.	Moderate: too sandy.	Moderate: percs slowly, too sandy.	Moderate: too sandy.	Moderate: too sandy.
HbB----- Hinesburg	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, percs slowly, too sandy.	Moderate: too sandy.	Moderate: too sandy.
HbC----- Hinesburg	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: slope, too sandy.
HbD----- Hinesburg	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, too sandy.	Severe: slope.
HbE----- Hinesburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
KbA, KbB----- Kingsbury	Severe: percs slowly, too clayey.	Severe: too clayey.	Severe: percs slowly, too clayey.	Severe: too clayey.	Severe: too clayey.
Le----- Limerick	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: floods, wetness.
LoB----- Lordstown	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Moderate: depth to rock, small stones.
LoC----- Lordstown	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Moderate: slope, depth to rock, small stones.
LoD----- Lordstown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.	Severe: slope.
<sup>1</sup> LrC: Lordstown-----	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Moderate: slope, depth to rock, small stones.
Rock outcrop.					
<sup>1</sup> LrD: Lordstown-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.	Severe: slope.
Rock outcrop.					

See footnote at end of table.

TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
<sup>1</sup> LrE: Lordstown-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Rock outcrop.					
Ly----- Lyons	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ma. Marsh					
MeA----- Massena	Moderate: percs slowly, wetness.	Slight-----	Moderate: percs slowly, wetness.	Slight-----	Moderate: wetness.
MeB----- Massena	Moderate: percs slowly, wetness.	Slight-----	Moderate: slope, wetness, percs slowly.	Slight-----	Moderate: wetness.
MnA----- Massena	Severe: percs slowly, wetness, large stones.	Severe: large stones, wetness.	Severe: large stones.	Severe: large stones.	Severe: wetness, large stones.
MsA----- Missisquoi	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.
MsB----- Missisquoi	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.
MsC----- Missisquoi	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Severe: too sandy, droughty.
MsD----- Missisquoi	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, too sandy.	Severe: slope, too sandy, droughty.
MsE----- Missisquoi	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, too sandy, droughty.
MuB----- Munson	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
MuC----- Munson	Severe: wetness, percs slowly.	Severe: wetness.	Severe: slope, wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
Od----- Ondawa Variant	Severe: floods.	Moderate: floods.	Moderate: slope, floods.	Slight-----	Moderate: floods.
<sup>1</sup> Pa----- Peacham	Severe: large stones, wetness, percs slowly.	Severe: wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.

See footnote at end of table.



TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
PeB----- Peru	Moderate: percs slowly.	Slight-----	Moderate: percs slowly.	Severe: slope.	Slight.
PeC----- Peru	Moderate: percs slowly.	Moderate: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
PeD----- Peru	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PrC----- Peru	Severe: large stones.	Severe: large stones.	Severe: slope.	Severe: large stones.	Severe: large stones.
PrD----- Peru	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones.	Severe: slope.
Pu----- Podunk Variant	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.	Severe: floods.
RaB----- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
<sup>1</sup> RoE: Rock outcrop.					
Woodstock-----	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Ru----- Rumney Variant	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.
SaA, SaB----- St. Albans	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Moderate: small stones.
SaC----- St. Albans	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Moderate: slope, small stones.
SbB----- St. Albans	Moderate: large stones.	Slight-----	Moderate: slope, large stones.	Moderate: large stones.	Severe: large stones.
SbC----- St. Albans	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Severe: large stones.
SbD----- St. Albans	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope, large stones.
SbE----- St. Albans	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, large stones.
ScA, ScB----- Scantic	Severe: wetness.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
StB----- Stowe	Moderate: percs slowly.	Slight-----	Moderate: slope, percs slowly.	Slight-----	Slight.

See footnote at end of table.

TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
StC----- Stowe	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.
StD----- Stowe	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
SwC----- Stowe	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
SwD----- Stowe	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.
<sup>1</sup> SyE----- Stowe	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Tm. Terric Medisaprists					
<sup>1</sup> TwB: Tunbridge-----	Slight-----	Slight-----	Moderate: slope, depth to rock.	Slight-----	Moderate: depth to rock.
Woodstock-----	Slight-----	Slight-----	Severe: depth to rock.	Slight-----	Severe: depth to rock.
<sup>1</sup> TwC: Tunbridge-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope, depth to rock.
Woodstock-----	Moderate: slope.	Moderate: slope.	Severe: slope, depth to rock.	Slight-----	Severe: depth to rock.
<sup>1</sup> TwD: Tunbridge-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Woodstock-----	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
Wa----- Wallkill	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Wh----- Wareham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.
WrA, WrB----- Westbury	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
WrC----- Westbury	Moderate: wetness, percs slowly.	Moderate: wetness.	Severe: slope.	Moderate: wetness.	Moderate: wetness.
WsA, WsB----- Windsor	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.

See footnote at end of table.

## SOIL SURVEY

TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WsC----- Windsor	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope, too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.
WsD----- Windsor	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Moderate: too sandy.	Severe: slope, too sandy, droughty.
WsE----- Windsor	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy, droughty.
Wt----- Winooski	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight-----	Moderate: floods.
<sup>1</sup> WxC: Woodstock-----	Moderate: slope.	Moderate: slope.	Severe: slope, depth to rock.	Slight-----	Severe: depth to rock.
Rock outcrop.					
<sup>1</sup> WxD: Woodstock-----	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
Rock outcrop.					
<sup>1</sup> WxE: Woodstock-----	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.					

<sup>1</sup> See map unit description for the composition and behavior of the map unit.



TABLE 14.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AuA----- Au Gres	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
BeB----- Belgrade	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BeC----- Belgrade	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bg----- Binghamville	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Br----- Birdsall	Very poor.	Poor	Poor	Poor	Poor	Good	Poor	Poor	Poor	Fair.
BxC----- Buxton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BxD----- Buxton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BxE----- Buxton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CaA----- Cabot	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
CaB----- Cabot	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
CbA----- Cabot	Very poor.	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
CbB----- Cabot	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Ce----- Carlisle	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
CoB, CoC, CoD----- Colton	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
CoE----- Colton	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
CpB----- Copake	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Cv----- Covington	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
DeB----- Deerfield	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
DeC----- Deerfield	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
EdA----- Eldridge	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
EdB----- Eldridge	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
EdC----- Eldridge	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

## SOIL SURVEY

TABLE 14.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
EnA----- Enosburg	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Good	Fair.
EnB----- Enosburg	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Good	Very poor.
FaB, FaC----- Farmington	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
<sup>1</sup> FmC: Farmington-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
<sup>1</sup> FmD: Farmington-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
GeA----- Georgia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GeB----- Georgia	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GeC----- Georgia	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GrB----- Georgia	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
GrC----- Georgia	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Ha----- Hadley	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HbA, HbB----- Hinesburg	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
HbC, HbD----- Hinesburg	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HbE----- Hinesburg	Poor	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
KbA, KbB----- Kingsbury	Poor	Fair	Fair	Good	Good	Poor	Fair	Fair	Good	Poor.
Le----- Limerick	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
LoB----- Lordstown	Fair	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
LoC----- Lordstown	Fair	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
LoD----- Lordstown	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
<sup>1</sup> LrC: Lordstown-----	Fair	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 14.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
<sup>1</sup> LrC: Rock outcrop.										
<sup>1</sup> LrD: Lordstown----- Rock outcrop.	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
<sup>1</sup> LrE: Lordstown----- Rock outcrop.	Very poor.	Poor	Good	Good	---	Very poor.	Very poor.	Poor	Fair	Very poor.
Ly----- Lyons	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Ma. Marsh										
MeA----- Massena	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
MeB----- Massena	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MnA----- Massena	Very poor.	Poor	Fair	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
MsA, MsB, MsC, MsD- Missisquoi	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MsE----- Missisquoi	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MuB----- Munson	Fair	Good	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
MuC----- Munson	Fair	Good	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Od----- Ondawa Variant	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
<sup>1</sup> Pa----- Peacham	Very poor.	Very poor.	Poor	Poor	Poor	Good	Fair	Very poor.	Poor	Fair.
PeB----- Peru	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
PeC----- Peru	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
PeD----- Peru	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
PrC, PrD----- Peru	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Pu----- Podunk Variant	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
RaB----- Raynham	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
<sup>1</sup> RoE: Rock outcrop.										

