United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Texas Agricultural Experiment Station and United States Department of Agriculture, Forest Service

Soil Survey of Trinity County, Texas

How to Use This Soil Survey

General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

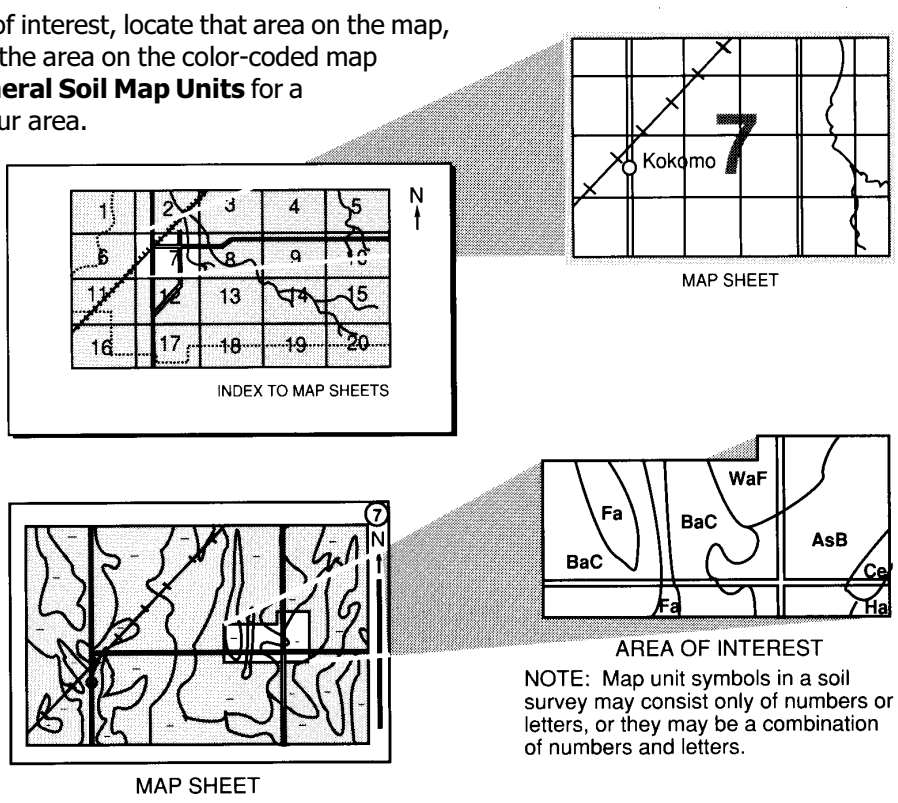
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map units symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.



The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1998. Soil names and descriptions were approved in 1998. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1998. This survey was made cooperatively by the Natural Resources Conservation Service, the Texas Agricultural Experiment Station, and the United States Department of Agriculture, Forest Service. The survey is part of the technical assistance furnished to the Davy Crockett-Trinity Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Small water areas, such as the one pictured, provide water, food, and cover for many species of wildlife. The pond is in an area of Colita fine sandy loam, 0 to 1 percent slopes, in the Brushy Creek Wildlife Management Area.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Issued 2003

Contents

Foreword

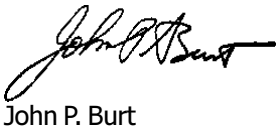
This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as 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 soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.



John P. Burt
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Trinity County, Texas

By Levi J. Steptoe, Jr., Natural Resources Conservation Service

Fieldwork by Levi J. Steptoe, Jr., Lynn D. Gray, and Joseph Castille, soil scientists, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
Texas Agricultural Experiment Station and United States Department of Agriculture, Forest Service

Trinity County is in the east-central part of Texas in the pine region (fig. 1). It extends diagonally from the Trinity River, which forms the southwest border, to the Neches River, which forms the northeast border. It is bounded on the north by Houston and Angelina Counties, on the east by Angelina and Polk Counties, on the south by Walker and Polk Counties, and on the west by Houston and Walker Counties.

The county has an area of 704 square miles. The county is approximately 37 miles in length and 25 miles in width. It resembles a parallelogram in shape, but the northern and southern boundaries follow the irregular meanderings of the Trinity and Neches Rivers, respectively.

The topography of the county is undulating, breaking into abrupt, but low hills in some parts near the Neches River. The elevation ranges from 250 to 300 feet above sea level. The highest elevation is one-half mile south of the town of Groveton.

The county is in the East Texas Timberlands resource area. The relief of the area is nearly level to sloping. The area has well defined drainage patterns and is dissected by many streams.

Timber and cattle production are important to the economy of Trinity County. Most areas in the county are used as woodland, pastureland, and hayland. Some limited acreage is used as cropland.

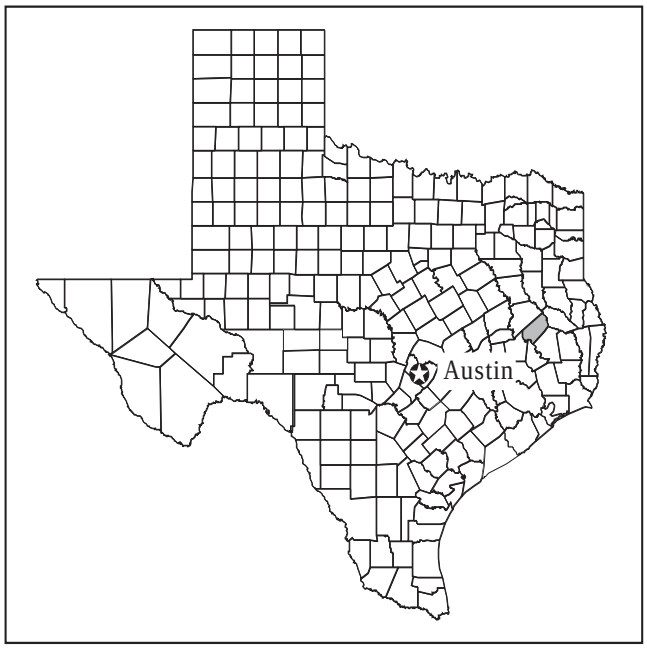


Figure 1.—Location of Trinity County in Texas.

General Nature of the Survey Area

This section gives general information concerning Trinity County. It discusses settlement and population, agriculture, natural resources, and climate of the county.

Settlement and Population

Trinity County was in the original municipality of Nacogdoches and was granted to Joseph Vehlins by the Mexican government in 1827.

This grant called for the colonization of 200 families. Several grants were made afterwards from the Vehlins Grant to would-be colonizers. The most important of

these grants was a league granted by the state of Coahuila in Mexico and Texas to Maria Guadeloupe De Castro. The land upon which the city of Groveton is built is within the bounds of this grant.

The native population in the early days is described by travelers as scarce, but friendly and kind. A tribe of Indians settled in the northeastern part of what is now Trinity County in about 1850. They were locally known as the Alabama Indians. The creek upon which they settled is known by the name of these Indians—Alabama Creek.

Trinity County was created on December 7, 1841, by an act of the Republic of Texas. The first permanent settler within the present bounds of Trinity County was Jesse James. He settled on Alabama Creek with the Indian village in the year 1844.

Agriculture

Woodland, livestock, and hay are the main agricultural enterprises in Trinity County. Timber production in the county is a major product. Pine timber is sold for pulpwood, posts, crossties, and other wood products. Mature pine stands are sold for sawtimber. Hardwood forests are cut mainly as crossties, pulpwood, or firewood. There are several large timber companies and a national forest with timberlands that produce timber that accounts for more than 60 percent of agriculture revenues in Trinity County.

Livestock operations are mainly cow/calf. Beef cattle sales account for 30 percent of the agricultural income in the county. The livestock are mainly pastured in the summer and fed hay and feed supplement in the winter. Cattle graze improved cool-season grasses and legumes in winter, spring, and early summer.

Natural Resources

Woodland is a very important natural resource in Trinity County. The woodland areas in the county are diversified and have various wildlife and recreation potential. Most of the areas in the county are leased for deer hunting, which provides added income to landowners.

Water is an important natural resource. Lake Livingston in the southwestern part of the county provides flood control, fishing, and other recreational activities. The smaller creeks and lakes provide abundant water supplies for the county.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Groveton in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 50 degrees F and the average daily minimum temperature is 38 degrees. The lowest temperature on record, which occurred at Groveton on December 23, 1989, was 1 degree. In summer, the average temperature is 81 degrees and the average daily maximum temperature is 93 degrees. The highest temperature, which occurred at Groveton on August 11, 1969, was 108 degrees.

Growing degree days are shown in table 1. They 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 (50 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.

The average annual total precipitation is about 45 inches. Of this, about 30 inches, or 67 percent, usually falls in March through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 12 inches at Groveton on October 17, 1994. Thunderstorms occur on about 61 days each year, and most occur between May and September.

The average seasonal snowfall is 0.3 inches. The greatest snow depth at any one time during the period of record was 9 inches recorded on December 21, 1929. The heaviest 1-day snowfall on record was 9.5 inches recorded on December 21, 1929.

The average relative humidity in mid-afternoon is about 59 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 65 percent of the time in summer and 47 percent in winter. The prevailing wind is from the south. Average wind speed is highest, around 9 miles per hour, from February to April.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or

horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually

Figure 2.—Piezometer study site on Alazan soils in an area of Alazan-Besner complex, 0 to 2 percent slopes. Soil scientists collect data on seasonal water table fluctuations in order to make predictions about the behavior of the soils for a variety of land uses.

change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date (fig. 2).

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in some of the adjacent survey areas. Differences are a result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map 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 soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soil Descriptions

1. Fuller-Kurth-Keltys

Nearly level to moderately sloping, loamy soils that are moderately well drained to somewhat poorly drained; on uplands

This map unit is made up mainly of Fuller soils on broad, nearly level to very gently sloping and slightly concave interstream divides. Keltys and Kurth soils are on broad, smooth, slightly convex, very gently sloping to moderately sloping interstream divides. These soils are slowly permeable to very slowly permeable. The underlying material is stratified mudstone, shale, and soft sandstone with yellowish brown mottles.

This map unit makes up about 30 percent of the county. It is about 35 percent Fuller and similar soils, 30 percent Kurth and similar soils, 20 percent Keltys and similar soils, and 15 percent soils of minor extent (fig. 3).

Typically, the surface layer of the Fuller soils is grayish brown fine sandy loam. The subsurface layer is light brownish gray fine sandy loam. The subsoil is grayish brown loam with light gray streaks of sandy loam. The substratum is light brownish gray mudstone.

Typically, the surface layer of the Kurth soils is dark brown fine sandy loam. The subsurface layer is pale brown fine sandy loam. The upper part of the subsoil is yellowish brown sandy clay loam with brownish yellow and red iron concentrations and pale brown and light brownish gray streaks. The lower part of the subsoil is light gray clay loam with red and brownish yellow iron concentrations. The underlying material is reddish yellow stratified sandstone and mudstone.

Typically, the surface layer of the Keltys soils is dark brown fine sandy loam. The subsurface layer is pale brown fine sandy loam. The upper part of the subsoil is brownish yellow loam with light brownish gray streaks. The lower part of the subsoil is pale brown sandy loam with pockets of brownish yellow loam and reddish yellow iron concentrations. The underlying material is light brownish gray mudstone with light yellowish brown iron concentrations.

Of minor extent in this map unit are Herty, Koury, Lovelady, Moswell, Moten, Multey, Penning, and Pophers soils. Herty and Moswell soils are more clayey in the subsoil and have a thinner surface layer than Keltys and Kurth soils. Koury and Pophers soils are on flood plains of creeks. Lovelady soils are on very gently sloping to moderately sloping, smooth, convex ridges or side slopes. Moten, Multey, and Penning soils are on lower slopes and terraces.

Most of the acreage of this map unit is used as woodland. Some areas are used as pastureland, and a few areas are used as cropland, primarily truck crops.

These soils are moderately well suited to poorly suited for pasture and hayland. Most of the pasture and hayland is improved bermudagrass and bahiagrass, which can be overseeded to clover or vetch. Fertilizer, lime, and rotational grazing are needed for sustained yields.

These soils are well suited to use as woodland. Native pines and mixed hardwoods grow on these soils. Loblolly pine is dominant. Lack of moisture during the summer months is a limiting factor. Seedling mortality is a limiting factor, especially on Fuller soils, and it is also difficult to reestablish seedling on this soil once it has been clearcut and site prepared.

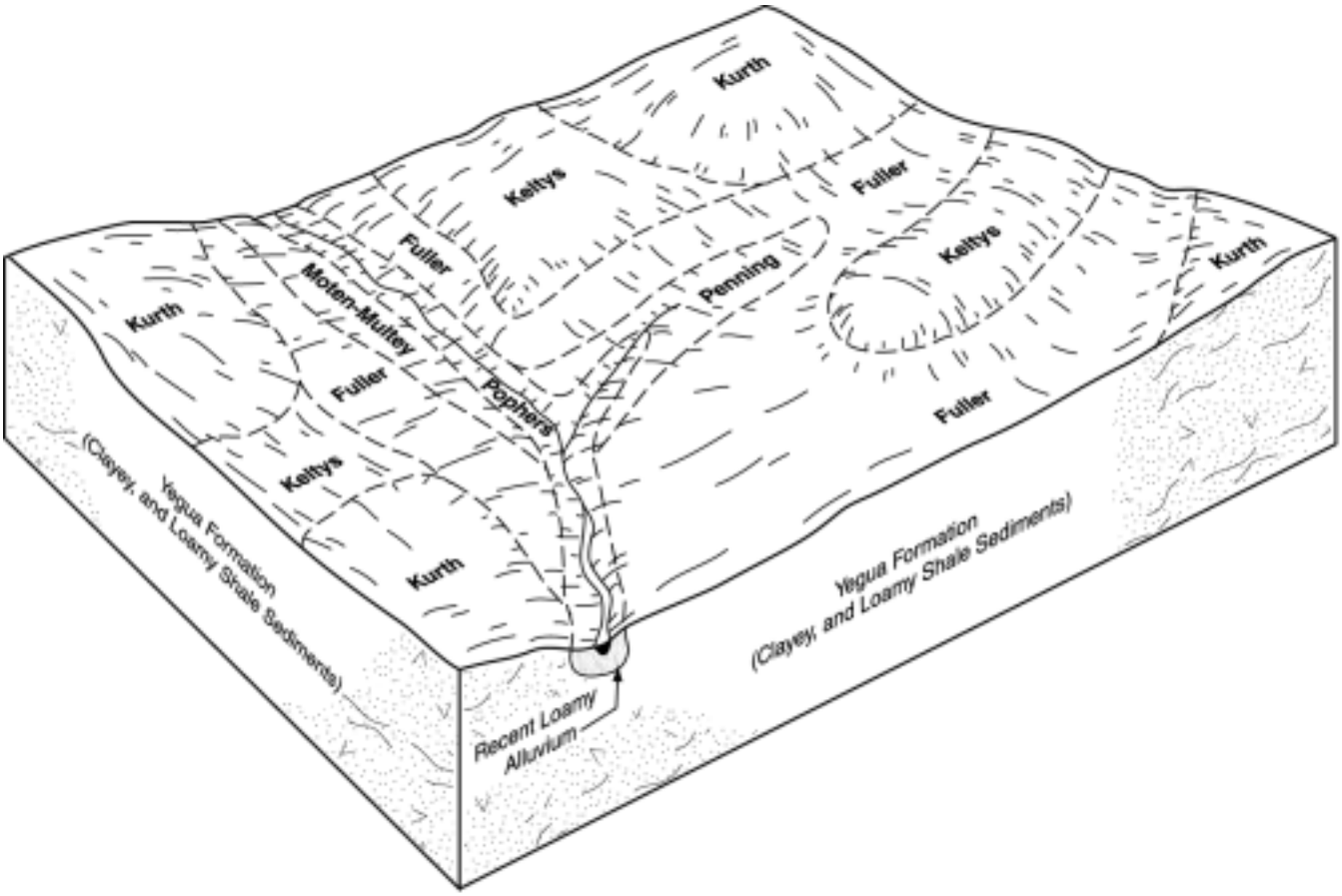


Figure 3.—Typical pattern of soils and parent material in the Fuller-Kurth-Keltys general soil map unit.

2. Kurth-Colita-Lovelady

Nearly level to moderately sloping, loamy soils that are well drained to somewhat poorly drained; on uplands

This map unit is made up mainly of Kurth soils that are on very gently sloping to moderately sloping stream divides and convex ridges. Colita soils are on nearly level to very gently sloping broad areas between drainageways. Lovelady soils are on very gently sloping to moderately sloping interstream divides and side slopes. These soils are moderately permeable to slowly permeable. The underlying material is sandstone, mudstone, and shale.

This map unit makes up about 29 percent of the county. It is about 35 percent Kurth and similar soils, 30 percent Colita and similar soils, 20 percent Lovelady and similar soils, and 15 percent soils of minor extent.

Typically, the surface layer of the Kurth soils is dark brown fine sandy loam. The subsurface layer is pale brown fine sandy loam. The upper part of the subsoil is yellowish brown sandy clay loam with brownish yellow and red iron concentrations and pale brown to light brownish gray streaks. The lower part of the subsoil is light gray clay loam with red and brownish yellow iron concentrations. The underlying material is reddish yellow stratified sandstone and mudstone.