See footnote at end of table.



## SOIL SURVEY

TABLE 14.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
<sup>1</sup> RoE: Woodstock-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Ru----- Rumney Variant	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair	Fair.
SaA----- St. Albans	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SaB----- St. Albans	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
SaC----- St. Albans	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SbB----- St. Albans	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
SbC, SbD, SbE----- St. Albans	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
ScA----- Scantic	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
ScB----- Scantic	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
StB----- Stowe	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
StC----- Stowe	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
StD----- Stowe	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SwC, SwD, <sup>1</sup> SyE----- Stowe	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Tm. Terric Medisaprists										
<sup>1</sup> TwB, <sup>1</sup> TwC: Tunbridge-----	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Woodstock-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
<sup>1</sup> TwD: Tunbridge-----	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Woodstock-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Wa----- Wallkill	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Wh----- Wareham	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
WrA----- Westbury	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
WrB----- Westbury	Fair	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.

See footnote at end of table.

TABLE 14.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
WrC----- Westbury	Fair	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
WsA, WsB, WsC, WsD- Windsor	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
WsE----- Windsor	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Wt----- Winooski	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
<sup>1</sup> WxC, <sup>1</sup> WxD: Woodstock-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
<sup>1</sup> WxE: Woodstock-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										

<sup>1</sup> See map unit description for the composition and behavior of the map unit.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol &lt; means less than; &gt; means greater than. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AuA----- Au Gres	0-9	Loamy fine sand-	SP, SM	A-2-4, A-3	0	95-100	90-100	60-80	15-30	---	NP <sup>1</sup>
	9-22	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3	0	95-100	90-100	60-80	0-15	---	NP
	22-60	Sand-----	SP, SP-SM	A-3, A-2-4	0	95-100	90-100	50-80	0-10	---	NP
BeB, BeC----- Belgrade	0-5	Silt loam-----	ML, CL	A-4	0	100	95-100	90-100	55-90	<40	NP-8
	5-22	Silt loam, very fine sandy loam.	ML, CL	A-4	0	100	95-100	90-100	55-90	<40	NP-8
	22-60	Silt loam, very fine sandy loam.	ML, CL	A-4	0	100	95-100	90-100	50-90	<40	NP-8
Bg----- Binghamville	0-11	Silt loam-----	ML	A-4	0	100	95-100	90-100	85-90	20-30	NP
	11-27	Silt, silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	90-100	80-90	20-30	NP-7
	27-60	Silt loam, silt, very fine sandy loam.	ML, CL	A-4, A-6	0	100	95-100	90-100	55-95	20-40	NP-15
Br----- Birdsall	0-5	Silt loam-----	ML, OL, CL-ML	A-4	0	100	100	90-100	70-90	<30	NP-7
	5-21	Silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<30	NP-7
	21-60	Stratified silt to very fine sand.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<30	NP-7
BxC, BxD, BxE----- Buxton	0-9	Silt loam-----	ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-90	36-51	5-15
	9-31	Silt loam, silty clay loam.	ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-95	25-51	3-11
	31-60	Silty clay, silty clay loam, clay.	CL, MH	A-6, A-7	0	100	100	95-100	80-95	25-51	5-15
CaA, CaB----- Cabot	0-7	Stony fine sandy loam.	ML, SM	A-4, A-2	5-20	80-100	75-95	50-90	30-75	<30	NP
	7-16	Loam, silt loam, gravelly fine sandy loam.	ML, SM	A-4, A-2	5-20	80-95	65-95	50-85	30-70	<30	NP
	16-60	Loam, gravelly loam, silt loam.	ML, SM	A-4	5-20	80-95	65-95	55-85	40-70	<30	NP
CbA, CbB----- Cabot	0-7	Extremely stony fine sandy loam.	ML, SM	A-4, A-2	15-35	80-95	75-95	50-90	30-75	<30	NP
	7-16	Loam, silt loam, gravelly fine sandy loam.	ML, SM	A-4, A-2	5-35	80-95	65-95	50-85	30-70	<30	NP
	16-60	Loam, gravelly loam, silt loam.	ML, SM	A-4, A-2	5-35	80-95	65-95	45-85	25-70	<30	NP
Ce----- Carlisle	0-60	Muck-----	Pt	---	---	---	---	---	---	---	---

See footnotes at end of table.



TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
CoB, CoC, CoD, CoE- Colton	<u>In</u>										
	0-7	Gravelly loamy sand.	SM, SP	A-1, A-2	5-20	65-80	55-70	25-60	2-25	---	NP
	7-25	Gravelly loamy sand, very gravelly sand, cobbly sand.	SM, GM, SP, GP	A-1	5-20	45-75	40-60	20-50	2-20	---	NP
	25-60	Very gravelly sand, very cobbly sand.	GP, SP, GW, SW	A-1	10-45	30-65	20-40	10-30	0-5	---	NP
CpB----- Copake	0-8	Fine sandy loam	ML, SM	A-2, A-4	0-5	80-95	75-90	50-85	30-80	20-25	NP-4
	8-21	Gravelly loam, gravelly silt loam, fine sandy loam.	ML, SM, GM	A-2, A-4	0-5	60-95	55-90	40-85	20-80	20-25	NP-4
	21-60	Very gravelly loamy sand, very gravelly sand, gravelly sand.	GM, SM, GP, SP	A-1	0-5	40-75	35-70	15-50	2-20	<10	NP
Cv----- Covington	0-6	Clay-----	CH, MH	A-7	0	100	95-100	95-100	90-100	55-80	15-50
	6-32	Clay-----	CH, MH	A-7	0	100	95-100	95-100	95-100	50-80	25-55
	32-60	Clay-----	CH, MH	A-7	0	100	95-100	95-100	95-100	50-80	25-55
DeB, DeC----- Deerfield	0-8	Loamy fine sand	SP-SM, SM	A-1, A-2, A-3	0	95-100	80-100	40-75	5-30	---	NP
	8-18	Loamy sand, sand, coarse sand.	SM, SP-SM	A-1, A-2, A-3	0	95-100	80-100	40-75	5-30	---	NP
	18-60	Sand, fine sand, coarse sand.	SP, SM	A-1, A-2, A-3	0	95-100	65-100	30-75	3-30	---	NP
EdA, EdB, EdC----- Eldridge	0-7	Loamy fine sand	SM	A-2, A-4	0-5	95-100	90-100	60-80	20-45	---	NP
	7-28	Loamy fine sand, fine sand, sand.	SM, SP-SM	A-2	0-5	95-100	90-100	50-80	10-30	---	NP
	28-60	Stratified very fine sand to clay.	SM, CL-ML, ML	A-4	0	100	90-100	70-100	35-100	10-20	NP-5
EnA, EnB----- Enosburg	0-7	Loamy fine sand	SM, SP-SM	A-2	0-5	95-100	90-100	45-80	10-35	---	NP
	7-22	Sand, coarse sand, loamy fine sand.	SP-SM, SM	A-2	0-5	95-100	90-100	50-80	10-35	---	NP
	22-60	Silt, very fine sandy loam, silty clay loam.	ML, CL	A-4, A-6	0	100	100	85-100	50-100	<30	NP-25
FaB, FaC----- Farmington	0-4	Loam-----	ML, CL, SM	A-2, A-4, A-6	0-5	80-95	75-90	50-85	30-80	25-35	5-15
	4-14	Silt loam, loam, gravelly fine sandy loam.	ML, CL, GM, GC	A-2, A-4, A-6	0-5	60-95	55-90	35-85	20-80	25-35	5-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
2FmC, 2FmD: Farmington-----	0-4	Loam-----	ML, CL, SM	A-2, A-4, A-6	0-5	80-95	75-90	50-85	30-80	25-35	5-15
	4-14	Silt loam, loam, gravelly fine sandy loam.	ML, CL, GM, GC	A-2, A-4, A-6	0-5	60-95	55-90	35-85	20-80	25-35	5-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
2FmC, 2FmD: Rock outcrop.	In										
GeA, GeB, GeC----- Georgia	0-2	Loam-----	ML, CL-ML	A-4	5-20	85-95	80-95	75-90	65-80	15-30	NP-10
	2-22	Loam, silt loam, gravelly loam.	ML, SM, CL-ML, SM-SC	A-4	5-20	60-95	50-90	40-85	35-80	15-25	NP-10
	22-60	Loam, gravelly fine sandy loam, silt loam.	ML, SM, CL-ML, SM-SC	A-4, A-2	5-20	60-95	50-90	40-80	30-70	15-25	NP-10
GrB, GrC----- Georgia	0-2	Extremely stony loam.	ML, SM, CL-ML, SM-SC	A-4	10-35	70-80	50-75	40-70	35-65	15-25	NP-10
	2-22	Loam, silt loam, gravelly loam.	ML, SM, CL-ML, SM-SC	A-4	5-20	60-95	50-90	40-85	35-80	15-25	NP-10
	22-60	Loam, gravelly fine sandy loam, silt loam.	ML, SM, CL-ML, SM-SC	A-4, A-2	5-20	60-95	50-90	40-80	30-70	15-25	NP-10
Ha----- Hadley	0-8	Silt loam-----	ML, CL-ML	A-4	0	100	95-100	95-100	70-95	<30	NP-9
	8-32	Silt loam, very fine sandy loam, very fine sand.	ML, CL-ML	A-4	0	100	95-100	90-100	60-95	<39	NP-13
	32-60	Silt loam, sandy loam, sand.	ML, CL-ML, SM	A-4	0	100	95-100	75-95	40-85	<30	NP-13
HbA, HbB, HbC, HbD, HbE----- Hinesburg	0-7	Loamy fine sand	SM	A-2	0-5	95-100	85-100	50-80	15-30	---	NP
	7-22	Loamy fine sand, loamy sand, sand.	SP-SM, SM	A-2, A-3	0-5	95-100	85-100	50-80	5-30	---	NP
	22-60	Very fine sandy loam, silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	75-90	55-80	20-40	NP-25
KbA, KbB----- Kingsbury	0-6	Clay-----	ML, MH, OL, OH	A-7, A-6	0	100	95-100	90-100	80-95	40-55	11-20
	6-36	Clay-----	MH, CH	A-7	0	100	95-100	90-100	90-100	50-65	25-35
	36-60	Clay, silty clay	MH, CH	A-7	0	100	95-100	90-100	90-100	50-65	25-35
Le----- Limerick	0-8	Silt loam-----	ML	A-4	0	100	100	95-100	80-95	15-30	NP
	8-18	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	80-95	15-30	NP
	18-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	80-95	15-25	NP
LoB, LoC, LoD----- Lordstown	0-9	Loam-----	ML, GM	A-4	5-20	65-85	50-75	50-75	40-65	<30	NP-4
	9-27	Channery silt loam, channery loam.	ML, GM	A-4	5-10	65-85	50-75	50-75	40-65	<30	NP-4
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
2LrC, 2LrD, 2LrE: Lordstown-----	0-9	Loam-----	ML, GM	A-4	5-20	65-85	50-75	50-75	40-65	<30	NP-4
	9-27	Channery silt loam, channery loam.	ML, GM	A-4	5-10	65-85	50-75	50-75	40-65	<30	NP-4
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
2LrC, 2LrD, 2LrE: Rock outcrop.	In										
Ly----- Lyons	0-9	Loam-----	ML, OL	A-5, A-7	0	80-95	75-90	65-85	55-80	42-50	5-15
	9-31	Silt loam, gravelly loam, clay loam.	ML, CL, GC	A-4, A-6	0-5	60-95	55-90	45-85	40-80	20-35	5-15
	31-60	Gravelly loam, gravelly silt loam, very gravelly fine sandy loam.	ML, CL, GC, SC	A-2, A-4, A-6	5-10	35-95	30-90	25-85	15-80	20-35	5-15
Ma. Marsh											
MeA, MeB----- Massena	0-8	Loam-----	CL, SC	A-6, A-7	0	80-95	75-90	65-90	45-80	35-45	12-20
	8-25	Gravelly fine sandy loam, gravelly sandy loam, loam.	GC, CL, CL-ML, SM-SC	A-4, A-6, A-2, A-1	0-5	55-95	55-90	35-85	15-65	15-25	5-15
	25-44	Gravelly fine sandy loam, gravelly loam, very gravelly sandy loam.	GC, CL, SC, CL-ML	A-4, A-6, A-2, A-1	0-5	50-75	40-70	25-65	10-55	15-25	5-15
MnA----- Massena	0-8	Extremely stony loam.	GC, SC, CL, ML	A-6, A-7, A-2	5-25	55-85	50-80	30-75	15-60	35-45	12-20
	8-25	Gravelly fine sandy loam, gravelly sandy loam, loam.	GC, SC, CL, CL-ML	A-4, A-6, A-2, A-1	0-5	55-95	55-90	35-85	15-65	15-25	5-15
	25-44	Gravelly fine sandy loam, gravelly loam, very gravelly sandy loam.	GC, CL, SC, CL-ML	A-4, A-6, A-2, A-1	0-5	50-75	40-70	25-65	10-55	15-25	5-15
MsA, MsB, MsC, MsD, MsE----- Missisquoi	0-5	Loamy sand-----	SM	A-1, A-2	0-5	75-95	70-90	35-65	15-30	---	NP
	5-12	Loamy sand, loamy fine sand, gravelly loamy sand.	SM	A-1, A-2	0-5	75-95	70-95	35-65	15-30	---	NP
	12-35	Gravelly coarse sand, loamy sand, loamy fine sand.	SP, SM	A-1, A-2, A-3	0-5	75-95	65-90	30-60	0-20	---	NP
	35-60	Stratified gravelly coarse sand to loamy fine sand.	SP, GP, SP-SM	A-1, A-2, A-3	0-30	40-80	35-75	20-50	0-10	---	NP
MuB, MuC----- Munson	0-8	Silt loam-----	ML	A-4	0	100	95-100	90-100	80-95	20-35	NP-10
	8-14	Silt loam, very fine sandy loam.	ML	A-4	0	100	95-100	90-100	80-95	20-40	NP-10
	14-40	Silty clay, clay, silty clay loam.	MH, CH, CL	A-6, A-7	0	100	95-100	95-100	90-100	40-80	20-45
Od----- Ondawa Variant	0-7	Silt loam-----	ML	A-4	0-5	95-100	95-100	85-95	65-90	20-40	NP-10
	7-27	Silt loam-----	ML	A-4	0-5	95-100	95-100	85-95	65-90	20-40	NP-10
	27-60	Gravelly fine sand.	SM	A-2, A-1, A-3	0-10	75-85	65-80	35-70	15-30	<20	NP

See footnotes at end of table.



## SOIL SURVEY

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
2Pa----- Peacham	7-0	Extremely stony muck.	Pt	A-8	5-20	---	---	---	---	---	---
	0-6	Loam, silt loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-15	75-100	65-95	50-95	30-85	<30	NP
	6-60	Loam, silt loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-15	75-100	65-95	50-95	30-85	<30	NP
PeB, PeC, PeD----- Peru	0-8	Fine sandy loam	SM, ML	A-2, A-4	0-10	80-95	70-90	50-85	25-60	<30	NP-10
	8-20	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC	A-2, A-4	0-15	75-95	65-95	60-85	30-65	<30	NP-10
	20-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC	A-2, A-4	0-15	70-90	60-90	55-85	20-60	<30	NP-10
PrC, PrD----- Peru	0-8	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-15	80-95	70-90	50-85	25-60	<30	NP-10
	8-20	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	75-95	65-95	60-85	30-65	<30	NP-10
	20-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-90	55-85	20-60	<30	NP-10
Pu----- Podunk Variant	0-8	Silt loam-----	ML	A-4	0	95-100	95-100	85-95	65-90	20-40	NP-10
	8-20	Silt loam, fine sandy loam.	ML, SM	A-4	0	95-100	90-100	80-95	40-90	20-40	NP-10
	20-60	Loamy fine sand, fine sand, sand.	SP-SM, SM	A-2, A-1, A-3	0-5	90-100	80-95	35-70	5-30	<20	NP
RaB----- Raynham	0-7	Silt loam-----	ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10
	7-17	Silt loam, silt, very fine sandy loam.	ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10
	17-60	Silt loam, silt, very fine sandy loam.	ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10
2RoE: Rock outcrop.											
Woodstock-----	0-12	Fine sandy loam	SM	A-2, A-4	5-25	85-95	80-95	50-75	25-45	---	NP
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ru----- Rumney variant	0-7	Silt loam-----	ML	A-4	0	95-100	95-100	85-95	65-90	20-40	NP-10
	7-35	Silt loam, very fine sandy loam.	ML	A-4	0	95-100	95-100	80-90	60-90	20-40	NP-10
	35-60	Coarse sand, sand, loamy fine sand.	SP, SM	A-2, A-1, A-3	0-5	90-100	80-95	40-75	0-30	<20	NP
SaA, SaB, SaC----- St. Albans	0-7	Slaty loam-----	SM, GM	A-2, A-4	5-20	60-80	50-70	30-55	25-45	20-30	NP
	7-19	Slaty sandy loam, slaty fine sandy loam, slaty coarse sandy loam.	SM, GM	A-2, A-4, A-1	5-20	60-80	50-70	30-50	20-40	20-30	NP
	19-60	Slaty coarse sandy loam, slaty loamy coarse sand, slaty fine sandy loam.	SM, GM	A-2, A-4, A-1	5-25	55-80	50-70	30-50	15-40	15-30	NP

See footnotes at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
SbB, SbC, SbD, SbE- St. Albans	0-7	Very stony loam	SM, ML	A-2, A-4	5-25	85-95	80-95	40-50	30-60	20-30	NP
	7-19	Slaty sandy loam, slaty fine sandy loam, slaty coarse sandy loam.	SM, GM	A-2, A-4, A-1	5-25	60-80	50-70	30-50	20-40	20-30	NP
	19-60	Slaty coarse sandy loam, slaty loamy coarse sand, slaty fine sandy loam.	SM, GM	A-2, A-4, A-1	5-25	55-80	50-70	30-50	15-40	15-30	NP
ScA, ScB----- Scantic	0-14	Silt loam-----	ML, MH, CL	A-4, A-6, A-7	0	100	95-100	90-100	70-95	30-62	5-25
	14-21	Silty clay loam, silt loam, clay.	CL, MH, CH, CL-ML	A-7, A-6, A-4, A-5	0	100	95-100	90-100	75-100	24-54	6-27
	21-41	Clay, silty clay loam, silty clay.	CL, CL-ML, MH	A-6, A-7, A-4, A-5	0	100	95-100	95-100	80-100	25-54	6-23
StB, StC, StD----- Stowe	0-8	Fine sandy loam	SM, ML	A-2, A-4	5-20	75-95	65-95	50-85	30-60	<40	NP
	8-29	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-20	75-95	65-95	50-85	25-55	<30	NP
	29-60	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-25	65-95	60-90	40-80	25-55	<25	NP
SwC, SwD, 2SyE----- Stowe	0-8	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-95	65-95	50-85	30-60	<40	NP
	8-29	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-25	75-95	65-95	50-85	25-55	<30	NP
	29-60	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-30	65-95	60-90	40-80	25-55	<25	NP
Tm. Terric Medisaprists											
2TwB, 2TwC, 2TwD: Tunbridge-----	0-7	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	80-90	60-80	30-65	<20	NP
	7-25	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	85-95	70-85	60-80	30-65	<20	NP
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Woodstock-----	0-12	Fine sandy loam	SM	A-2, A-4	5-25	85-95	80-95	50-75	25-45	---	NP
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Wa----- Wallkill	0-7	Silt loam-----	ML, SM, OL	A-4, A-5, A-6, A-7	0	95-100	90-100	70-100	40-90	40-50	5-15
	7-14	Silt loam, loam, gravelly silt loam.	CL, CL-ML, SM-SC, SC	A-4	0	75-100	70-100	60-100	40-90	15-25	5-10
	14-45	Sapric material, hemic material.	Pt	A-8	0	---	---	---	---	---	---
Wh----- Wareham	0-9	Loamy fine sand	SM, SP-SM	A-1, A-2	0	85-100	75-100	40-85	10-35	---	---
	9-15	Loamy coarse sand, loamy fine sand, sand.	SM, SP-SM	A-1, A-2, A-3	0	85-100	75-100	25-85	5-35	---	---
	15-60	Loamy coarse sand, loamy fine sand, coarse sand.	SM, SP-SM	A-1, A-2, A-3	0	85-100	75-100	25-85	5-35	---	---
WrA, WrB, WrC----- Westbury	0-6	Stony fine sandy loam.	SM, ML	A-2, A-4	0-2	80-90	75-85	50-85	30-60	20-30	2-4
	6-20	Gravelly loam, gravelly silt loam, gravelly sandy loam.	SM, GM	A-2, A-4, A-1	0-5	55-80	50-70	30-65	15-40	<25	NP-3
	20-60	Gravelly sandy loam, very gravelly fine sandy loam.	SM, GM	A-1, A-2, A-4	0-5	45-75	40-70	25-60	15-40	<15	NP-3
WsA, WsB, WsC, WsD, WsE----- Windsor	0-10	Loamy fine sand	SM	A-2	0	95-100	85-100	35-85	20-35	---	NP
	10-27	Loamy sand, loamy fine sand, sand.	SW-SM, SM	A-2, A-3	0	95-100	85-100	45-95	10-30	---	NP
	27-60	Sand, fine sand	SP-SM, SM	A-2, A-3	0	90-100	75-100	40-95	5-20	---	NP
Wt----- Winooski	0-33	Silt loam-----	ML, SM	A-4	0	100	95-100	90-100	40-90	<30	NP
	33-60	Silt loam, very fine sandy loam, loamy very fine sand.	ML, SM	A-4	0	100	95-100	90-100	40-90	<30	NP
2WxC, 2WxD, 2WxE: Woodstock-----	0-12 12	Fine sandy loam Unweathered bedrock.	SM ---	A-2, A-4 ---	5-25 ---	85-95 ---	80-95 ---	50-75 ---	25-45 ---	---	NP ---
Rock outcrop.											