Typically, the surface layer of the Colita soils is dark grayish brown fine sandy loam. The subsurface layer is light brownish gray fine sandy loam. The upper part of the subsoil is dark grayish brown fine sandy loam with light brownish gray streaks. The middle part of the subsoil is dark grayish brown sandy clay loam with light brownish gray streaks. The lower part of the subsoil is grayish brown sandy clay loam with pale yellow shale fragments. The underlying material is pale yellow shale.

Typically, the surface layer of the Lovelady soils is brown loamy fine sand. The subsurface layer is loamy fine sand that is pale brown in the upper part and light yellowish brown in the lower part. The upper part of the subsoil is yellowish brown sandy clay loam with red iron concentrations and pale brown streaks. The

middle part of the subsoil is variegated dark red, grayish brown, and brownish yellow sandy clay loam. The lower part of the subsoil is grayish brown clay loam with pale brown streaks.

Of minor extent in this map unit are Browndell, Kitterll, Laska, and Rayburn soils. Browndell soils are clayey and shallow and are on moderately sloping to moderately steep side slopes. Kitterll soils are loamy and very shallow and are on small knobs. Laska soils are loamy and are in similar landscape positions. Rayburn soils have a clayey subsoil and are on small knobs.

Most of the acreage of this map unit is used as woodland. The soils in the smoother areas of this map unit are used as pasture or hayland, with some areas as cropland. The soils in this map unit are used as woodland in most of the rougher, more sloping areas.

Most of the pasture and hayland is improved bermudagrass. The main limitation for use as pasture and hayland is droughtiness. Pastures require light applications of fertilizer and lime at frequent intervals for best production. Legumes, such as vetch, crimson clover, and singletary pea, overseeded into the grass, lengthen the grazing season and improve the soil tilth. Fertilizer, lime, and rotational grazing are needed for sustained yields.

These soils are moderately well suited to pine tree production. Loblolly pine and shortleaf pine are the dominant species, with sweetgum, hickory, post oak, southern red oak, and white oak intermingled. The low available water capacity, which causes seedling mortality and slow tree growth, is the main limitation. Longleaf uniola, pinehill bluestem, purpletop, and diverse shrubs are the main plants in the understory.

3. Herty-Moswell

Nearly level to moderately steep, clayey soils that are well drained to moderately well drained; on uplands

This map unit is made up mainly of Herty soils on broad, nearly level to very gently sloping interstream divides. Moswell soils are on broad, very gently sloping interstream divides to moderately steep side slopes. These soils are very slowly permeable. The underlying material is shale.

This map unit makes up about 12 percent of the county. It is about 40 percent Herty and similar soils, 35 percent Moswell and similar Etoile soils, and 25 percent soils of minor extent (fig. 4).

Typically, the surface layer of the Herty soils is dark brown loam. The subsurface layer is grayish brown loam. The subsoil is dark grayish brown clay and has light brownish gray clay depletions in the lower part. The underlying material is brown shale.

Typically, the surface layer of the Moswell soils is brown loam. The subsurface layer is pale brown loam with yellowish brown iron concentrations. The upper part of the subsoil is red clay with brown iron accumulations and gray iron depletions. The middle part of the subsoil is yellowish red, light brownish gray, and red clay. The lower part of the subsoil is grayish brown clay with brownish yellow iron concentrations. The underlying material is light brownish gray and gray shale.

Of minor extent in this map unit are Kellison, Keltys, Koury, Kurth, Lovelady, Moten, Multey, and Pophers soils. Koury and Pophers soils are on flood plains of creeks. Keltys, Kurth, and Lovelady soils have a loamy subsoil and are in higher landscape positions. In addition, Lovelady soils have a thick, sandy surface and subsurface layer. Moten and Multey soils are loamy and are in lower landscape positions.

Most of the acreage of this map unit is used as woodland. Some areas are used as pastureland, and a few areas are used as cropland.

These soils are moderately well suited to use as pasture and hayland. Most of the pasture and hayland is improved bermudagrass and bahiagrass, which can be overseeded with legumes, such as crimson clover or vetch. Fertilizer, lime, and rotational grazing are needed for sustained yields.

These soils are moderately well suited to use as woodland. Native pines and mixed hardwoods grow on these soils. Loblolly pine is dominant. The potential for erosion increases with slope; therefore, care must be taken to avoid excessive uphill and downhill rutting on steeper sites.

4. Colita-Laska-Corrigan

Nearly level to strongly sloping, loamy and clayey soils that are moderately well drained to somewhat poorly drained; on uplands

This map unit is made up mainly of Colita soils on broad, nearly level to very gently sloping and slightly concave interstream divides. Laska soils are on nearly level to gently sloping, broad, smooth to slightly concave, low ridges. Corrigan soils are on very gently sloping to strongly sloping interstream divides and side slopes. These soils are moderately rapidly permeable to very slowly permeable.

This map unit makes up about 11 percent of the county. It is about 35 percent Colita and similar soils, 30 percent Laska and similar soils, 25 percent Corrigan

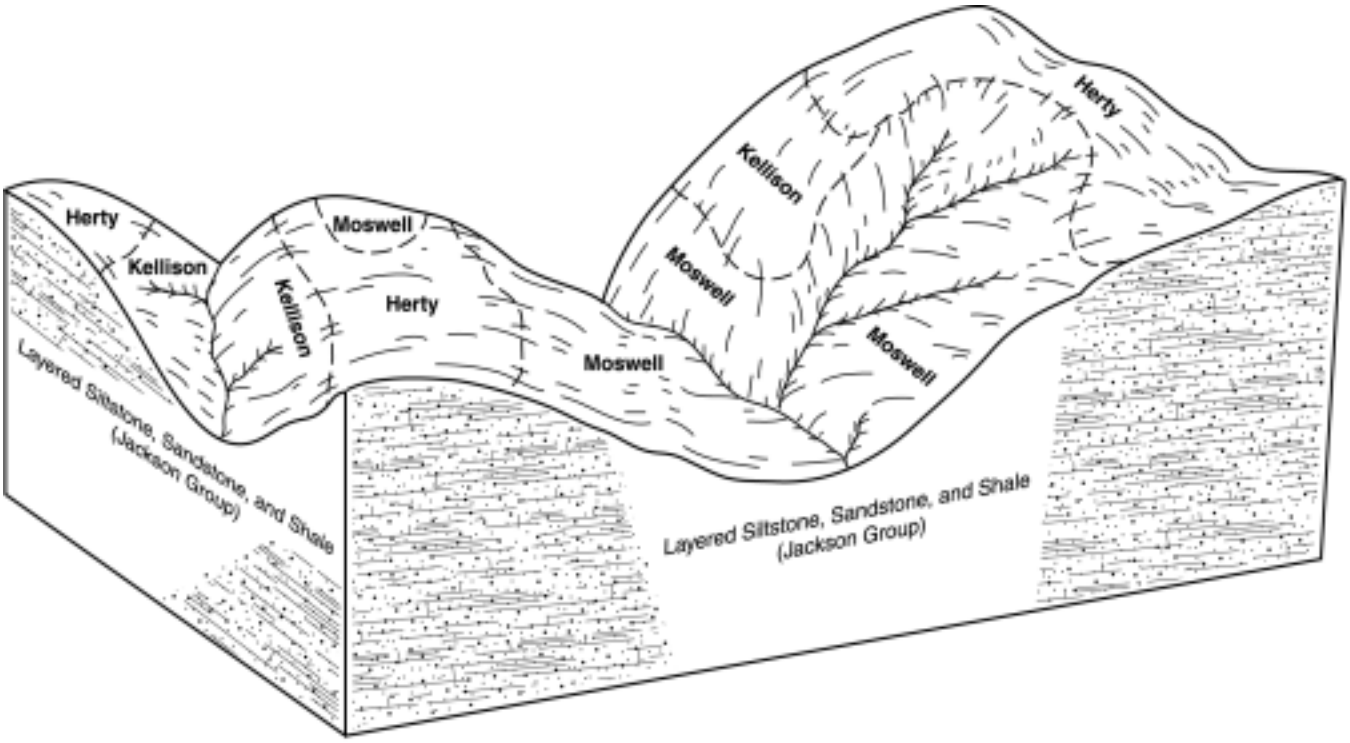


Figure 4.—Typical pattern of soils and parent material in the Herty-Moswell general soil map unit.

and similar soils, and 10 percent soils of minor extent (fig. 5).

Typically, the surface layer of the Colita soils is dark grayish brown fine sandy loam. The subsurface layer is light brownish gray fine sandy loam. The upper part of the subsoil is dark grayish brown fine sandy loam with light brownish gray streaks. The middle part of the subsoil is dark grayish brown sandy clay loam with light brownish gray streaks. The lower part of the subsoil is grayish brown sandy clay loam with pale yellow shale fragments. The underlying material is pale yellow shale.

Typically, the surface layer of the Laska soils is dark brown fine sandy loam. The subsurface layer is pale brown fine sandy loam in the upper part and light yellowish brown fine sandy loam in the lower part. The upper part of the subsoil is strong brown loam with pale brown streaks and yellowish brownish iron concentrations. The middle part of the subsoil is yellowish brown loam with pale brown streaks and strong brown iron concentrations. The lower part of the subsoil is strong brown sandy clay loam with pale brown streaks and concentrations and red iron concentrations. The underlying material is light yellowish brown, olive yellow, dark grayish brown, and pale yellow weathered bedrock.

Typically, the surface layer of the Corrigan soils is dark grayish brown loam. The upper part of the subsoil is dark grayish brown clay with yellowish brown iron concentrations and dark gray iron depletions. The middle part of the subsoil is grayish brown clay with yellowish brown iron concentrations. The lower part of the subsoil is dark grayish brown clay. The underlying material is light yellowish brown tuffaceous siltstone.

Of minor extent in this map unit are Koury, Letney, Lovelady, Pophers, and Tehran soils. Koury and Pophers soils are on flood plains of creeks. Letney, Lovelady, and Tehran soils are on very gently sloping to moderately steep, smooth, convex ridges or side slopes.

Most of the acreage of this map unit is used as woodland. Some areas are used as pastureland.

These soils are well suited to use as pasture and hayland. Most of the pasture and hayland is improved bermudagrass and bahiagrass. Fertilizer, lime, and rotational grazing are needed for sustained yields.

These soils are well suited to use as woodland. Native pines and mixed hardwoods grow on these soils. Loblolly pine is dominant. Lack of moisture during summer months is a limiting factor. Generally, pine seedlings are easily planted on these soils.

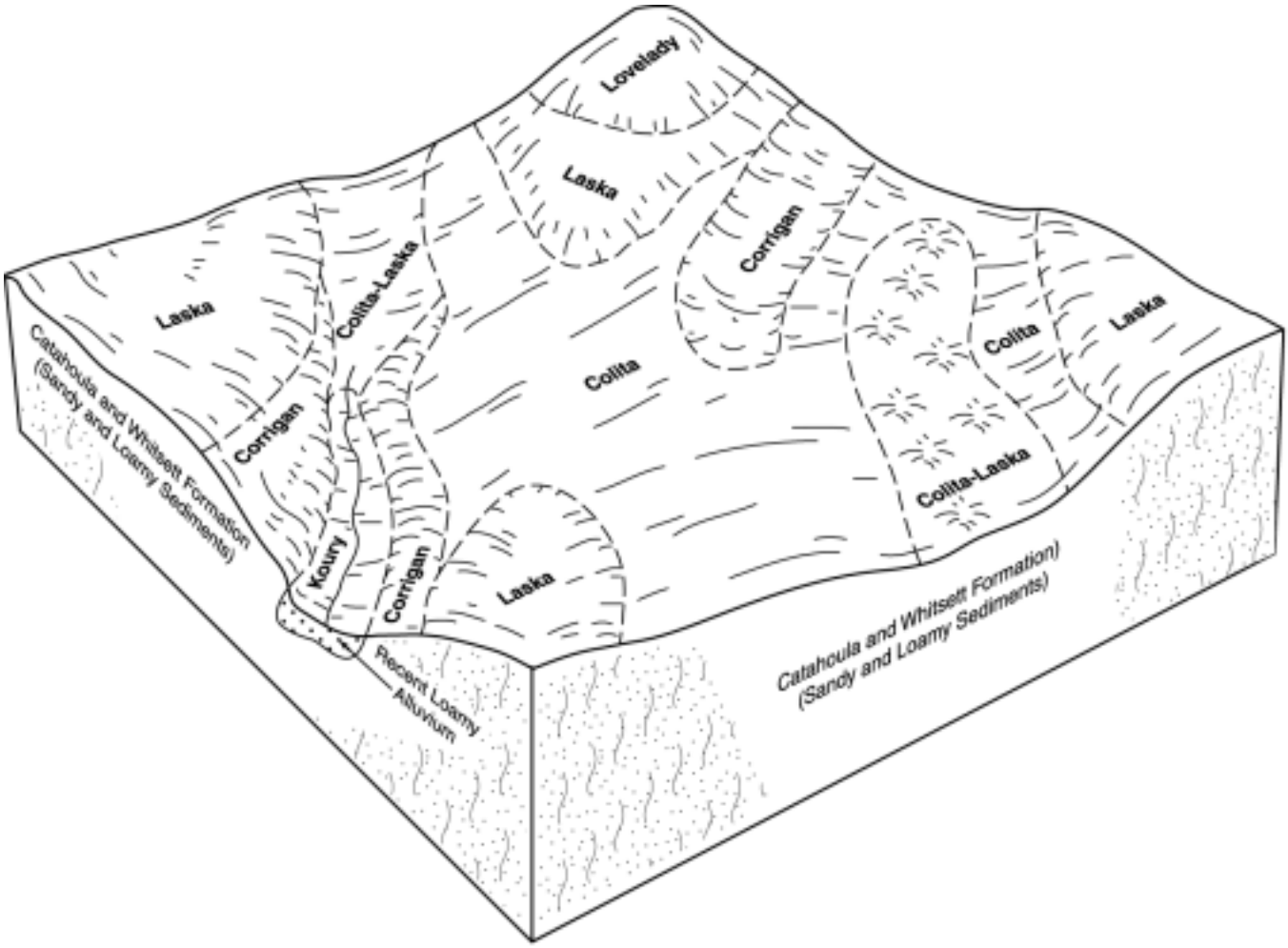


Figure 5.—Typical pattern of soils and parent material in the Colita-Laska-Corrigan general soil map unit.

5. Koury-Pophers

Nearly level, loamy soils that are moderately well drained to somewhat poorly drained; on flood plains

This map unit is made up mainly of moderately well drained Koury soils and somewhat poorly drained Pophers soils on nearly level flood plains of several major streams on the Yegua, Caddell, Manning, and Catahoula Formations. These soils are moderately slowly permeable. These soils are subject to flooding almost annually.

This map unit makes up about 6 percent of the county. It is about 45 percent Koury and similar soils, 35 percent Pophers and similar soils, and 20 percent soils of minor extent.

Typically, the surface layer of the Koury soils is dark grayish brown silt loam. The upper part of the subsoil is grayish brown grading to brown loam. The middle part of the subsoil is dark grayish brown to grayish brown silt loam. The lower part of the subsoil is dark grayish brown loam with brownish yellow iron concentrations.

Typically, the surface layer of the Pophers soils is dark grayish brown silty clay loam. The upper part of the subsoil is light brownish gray silty clay loam with yellowish brown iron concentrations. The middle part of the subsoil is dark grayish brown silty clay loam with light gray clay depletions and dark yellowish brown iron concentrations. The lower part of the subsoil is grayish brown silty clay loam with dark yellowish brown iron concentrations.

Of minor extent in this map unit are Colita, Fuller, Herty, Keltys, Kurth, Moten, Multey, and Penning soils. Colita and Fuller soils are in slightly higher landscape positions. Herty soils are in higher landscape positions and have a clayey subsoil. Keltys and Kurth soils are in higher landscape positions and are moderately well

drained. Moten and Multey soils are in slightly higher landscape positions and are mounded. Penning soils are in slightly higher landscape positions and have a solum less than 60 inches thick.

Most of the acreage of this map unit is used as woodland. Some areas are used as pastureland. The soils in this map unit generally are not used as cropland because of flooding and wetness.

The Pophers soils are poorly suited to the production of grasses and legumes. The Koury soils are very well suited to the production of grasses and legumes. Most of the pasture and hayland is bahiagrass and common bermudagrass. Fertilizer, lime, and rotational grazing are needed for sustained yields.

In some areas, these soils are used as woodland. Sweetgum, water oak, and willow oak are dominant. Loblolly pine grows well on moderately well drained areas. Flooding and wetness hinders most harvesting operations.

6. Pophers-Ozias

Nearly level, loamy and clayey soils that are somewhat poorly drained; on flood plains

This map unit is made up mainly of loamy Pophers soils and clayey Ozias soils on nearly level flood plains of several major streams on the Yegua, Caddell, Manning, and Catahoula Formations. These soils are moderately slowly permeable to very slowly permeable. These soils are subject to flooding almost annually.

This map unit makes up about 4 percent of the county. It is about 45 percent Pophers and similar soils, 35 percent Ozias and similar soils, and 20 percent soils of minor extent.

Typically, the surface layer of the Pophers soils is dark grayish brown silty clay loam. The upper part of the subsoil is light brownish gray silty clay loam with yellowish brown iron concentrations. The middle part of the subsoil is dark grayish brown silty clay loam with light gray clay depletions and dark yellowish brown iron concentrations. The lower part of the subsoil is grayish brown silty clay loam with dark yellowish brown iron concentrations.