<sup>1</sup> NP means nonplastic.

<sup>2</sup> See map unit description for the composition and behavior of the map unit.



TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
AuA-----	0-9	6.0-20	0.07-0.10	4.5-7.3	Very low----	Low-----	Moderate	0.15	5
Au Gres	9-22	6.0-20	0.06-0.09	4.5-7.3	Very low----	Low-----	Moderate	0.15	
	22-60	>20	0.05-0.07	5.1-6.0	Very low----	Low-----	Moderate	0.15	
BeB, BeC-----	0-5	0.6-2.0	0.17-0.30	5.1-6.5	Low-----	Moderate	Moderate	0.49	3
Belgrade	5-22	0.6-2.0	0.15-0.26	5.1-6.5	Low-----	Moderate	Moderate	0.64	
	22-60	0.06-2.0	0.15-0.26	5.1-6.5	Low-----	Moderate	Moderate	0.64	
Bg-----	0-11	0.6-2.0	0.20-0.25	5.6-7.3	Low-----	High-----	Moderate	0.49	3
Binghamville	11-27	0.2-2.0	0.18-0.22	5.1-7.3	Low-----	High-----	Moderate	0.49	
	27-60	0.06-0.2	0.18-0.22	5.6-7.3	Low-----	High-----	Moderate	0.49	
Br-----	0-5	0.2-2.0	0.17-0.30	4.5-6.0	Low-----	High-----	High-----	0.49	3
Birdsall	5-21	0.2-0.6	0.15-0.26	5.1-7.3	Low-----	High-----	High-----	0.49	
	21-60	0.06-0.2	0.15-0.26	5.1-7.3	Low-----	High-----	High-----	0.49	
BxC, BxD, BxE-----	0-9	0.2-2.0	0.14-0.22	4.5-6.5	Low-----	High-----	Moderate	0.28	3
Buxton	9-31	0.2-0.6	0.11-0.21	4.5-6.5	Low-----	High-----	Moderate	0.49	
	31-60	<0.2	0.09-0.21	5.6-7.3	Moderate-----	High-----	Moderate	0.49	
CaA, CaB-----	0-7	0.6-2.0	0.18-0.22	5.1-7.3	Low-----	High-----	Low-----	0.28	3
Cabot	7-16	0.6-2.0	0.16-0.20	5.6-7.3	Low-----	High-----	Low-----	0.28	
	16-60	<0.2	0.05-0.12	5.6-7.3	Low-----	High-----	Low-----	0.28	
CbA, CbB-----	0-7	0.6-2.0	0.14-0.20	5.1-7.3	Low-----	High-----	Low-----	0.28	3
Cabot	7-16	0.6-2.0	0.16-0.20	5.6-7.3	Low-----	High-----	Low-----	0.28	
	16-60	<0.2	0.05-0.12	5.6-7.3	Low-----	High-----	Low-----	0.28	
Ce-----	0-60	0.2-6.0	0.35-0.45	5.6-7.3	-----	High-----	Low-----	---	---
CoB, CoC, CoD, CoE-----	0-7	>6.0	0.03-0.07	4.5-5.0	Low-----	Low-----	High-----	0.17	3
Colton	7-25	>6.0	0.02-0.05	4.5-5.0	Low-----	Low-----	High-----	0.17	
	25-60	>20	0.01-0.02	4.5-5.0	Low-----	Low-----	High-----	0.17	
CpB-----	0-8	0.6-6.0	0.11-0.18	4.5-6.5	Low-----	Low-----	Moderate	0.32	3
Copake	8-21	0.6-6.0	0.08-0.18	4.5-7.3	Low-----	Low-----	Moderate	0.24	
	21-60	>20	0.01-0.05	6.6-8.4	Low-----	Low-----	Low-----	0.17	
Cv-----	0-6	<0.2	0.14-0.16	5.6-7.3	High-----	High-----	Moderate	0.49	3
Covington	6-32	<0.06	0.12-0.14	5.6-7.8	High-----	High-----	Moderate	0.49	
	32-60	<0.06	0.12-0.14	6.6-8.4	High-----	High-----	Low-----	0.49	
DeB, DeC-----	0-8	6.0-20	0.07-0.13	4.5-6.0	Low-----	Low-----	High-----	0.17	5
Deerfield	8-18	6.0-20	0.01-0.13	4.5-6.0	Low-----	Low-----	High-----	0.15	
	18-60	>20	0.01-0.08	4.5-6.0	Low-----	Low-----	High-----	0.15	
EdA, EdB, EdC-----	0-7	6.0-20	0.08-0.16	5.1-6.5	Low-----	Moderate	Moderate	0.32	3
Eldridge	7-28	6.0-20	0.04-0.11	5.1-6.5	Low-----	Moderate	Moderate	0.32	
	28-60	0.2-0.6	0.18-0.22	5.1-7.3	Low-----	Moderate	Low-----	0.43	
EnA, EnB-----	0-7	6.0-20	0.10-0.18	4.5-6.5	Low-----	High-----	Moderate	0.32	3
Enosburg	7-22	6.0-20	0.04-0.08	4.5-7.3	Low-----	High-----	Moderate	0.32	
	22-60	0.2-0.6	0.18-0.22	6.1-7.3	Low-----	High-----	Low-----	0.43	
FaB, FaC-----	0-4	0.6-2.0	0.11-0.19	5.1-6.5	Low-----	Low-----	Moderate	0.32	2
Farmington	4-14	0.6-2.0	0.07-0.18	5.6-7.3	Low-----	Low-----	Moderate	0.28	
	14	---	---	---	-----	-----	-----	---	
<sup>1</sup> FmC, <sup>1</sup> FmD:-----	0-4	0.6-2.0	0.11-0.19	5.1-6.5	Low-----	Low-----	Moderate	0.32	2
Farmington	4-14	0.6-2.0	0.07-0.18	5.6-7.3	Low-----	Low-----	Moderate	0.28	
	14	---	---	---	-----	-----	-----	---	