Typically, the surface layer of the Ozias soils is dark grayish brown clay with dark red, strong brown, and reddish yellow iron stains and concentrations. The upper part of the subsoil is grayish brown clay with strong brown iron concentrations. The middle part of the subsoil is light brownish gray silty clay loam with strong brown redoximorphic concentrations. The lower part of the subsoil is dark gray clay with strong brown iron concentrations.

Of minor extent in this map unit are Fuller, Herty, Keltys, Kurth, Moten, Multey, and Penning soils. Fuller soils are in slightly higher landscape positions. Herty soils are in higher landscape positions and have a clayey subsoil. Keltys and Kurth soils are in higher landscape positions and are moderately well drained. Moten and Multey soils are in slightly higher landscape positions and are mounded. Penning soils are in slightly higher landscape positions and have a solum less than 60 inches thick.

Most of the acreage of this map unit is used as woodland. Some areas are used as pastureland. The soils in this map unit generally are not used as cropland because of flooding and wetness.

The Pophers and Ozias soils are poorly suited to the production of grasses and legumes. Most of the pasture and hayland is bahiagrass and common bermudagrass. Fertilizer, lime, and rotational grazing are needed for sustained yields.

In some areas, these soils are used as woodland. Sweetgum, water oak, and willow oak are dominant. Loblolly pine grows well on moderately well drained areas. Flooding and wetness hinders most harvesting operations.

7. Penning-Moten

Nearly level to very gently sloping, loamy soils that are moderately well drained; on uplands and terraces

This map unit is made up mainly of Penning soils on nearly level to very gently sloping drainageways and stream divides and Moten soils on broad, nearly level to very gently sloping mounded terraces. These soils are moderately permeable to slowly permeable.

This map unit makes up about 3 percent of the county. It is about 40 percent Penning and similar soils, 35 percent Moten and similar soils, and 25 percent soils of minor extent.

Typically, the surface layer of the Penning soils is dark grayish brown very fine sandy loam. The subsurface layer is pale brown very fine sandy loam with yellowish brown iron stains in the upper part and brownish yellow iron concentrations and brownish gray iron depletions in the lower part. The upper part of the subsoil is brownish yellow loam with pale brown streaks of sandy loam. The lower part of the subsoil is grayish brown loam with light gray streaks of fine sandy loam. The underlying material is pale yellow mudstone.

Typically, the surface layer of the Moten soils is dark grayish brown silt loam. The upper part of the subsurface layer is pale brown silt loam with dark yellowish brown and yellowish brown iron concentrations. The lower part of the subsurface layer is light brownish gray silt loam with grayish brown

streaks of loam. The upper part of the subsoil is variegated grayish brown loam and pale brown silt loam. The lower part of the subsoil is grayish brown loam and light yellowish brown clay loam. The substratum is grayish brown and pale yellow clay loam.

Of minor extent in this map unit are Austonio, Besner, Hainesville, Mollville, Multey, Sawtown, and Sawlit soils. Austonio soils are loamy and are on nearly level to moderately steep, beveled side slopes. Besner soils are loamy and are on broad, nearly level to very gently sloping terraces. Hainesville soils are on sand ridges. Mollville soils are loamy and wet and are on nearly level to very gently sloping, smooth to slightly concave areas on terraces. Multey soils are loamy and are on mounds. Sawlit and Sawtown soils are loamy and are on mounded landscapes.

Most of the acreage of this map unit is used as woodland. Some areas are used as pastureland, and a few areas are used as cropland.

These soils are moderately well suited to poorly suited to use as pasture and hayland. Most of the pasture and hayland is improved bermudagrass and bahiagrass, which can be overseeded to clover or vetch. Fertilizer, lime, and rotational grazing are needed for sustained yields.

These soils are well suited to use as woodland. Native pines and mixed hardwoods grow on these soils. Loblolly pine is dominant. Lack of moisture during the summer months is a limiting factor. Seedling mortality is a limiting factor, especially on Fuller soils, and it is also difficult to reestablish seedlings on this soil once it has been clearcut and site prepared.

8. Eastham-Garner

Nearly level to gently sloping, clayey soils that are moderately well drained; on terraces

This map unit is made up mainly of Eastham soils on broad, smooth, nearly level to gently sloping terraces. Garner soils are on smooth, nearly level terraces. These soils are very slowly permeable.

This map unit makes up about 2 percent of the county. It is about 35 percent Eastham and similar soils, 30 percent Garner and similar soils, and 35 percent soils of minor extent.

Typically, the surface layer of the Eastham soils is very dark gray clay. The upper part of the subsoil is dark gray clay with red iron concentrations and very dark gray organic concentrations. The middle part of the subsoil is gray clay with strong brown iron concentrations. The lower part of the subsoil is dark grayish brown clay with light yellowish brown iron concentrations grading to dark yellowish brown clay with light gray iron depletions.

Typically, the surface layer of the Garner soils is dark gray clay with dark brown and yellowish brown iron concentrations. The upper part of the subsoil is dark grayish brown clay with brownish yellow iron concentrations and light brownish gray iron depletions. The middle part of the subsoil is light brownish gray and light gray clay with brownish yellow and yellowish brown iron concentrations. The lower part of the subsoil is gray clay with yellowish brown iron concentrations grading to dark grayish brown clay with yellow iron concentrations.

Of minor extent in this map unit are Annona, Besner, Gladewater, Hainesville, and Mollville soils. Annona soils are in landscape positions similar to those of the Eastham soils. Besner soils are loamy and are on broad, nearly level to very gently sloping terraces. Gladewater soils are on flood plains of the Trinity River. Hainesville soils are on sand ridges. Mollville soils are loamy and wet and are on nearly level to very gently sloping, smooth to slightly concave areas on terraces.

The soils in this map unit are used mainly as pastureland. Some areas are used as woodland, and a few areas are used as cropland.

These soils are moderately well suited to use as pasture and hayland. Most of the pasture and hayland is improved bermudagrass and bahiagrass, which can be overseeded with legumes, such as crimson clover, white dutch clover, arrowleaf clover, or vetch. Fertilizer, lime, and rotational grazing are needed for sustained yields.

These soils are moderately well suited to use as woodland. Native pines and mixed hardwoods grow on these soils. Loblolly pines are dominant on Freestone soils. Some sites, however, may have a high pH, which will limit their suitability for pine trees. The clayey surface may restrict equipment use during any harvesting operation to prevent excessive rutting and to maintain normal drainage.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Kurth fine sandy loam, 1 to 3 percent slopes, is a phase of the Kurth series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Colita-Laska complex, 0 to 2 percent slopes, is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Soil Descriptions

AaB—Alazan very fine sandy loam, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: None
Landscape position: Toeslopes and drainageways
Slope: Nearly level to very gently sloping
Shape of areas: Long and narrow
Size of areas: Average about 50 acres in size
Native vegetation: Pine-hardwood forest

Composition

Alazan and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Hainesville soils are in slightly higher areas and are sandy throughout
- Mollville soils are gray throughout and are poorly drained

Similar Soils

- Besner soils are in slightly higher landscape positions and are coarser in texture
- Latex soils are in higher landscape positions and are better drained
- Penning soils are in similar positions and have a solum depth of 40 to 60 inches

Typical Profile

Surface layer:
0 to 4 inches—moderately acid, very dark grayish brown very fine sandy loam

Subsoil:
4 to 19 inches—strongly acid, brownish yellow sandy clay loam with yellowish brown iron concentrations and light brownish gray clay depletions
19 to 33 inches—strongly acid, brownish yellow loam with light gray streaks and yellowish brown iron concentrations
33 to 40 inches—strongly acid, brownish yellow sandy clay loam with light gray streaks and gray clay depletions
40 to 53 inches—slightly acid, gray sandy clay loam with light gray streaks and yellowish red and brownish yellow iron concentrations
53 to 62 inches—slightly acid, gray, yellowish brown, light gray, and strong brown clay loam with light gray streaks
62 to 80 inches—slightly acid, yellowish brown, light gray, and brownish yellow sandy clay loam with light gray streaks

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: Apparent at 1.5 to 2.5 feet during January through April
Flooding: None
Runoff: Low
Permeability: Moderate
Available water capacity: High
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Low strength may limit road use by heavy equipment
- The use of some types of equipment may be restricted when the water table is high
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Slightly wet conditions during the winter and early spring may interfere with harvesting hay, the grazing rotation, or the use of equipment
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2w
Woodland management group: 10

AbA—Alazan-Besner complex, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: Mounds
Landscape position: Toeslopes
Slope: Nearly level to very gently sloping
Shape of areas: Oblong
Size of areas: 20 to 75 acres
Native vegetation: Pine-hardwood forest

Composition

Alazan and similar soils: 60 percent
Besner and similar soils: 30 percent
Contrasting soils: 10 percent

Contrasting Soils

- Mollville soils are grayish throughout and are poorly drained

Similar Soils

- Multey soils are in slightly higher landscape positions
- Penning soils are in similar positions and have a solum depth of 40 to 60 inches

Typical Profile

Alazan

Surface layer:
0 to 4 inches—strongly acid, dark brown very fine sandy loam

Subsurface layer:
4 to 12 inches—strongly acid, pale brown very fine sandy loam
12 to 18 inches—slightly acid, light yellowish brown very fine sandy loam

Subsoil:
18 to 28 inches—very strongly acid, brownish yellow loam with yellowish brown streaks
28 to 40 inches—very strongly acid, strong brown loam with red mottles and pale brown and light brownish gray streaks
40 to 46 inches—very strongly acid, yellowish brown loam with light brownish gray and very pale brown streaks
46 to 56 inches—very strongly acid, variegated strong brown, light brownish gray, and very pale brown sandy clay loam
56 to 63 inches—very strongly acid, light brownish gray sandy clay loam with brownish yellow iron concentrations
63 to 80 inches—very strongly acid, light brownish gray sandy clay loam with yellowish brown and very pale brown iron concentrations

Besner

Surface layer:
0 to 3 inches—moderately acid, dark grayish brown fine sandy loam

Subsurface layer:
3 to 8 inches—moderately acid, light yellowish brown fine sandy loam
8 to 29 inches—moderately acid, light yellowish brown fine sandy loam with yellowish brown iron concentrations

Subsoil:
29 to 38 inches—moderately acid, yellowish brown and light gray fine sandy loam with yellowish brown iron concentrations
38 to 44 inches—strongly acid, strong brown loam with light gray streaks
44 to 52 inches—strongly acid, yellowish brown loam with light gray streaks and red iron concentrations
52 to 64 inches—strongly acid, variegated yellowish brown, red, and yellowish red loam with light gray streaks
64 to 70 inches—strongly acid, variegated yellowish red, yellowish brown, and light brownish gray sandy clay loam with light gray streaks
70 to 80 inches—strongly acid, strong brown sandy clay loam with light gray streaks

Soil Properties

Depth: Very deep
Drainage class: Alazan—moderately well drained; Besner—well drained
Water table: Alazan—apparent at 1.5 to 2.5 feet during January through April; Besner—apparent at 4 to 6 feet in January and February
Flooding: None
Runoff: Low
Permeability: Moderate
Available water capacity: Alazan—high; Besner—moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Alazan—slight; Besner—moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Alazan—low strength may limit road use by heavy equipment
- Alazan—the use of some types of equipment may be restricted when the water table is high
- Alazan—abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- These soils are well suited to the production of grasses and legumes

Minor limitations:
- Alazan—slightly wet conditions during the winter and early spring may interfere with harvesting hay, the grazing rotation, or the use of equipment
- Alazan and Besner—soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: Alazan—2w; Besner—2e
Woodland management group: Alazan—10; Besner—6

AnB—Annona fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: None
Landscape position: Toeslopes
Slope: Very gently sloping
Shape of areas: Broad and oval
Size of areas: 25 to 50 acres
Native vegetation: Pine-hardwood forest

Composition

Annona and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Hainesville soils are sandy throughout and are somewhat excessively drained
- Mollville soils are poorly drained and are in depressions

Similar Soils

- Moswell and Etoile soils have a solum depth of 40 to 60 inches thick

Typical Profile

Surface layer:
0 to 4 inches—slightly acid, brown fine sandy loam

Subsurface layer:
4 to 9 inches—moderately acid, pale brown fine sandy loam

Subsoil:
9 to 13 inches—very strongly acid, yellowish brown clay loam with light gray iron depletions
13 to 17 inches—strongly acid, yellowish red clay with light gray iron depletions
17 to 21 inches—strongly acid, yellowish red clay with red iron concentrations
21 to 27 inches—strongly acid, red clay with yellow and red iron concentrations and light gray iron depletions
27 to 38 inches—strongly acid, variegated red, yellow, and white clay
38 to 43 inches—strongly acid, white clay with red and yellow iron concentrations
43 to 52 inches—slightly acid, variegated red, brownish yellow, and white clay
52 to 80 inches—neutral, light reddish brown clay with yellowish red and white iron depletions

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: More than 6 feet
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The use of some types of equipment may be restricted during wet seasons

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 3e
Woodland management group: 12

AuB—Austonio fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: None
Landscape position: Ridgetops and toeslopes
Slope: Very gently sloping
Shape of areas: Oval
Size of areas: 15 to 60 acres
Native vegetation: Pine-hardwood forest

Composition

Austonio and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Hainesville soils are in similar landscape positions and are somewhat excessively drained
- Mollville soils are in depressions and are poorly drained

Similar Soils

- Besner soils have less than 18 percent clay in the upper part of the subsoil
- Sawtown soils have a clayey subsoil within 60 inches

Typical Profile

Surface layer:
0 to 4 inches—slightly acid, brown fine sandy loam

Subsurface layer:
4 to 9 inches—strongly acid, pale brown fine sandy loam
9 to 13 inches—strongly acid, pale brown fine sandy loam with yellowish brown mottles

Subsoil:
13 to 20 inches—strongly acid, yellowish red sandy clay loam with pale brown iron depletions
20 to 32 inches—strongly acid, strong brown sandy clay loam
32 to 38 inches—strongly acid, yellowish brown fine sandy loam with pale brown iron depletions
38 to 51 inches—strongly acid, reddish yellow fine sandy loam with pale brown pockets

Underlying material:
51 to 62 inches—very strongly acid, pale brown loamy fine sand with reddish yellow iron concentrations
62 to 70 inches—very strongly acid, yellowish brown fine sandy loam with pale brown pockets
70 to 80 inches—very strongly acid, strong brown fine sandy loam with brownish yellow iron concentrations

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Low
Permeability: Moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Moderate
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 3e
Woodland management group: 6

AuD—Austonio fine sandy loam, 5 to 15 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping to moderately steep
Shape of areas: Narrow
Size of areas: 25 to 40 acres
Native vegetation: Pine-hardwood forest

Composition

Austonio and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Moswell soils have more than 60 percent clay throughout the subsoil

Similar Soils

- Woden soils have less clay in the subsoil

Typical Profile

Surface layer:
0 to 3 inches—moderately acid, very dark grayish brown fine sandy loam

Subsurface layer:
3 to 12 inches—moderately acid, dark brown fine sandy loam

Subsoil:
12 to 21 inches—very strongly acid, red sandy clay loam with light yellowish brown mottles
21 to 30 inches—very strongly acid, yellowish red sandy clay loam
30 to 56 inches—very strongly acid, strong brown sandy clay loam with light gray streaks
56 to 68 inches—very strongly acid, strong brown sandy clay loam with red iron concentrations

Underlying material:
68 to 80 inches—very strongly acid, white loamy fine sand

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Medium
Permeability: Moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Moderate
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Slope may cause a moderate rate of erosion following harvesting or other disturbance

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- On steeper slopes, water runoff is higher and less water enters the root zone for plant production
- Steeper slopes also increase the hazard of excessive erosion during pasture establishment or renovation and in pastures that are overgrazed

Interpretive Groups

Land capability classification: 6e
Woodland management group: 6

BeA—Besner fine sandy loam, 0 to 3 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: None
Landscape position: Toeslopes
Slope: Nearly level to very gently sloping
Shape of areas: Oblong
Size of areas: 15 to 60 acres
Native vegetation: Pine-hardwood forest

Composition

Besner and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Mollville soils are in depressions and are poorly drained

Similar Soils

- Alazan soils are in lower landscape positions and are wetter
- Hainesville soils are in slightly higher landscape positions and are coarser in texture

Typical Profile

Surface layer:
0 to 3 inches—moderately acid, dark grayish brown fine sandy loam

Subsurface layer:
3 to 8 inches—moderately acid, light yellowish brown fine sandy loam
8 to 29 inches—moderately acid, light yellowish brown fine sandy loam

Subsoil:
29 to 38 inches—moderately acid, yellowish brown loam with light gray streaks and yellowish brown iron concentrations
38 to 44 inches—strongly acid, strong brown loam with light gray streaks and yellowish red iron concentrations
44 to 52 inches—strongly acid, yellowish brown loam with light gray streaks and red iron concentrations
52 to 70 inches—strongly acid, yellowish red, yellowish brown, and light brownish gray sandy clay loam with light gray streaks
70 to 80 inches—strongly acid, strong brown sandy clay loam with light gray streaks

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: Apparent at 4 to 6 feet during January and February
Flooding: None
Runoff: Low
Permeability: Moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is very well suited to the production of grasses and legumes

Minor limitations:
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2e
Woodland management group: 6

Minor limitations:
- None

CaA—Colita fine sandy loam, 0 to 1 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Toeslopes and footslopes
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 20 to 100 acres
Native vegetation: Pine-hardwood forest

Composition

Colita and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Laska soils have less clay in the subsoil and are in slightly higher positions
- Rayburn soils have a clayey subsoil and are in higher landscape positions

Similar Soils

- Alazan soils are not underlain by soft bedrock and have a yellower and browner subsoil
- Fuller soils have higher salinity in the subsoil
- Moten soils have less clay in the subsoil and have a solum more than 60 inches deep

Typical Profile

Surface layer:
0 to 4 inches—strongly acid, dark grayish brown fine sandy loam

Subsurface layer:
4 to 11 inches—strongly acid, light brownish gray fine sandy loam

Subsoil:
11 to 24 inches—moderately acid, dark grayish brown fine sandy loam with light brownish gray streaks
24 to 39 inches—moderately acid, dark grayish brown sandy clay loam with light brownish gray streaks
39 to 43 inches—moderately acid, grayish brown sandy clay loam with pale yellow shale fragments

Underlying material:
43 to 65 inches—neutral, pale yellow shale with texture of clay loam

Soil Properties

Depth: Deep
Drainage class: Somewhat poorly drained
Water table: Perched at 0.5 foot to 2 feet during November through April
Flooding: None
Runoff: Very low
Permeability: Moderate
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- The reduced availability of moisture during dry periods may cause a high rate of seedling mortality

Minor limitations:
- The use of some types of equipment may be restricted when the water table is high
- Low strength may limit road use by heavy equipment
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Wetness, poor internal drainage, and presence of salts limit production
- Wetness interferes with establishment, maintenance, and harvesting of the forage produced

Interpretive Groups

Land capability classification: 3w
Woodland management group: 20

CaB—Colita fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Toeslopes and footslopes
Slope: Very gently sloping
Shape of areas: Irregular
Size of areas: 50 to 100 acres
Native vegetation: Pine-hardwood forest

Composition

Colita and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Rayburn soils have a clayey subsoil and are in higher landscape positions

Similar Soils

- Alazan soils are not underlain by soft bedrock and have a yellower and browner subsoil
- Fuller soils have higher salinity in the subsoil
- Laska soils have less wetness and are in slightly higher, smooth to convex positions
- Moten soils have less than 18 percent clay in the upper part of the subsoil and are not underlain by soft bedrock

Typical Profile

Surface layer:
0 to 7 inches—strongly acid, brown fine sandy loam
7 to 11 inches—strongly acid, grayish brown fine sandy loam

Subsurface layer:
11 to 21 inches—strongly acid, grayish brown fine sandy loam

Subsoil:
21 to 40 inches—very strongly acid, dark grayish brown sandy clay loam with very pale brown streaks
40 to 48 inches—very strongly acid, grayish brown sandy clay loam with very pale brown streaks and olive gray mudstone

Underlying material:
48 to 65 inches—neutral, dark grayish brown shale with texture of clay loam

Soil Properties

Depth: Deep
Drainage class: Somewhat poorly drained
Water table: Perched at 0.5 foot to 2 feet during November through April
Flooding: None
Runoff: Very low
Permeability: Moderate
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The use of some types of equipment may be restricted when the water table is high
- Road-ditch erosion may be a problem due to slope
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Wetness, poor internal drainage, and presence of salts limit production
- Wetness interferes with establishment, maintenance, and harvesting of the forage produced

Interpretive Groups

Land capability classification: 3w
Woodland management group: 20

ClA—Colita-Laska complex, 0 to 2 percent slopes

Setting

Landform: Uplands and stream terraces
Distinctive landscape features: Mounds
Landscape position: Toeslopes
Slope: Nearly level to very gently sloping
Shape of areas: Irregular
Size of areas: 50 to 100 acres
Native vegetation: Pine-hardwood forest

Composition

Colita and similar soils: 45 percent
Laska and similar soils: 35 percent
Contrasting soils: 20 percent

Contrasting Soils

- Rayburn soils have a clayey subsoil and have higher shrink-swell potential

Similar Soils

- Alazan soils are not underlain by soft bedrock and have a yellower and browner subsoil
- Fuller soils have higher salinity in the subsoil
- Keltys soils have sand strippings penetrating the subsoil and have a solum that is 40 to 60 inches deep
- Moten soils have less than 18 percent clay in the upper part of the subsoil and are not underlain by soft bedrock

Typical Profile

Colita

Surface layer:
0 to 4 inches—very strongly acid, dark grayish brown fine sandy loam
4 to 11 inches—very strongly acid, grayish brown fine sandy loam

Subsurface layer:
11 to 28 inches—very strongly acid, light brownish gray fine sandy loam

Subsoil:
28 to 37 inches—very strongly acid, dark grayish brown loam with grayish brown streaks
37 to 43 inches—very strongly acid, dark gray silty clay loam with olive yellow siltstone and light brownish gray streaks

Underlying material:
43 to 65 inches—slightly alkaline, pale yellow siltstone with yellowish brown mottles

Laska

Surface layer:
0 to 4 inches—very strongly acid, dark brown fine sandy loam

Subsurface layer:
4 to 28 inches—very strongly acid, brown fine sandy loam
28 to 37 inches—very strongly acid, pale brown fine sandy loam

Subsoil:
37 to 43 inches—very strongly acid, pale brown and brown fine sandy loam
43 to 50 inches—very strongly acid, brown fine sandy loam with pale brown streaks
50 to 56 inches—very strongly acid, dark brown sandy clay loam with pale yellow streaks

Underlying material:
56 to 65 inches—very strongly acid, pale yellow siltstone with yellow streaks

Soil Properties

Depth: Colita—deep; Laska—very deep
Drainage class: Colita—somewhat poorly drained; Laska—moderately well drained
Water table: Colita—perched at 0.5 foot to 2 feet during November through April; Laska—apparent at 1.5 to 3 feet during December through April
Flooding: None
Runoff: Colita—low; Laska—very low
Permeability: Colita—moderate; Laska—moderately rapid
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Severe

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- The droughty nature of these soils may cause a high rate of seedling mortality

Minor limitations:
- Road-ditch erosion may be a problem due to slope

Pastureland

Major limitations:
- Slightly wet conditions during the winter and early spring may interfere with harvesting hay, the grazing rotation, or the use of equipment

Minor limitations:
- These soils are moderately well suited to the production of grasses and legumes

Interpretive Groups

Land capability classification: Colita—3w; Laska—2w
Woodland management group: Colita—20; Laska—14

CoB—Corrigan loam, 1 to 5 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Gently sloping
Shape of areas: Oblong
Size of areas: 30 to 150 acres
Native vegetation: Pine forest

Composition

Corrigan and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Kitterll soils are loamy and have a solum less than 20 inches thick
- Laska soils have less than 18 percent clay in the upper part of the subsoil and are in slightly higher landscape positions

Similar Soils

- Browndell soils have a solum less than 20 inches thick
- Colita soils have less than 35 percent clay in the upper part of the solum and are in slightly lower landscape positions
- Rayburn soils have a red upper subsoil and are in slightly higher landscape positions

Typical Profile

Surface layer:
0 to 4 inches—moderately acid, dark grayish brown loam

Subsoil:
4 to 10 inches—very strongly acid, dark grayish brown clay with yellowish brown iron concentrations
10 to 24 inches—very strongly acid, grayish brown clay with yellowish brown iron concentrations
24 to 38 inches—very strongly acid, dark grayish brown clay

Underlying material:
38 to 50 inches—very strongly acid, light yellowish brown siltstone with a texture of silty clay

Soil Properties

Depth: Moderately deep
Drainage class: Moderately well drained
Water table: Seasonal; perched at 0.5 to 1 foot during December through March

Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: Moderate
Root zone: Moderately deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Forestland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The abundance of moisture may cause competition for sunlight between seedlings and other plants
- Low soil strength may limit equipment use when this soil is wet
- Poor drainage may cause moderate pine seedling mortality

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 4e
Woodland management group: 11

CoD—Corrigan loam, 5 to 12 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Strongly sloping
Shape of areas: Long and narrow
Size of areas: 20 to 50 acres
Native vegetation: Pine-hardwood forest

Composition

Corrigan and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Moswell soils have a red clayey subsoil and a solum depth of 40 to 60 inches
- Rosenwall soils have a red clayey subsoil and are more acid in the lower part

Similar Soils

- Kellison soils have a solum depth of 40 to 60 inches and are on the Yegua, Caddell, and Manning Formations

Typical Profile

Surface layer:
0 to 3 inches—moderately acid, very dark grayish brown loam

Subsurface layer:
3 to 13 inches—very strongly acid, dark grayish brown loam

Subsoil:
13 to 16 inches—very strongly acid, dark grayish brown clay with strong brown iron concentrations
16 to 21 inches—very strongly acid, grayish brown clay with yellowish brown iron concentrations
21 to 36 inches—very strongly acid, grayish brown clay with white shale fragments

Underlying material:
36 to 55 inches—very strongly acid, grayish brown and light brownish gray shale

Soil Properties

Depth: Moderately deep
Drainage class: Moderately well drained
Water table: Seasonal; perched at 0.5 to 1 foot during December through March
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: Moderate
Root zone: Moderately deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Moderate

Land Use

Major land uses: Pastureland and woodland
Other land use: Cropland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 4e
Woodland management group: 11

EaA—Eastham clay, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: Gilgai
Landscape position: Toeslopes
Slope: Nearly level to very gently sloping
Shape of areas: Oval to elongated
Size of areas: 25 to 150 acres
Native vegetation: Savannah

Composition

Eastham and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Austonio and Sawtown soils are loamy throughout and are in slightly higher landscape positions
- Hainesville soils are sandy throughout and are in slightly higher landscape positions

Similar Soils

- Garner soils are in similar or slightly lower positions and are lighter gray within 12 inches of the soil surface

Typical Profile

Surface layer:
0 to 15 inches—neutral, very dark gray clay
15 to 22 inches—slightly acid, very dark gray clay with dark gray iron depletions and strong brown iron concentrations

Subsoil:
22 to 33 inches—slightly acid, dark gray clay with red iron concentrations and very dark gray organic concentrations
33 to 40 inches—neutral, gray clay with strong brown iron concentrations
40 to 56 inches—moderately alkaline, dark grayish brown clay with light yellowish brown iron concentrations
56 to 80 inches—moderately alkaline, dark yellowish brown clay with light gray iron depletions

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: More than 6 feet
Flooding: None
Runoff: Medium
Permeability: Very slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: High
Shrink-swell potential: High
Water erosion hazard: Moderate

Land Use

Major land use: Cropland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Low soil strength may limit equipment use when this soil is wet

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Inadequate fertility is easily corrected with additions of fertilizer

Interpretive Groups

Land capability classification: 2e
Woodland management group: 18

EaB—Eastham clay, 2 to 5 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: Gilgai
Landscape position: Footslopes
Slope: Gently sloping
Shape of areas: Long and narrow
Size of areas: 10 to 50 acres
Native vegetation: Savannah

Composition

Eastham and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Austonio and Sawtown soils are loamy throughout and are in slightly higher landscape positions
- Hainesville soils are sandy throughout and are in slightly higher landscape positions

Similar Soils

- Garner soils are in similar or slightly lower positions and are lighter gray within 12 inches of the soil surface

Typical Profile

Surface layer:
0 to 5 inches—moderately alkaline, very dark gray clay
5 to 14 inches—moderately alkaline, very dark gray clay with light olive brown iron concentrations

Subsoil:
14 to 21 inches—moderately alkaline, light olive brown silty clay with very dark gray organic concentrations
21 to 47 inches—moderately alkaline, yellowish brown silty clay with light brownish gray iron depletions
47 to 80 inches—moderately alkaline, yellowish brown silty clay with light gray and light brownish gray iron depletions

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: More than 6 feet
Flooding: None
Runoff: High
Permeability: Very slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: High
Shrink-swell potential: High
Water erosion hazard: Moderate

Land Use

Major land use: Pastureland
Other land uses: Woodland and cropland

Management Concerns

Woodland

Major limitations:
- The reduced availability of moisture during dry periods, the difficulty in achieving proper rooting depth, and soil compaction during tree planting may cause a high rate of seedling mortality

Minor limitations:
- Low soil strength may limit equipment use when this soil is wet

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Inadequate fertility is easily corrected with additions of fertilizer

Interpretive Groups

Land capability classification: 3e
Woodland management group: 18

EtB—Etoile loam, 1 to 3 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Very gently sloping
Shape of areas: Broad and oval
Size of areas: 20 to 150 acres
Native vegetation: Hardwood-pine forest

Composition

Etoile and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Penning soils are loamy throughout and are in slightly lower landscape positions

Similar Soils

- Kellison and Rayburn soils are more acid in the upper subsoil and are less alkaline in the lower subsoil

- Moswell soils have more than 60 percent clay in the subsoil and are more acid

Typical Profile

Surface layer:
0 to 4 inches—moderately acid, dark brown loam

Subsurface layer:
4 to 7 inches—moderately acid, yellowish brown loam

Subsoil:
7 to 15 inches—strongly acid, red clay with brownish yellow iron concentrations and gray iron depletions
15 to 32 inches—strongly acid, red, yellowish brown, brownish yellow, and gray clay
32 to 38 inches—moderately acid, gray clay with yellowish brown and red mottles and iron concentrations and light gray iron depletions
38 to 54 inches—neutral, gray, light gray and light olive brown clay
54 to 58 inches—slightly alkaline, gray, light olive brown, and yellowish brown clay

Underlying material:
58 to 66 inches—slightly alkaline, light olive brown, olive brown, gray, and yellowish brown shale with texture of clay
66 to 72 inches—slightly alkaline, brownish yellow, white, gray, and light olive brown shale with texture of clay
72 to 80 inches—moderately alkaline, light olive gray shale with texture of clay with brownish yellow iron concentrations

Soil Properties

Depth: Deep
Drainage class: Moderately well drained
Water table: More than 6 feet
Flooding: None
Runoff: Medium
Permeability: Very slow
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The use of some types of equipment may be restricted during wet seasons

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 4e
Woodland management group: 12

FuA—Fuller fine sandy loam, 0 to 1 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Toeslopes and footslopes
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 20 to 100 acres
Native vegetation: Pine forest

Composition

Fuller and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Herty soils have a clayey subsoil and are in similar to slightly higher positions

Similar Soils

- Colita soils do not have saline layers
- Keltys soils have less than 18 percent clay in the upper part of the solum and are in slightly higher landscape positions
- Moten soils have less than 18 percent clay in the upper part of the solum and do not have soft bedrock within 60 inches

Typical Profile

Surface layer:
0 to 4 inches—strongly acid, dark grayish brown fine sandy loam

Subsurface layer:
4 to 13 inches—strongly acid, grayish brown fine sandy loam
13 to 26 inches—strongly acid, grayish brown fine sandy loam with dark grayish brown mottles

Subsoil:
26 to 36 inches—strongly acid, dark grayish brown loam with yellowish brown iron concentrations and light gray streaks
36 to 44 inches—strongly acid, dark gray loam with yellowish brown iron concentrations and light gray streaks

Underlying material:
44 to 66 inches—very strongly acid, light brownish gray sandstone with olive yellow iron concentrations

Soil Properties

Depth: Deep
Drainage class: Somewhat poorly drained
Water table: Perched at 0.5 foot to 1.5 feet during January through April
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- The reduced availability of moisture during dry periods may cause a high rate of seedling mortality

Minor limitations:
- The use of some types of equipment may be restricted when the water table is high
- Low strength may limit road use by heavy equipment
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Wetness, poor internal drainage, and presence of salts limit production
- Wetness interferes with establishment, maintenance, and harvesting of the forage produced

Interpretive Groups

Land capability classification: 3w
Woodland management group: 17

FuB—Fuller fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Toeslopes and footslopes
Slope: Very gently sloping
Shape of areas: Irregular
Size of areas: 50 to 100 acres
Native vegetation: Pine forest

Composition

Fuller and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Herty soils have a clayey subsoil and are in similar to slightly higher positions

Similar Soils

- Colita soils do not have saline layers
- Keltys soils have less than 18 percent clay in the upper part of the subsoil and are in slightly higher landscape positions
- Moten soils have less than 18 percent clay in the upper part of the subsoil and are not underlain by soft bedrock

Typical Profile

Surface layer:
0 to 7 inches—very strongly acid, grayish brown fine sandy loam

Subsurface layer:
7 to 27 inches—very strongly acid, light brownish gray fine sandy loam

Subsoil:
27 to 35 inches—very strongly acid, grayish brown loam with light gray streaks and pockets
35 to 45 inches—very strongly acid, grayish brown loam with light gray streaks and yellowish brown iron concentrations

Underlying material:
45 to 65 inches—very strongly acid, light brownish gray mudstone

Soil Properties

Depth: Deep
Drainage class: Somewhat poorly drained
Water table: Perched at 0.5 foot to 1.5 feet during January through April
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The use of some types of equipment may be restricted when the water table is high
- Road-ditch erosion may be a problem due to slope
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes (fig. 6)

Minor limitations:
- Wetness, poor internal drainage, and presence of salts limit production
- Wetness interferes with establishment, maintenance, and harvesting of the forage produced

Interpretive Groups

Land capability classification: 3e
Woodland management group: 17

Figure 6.—A cover crop of oats in an area of Fuller fine sandy loam, 1 to 3 percent slopes.