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
<sup>1</sup> FmC, <sup>1</sup> FmD: Rock outcrop.									
GeA, GeB, GeC----- Georgia	0-2 2-22 22-60	0.6-2.0 0.6-2.0 0.06-0.2	0.13-0.20 0.08-0.19 0.08-0.19	5.6-7.3 5.6-7.3 6.1-7.3	Low----- Low----- Low-----	Moderate Moderate Moderate	Low----- Low----- Low-----	0.43 0.32 0.32	3
GrB, GrC----- Georgia	0-2 2-22 22-60	0.6-2.0 0.6-2.0 0.06-0.2	0.08-0.16 0.08-0.19 0.08-0.19	5.6-7.3 5.6-7.3 6.1-7.3	Low----- Low----- Low-----	Moderate Moderate Moderate	Low----- Low----- Low-----	0.32 0.32 0.32	3
Ha----- Hadley	0-8 8-32 32-60	0.6-2.0 0.6-6.0 0.6-6.0	0.15-0.25 0.13-0.20 0.10-0.20	4.5-7.3 4.5-7.8 5.6-7.8	Low----- Low----- Low-----	Low----- Low----- Low-----	Moderate Moderate Moderate	0.49 0.49 0.49	3
HbA, HbB, HbC, HbD, HbE----- Hinesburg	0-7 7-22 22-60	6.0-20 6.0-20 0.2-0.6	0.08-0.12 0.04-0.10 0.18-0.22	5.6-6.5 5.6-6.5 5.1-7.3	Low----- Low----- Low-----	Low----- Low----- Low-----	Moderate Moderate Low-----	0.17 0.20 0.43	3
KbA, KbB----- Kingsbury	0-6 6-36 36-60	0.06-0.2 <0.06 <0.06	0.12-0.22 0.12-0.13 0.12-0.14	5.1-6.5 5.1-7.3 6.6-8.4	High----- High----- High-----	High----- High----- High-----	Moderate Low----- Low-----	0.49 0.28 0.28	3
Le----- Limerick	0-8 8-18 18-60	0.6-2.0 0.6-2.0 0.6-2.0	0.18-0.25 0.18-0.25 0.18-0.25	5.1-7.3 5.6-7.3 5.6-7.3	Low----- Low----- Low-----	High----- High----- High-----	Low----- Low----- Low-----	0.20 0.20 0.20	3
LoB, LoC, LoD----- Lordstown	0-9 9-27 27	0.6-2.0 0.6-2.0 ---	0.11-0.17 0.10-0.16 ---	4.5-5.5 4.5-5.5 ---	Low----- Low----- ---	Low----- Low----- ---	High----- High----- ---	0.20 0.28 ---	3
<sup>1</sup> LrC, <sup>1</sup> LrD, <sup>1</sup> LrE: Lordstown-----	0-9 9-27 27	0.6-2.0 0.6-2.0 ---	0.11-0.17 0.10-0.16 ---	4.5-5.5 4.5-5.5 ---	Low----- Low----- ---	Low----- Low----- ---	High----- High----- ---	0.20 0.28 ---	3
Rock outcrop.									
Ly----- Lyons	0-9 9-31 31-60	0.6-2.0 0.2-2.0 <0.2	0.15-0.20 0.08-0.18 0.06-0.15	5.6-7.3 6.1-7.3 7.4-8.4	Low----- Low----- Low-----	High----- High----- High-----	Low----- Low----- Low-----	--- --- ---	---
Ma. Marsh									
MeA, MeB----- Massena	0-8 8-25 25-44	0.6-2.0 0.06-0.6 0.06-0.6	0.14-0.20 0.08-0.15 0.06-0.14	5.6-7.3 5.6-7.3 6.6-7.8	Low----- Low----- Low-----	Moderate Moderate Moderate	Moderate Moderate Low-----	0.28 0.28 0.28	3
MnA----- Massena	0-8 8-25 25-44	0.6-2.0 0.06-0.6 0.06-0.6	0.12-0.18 0.08-0.15 0.06-0.14	5.6-7.3 5.6-7.3 6.6-7.8	Low----- Low----- Low-----	Moderate Moderate Moderate	Moderate Moderate Low-----	0.17 0.28 0.28	3
MsA, MsB, MsC, MsD, MsE----- Missisquoi	0-5 5-12 12-35 35-60	6.0-20 6.0-20 6.0-20 6.0-20	0.04-0.08 0.02-0.12 0.03-0.07 0.02-0.03	5.1-6.5 5.1-6.5 5.1-6.5 6.1-7.8	Low----- Low----- Low----- Low-----	Low----- Low----- Low----- Low-----	High----- High----- High----- Moderate	0.17 0.17 0.17 0.17	2
MuB, MuC----- Munson	0-8 8-14 14-40	0.6-2.0 0.2-2.0 <0.2	0.18-0.25 0.14-0.22 0.14-0.20	5.6-6.5 5.6-6.5 5.6-7.3	Low----- Low----- Moderate-----	High----- High----- High-----	Low----- Low----- Low-----	0.49 0.49 0.49	3
Od----- Ondawa Variant	0-7 7-27 27-60	0.6-2.0 0.6-2.0 6.0-20	0.18-0.22 0.18-0.21 0.01-0.10	5.6-7.3 5.6-7.3 5.7-7.3	Low----- Low----- Low-----	Low----- Low----- Low-----	Low----- Low----- Low-----	--- --- ---	---