GaA—Garner clay, 0 to 1 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: Gilgai
Landscape position: Toeslopes
Slope: Nearly level
Shape of areas: Broad and irregular
Size of areas: 25 to 150 acres
Native vegetation: Savannah

Composition

Garner and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Austonio soils are loamy throughout and are in slightly higher landscape positions

Similar Soils

- Corrigan soils have a solum less than 60 inches thick
- Eastham soils have a dark surface and are in slightly higher landscape positions

Typical Profile

Surface layer:
0 to 3 inches—strongly acid, dark gray clay with dark brown and yellowish brown iron concentrations

Subsoil:
3 to 11 inches—strongly acid, dark grayish brown clay with brownish yellow iron concentrations and light brownish gray iron depletions
11 to 21 inches—moderately acid, light brownish gray clay with brownish yellow iron concentrations
21 to 33 inches—moderately acid, light gray clay with yellowish brown iron concentrations
33 to 40 inches—moderately acid, light brownish gray clay with yellowish brown iron concentrations
40 to 51 inches—moderately acid, gray clay with yellowish brown iron concentrations
51 to 80 inches—moderately acid, dark grayish brown clay with yellow iron concentrations

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: More than 6 feet
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: High
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Pastureland
Other land use: Woodland

Management Concerns

Woodland

Major limitations:
- Abundant moisture causes competition for sunlight and space from invading plants to severely reduce the success of regeneration efforts

Minor limitations:
- Low soil strength may limit equipment use when this soil is wet
- Poor drainage may cause moderate pine seedling mortality

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Inadequate fertility is easily corrected with additions of fertilizer

Interpretive Groups

Land capability classification: 3w
Woodland management group: 13

GwA—Gladewater clay, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plains
Distinctive landscape features: None
Landscape position: Bottomlands
Slope: Nearly level
Shape of areas: Broad and irregular
Size of areas: 100 to 200 acres
Native vegetation: Savannah

Composition

Gladewater and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Hainesville soils are sandy throughout and are in slightly higher landscape positions
- Other soils that have a dark surface, are loamy throughout, and are in slightly higher landscape positions

Similar Soils

- Eastham soils have a dark surface more than 12 inches thick and are on terraces
- Other soils that have a dark loamy surface more than 12 inches thick and are in similar landscape positions

Typical Profile

Surface layer:
0 to 11 inches—slightly acid, very dark grayish brown clay with dark brown root stains

Subsoil:
11 to 25 inches—moderately acid, dark gray clay with yellowish red iron concentrations
25 to 48 inches—slightly acid, dark gray clay with yellowish red and yellowish brown iron concentrations
48 to 64 inches—slightly acid, dark gray clay with brown iron concentrations
64 to 80 inches—neutral, dark grayish brown clay

Soil Properties

Depth: Very deep
Drainage class: Somewhat poorly drained
Water table: Apparent at 1.5 to 3.5 feet during November through May
Flooding: Frequent; very long duration
Runoff: Low
Permeability: Very slow
Available water capacity: High
Root zone: Very deep
Natural soil fertility: High
Shrink-swell potential: Very high
Water erosion hazard: Slight

Land Use

Major land use: Pastureland
Other land use: Woodland

Management Concerns

Woodland

Major limitations:
- The reduced availability of moisture during dry periods, the difficulty in achieving proper rooting depth, and soil compaction during tree planting may cause a high rate of seedling mortality
- Abundant moisture causes competition for sunlight and space from invading plants to severely reduce the success of regeneration efforts

Minor limitations:
- The use of some types of equipment may be restricted during wet seasons or when flooding occurs

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Flooding and slight wetness in some years may interfere with establishment, maintenance, and harvesting of the forage produced

Interpretive Groups

Land capability classification: 5w
Woodland management group: 9

HaA—Hainesville loamy fine sand, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: None
Landscape position: Toeslopes
Slope: Nearly level to very gently sloping
Shape of areas: Irregular and narrow
Size of areas: 30 to 50 acres
Native vegetation: Pine-hardwood forest

Composition

Hainesville and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Alazan soils have more than 18 percent clay in the upper part of the subsoil
- Austonio soils are in slightly higher landscape positions and have more than 18 percent clay in the upper part of the subsoil

Similar Soils

- Besner soils have a more developed subsoil

Typical Profile

Surface layer:
0 to 3 inches—strongly acid, dark brown loamy fine sand
3 to 7 inches—strongly acid, dark yellowish brown loamy fine sand

Subsoil:
7 to 33 inches—strongly acid, yellowish brown loamy fine sand
33 to 38 inches—very strongly acid, yellowish brown loamy fine sand with yellowish brown pockets of fine sand
38 to 80 inches—very strongly acid, yellowish brown loamy fine sand with thin dark brown lamellae

Soil Properties

Depth: Very deep
Drainage class: Somewhat excessively drained
Water table: More than 6 feet
Flooding: None
Runoff: Very low
Permeability: Rapid
Available water capacity: Low
Root zone: Very deep
Natural soil fertility: Low
Shrink-swell potential: Low
Water erosion hazard: Severe

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The sandy surface may interfere with equipment use during dry periods
- The low available water capacity of this soil may cause moderate seedling mortality

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is limited due to the thick, sandy surface layer allowing rapid movement of water and nutrients through the root zone, resulting in low inherent soil fertility and limited water storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 3s
Woodland management group: 8

HeA—Herty loam, 0 to 1 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Toeslopes
Slope: Nearly level
Shape of areas: Oblong
Size of areas: 45 to 50 acres
Native vegetation: Pine forest

Composition

Herty and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Keltys soils have less than 18 percent clay in the upper part of the subsoil and are in higher landscape positions
- Kurth soils have less than 35 percent clay in the upper part of the subsoil and are in higher landscape positions

Similar Soils

- Fuller and Penning soils are loamy throughout and are in slightly lower landscape positions
- Moswell soils have a redder subsoil

Typical Profile

Surface layer:
0 to 5 inches—strongly acid, brown loam

Subsurface layer:
5 to 8 inches—strongly acid, pale brown loam

Subsoil:
8 to 13 inches—strongly acid, dark grayish brown clay
13 to 18 inches—very strongly acid, grayish brown clay
18 to 28 inches—very strongly acid, dark grayish brown clay
28 to 39 inches—very strongly acid, dark brown clay
39 to 47 inches—very strongly acid, dark grayish brown clay with light yellowish brown iron concentrations

Underlying material:
47 to 61 inches—very strongly acid, very pale brown mudstone with very dark grayish brown mottles
61 to 80 inches—very strongly acid, light yellowish brown mudstone with texture of clay with yellowish brown mottles

Soil Properties

Depth: Deep
Drainage class: Moderately well drained
Water table: Perched at 0.5 to 1 foot during January through April
Flooding: None
Runoff: Low
Permeability: Very slow
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Poor drainage may cause moderate pine seedling mortality
- Low strength may limit road use by heavy equipment
- Low soil strength may limit equipment use when this soil is wet
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly due to the clayey subsoil, which limits water intake and storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 3w
Woodland management group: 12

HeB—Herty loam, 1 to 3 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Toeslopes
Slope: Very gently sloping
Shape of areas: Oblong
Size of areas: 45 to 50 acres
Native vegetation: Pine forest

Composition

Herty and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Keltys soils have less than 18 percent clay in the upper part of the subsoil and are in higher landscape positions
- Kurth soils have less than 35 percent clay in the upper part of the subsoil and are in higher landscape positions

Similar Soils

- Fuller and Penning soils are loamy throughout and are in slightly lower landscape positions
- Moswell soils have a redder subsoil

Typical Profile

Surface layer:
0 to 3 inches—very strongly acid, dark brown loam
3 to 8 inches—very strongly acid, grayish brown loam

Subsoil:
8 to 23 inches—very strongly acid, dark grayish brown clay
23 to 48 inches—strongly acid, dark grayish brown clay with light brownish gray clay depletions

Underlying material:
48 to 80 inches—very strongly acid, brown shale with texture of clay

Soil Properties

Depth: Deep
Drainage class: Moderately well drained
Water table: Perched at 0.5 to 1 foot during January through April
Flooding: None
Runoff: Low to high
Permeability: Very slow
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Low strength may limit road use by heavy equipment
- Low soil strength may limit off-road equipment use when this soil is wet

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly due to the clayey subsoil, which limits water intake and storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 3e
Woodland management group: 12

KcD—Kellison loam, 5 to 15 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping to moderately steep
Shape of areas: Long and narrow
Size of areas: 30 to 65 acres
Native vegetation: Pine forest

Composition

Kellison and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Keltys and Kurth soils are loamy and are slightly higher on the slope
- Lovelady soils have a sandy surface at least 20 inches thick and are slightly higher on the slope

Similar Soils

- Moswell soils have a redder subsoil
- Rayburn soils have soft bedrock at a depth of 40 to 60 inches

Typical Profile

Surface layer:
0 to 3 inches—moderately acid, very dark grayish brown loam

Subsoil:
3 to 12 inches—very strongly acid, dark grayish brown clay
12 to 28 inches—very strongly acid, brown clay
28 to 40 inches—very strongly acid, brown clay with pale yellow fragments of weathered shale

Underlying material:
40 to 50 inches—very strongly acid, pale yellow layered shale with texture of clay

Soil Properties

Depth: Deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: High
Permeability: Very slow
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- Steepness of slope may cause severe road-surface or road-ditch erosion

Minor limitations:
- Slope may restrict the use of some types of equipment during management operations

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- On steeper slopes, water runoff is higher and less water enters the root zone for plant production
- Steeper slopes also increase the hazard of excessive erosion during pasture establishment or renovation and in pastures that are overgrazed

Interpretive Groups

Land capability classification: 6e
Woodland management group: 12

KeB—Keltys fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Very gently sloping
Shape of areas: Oblong
Size of areas: 25 to 75 acres
Native vegetation: Pine forest

Composition

Keltys and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Herty and Moswell soils have a clayey subsoil and are in slightly lower landscape positions

Similar Soils

- Kurth soils have more than 18 percent clay in the upper part of the subsoil
- Multey soils have a solum more than 60 inches thick

Typical Profile

Surface layer:
0 to 6 inches—strongly acid, dark brown fine sandy loam

Subsurface layer:
6 to 14 inches—strongly acid, pale brown fine sandy loam

Subsoil:
14 to 36 inches—very strongly acid, brownish yellow loam with streaks of light brownish gray fine sandy loam
36 to 56 inches—very strongly acid, pale brown sandy loam with brownish pockets of loam and reddish yellow iron concentrations

Underlying material:
56 to 62 inches—very strongly acid, light brownish gray mudstone with texture of clay loam with light yellowish brown iron concentrations
62 to 86 inches—very strongly acid, light gray mudstone with texture of clay loam with brownish yellow mottles

Soil Properties

Depth: Deep
Drainage class: Moderately well drained
Water table: Perched at 2.5 to 3.5 feet during January through April
Flooding: None
Runoff: Low to high
Permeability: Slow
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Moderate capacity to store water slightly lowers potential forage production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2e
Woodland management group: 6

KeD—Keltys fine sandy loam, 5 to 8 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping
Shape of areas: Long and narrow
Size of areas: 15 to 25 acres
Native vegetation: Pine forest

Composition

Keltys and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Kellison and Moswell soils have a clayey subsoil and are in slightly lower landscape positions

Similar Soils

- Kurth soils have more than 18 percent clay in the upper part of the subsoil

Typical Profile

Surface layer:
0 to 4 inches—strongly acid, dark brown fine sandy loam
4 to 8 inches—strongly acid, brown fine sandy loam

Subsurface layer:
8 to 17 inches—strongly acid, brown fine sandy loam with very pale brown mottles

Subsoil:
17 to 28 inches—very strongly acid, brownish yellow fine sandy loam with dark grayish brown and grayish brown mottles and pale brown streaks
28 to 53 inches—very strongly acid, grayish brown fine sandy loam with yellowish brown, yellowish red, red, and brownish yellow mottles and pale brown streaks

Underlying material:
53 to 80 inches—moderately acid, light yellowish brown and light gray mudstone with texture of clay loam

Soil Properties

Depth: Deep
Drainage class: Moderately well drained
Water table: Perched at 2.5 to 3.5 feet during January through April
Flooding: None
Runoff: High
Permeability: Slow
Available water capacity: Moderate
Root zone: Deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Moderate capacity to store water slightly lowers potential forage production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 4e
Woodland management group: 6

KiB—Kitterll fine sandy loam, 1 to 5 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Convex ridges
Slope: Gently sloping
Shape of areas: Round
Size of areas: 10 to 35 acres
Native vegetation: Pine trees

Composition

Kitterll and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Colita and Laska soils have a solum more than 20 inches thick
- Rayburn soils have a solum more than 20 inches thick and are clayey throughout the subsoil

Similar Soils

- Browndell soils are clayey throughout the subsoil

Typical Profile

Surface layer:
0 to 3 inches—moderately acid, grayish brown fine sandy loam
3 to 15 inches—strongly acid, grayish brown fine sandy loam

Underlying material:
15 to 26 inches—strongly acid, light yellowish brown sandstone with very dark grayish brown coatings

Soil Properties

Depth: Very shallow
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Very high
Permeability: Moderate
Available water capacity: Very low
Root zone: Very shallow
Natural soil fertility: Low
Shrink-swell potential: Low
Water erosion hazard: Severe

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- Shallow root depth is poor for commercial tree production
- Tree harvest rotation on these soils should coincide with cessation of growth

Minor limitations:
- None

Pastureland

Major limitations:
- This soil should be carefully protected from erosion because of the shallowness
- Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods help to keep the soil in good condition

Minor limitations:
- Overgrazing or grazing when the soil is too wet causes surface compaction and poor soil tilth and increases runoff

Interpretive Groups

Land capability classification: 7s
Woodland management group: 19

KiD—Kitterll-Browndell complex, 5 to 15 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping to moderately steep
Shape of areas: Narrow and long
Size of areas: 25 to 60 acres
Native vegetation: Pine-hardwood forest

Composition

Kitterll and similar soils: 40 percent
Browndell and similar soils: 35 percent
Contrasting soils: 25 percent

Contrasting Soils

- Laska soils are in lower positions and have a solum more than 40 inches thick
- Letney soils are on nearby broad ridges, have a thicker solum, and have a sandy surface and subsurface more than 20 inches thick

Similar Soils

- Corrigan soils have a solum more than 20 inches thick
- Kisatchie and Rayburn soils are in slightly higher convex positions and have a thicker solum

Typical Profile

Kitterll

Surface layer:
0 to 6 inches—moderately acid, brown fine sandy loam
6 to 12 inches—strongly acid, grayish brown fine sandy loam

Underlying material:
12 to 15 inches—light yellowish brown sandstone

Browndell

Surface layer:
0 to 3 inches—moderately acid, very dark brown fine sandy loam

Subsurface layer:
3 to 6 inches—moderately acid, brown fine sandy loam

Subsoil:
6 to 16 inches—very strongly acid, brown clay with yellow iron concentrations

Underlying material:
16 to 24 inches—very strongly acid, light yellowish brown sandstone with grayish brown material in fractures

Soil Properties

Depth: Kitterll—very shallow; Browndell—shallow
Drainage class: Kitterll—well drained; Browndell—somewhat poorly drained

Water table: Kitterll—more than 6 feet; Browndell—0.5 foot to 1.5 feet during January through March
Flooding: None
Runoff: Medium to high
Permeability: Kitterll—moderate; Browndell—very slow
Available water capacity: Moderate
Root zone: Shallow
Natural soil fertility: Medium
Shrink-swell potential: Kitterll—low; Browndell—high
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- The clayey nature of these soils and the difficulty of proper rooting during tree planting may cause severe seedling mortality

Minor limitations:
- Soil slope may cause a moderate rate of erosion following harvesting or other mechanical disturbance

Pastureland

Major limitations:
- Increased slope also increases the hazard of excessive erosion during pasture establishment or renovation and in pastures that are overgrazed
- Production is decreased as slopes increase above 10 percent

Interpretive Groups

Land capability classification: Kitterll—7s; Browndell—6e
Woodland management group: 19

Kp—Koury silt loam, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plains
Distinctive landscape features: None
Landscape position: Bottomlands
Slope: Nearly level
Shape of areas: Long and narrow
Size of areas: 25 to 75 acres
Native vegetation: Pine-hardwood forest

Composition

Koury and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Ozias soils are clayey throughout

Similar Soils

- Pophers soils have more than 18 percent clay in the upper part of the subsoil and are dominated by grayish colors in the upper 20 inches

Typical Profile

Surface layer:
0 to 7 inches—strongly acid, dark grayish brown silt loam

Subsoil:
7 to 21 inches—very strongly acid, grayish brown loam
21 to 32 inches—very strongly acid, brown loam with dark brown iron concentrations
32 to 46 inches—very strongly acid, dark grayish brown silt loam with light brownish gray iron depletions
46 to 54 inches—very strongly acid, grayish brown silt loam with dark brown iron concentrations and light gray iron depletions
54 to 84 inches—very strongly acid, dark grayish brown loam with brown and brownish yellow iron concentrations

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: Apparent at 2.5 to 3.5 feet during January through May
Flooding: Frequent
Runoff: Low
Permeability: Moderately slow
Available water capacity: High
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The use of some types of equipment may be restricted when the water table is high or flooding occurs
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is very well suited to the production of grasses and legumes

Minor limitations:
- Flooding and slight wetness in some years may interfere with establishment, maintenance, and harvesting of the forage produced

Interpretive Groups

Land capability classification: 5w
Woodland management group: 3

KuB—Kurth fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Very gently sloping
Shape of areas: Oblong to irregular
Size of areas: 30 to 85 acres
Native vegetation: Pine forest

Composition

Kurth and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Herty and Moswell soils have a clayey subsoil within 12 inches of the surface and are in slightly lower landscape positions

Similar Soils

- Keltys soils have less than 18 percent clay in the upper part of the subsoil
- Penning soils have a water table within 40 inches of the soil surface
- Sawlit soils have a solum thicker than 80 inches and a water table within 40 inches of the soil surface

Typical Profile

Surface layer:
0 to 7 inches—strongly acid, dark brown fine sandy loam

Subsurface layer:
7 to 17 inches—strongly acid, pale brown fine sandy loam

Subsoil:
17 to 37 inches—strongly acid, yellowish brown sandy clay loam with brownish yellow iron concentrations and pale brown streaks of loamy fine sand
30 to 37 inches—strongly acid, yellowish brown sandy clay loam with red iron concentrations and light brownish gray streaks of fine sandy loam
37 to 57 inches—very strongly acid, light gray clay loam with red and brownish yellow iron concentrations

Underlying material:
57 to 80 inches—very strongly acid, reddish yellow stratified sandstone and mudstone with texture of sandy clay loam

Soil Properties

Depth: Deep
Drainage class: Moderately well drained
Water table: Perched at 2.5 to 3.5 feet during December through April
Flooding: None
Runoff: Low to medium
Permeability: Slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Moderate
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Moderate capacity to store water slightly lowers potential forage production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2e
Woodland management group: 6

KuD—Kurth fine sandy loam, 5 to 8 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping
Shape of areas: Long and narrow
Size of areas: 5 to 40 acres
Native vegetation: Pine forest

Composition

Kurth and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Kellison and Moswell soils have a clayey subsoil within 12 inches of the surface and are in slightly lower landscape positions

Similar Soils

- Keltys soils have less than 18 percent clay in the upper part of the subsoil
- Moswell soils have a clayey subsoil

Typical Profile

Surface layer:
0 to 2 inches—moderately acid, dark grayish brown fine sandy loam
2 to 6 inches—moderately acid, brown fine sandy loam

Subsurface layer:
6 to 11 inches—strongly acid, pale brown fine sandy loam with brownish yellow iron concentrations
11 to 22 inches—strongly acid, very pale brown fine sandy loam with yellow iron concentrations

Subsoil:
22 to 29 inches—strongly acid, yellowish brown sandy clay loam with light brownish gray iron depletions
29 to 37 inches—strongly acid, light brownish gray sandy clay loam with red and brownish yellow iron concentrations
37 to 49 inches—strongly acid, light brownish gray sandy clay loam with red and brownish yellow iron concentrations

Underlying material:
49 to 80 inches—very strongly acid, stratified grayish brown, light gray, gray, and light brownish gray layered mudstone

Soil Properties

Depth: Deep
Drainage class: Moderately well drained
Water table: Perched at 2.5 to 3.5 feet during December through April
Flooding: None
Runoff: Low to medium
Permeability: Slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Moderate
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Moderate capacity to store water slightly lowers potential forage production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 4e
Woodland management group: 6

LaB—Laska fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Very gently sloping

Shape of areas: Oblong to irregular
Size of areas: 30 to 85 acres
Native vegetation: Pine forest

Composition

Laska and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Rayburn soils have a clayey subsoil within 12 inches of the surface and are in slightly higher landscape positions

Similar Soils

- Colita soils have a thinner surface, more clay in the subsoil, and soft bedrock at 40 to 60 inches
- Keltys soils have sand strippings penetrating the subsoil and have a solum 40 to 60 inches thick
- Moten soils are grayer throughout

Typical Profile

Surface layer:
0 to 6 inches—strongly acid, dark brown fine sandy loam

Subsurface layer:
6 to 14 inches—strongly acid, pale brown fine sandy loam
14 to 24 inches—strongly acid, light yellowish brown fine sandy loam with brownish yellow iron concentrations

Subsoil:
24 to 41 inches—very strongly acid, strong brown loam with pale brown streaks, light brownish gray iron depletions, and yellowish brown iron concentrations
41 to 56 inches—very strongly acid, yellowish brown loam with pale brown streaks, light brownish gray iron depletions, and strong brown iron concentrations
56 to 63 inches—very strongly acid, strong brown sandy clay loam with pale brown streaks, light brownish gray iron depletions, and red iron concentrations

Underlying material:
63 to 70 inches—very strongly acid, light yellowish brown, dark grayish brown, olive yellow, and pale yellow weathered bedrock

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: Apparent at 1.5 to 3 feet during December through April
Flooding: None
Runoff: Low to medium
Permeability: Moderately rapid
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Moderate capacity to store water slightly lowers potential forage production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2w
Woodland management group: 14

LeB—Latex fine sandy loam, 1 to 3 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides and knolls
Slope: Very gently sloping
Shape of areas: Irregular
Size of areas: 25 to 40 acres
Native vegetation: Pine-hardwood forest

Composition

Latex and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Etoile soils have a clayey subsoil and are in slightly lower landscape positions

Similar Soils

- Sawtown soils have more streaks of sandy material in the subsoil

Typical Profile

Surface layer:
0 to 3 inches—moderately acid, dark brown fine sandy loam

Subsurface layer:
3 to 10 inches—moderately acid, light yellowish brown fine sandy loam

Subsoil:
10 to 16 inches—strongly acid, yellowish brown sandy clay loam with yellowish brown iron concentrations
16 to 49 inches—strongly acid, brownish yellow sandy clay loam with yellowish red and red iron concentrations
49 to 58 inches—strongly acid, yellowish brown sandy clay loam with red iron concentrations and light brownish gray streaks of fine sandy loam
58 to 64 inches—very strongly acid, variegated red and yellowish brown clay loam with light brownish gray streaks of fine sandy loam
64 to 80 inches—very strongly acid, variegated red, yellowish brown, and light gray clay loam

Soil Properties

Depth: Very deep
Drainage class: Moderately well drained
Water table: Perched at 3 to 4.5 feet during December through April
Flooding: None
Runoff: Medium
Permeability: Slow
Available water capacity: High
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Moderate
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is very well suited to the production of grasses and legumes

Minor limitations:
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2e
Woodland management group: 6

LnB—Letney loamy sand, 1 to 5 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Gently sloping
Shape of areas: Oblong
Size of areas: 30 to 50 acres
Native vegetation: Pine forest

Composition

Letney and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Corrigan soils have a loamy surface, a dense clayey subsoil within 12 inches, and are in slightly lower landscape positions

Similar Soils

- Tehran soils have a sandy surface more than 40 inches thick and occur as broad ridgetops and footslopes of steep side slopes

Typical Profile

Surface layer:
0 to 3 inches—moderately acid, brown loamy sand

Subsurface layer:
3 to 24 inches—moderately acid, pale brown loamy sand

Subsoil:
24 to 29 inches—strongly acid, brownish yellow sandy clay loam with reddish yellow iron concentrations
29 to 43 inches—strongly acid, brownish yellow sandy clay loam with yellowish red to yellow and dark red iron concentrations

43 to 80 inches—strongly acid, red sandy clay loam with brownish yellow iron concentrations

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Low
Permeability: Surface and subsurface—rapid; subsoil—moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Severe

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- The reduced availability of moisture during dry periods may cause a high rate of seedling mortality

Minor limitations:
- The sandy surface may interfere with equipment use during dry periods

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is limited due to the thick, sandy surface layer allowing rapid movement of water and nutrients through the root zone, resulting in low inherent soil fertility and limited water storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 3s
Woodland management group: 7

LvC—Lovelady loamy fine sand, 1 to 5 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Gently sloping
Shape of areas: Oblong
Size of areas: 30 to 50 acres
Native vegetation: Pine forest

Composition

Lovelady and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Moswell soils have a loamy surface, a dense clayey subsoil within 12 inches, and are in slightly lower landscape positions

Similar Soils

- Kurth soils have a loamy subsurface or subsoil within a depth of 20 inches
- Penning soils have a loamy subsurface or subsoil within a depth of 20 inches and have soft bedrock at 40 to 60 inches

Typical Profile

Surface layer:
0 to 6 inches—moderately acid, brown loamy fine sand

Subsurface layer:
6 to 23 inches—moderately acid, pale brown loamy fine sand
23 to 32 inches—moderately acid, light yellowish brown loamy fine sand

Subsoil:
32 to 51 inches—strongly acid, yellowish brown sandy clay loam with red iron concentrations and pale brown streaks of fine sand
51 to 55 inches—strongly acid, variegated dark red, grayish brown, and brownish yellow sandy clay loam with pale brown streaks of fine sand
55 to 80 inches—very strongly acid, grayish brown clay loam

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: Perched at 2 to 4 feet during December through April
Flooding: None
Runoff: Low
Permeability: Surface and subsurface—rapid; subsoil—moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Severe

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- The reduced availability of moisture during dry periods may cause a high rate of seedling mortality

Minor limitations:
- The sandy surface may interfere with equipment use during dry periods

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is limited due to the thick, sandy surface layer allowing rapid movement of water and nutrients through the root zone, resulting in low inherent soil fertility and limited water storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2e
Woodland management group: 7

LvD—Lovelady loamy fine sand, 5 to 8 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping
Shape of areas: Narrow and long
Size of areas: 25 to 40 acres
Native vegetation: Pine forest

Composition

Lovelady and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Moswell soils have a loamy surface and a clayey subsoil within 12 inches

Similar Soils

- Kurth soils have a loamy subsurface or subsoil within a depth of 20 inches
- Penning soils have a loamy subsurface or subsoil within a depth of 20 inches and have soft bedrock at 40 to 60 inches

Typical Profile

Surface layer:
0 to 4 inches—strongly acid, brown loamy fine sand

Subsurface layer:
4 to 26 inches—strongly acid, pale brown loamy fine sand
26 to 38 inches—strongly acid, very pale brown loamy fine sand with brownish yellow iron concentrations

Subsoil:
38 to 42 inches—very strongly acid, strong brown sandy clay loam with red iron concentrations and pale brown streaks
42 to 63 inches—very strongly acid, gray sandy clay with dark yellowish red and strong brown iron concentrations
63 to 80 inches—very strongly acid, grayish brown sandy clay with dark yellowish red and reddish yellow iron concentrations and gray iron depletions

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: Perched at 2 to 4 feet during December through April
Flooding: None
Runoff: Medium
Permeability: Surface and subsurface—rapid; subsoil—moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Severe

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- The loose, sandy surface and steep slopes severely restrict the use of equipment during management operations

Minor limitations:
- Slope may cause a moderate rate of erosion following harvesting or other disturbance

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is limited due to the thick, sandy surface layer allowing rapid movement of water and nutrients through the root zone, resulting in low inherent soil fertility and limited water storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 4e
Woodland management group: 7

MpA—Mollville-Besner complex, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: Mounds
Landscape position: Toeslopes; Mollville soils are in low, concave areas; Besner soils are on mounds
Slope: Nearly level to very gently sloping
Shape of areas: Oblong
Size of areas: 20 to 45 acres
Native vegetation: Hardwood-pine forest

Composition

Mollville and similar soils: 45 percent
Besner and similar soils: 40 percent
Contrasting soils: 15 percent

Contrasting Soils

- Hainesville soils are sandy throughout, have less wetness, and are in higher landscape positions

Similar Soils

- Alazan soils are moderately well drained and are in slightly higher landscape positions
- Sawtown soils have more than 18 percent clay in the upper part of the subsoil and are well drained

Typical Profile

Mollville

Surface layer:
0 to 5 inches—strongly acid, dark grayish brown loam

Subsoil:
5 to 12 inches—strongly acid, grayish brown loam with strong brown iron stains and light gray streaks of fine sand
12 to 30 inches—moderately acid, grayish brown clay loam with light olive brown and yellowish brown iron concentrations and light gray streaks of fine sand
30 to 47 inches—moderately acid, grayish brown clay loam with yellowish brown and strong brown iron concentrations and light gray streaks of fine sandy loam
47 to 64 inches—slightly alkaline, grayish brown clay loam with strong brown iron concentrations and pale brown and light brownish gray streaks and pockets
64 to 72 inches—slightly alkaline, grayish brown clay loam with strong brown iron concentrations and pockets of light gray fine sandy loam

Underlying material:
72 to 80 inches—slightly alkaline, grayish brown fine sandy loam with pale yellow and yellowish brown iron concentrations

Besner

Surface layer:
0 to 7 inches—very strongly acid, brown fine sandy loam

Subsurface layer:
7 to 24 inches—very strongly acid, light yellowish brown fine sandy loam
24 to 36 inches—very strongly acid, light yellowish brown and yellowish brown fine sandy loam

Subsoil:
36 to 48 inches—very strongly acid, variegated strong brown and light brownish gray fine sandy loam with light yellowish brown iron concentrations
48 to 66 inches—very strongly acid, gray and light yellowish brown sandy clay loam with strong brown iron concentrations and very pale brown streaks
66 to 85 inches—very strongly acid, light brownish gray and light yellowish brown sandy clay loam with strong brown and yellowish brown iron concentrations and very pale gray streaks

Soil Properties

Depth: Very deep
Drainage class: Mollville—poorly drained; Besner—well drained
Water table: Mollville—apparent at the surface; Besner—apparent at 4 to 6 feet during January and February

Flooding: Mollville—frequent; Besner—none
Runoff: Negligible
Permeability: Mollville—slow; Besner—moderate
Available water capacity: Mollville—high; Besner—moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Mollville—moderate; Besner—low
Water erosion hazard: Mollville—slight; Besner—moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- Mollville—wetness from ponding or a high water table severely restricts the use of equipment
- Mollville—low strength may severely restrict the use of roads during wet seasons
- Mollville—abundant moisture causes competition for sunlight and space from invading plants to severely reduce the success of regeneration efforts
- Mollville—long duration of wetness due to ponding or a high water table makes this soil unsuited for pine management

Minor limitations:
- None

Pastureland

Major limitations:
- These soils are moderately suited to poorly suited to the production of grasses and legumes

Minor limitations:
- Mollville—severe wetness, water ponding on the surface, and poor internal drainage limit production
- Mollville—extreme wetness interferes with establishment, maintenance, and the harvesting of the forage produced
- Besner—soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: Mollville—4w; Besner—2e
Woodland management group: Mollville—16; Besner—6

MsB—Moswell loam, 1 to 5 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Gently sloping
Shape of areas: Broad and irregular
Size of areas: 35 to 80 acres
Native vegetation: Pine forest

Composition

Moswell and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Fuller, Keltys, and Kurth soils are loamy throughout and are in slightly lower landscape positions
- Lovelady soils have a sandy surface, a loamy subsoil, and are in slightly higher landscape positions

Similar Soils

- Kellison soils have a grayer subsoil
- Rayburn soils have soft bedrock of tuffaceous sandstone and siltstone
- Rosenwall soils have a thinner solum and are more acid

Typical Profile

Surface layer:
0 to 4 inches—strongly acid, brown loam

Subsurface layer:
4 to 9 inches—strongly acid, pale brown loam with yellowish brown iron concentrations

Subsoil:
9 to 15 inches—very strongly acid, red clay with brown iron concentrations and gray iron depletions
15 to 32 inches—very strongly acid, variegated yellowish red, red, and light brownish gray clay
32 to 45 inches—strongly acid, grayish brown clay with brownish yellow iron concentrations

Underlying material:
45 to 53 inches—strongly acid, light brownish gray shale with texture of clay
53 to 80 inches—strongly acid, horizontally bedded layers of light brownish gray and gray shale with texture of clay

Soil Properties

Depth: Deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Medium
Permeability: Very slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The use of some types of equipment may be restricted when the water table is high
- Low strength may limit road use by heavy equipment

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 4e
Woodland management group: 5

MsE—Moswell loam, 5 to 15 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping to moderately steep
Shape of areas: Long and narrow
Size of areas: 50 to 75 acres
Native vegetation: Pine forest

Composition

Moswell and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Keltys and Kurth soils are loamy throughout and are in slightly higher landscape positions
- Lovelady soils have a sandy surface, a loamy subsoil, and are in slightly higher landscape positions

Similar Soils

- Kellison soils have a grayer subsoil
- Rayburn soils have soft bedrock of tuffaceous sandstone and siltstone
- Rosenwall soils have a thinner solum and are more acid

Typical Profile

Surface layer:
0 to 3 inches—strongly acid, brown loam

Subsurface layer:
3 to 6 inches—strongly acid, pale brown loam

Subsoil:
6 to 16 inches—strongly acid, red clay with grayish brown iron depletions and yellowish brown iron concentrations
16 to 22 inches—strongly acid, grayish brown clay with red iron concentrations
22 to 47 inches—very strongly acid, light brownish gray clay with red and strong brown iron concentrations

Underlying material:
47 to 59 inches—very strongly acid, pale brown shale with texture of clay with red and yellow iron concentrations
59 to 80 inches—very strongly acid, light yellowish brown mudstone with texture of clay

Soil Properties

Depth: Deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Very high
Permeability: Very slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- Low strength may severely restrict the use of roads during wet periods