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
<sup>1</sup> Pa----- Peacham	7-0 0-6 6-60	0.6-2.0 0.6-2.0 <0.06	0.15-0.21 0.08-0.21 0.05-0.11	5.6-7.3 5.6-7.3 5.6-7.3	Low----- Low----- Low-----	High----- High----- High-----	Low----- Low----- Low-----	--- --- ---	---
PeB, PeC, PeD----- Peru	0-8 8-20 20-60	0.60-2.0 0.60-2.0 0.06-0.60	0.10-0.24 0.06-0.21 0.05-0.12	4.5-5.5 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	Moderate Moderate Moderate	Moderate Moderate Moderate	0.24 0.43 0.17	3
PrC, PrD----- Peru	0-8 8-20 20-60	0.60-2.0 0.60-2.0 <0.60	0.10-0.24 0.06-0.21 0.05-0.12	4.5-5.5 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	Moderate Moderate Moderate	Moderate Moderate Moderate	0.24 0.43 0.17	3
Pu----- Podunk Variant	0-8 8-20 20-60	0.6-2.0 0.6-2.0 6.0-20	0.18-0.22 0.16-0.21 0.02-0.10	4.5-7.3 4.5-7.3 4.5-7.3	Low----- Low----- Low-----	Low----- Low----- Low-----	Moderate Moderate Moderate	--- --- ---	---
RaB----- Raynham	0-7 7-17 17-60	0.6-2.0 0.2-2.0 0.06-0.2	0.20-0.25 0.18-0.22 0.18-0.22	5.1-7.3 5.1-7.3 5.6-7.8	Low----- Low----- Low-----	High----- High----- High-----	Low----- Moderate Moderate	0.49 0.64 0.64	3
<sup>1</sup> RoE: Rock outcrop.									
Woodstock-----	0-12 12	2.0-6.0 ---	0.14-0.16 ---	5.6-6.5 ---	Low----- ---	Low----- ---	Moderate ---	0.20 ---	2
Ru----- Rumney Variant	0-7 7-35 35-60	0.6-2.0 0.6-2.0 6.0-2.0	0.18-0.22 0.18-0.21 0.01-0.10	5.1-7.3 5.1-7.3 5.1-7.3	Low----- Low----- Low-----	High----- High----- High-----	Moderate Moderate Moderate	--- --- ---	---
SaA, SaB, SaC----- St. Albans	0-7 7-19 19-60	2.0-6.0 2.0-6.0 2.0-6.0	0.10-0.16 0.08-0.14 0.06-0.12	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	Low----- Low----- Low-----	Moderate Moderate Moderate	0.20 0.20 0.20	3
SbB, SbC, SbD, SbE----- St. Albans	0-7 7-19 19-60	2.0-6.0 2.0-6.0 2.0-6.0	0.10-0.15 0.08-0.14 0.06-0.12	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	Low----- Low----- Low-----	Moderate Moderate Moderate	0.20 0.20 0.20	3
ScA, ScB----- Scantic	0-14 14-21 21-41	0.2-2.0 <0.2 <0.2	0.14-0.30 0.11-0.21 0.09-0.21	5.1-6.5 5.1-7.3 5.6-7.3	Low----- Moderate----- Moderate-----	High----- High----- High-----	Moderate Low----- Low-----	0.28 0.49 0.49	3
StB, StC, StD----- Stowe	0-8 8-29 29-60	0.6-6.0 0.6-6.0 0.06-0.2	0.10-0.22 0.10-0.20 0.08-0.12	5.1-7.3 5.1-7.3 5.1-7.3	Low----- Low----- Low-----	Low----- Low----- Low-----	Moderate Moderate Moderate	0.24 0.43 0.17	3
SwC, SwD, <sup>1</sup> SyE----- Stowe	0-8 8-29 29-60	0.6-6.0 0.6-6.0 0.06-0.2	0.10-0.18 0.10-0.18 0.08-0.12	5.1-7.3 5.1-7.3 5.1-7.3	Low----- Low----- Low-----	Low----- Low----- Low-----	Moderate Moderate Moderate	0.24 0.43 0.17	3
Tm. Terric Medisaprists									
<sup>1</sup> TwB, <sup>1</sup> TwC, <sup>1</sup> TwD: Tunbridge-----	0-7 7-25 25	2.0-6.0 2.0-6.0 ---	0.12-0.16 0.10-0.14 ---	5.1-7.3 5.1-7.3 ---	Low----- Low----- ---	Low----- Low----- ---	Moderate Moderate ---	0.20 0.20 ---	2
Woodstock-----	0-12 12	2.0-6.0 ---	0.14-0.16 ---	5.6-6.5 ---	Low----- ---	Low----- ---	Moderate ---	0.20 ---	2
Wa----- Wallkill	0-7 7-14 14-45	0.6-2.0 0.6-2.0 2.0-20.0	0.16-0.21 0.15-0.20 0.19-0.22	5.1-7.3 5.1-7.3 5.6-7.3	Low----- Low----- Low-----	Moderate Moderate ---	Moderate Moderate ---	--- --- ---	---
Wh----- Wareham	0-9 9-15 15-60	6.0-20 6.0-20 6.0-20	0.06-0.15 0.03-0.13 0.01-0.13	3.6-5.5 3.6-5.5 3.6-5.5	Low----- Low----- Low-----	Moderate Moderate Moderate	High----- High----- High-----	0.17 0.17 0.17	5

See footnote at end of table.



## SOIL SURVEY

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permea- bility	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	<u>In</u>	<u>In/hr</u>	<u>In/in</u>	<u>pH</u>					
WrA, WrB, WrC----- Westbury	0-6	0.6-2.0	0.12-0.18	3.6-6.0	Low-----	Moderate	High-----	0.28	3
	6-20	0.6-2.0	0.07-0.15	3.6-6.0	Low-----	Moderate	High-----	0.28	
	20-60	0.06-0.2	0.02-0.06	4.5-6.0	Low-----	Moderate	High-----	0.28	
WsA, WsB, WsC, WsD, WsE----- Windsor	0-10	6.0->20	0.08-0.12	4.5-6.0	Low-----	Low-----	High-----	0.17	5
	10-27	6.0->20	0.02-0.12	4.5-6.0	Low-----	Low-----	High-----	0.17	
	27-60	6.0->20	0.01-0.08	4.5-6.5	Low-----	Low-----	High-----	0.17	
Wt----- Winooski	0-33	0.6-6.0	0.15-0.30	4.5-7.3	Low-----	Moderate	Moderate	0.49	3
	33-60	0.6-6.0	0.13-0.26	4.5-7.3	Low-----	Moderate	Moderate	0.49	
<sup>1</sup> WxC, <sup>1</sup> WxD, <sup>1</sup> WxE: Woodstock-----	0-12	2.0-6.0	0.14-0.16	5.6-6.5	Low-----	Low-----	Moderate	0.20	2
	12	---	---	---	-----	-----	-----	---	
Rock outcrop.									