Minor limitations:
- The use of some types of equipment may be restricted when the water table is high or flooding occurs

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- On steeper slopes, water runoff is greater and less water enters the root zone for plant production
- Steeper slopes also increase the hazard of excessive erosion during pasture establishment or renovation and in pastures that are overgrazed

Interpretive Groups

Land capability classification: 6e
Woodland management group: 5

MxA—Moten-Multey complex, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: Mounds
Landscape position: Toeslopes; Moten soils are on intermounds; Multey soils are on mounds
Slope: Nearly level to very gently sloping
Shape of areas: Oblong
Size of areas: 30 to 100 acres
Native vegetation: Hardwood-pine forest

Composition

Moten and similar soils: 55 percent
Multey and similar soils: 35 percent
Contrasting soils: 10 percent

Contrasting Soils

- Hainesville soils are sandy throughout, have less wetness, and are in higher landscape positions

Similar Soils

- Alazan soils are more clayey
- Keltys soils are dominated by brownish colors and are better drained
- Mollville soils have more than 18 percent clay and more silt in the upper part of the subsoil

Typical Profile

Moten

Surface layer:
0 to 3 inches—strongly acid, dark grayish brown silt loam

Subsurface layer:
3 to 11 inches—strongly acid, pale brown silt loam
11 to 20 inches—very strongly acid, light brownish gray silt loam with grayish brown streaks of loam

Subsoil:
20 to 45 inches—very strongly acid, grayish brown loam with pale brown streaks of silt loam
45 to 61 inches—slightly acid, grayish brown loam with pockets of light yellowish brown clay loam
61 to 80 inches—neutral, grayish brown and pale yellow clay loam

Multey

Surface layer:
0 to 4 inches—strongly acid, dark grayish brown fine sandy loam

Subsurface layer:
4 to 26 inches—strongly acid, pale brown fine sandy loam with brownish yellow iron concentrations
26 to 35 inches—strongly acid, pale brown fine sandy loam and brownish yellow loam

Subsoil:
35 to 49 inches—strongly acid, yellowish brown loam with pale brown streaks of sandy loam and strong brown iron concentrations
49 to 80 inches—strongly acid, yellowish brown loam with streaks of pale brown sandy loam

Soil Properties

Depth: Very deep
Drainage class: Moten—moderately well drained; Multey—well drained

Water table: Moten—perched at 1 foot to 2.5 feet during January through April; Multey—apparent at 4 to 6 feet during January through April
Flooding: None
Runoff: Moten—very low; Multey—low
Permeability: Moten—slow; Multey—moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Moten—the use of some types of equipment may be restricted when the water table is high
- Moten—poor drainage may cause moderate pine seedling mortality
- Moten—the abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- These soils are moderately suited to poorly suited to the production of grasses and legumes

Minor limitations:
- Moten—wetness, water ponding on the surface, and poor internal drainage limit production
- Moten—wetness may interfere with establishment, maintenance, and the harvesting of the forage produced
- Multey—soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: Moten—2w; Multey—2s
Woodland management group: Moten—10; Multey—6

Oz—Ozias-Pophers complex, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plains
Distinctive landscape features: Low, convex ridges and concave swales
Landscape position: Bottomlands; Ozias soils are on concave swales; Pophers soils are on convex ridges
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 175 acres
Native vegetation: Hardwood forest

Composition

Ozias and similar soils: 50 percent
Pophers and similar soils: 40 percent
Contrasting soils: 10 percent

Contrasting Soils

- Hainesville soils are sandy throughout, have less wetness, and are in higher landscape positions

Similar Soils

- Koury soils have less than 18 percent clay in the upper part of the subsoil and have less wetness
- Moten soils have less than 18 percent clay in the upper part of the subsoil and are in slightly higher landscape positions

Typical Profile

Ozias

Surface layer:
2 to 0 inch—dark brown fibric material
0 to 9 inches—very strongly acid, dark grayish brown clay with dark red, strong brown, and reddish yellow iron concentrations

Subsoil:
9 to 31 inches—extremely acid, grayish brown clay with strong brown iron concentrations
31 to 44 inches—very strongly acid, grayish brown clay with strong brown iron concentrations
44 to 58 inches—very strongly acid, light brownish gray silty clay loam with strong brown iron concentrations
58 to 70 inches—very strongly acid, light brownish gray silty clay loam with strong brown iron concentrations
70 to 84 inches—very strongly acid, dark gray clay with strong brown iron concentrations

Pophers

Surface layer:
0 to 5 inches—very strongly acid, brown silty clay loam
5 to 18 inches—strongly acid, light grayish brown silty clay loam

Subsoil:
18 to 30 inches—strongly acid, dark grayish brown silty clay loam with light brownish gray iron depletions

30 to 47 inches—very strongly acid, dark gray silty clay loam with light brownish gray iron concentrations
47 to 69 inches—strongly acid, dark gray silty clay loam with light brownish gray iron concentrations
69 to 80 inches—strongly acid, dark grayish brown silty clay loam with light brownish gray iron depletions

Soil Properties

Depth: Very deep
Drainage class: Somewhat poorly drained
Water table: Ozias—perched at the surface to 1.5 feet during November through May; Pophers—apparent at 1 foot to 2 feet December through May
Flooding: Frequent
Runoff: Very low
Permeability: Ozias—very slow; Pophers—moderately slow
Available water capacity: High
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Ozias—high; Pophers—moderate
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- Wetness from flooding, ponding, or a high water table severely restricts the use of equipment
- Wetness may cause a high rate of seedling mortality

Minor limitations:
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- These soils are poorly suited to very poorly suited to the production of grasses and legumes

Minor limitations:
- Extreme wetness, water ponding on the surface, flooding, and poor internal drainage limit production
- Extreme wetness interferes with establishment, maintenance, and the harvesting of the forage produced

Interpretive Groups

Land capability classification: 5w
Woodland management group: 2

PeB—Penning very fine sandy loam, 0 to 2 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Toeslopes and drainageways
Slope: Nearly level to gently sloping
Shape of areas: Oblong
Size of areas: 35 to 75 acres
Native vegetation: Pine forest

Composition

Penning and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Herty and Moswell soils have a clayey subsoil within 12 inches and are in slightly higher landscape positions

Similar Soils

- Alazan soils have a solum thickness more than 60 inches
- Keltys and Kurth soils are well drained and are in higher landscape positions
- Multey soils have clay content less than 18 percent in the upper part of the subsoil

Typical Profile

Surface layer:
0 to 3 inches—moderately acid, dark grayish brown very fine sandy loam

Subsurface layer:
3 to 8 inches—strongly acid, pale brown very fine sandy loam with yellowish brown iron stains
8 to 15 inches—strongly acid, pale brown very fine sandy loam with brownish yellow iron concentrations and light brownish gray iron depletions

Subsoil:
15 to 25 inches—strongly acid, brownish yellow loam with light gray clay depletions and pale brown streaks
25 to 48 inches—very strongly acid, brownish yellow loam with light gray streaks and brownish yellow to dark yellowish brown iron concentrations
48 to 58 inches—moderately acid, grayish brown loam with brownish yellow and yellowish brown iron concentrations and light gray streaks

Underlying material:
58 to 72 inches—neutral, pale yellow mudstone with texture of clay loam with grayish brown mottles

Soil Properties

Depth: Deep
Drainage class: Moderately well drained
Water table: Perched at 1.5 to 4 feet during January through April
Flooding: None
Runoff: Low
Permeability: Moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- Abundant moisture causes competition for sunlight and space from invading plants to severely reduce the success of regeneration efforts

Minor limitations:
- Low strength may limit the use of roads by heavy equipment
- Road-ditch erosion may be a problem due to slope

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Slightly wet conditions during the winter and early spring may interfere with harvesting hay, the grazing rotation, or the use of equipment
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2w
Woodland ordination symbol: 10

Po—Pophers silty clay loam, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plains
Distinctive landscape features: None
Landscape position: Bottomlands
Slope: Nearly level
Shape of areas: Irregular
Size of areas: 50 to 110 acres
Native vegetation: Hardwood forest

Composition

Pophers and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Hainesville soils are sandy throughout, have less wetness, and are in higher landscape positions

Similar Soils

- Koury soils have less than 18 percent clay in the upper part of the subsoil
- Moten soils have less than 18 percent clay in the upper part of the subsoil and are in slightly higher landscape positions

Typical Profile

Surface layer:
0 to 4 inches—strongly acid, dark grayish brown silty clay loam

Subsoil:
4 to 10 inches—strongly acid, light brownish gray silty clay loam with yellowish brown iron concentrations and dark grayish brown stains
10 to 30 inches—very strongly acid, dark grayish brown silty clay loam with light gray clay depletions
30 to 44 inches—strongly acid, dark grayish brown silty clay loam with dark yellowish brown iron concentrations
44 to 80 inches—strongly acid, grayish brown silty clay loam with dark yellowish brown iron concentrations

Soil Properties

Depth: Very deep
Drainage class: Somewhat poorly drained
Water table: Apparent at 1 foot to 2 feet during December through May
Flooding: Frequent
Runoff: Very low

Permeability: Moderately slow
Available water capacity: High
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Moderate
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- Wetness from flooding, ponding, or a high water table severely restricts the use of equipment
- Wetness severely restricts road use when the water table is high or during periods of flooding
- Wetness may cause a high rate of seedling mortality

Minor limitations:
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is poorly suited to the production of grasses and legumes

Minor limitations:
- Extreme wetness, water ponding on the surface, flooding, and poor internal drainage limit production
- Extreme wetness interferes with establishment, maintenance, and the harvesting of the forage produced

Interpretive Groups

Land capability classification: 5w
Woodland management group: 2

RbB—Rayburn fine sandy loam, 1 to 5 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Gently sloping
Shape of areas: Irregular
Size of areas: 20 to 30 acres
Native vegetation: Pine forest

Composition

Rayburn and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Colita and Laska soils are loamy throughout and are in slightly lower landscape positions
- Letney soils have a sandy surface, a loamy subsoil, and are in slightly higher landscape positions

Similar Soils

- Moswell soils do not have fragments of tuffaceous siltstone in the lower part of the subsoil
- Rosenwall soils are more acid

Typical Profile

Surface layer:
0 to 4 inches—very strongly acid, dark brown fine sandy loam

Subsoil:
4 to 11 inches—very strongly acid, yellowish red clay
11 to 16 inches—very strongly acid, red clay with dark red and yellow iron concentrations, and light brownish gray iron depletions
16 to 20 inches—very strongly acid, light brownish gray clay with red and dark brown iron concentrations
20 to 29 inches—extremely acid, light brownish gray silty clay

Underlying material:
29 to 45 inches—extremely acid, pale yellow tuffaceous sandstone with yellow and light brownish gray mottles

Soil Properties

Depth: Moderately deep
Drainage class: Moderately well drained
Water table: Perched at 2.5 to 4.5 feet during December through February
Flooding: None
Runoff: Medium
Permeability: Very slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- The use of some types of equipment may be restricted when the water table is high
- Low strength may limit road use by heavy equipment

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 4e
Woodland management group: 4

RwB—Rosenwall fine sandy loam, 1 to 5 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Knolls
Slope: Gently sloping
Shape of areas: Irregular and round
Size of areas: 25 to 50 acres
Native vegetation: Pine forest

Composition

Rosenwall and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Herty soils have a solum depth of 40 to 60 inches
- Kurth soils have a loamy control section

Similar Soils

- Moswell and Rayburn soils have more shrink-swell potential

Typical Profile

Surface layer:
0 to 5 inches—moderately acid, dark brown fine sandy loam

Subsurface layer:
5 to 8 inches—strongly acid, brown fine sandy loam

Subsoil:
8 to 15 inches—very strongly acid, dark red clay
15 to 19 inches—very strongly acid, dark red clay with gray iron depletions
19 to 24 inches—very strongly acid, gray clay with dark red iron concentrations

Underlying material:
24 to 39 inches—extremely acid, layered pale yellow, dark red, dark gray and yellowish red shale and mudstone with texture of clay
39 to 58 inches—extremely acid, olive yellow, dark grayish brown and strong brown shale and mudstone with texture of clay

Soil Properties

Depth: Moderately deep
Drainage class: Moderately well drained
Water table: More than 6 feet
Flooding: None
Runoff: Medium
Permeability: Very slow
Available water capacity: Moderate
Root zone: Moderately deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- The clayey nature of this soil and the difficulty of proper rooting during tree planting may cause severe seedling mortality

Minor limitations:
- Soil slope may cause a moderate rate of erosion following harvesting or other mechanical disturbance
- Low soil strength may limit equipment use when this soil is wet

Pastureland

Major limitations:
- Production is decreased slightly due to the clayey subsoil, which limits water intake and storage for plant production

Minor limitations:
- These soils are moderately suited to poorly suited to the production of grasses and legumes

Interpretive Groups

Land capability classification: 4e
Woodland management group: 11

RwD—Rosenwall fine sandy loam, 5 to 15 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping to moderately steep
Shape of areas: Long and narrow
Size of areas: 25 to 75 acres
Native vegetation: Pine-hardwood forest

Composition

Rosenwall and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Kurth soils have less than 35 percent clay in the upper part of the subsoil

Similar Soils

- Moswell and Rayburn soils have more shrink-swell potential

Typical Profile

Surface layer:
0 to 3 inches—very strongly acid, dark brown fine sandy loam

Subsoil:
3 to 14 inches—very strongly acid, yellowish red clay with reddish gray iron depletions
14 to 18 inches—very strongly acid, yellowish red clay with reddish brown iron concentrations
18 to 22 inches—very strongly acid, brown clay with yellowish red iron concentrations
22 to 28 inches—very strongly acid, brown clay

Underlying material:
28 to 45 inches—extremely acid, stratified grayish brown, light gray, and yellowish brown soft mudstone with texture of clay

Soil Properties

Depth: Moderately deep
Drainage class: Moderately well drained
Water table: More than 6 feet
Flooding: None
Runoff: High
Permeability: Very slow
Available water capacity: Moderate
Root zone: Moderately deep
Natural soil fertility: Medium
Shrink-swell potential: High
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Slope may cause a moderate rate of erosion following harvesting or other disturbance
- Slope may restrict the use of some types of equipment during management operations
- Low strength may limit road use by heavy equipment

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is limited by the clayey subsoil, which limits water intake and storage for plant production
- Due to high runoff, less water enters the root zone for plant production
- Steep slopes increase the hazard of excessive erosion during pasture establishment or renovation and in pastures that are overgrazed

Interpretive Groups

Land capability classification: 6e
Woodland management group: 11

SsA—Sawlit-Sawtown complex, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: Mounds and ridges
Landscape position: Toeslopes; Sawlit soils are on intermounds; Sawtown soils are on mounds or ridges
Slope: Nearly level to very gently sloping

Shape of areas: Oblong
Size of areas: 75 to 130 acres
Native vegetation: Pine forest

Composition

Sawlit and similar soils: 55 percent
Sawtown and similar soils: 35 percent
Contrasting soils: 10 percent

Contrasting Soils

- Mollville soils are grayish throughout and are poorly drained

Similar Soils

- Austonio soils do not have a clayey lower subsoil layer
- Besner soils are in slightly higher landscape positions and are coarser in texture
- Hainesville soils are sandy throughout
- Latex soils are in higher landscape positions and are better drained

Typical Profile

Sawlit

Surface layer:
0 to 3 inches—very strongly acid, brown loam

Subsurface layer:
3 to 7 inches—very strongly acid, pale brown loam with yellowish brown iron stains

Subsoil:
7 to 11 inches—very strongly acid, yellowish brown loam with grayish brown iron depletions
11 to 19 inches—very strongly acid, yellowish brown sandy clay loam with grayish brown clay depletions and pale brown streaks of fine sandy loam
19 to 29 inches—very strongly acid, strong brown clay loam with red iron concentrations and grayish brown iron depletions and pale brown streaks of fine sandy loam
29 to 39 inches—very strongly acid, grayish brown clay with red iron concentrations
39 to 61 inches—very strongly acid, light brownish gray clay with yellowish brown iron concentrations
61 to 80 inches—very strongly acid, light brownish gray sandy clay loam with brownish yellow iron concentrations

Sawtown

Surface layer:
0 to 5 inches—very strongly acid, dark brown fine sandy loam

Subsurface layer:
5 to 8 inches—very strongly acid, pale brown fine sandy loam

Subsoil:
8 to 18 inches—very strongly acid, brownish yellow sandy clay loam with pale brown streaks
18 to 26 inches—very strongly acid, brownish yellow sandy clay loam with red iron concentrations and pale brown streaks of fine sandy loam
26 to 36 inches—very strongly acid, yellowish brown sandy clay loam with red iron concentrations and pale brown streaks of fine sandy loam
36 to 43 inches—very strongly acid, variegated strong brown, brownish yellow, pale brown, red, and gray sandy clay loam
43 to 56 inches—very strongly acid, gray clay loam with red and yellowish brown iron concentrations
56 to 65 inches—very strongly acid, grayish brown clay loam with strong brown iron concentrations
65 to 80 inches—very strongly acid, light brownish gray sandy clay loam with strong brown iron concentrations

Soil Properties

Depth: Very deep
Drainage class: Sawlit—moderately well drained; Sawtown—well drained
Water table: Sawlit—perched at 2 to 3.5 feet during January through May; Sawtown—perched at 3.5 to 5 feet during January through May
Flooding: None
Runoff: Low
Permeability: Sawlit—very slow; Sawtown—moderate
Available water capacity: High
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Moderate
Water erosion hazard: Slight