<sup>1</sup> See map unit description for the composition and behavior of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. See text and glossary for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	
					<u>Ft</u>			<u>In</u>		
AuA----- Au Gres	B	None-----	---	---	0.5-1.5	Apparent	Nov-May	>60	---	Moderate.
BeB, BeC----- Belgrade	B	None-----	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	High.
Bg----- Binghamville	D	None-----	---	---	0.5-1.5	Apparent	Nov-Jun	>60	---	High.
Br----- Birdsall	D	None-----	---	---	0-1.0	Apparent	Oct-Jul	>60	---	High.
BxC, BxD, BxE----- Buxton	C	None-----	---	---	1.0-3.0	Perched	Nov-May	>60	---	High.
CaA, CaB, CbA, CbB----- Cabot	D	None-----	---	---	0.5-2.0	Perched	Nov-May	>60	---	High.
Ce----- Carlisle	A/D	Frequent-----	Long-----	Nov-May	0-1.0	Apparent	Sep-Jun	>60	---	High.
CoB, CoC, CoD, CoE----- Colton	A	None-----	---	---	>6.0	---	---	>60	---	Low.
CpB----- Copake	B	None-----	---	---	>6.0	---	---	>60	---	Low.
Cv----- Covington	D	None-----	---	---	0.5-1.0	Perched	Oct-May	>60	---	Moderate.
DeB, DeC----- Deerfield	B	None-----	---	---	1.0-3.0	Apparent	Dec-Apr	>60	---	Moderate.
EdA, EdB, EdC----- Eldridge	C	None-----	---	---	1.0-2.0	Apparent	Jan-May	>60	---	Moderate.
EnA, EnB----- Enosburg	D	None-----	---	---	0.5-1.0	Apparent	Nov-May	>60	---	Moderate.
FaB, FaC----- Farmington	C	None-----	---	---	>6.0	---	---	10-20	Hard	Low.
<sup>1</sup> FmC, <sup>1</sup> FmD: Farmington----- Rock outcrop.	C	None-----	---	---	>6.0	---	---	10-20	Hard	Low.
GeA, GeB, GeC, GrB, GrC----- Georgia	B	None-----	---	---	1.5-2.0	Perched	Mar-May	>60	---	High.
Ha----- Hadley	B	Common-----	Brief-----	Oct-Apr	3.0-6.0	Apparent	Nov-May	>60	---	High.
HbA, HbB, HbC, HbD, HbE----- Hinesburg	C	None-----	---	---	>5.0	---	---	>60	---	Moderate.
KbA, KbB----- Kingsbury	D	None-----	---	---	0.5-1.5	Perched	Dec-May	>60	---	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth <u>Ft</u>	Kind	Months	Depth <u>In</u>	Hardness	
Le----- Limerick	C	Frequent----	Brief-----	Apr-Jun	0.5-1.5	Apparent	Jan-Jun	>60	---	High.
LoB, LoC, LoD----- Lordstown	C	None-----	---	---	>6.0	---	---	20-40	Hard	Low.
<sup>1</sup> LrC, <sup>1</sup> LrD, <sup>1</sup> LrE: Lordstown----- Rock outcrop.	C	None-----	---	---	>6.0	---	---	20-40	Hard	Low.
Ly----- Lyons	D	None-----	---	---	0-0.5	Perched	Nov-Jun	>60	---	High.
Ma. Marsh										
MeA, MeB, MnA----- Massena	C	None-----	---	---	0.5-1.5	Perched	Feb-Apr	>60	---	High.
MsA, MsB, MsC, MsD, MsE----- Missisquoi	A	None-----	---	---	>6.0	---	---	>60	---	Low.
MuB, MuC----- Munson	D	None-----	---	---	0.5-2.0	Perched	Nov-May	>60	---	High.
Od----- Ondawa Variant	B	Common-----	Brief-----	Nov-May	>6.0	---	---	>60	---	Low.
<sup>1</sup> pa----- Peacham	D	None-----	---	---	0.0-1.5	Perched	Oct-Jun	>60	---	High.
PeB, PeC, PeD----- Peru	C	None-----	---	---	1.5-3.0	Perched	Nov-Mar	>60	---	High.
PrC, PrD----- Peru	C	None-----	---	---	1.0-3.0	Perched	Nov-Mar	>60	---	High.
Pu----- Podunk Variant	B	Frequent----	Brief-----	Nov-May	1.5-3.0	Apparent	Nov-May	>60	---	Moderate.
RaB----- Raynham	C	None-----	---	---	0.5-2.0	Apparent	Nov-Jun	>60	---	High.
<sup>1</sup> RoE: Rock outcrop.										
Woodstock-----	C/D	None-----	---	---	>6.0	---	---	10-20	Hard	Low.
Ru----- Rumney Variant	C	Frequent----	Brief-----	Oct-May	0-1.5	Apparent	Nov-May	>60	---	High.
SaA, SaB, SaC, SbB, SbC, SbD, SbE----- St. Albans	B	None-----	---	---	>6.0	---	---	>60	---	Moderate.
ScA, ScB----- Scantic	C	None-----	---	---	0-1.0	Perched	Oct-Jun	>60	---	High.
StB, StC, StD, SwC, SwD, <sup>1</sup> SyE--- Stowe	C	None-----	---	---	1.5-2.5	Perched	Nov-May	>60	---	Moderate.
Tm. Terric Medisaprists										

See footnote at end of table.



TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro- logic group	Flooding			High water table			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth <u>Ft</u>	Kind	Months	Depth <u>In</u>	Hardness	
<sup>1</sup> TwB, <sup>1</sup> TwC, <sup>1</sup> TwD: Tunbridge-----	C	None-----	---	---	>6.0	---	---	20-40	Hard	Moderate.
Woodstock-----	C/D	None-----	---	---	>6.0	---	---	10-20	Hard	Low.
Wa----- Wallkill	D	Frequent----	Brief to long.	Sep-Jun	0-0.5	Apparent	Sep-Jun	>60	---	High.
Wh----- Wareham	C	None-----	---	---	0-1.5	Apparent	Sep-Jun	>60	---	Moderate.
WrA, WrB, WrC----- Westbury	C	None-----	---	---	0.5-1.5	Perched	Jan-Apr	>60	---	Moderate.
WsA, WsB, WsC, WsD, WsE----- Windsor	A	None-----	---	---	>6.0	---	---	>60	---	Low.
Wt----- Winooski	B	Common-----	Brief-----	Sep-Apr	1.0-3.0	Apparent	Dec-Apr	>60	---	High.
<sup>1</sup> WxC, <sup>1</sup> WxD, <sup>1</sup> WxE: Woodstock-----	C/D	None-----	---	---	>6.0	---	---	10-20	Hard	Low.
Rock outcrop.										

<sup>1</sup> See map unit description for the composition and behavior of the map unit.

## SOIL SURVEY

TABLE 18.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics of this taxadjunct that are outside the range of the series]

Soil name	Family or higher taxonomic class
Au Gres-----	Sandy, mixed, frigid Entic Haplaquods
Belgrade-----	Coarse-silty, mixed, mesic Aquic Dystric Eutrochrepts
Binghamville-----	Coarse-silty, mixed, nonacid, mesic Typic Haplaquepts
Birdsall-----	Coarse-silty, mixed, nonacid, mesic Typic Humaquepts
Buxton-----	Fine, mixed, mesic Aquic Dystric Eutrochrepts
Cabot-----	Coarse-loamy, mixed, frigid Typic Fragiaquepts
Carlisle-----	Euic, mesic Typic Medisaprists
Colton-----	Sandy-skeletal, mixed, frigid Typic Haplorthods
*Copake-----	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Dystric Eutrochrepts
Covington-----	Very-fine, illitic, mesic Mollic Ochraqualfs
Deerfield-----	Mixed, mesic Aquic Udipsamments
Eldridge-----	Sandy over loamy, mixed, nonacid, mesic Aquic Udorthents
Enosburg-----	Sandy over loamy, mixed, nonacid, frigid Mollic Haplaquepts
Farmington-----	Loamy, mixed, mesic Lithic Eutrochrepts
Georgia-----	Coarse-loamy, mixed, mesic Aquic Dystric Eutrochrepts
Hadley-----	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents
Hinesburg-----	Sandy over loamy, mixed, nonacid, mesic Typic Udorthents
Kingsbury-----	Very-fine, illitic, mesic Aeric Ochraqualfs
Limerick-----	Coarse-silty, mixed, nonacid, mesic Typic Fluvaquepts
Lordstown-----	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Lyons-----	Fine-loamy, mixed, nonacid, mesic Mollic Haplaquepts
Massena-----	Coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts
Missisquoi-----	Sandy, mixed, frigid Entic Haplorthods
Munson-----	Coarse-silty over clayey, mixed, nonacid, mesic Aeric Haplaquepts
Ondawa Variant-----	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Dystrochrepts
Peacham-----	Coarse-loamy, mixed, frigid Humic Fragiaquepts
Peru-----	Coarse-loamy, mixed, frigid Aquic Fragiorthods
Podunk Variant-----	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluvaquentic Dystrochrepts
Raynham-----	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts
Rumney Variant-----	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Fluvaquepts
St. Albans-----	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Scantic-----	Fine, illitic, nonacid, mesic Typic Haplaquepts
Stowe-----	Coarse-loamy, mixed, frigid Entic Fragiorthods
Tunbridge-----	Coarse-loamy, mixed, frigid Entic Haplorthods
Wallkill-----	Fine-loamy, mixed, nonacid, mesic Thapto-Histic Fluvaquepts
*Wareham-----	Mixed, mesic Mollic Psammaquepts
Westbury-----	Coarse-loamy, mixed, frigid Typic Fragiaquods
Windsor-----	Mixed, mesic Typic Udipsamments
Winooski-----	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
Woodstock-----	Loamy, mixed, frigid Entic Lithic Haplorthods

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