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- Low strength may limit road use by heavy equipment
- The use of some types of equipment may be restricted when the water table is high
- The abundance of moisture may cause competition for sunlight between seedlings and other plants

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Slightly wet conditions during the winter and early spring may interfere with harvesting hay, the grazing rotation, or the use of equipment
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: Sawlit—2w; Sawtown—2e
Woodland management group: Sawlit—10; Sawtown—6

StD—Stringtown fine sandy loam, 5 to 15 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Side slopes
Slope: Moderately sloping to moderately steep
Shape of areas: Irregular
Size of areas: 40 to 75 acres
Native vegetation: Pine forest

Composition

Stringtown and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Tehran soils have a sandy surface 40 inches or more thick

Similar Soils

- Letney and Lovelady soils have a sandy surface and subsurface more than 20 inches thick and are in slightly higher areas

Typical Profile

Surface layer:
0 to 5 inches—moderately acid, dark brown fine sandy loam

Subsurface layer:
5 to 10 inches—moderately acid, pale brown fine sandy loam

Subsoil:
10 to 18 inches—strongly acid, strong brown sandy clay loam with red iron concentrations
18 to 25 inches—strongly acid, yellowish brown sandy clay loam with red iron concentrations
25 to 31 inches—strongly acid, strong brown sandy clay loam with red iron concentrations and light gray iron depletions
31 to 42 inches—strongly acid, variegated strong brown, red, and light gray sandy clay loam
42 to 51 inches—strongly acid, variegated yellowish brown, red, and light gray sandy clay loam
51 to 68 inches—strongly acid, variegated brownish yellow, red, and light gray fine sandy loam
68 to 80 inches—strongly acid, variegated strong brown, brownish yellow, and light gray fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Medium to high
Permeability: Moderate
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Moderate

Land Use

Major land use: Woodland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- Steepness of slope may cause a rapid rate of erosion following harvesting or other disturbance
- Steepness of slope may cause severe road-surface or road-ditch erosion

Minor limitations:
- Slope may restrict the use of some types of equipment during management operations

Pastureland

Major limitations:
- These soils are moderately well suited to the production of grasses and legumes

Minor limitations:
- Steepness of slope also increases the hazard of excessive erosion during pasture establishment or renovation and in pastures that are overgrazed

Interpretive Groups

Land capability classification: 6e
Woodland management group: 6

TeD—Tehran loamy sand, 5 to 15 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Stream divides
Slope: Moderately sloping to moderately steep
Shape of areas: Round to oblong
Size of areas: 10 to 200 acres
Native vegetation: Pine-hardwood forest

Composition

Tehran and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Stringtown soils have a loamy surface and have a subsoil within a depth of 12 inches

Similar Soils

- Letney and Lovelady soils have a sandy surface and subsurface 20 to 40 inches thick

Typical Profile

Surface layer:
0 to 8 inches—moderately acid, brown loamy sand

Subsurface layer:
8 to 17 inches—moderately acid, pale brown loamy sand
17 to 34 inches—moderately acid, pale brown loamy sand with light yellowish brown iron stains
34 to 45 inches—moderately acid, light yellowish brown loamy sand with yellowish red iron stains

Subsoil:
45 to 60 inches—strongly acid, red sandy clay loam
60 to 67 inches—strongly acid, variegated red and yellowish red sandy clay loam
67 to 80 inches—strongly acid, variegated red and yellowish red sandy loam

Soil Properties

Depth: Very deep
Drainage class: Somewhat excessively drained
Water table: More than 6 feet
Flooding: None
Runoff: Low
Permeability: Surface and subsurface—rapid; subsoil—moderately rapid
Available water capacity: Low
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: severe

Land Use

Major land use: Pastureland
Other land use: Woodland

Management Concerns

Woodland

Major limitations:
- The loose, sandy surface may severely restrict equipment use during dry periods

Minor limitations:
- The low available water capacity of this soil may cause moderate seedling mortality
- The low available water capacity causes competition for moisture between seedlings and other plants

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is limited by the thick, sandy surface layer allowing rapid movement of water and nutrients through the root zone, resulting in low inherent soil fertility and limited water storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 6e
Woodland management group: 15

UrB—Urland fine sandy loam, 1 to 5 percent slopes

Setting

Landform: Uplands
Distinctive landscape features: None
Landscape position: Knolls and ridgetops
Slope: Gently sloping
Shape of areas: Round
Size of areas: 20 to 50 acres
Native vegetation: Pine-hardwood forest

Composition

Urland and similar soils: 90 percent
Contrasting soils: 10 percent

Contrasting Soils

- Stringtown soils contain less than 35 percent clay in the upper part of the subsoil and are on steeper side slopes

Similar Soils

- Moswell soils have gray mottles due to wetness within 30 inches of the surface and are in lower-lying concave positions

Typical Profile

Surface layer:
0 to 2 inches—slightly acid, brown fine sandy loam
2 to 5 inches—slightly acid, yellowish red fine sandy loam

Subsoil:
5 to 22 inches—very strongly acid, red clay
22 to 43 inches—very strongly acid, red clay loam with brownish yellow iron concentrations
43 to 58 inches—very strongly acid, red sandy clay loam with red iron concentrations and gray shale fragments

Underlying material:
58 to 72 inches—very strongly acid, stratified yellowish brown soft sandstone with texture of fine sandy loam and red masses of sandy clay loam

Soil Properties

Depth: Deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Medium
Permeability: Moderately slow
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Medium
Water erosion hazard: Moderate

Land Use

Major land use: Forestland
Other land use: Pastureland

Management Concerns

Woodland

Major limitations:
- There are no soil limitations for growth and management of commercial timber

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is moderately well suited to the production of grasses and legumes

Minor limitations:
- Production is decreased slightly by the clayey subsoil, which limits water intake and storage for plant production
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 3e
Woodland management group: 11

WnB—Woden fine sandy loam, 1 to 4 percent slopes

Setting

Landform: Stream terraces
Distinctive landscape features: None
Landscape position: Toeslopes
Slope: Gently sloping
Shape of areas: Oblong
Size of areas: 30 to 60 acres
Native vegetation: Pine-hardwood forest

Composition

Woden and similar soils: 85 percent
Contrasting soils: 15 percent

Contrasting Soils

- Annona soils have a clayey subsoil and are in slightly lower landscape positions
- Derly soils have a clayey subsoil, are poorly drained, and are in depressions

Land Use

Major land uses: Pastureland and woodland
Other land use: Cropland

Typical Profile

Surface layer:
0 to 5 inches—strongly acid, dark brown fine sandy loam
Subsurface layer:
5 to 12 inches—strongly acid, brown fine sandy loam

Subsoil:
12 to 36 inches—slightly acid, strong brown fine sandy loam
36 to 62 inches—slightly acid, yellowish red fine sandy loam
62 to 74 inches—slightly acid, yellowish red loam
74 to 80 inches—slightly acid, strong brown fine sandy loam

Soil Properties

Depth: Very deep
Drainage class: Well drained
Water table: More than 6 feet
Flooding: None
Runoff: Negligible
Permeability: Moderately rapid
Available water capacity: Moderate
Root zone: Very deep
Natural soil fertility: Medium
Shrink-swell potential: Low
Water erosion hazard: Slight

Management Concerns

Woodland

Major limitations:
- None

Minor limitations:
- None

Pastureland

Major limitations:
- This soil is well suited to the production of grasses and legumes

Minor limitations:
- Soil acidity and inadequate fertility are easily corrected with additions of lime and fertilizer

Interpretive Groups

Land capability classification: 2e
Woodland management group: 1

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Pasture and Hayland

Rick Leopold, zone agronomist, Natural Resources Conservation Service, helped prepare this section.

Land used as pasture and hayland in Trinity County is mainly planted to introduced grasses that respond to recommended management practices. The primary warm-season perennial species used are common and hybrid varieties of bermudagrass and bahiagrass. Established bermudagrass and bahiagrass may be overseeded with winter annuals, such as adapted clovers, vetch, ryegrass, or small grains for additional winter and early spring grazing. Some crop fields are used continuously for annual winter pasture production.

Well-managed perennial warm-season pasture grasses usually produce more grass than is needed during the peak of the growing season (late May through early June). Excess pasture production is often harvested as hay for use during the winter. Some perennial grasses, as well as annual forage sorghum plantings, are managed strictly as hay for use during the winter.

Planning land use and kinds of forage to be grown

Figure 7.—An improved pasture in an area of Gladewater clay, 0 to 1 percent slopes, frequently flooded.

can develop year-round forage programs. Such a planned grazing system maximizes production by providing a guide to stocking rates, allowing timely rest periods from grazing and efficient forage harvest.

Recommended pasture management practices include adequate fence arrangement for rotational grazing and efficient use of forage. Proper use of forage ensures that plant vigor remains high for continued production and that the soil is protected from erosion. Selection of the best adapted plants that meet the yield and economic goals of the operation is important. In a well-managed pasture, weeds and brush are controlled, fertilization is done at the proper time and at the recommended rates, and an adequate supply of water is available for livestock (fig. 7).

Application of recommended amounts of fertilizer should be accomplished by splitting applications throughout the growing season, generally after grazing cycles in pasture or after harvest on hayland. This practice is particularly important on sandy soils due to the high potential for nitrogen and other applied nutrients to leach into ground water. Split applications are also important on clayey soils due to the high potential for applied fertilizer to run off during heavy rainfall. Some pastures and hayland need applications of agricultural limestone to correct soil acidity and allow better utilization of applied fertilizer by plants. Soil pH should be maintained at a minimum of 5.5 for most grasses. If legumes are to be overseeded, pH of at least 6.0 should be maintained.

Hay production requires the same high management standards as pasture production. Additionally, the forage needs to be cut at the proper interval and height based on species requirements in order to harvest good quality forage, maintain stand vigor, and promote timely regrowth (fig. 8).

Yield Potential

The yields shown in table 5 are based on soil characteristics, such as surface texture, available water holding capacity, permeability, drainage, and others. They represent current (1999) yield estimates for established grasses, which are attainable by following recommended management practices, assuming normal temperature and rainfall patterns. Recommended management practices include selection of species adapted to the soils; setting economically feasible yield goals; establishing and maintaining recommended levels of fertility based on current soil test results, rotational grazing, and weed, brush, insect, and disease control when needed; and maintaining proper grazing and cutting heights.

The yield for pasture is expressed in animal unit months (AUM) for the grass most commonly grown on each soil suitable for pasture production in the county. An animal unit month is the length of time that the forage produced on one acre will feed one animal unit at a given utilization rate. An animal unit is the equivalent of one 1,000-pound animal. For example, a yield of 8.00 AUM will provide forage for one animal unit for eight months in a normal year. Expressed another way, it will take 1.5 acres producing this rate to provide adequate forage for one animal unit for a year. Estimated forage yields given in table 5 are based on a utilization rate of 60 percent. Utilization rate is the amount of the total forage produced that is actually consumed by livestock. The remaining portion of the forage produced may be lost to grazing due to trampling and fouling or over maturity or must be left to assure erosion control and continued productivity. Utilization rate decreases as the rotational length increases, and yield estimates should be adjusted accordingly. As a general rule, utilization rates are 30 to 40 percent for continuous grazing, 40 to 60 percent for weekly rotation, and 60 to 70 percent for daily rotation. Hay yields in tons per acre may be estimated by multiplying the AUM value listed in table 5 by 1.67.

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 5. 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. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; 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 residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil 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.

Figure 8.—A bahiagrass hay meadow in an area of Kurth fine sandy loam, 1 to 3 percent slopes.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w,* or *s,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the 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); and *s* shows that the soil is limited mainly because it is shallow, droughty, or stony.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w* or *s* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The following map units are considered prime farmland. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

AaB Alazan very fine sandy loam, 0 to 2 percent slopes
AbA Alazan-Besner complex, 0 to 2 percent slopes
AuB Austonio fine sandy loam, 1 to 3 percent slopes
BeA Besner fine sandy loam, 0 to 3 percent slopes
EaA Eastham clay, 0 to 2 percent slopes
GaA Garner clay, 0 to 1 percent slopes
KeB Keltys fine sandy loam, 1 to 3 percent slopes
KuB Kurth fine sandy loam, 1 to 3 percent slopes
LeB Latex fine sandy loam, 1 to 3 percent slopes
MxA Moten-Multey complex, 0 to 2 percent slopes
SsA Sawlit-Sawtown complex, 0 to 2 percent slopes
UrB Urland fine sandy loam, 1 to 5 percent slopes
WnB Woden fine sandy loam, 1 to 4 percent slopes

Woodland Management and Productivity

Ray Stoner, zone forester, Natural Resources Conservation Service, helped prepare this section.

Trinity County has about 352,200 acres of woodland. The forests are used not only for commercial wood products but, also, for hunting and other recreational activities. Large commercial landowners manage about 212,500 acres, and the U.S. Forest Service manages another 66,700 acres in the Davy Crockett National Forest. The remaining 73,000 acres of woodland is managed by individual landowners.

The soils and climate in Trinity County are well suited to the production of timber. Harvesting timber and manufacturing wood products are major sources of income in the county. Reforestation and control of undesirable species are management problems, particularly on the privately-owned woodlands. Production could be increased with management on these lands.

Forested areas in the uplands mainly support mixed pine and hardwoods, although pine plantations are common, especially on commercial forestlands. The dominant pine species in the uplands are loblolly pine and shortleaf pine, as well as longleaf pine on some soils. Hardwood species are mainly red oak, hickory, and sweetgum. Wooded areas on bottomlands support mainly water oak, willow oak, overcup oak, green ash, and sweetgum.

Soils vary in their ability to produce trees. Natural fertility and texture influence tree growth. Permeability, drainage, and position on the landscape also are important factors.

This soil survey can be used by woodland owners or forest managers in planning the use of soils for wood crops. The soils in this survey area that require the same general management and that have about the same potential productivity have been organized into woodland groups. Soils that generally are not suited to woodland are not included in the groups. A detailed description of each of these woodland groups and the soils that are included in each is given below.

Woodland Management Groups

Woodland Management Group 1. This group includes the Woden soils in map unit WnB—Woden fine sandy loam, 1 to 4 percent slopes.

These soils are on stream terraces. They have a very high potential productivity for both pine and hardwoods. Common trees of the overstory include loblolly pine, shortleaf pine, white oak, southern red oak, water oak, sweetgum, ash, and elm. The 50-year site index for loblolly pine averages 100 feet (70 feet on a 25-year curve), but ranges from 95 to 105 plus feet. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 460 board feet (Doyle Rule) or 115 cubic feet per acre per year. Management can substantially increase this yield.

The problems associated with these soils are the somewhat limited access and the equipment operability during wet periods when rutting can be a moderate concern. Short-term restrictions may be necessary during these times. These soils are well suited to use as roads and log landings and should have few erosion problems when adequate water-control devices, such as wing ditches and water bars, are installed on the steeper slopes.

Woodland Management Group 2. This group includes the Ozias and Pophers soils in map units Oz—Ozias-Pophers complex, 0 to 1 percent slopes, frequently flooded, and Po—Pophers silty clay loam, 0 to 1 percent slopes, frequently flooded.

These soils are on flood plains and have a very high potential productivity for hardwoods. Common trees of the overstory include water oak, willow oak, green ash, sugarberry, and sweetgum. Overcup oak may be present on wetter sites. The 50-year site index for sweetgum and bottomland oaks ranges from 90 to 105 feet. The yield from an unmanaged, natural stand of sweetgum over a 50-year period is approximately 305 board feet (Doyle Rule) per acre per year. Although management can substantially increase this yield, it should also include attention to streamside management zone practices to protect water quality.

Access and equipment operability on these soils are poor for long periods due to flooding and wetness. It may be necessary to suspend harvesting and other operations during wet periods. Rutting during these operations can be severe due to the low strength of these soils. Flooding also makes these soils poorly suited to use as log landings and roads. Road

construction should be limited. Planting can be difficult due to wetness and the sticky nature of these soils. Site preparation operations should be limited to the dry months, and planting should be planned for the drier part of the planting season. Use of herbicides in site preparation must also include consideration of the possibility of flooding in order to prevent contamination of surface waters.

Woodland Management Group 3. This group includes the Koury soils in map unit Kp—Koury silt loam, 0 to 1 percent slopes, frequently flooded.

These soils are on flood plains and have a very high potential productivity for both pine and hardwoods. Common trees of the overstory include loblolly pine, water oak, white oak, cherrybark oak, green ash, American elm, sugarberry, and sweetgum. Shortleaf pine may occur on drier sites, and willow oak may occur on wetter sites. The 50-year site index for loblolly pine averages 105 feet (approximately 62 to 75 feet on a 25-year curve), and for bottomland oaks, it averages 85 to 100 feet. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 460 board feet (Doyle Rule) or 115 cubic feet per acre per year. Although management can substantially increase this yield, it should also include attention to streamside management zone practices to protect water quality.

Access and equipment operability on these soils are poor during wet periods due to flooding. It may be necessary to suspend harvesting and other operations during wet periods. Flooding also makes these soils poorly suited to use as log landings and roads. Road construction should be limited. When these soils are wet, low strength leads to severe rutting problems and makes these soils poorly suited for road construction. Site preparation operations should be limited to the dry months, and planting should be planned for the drier part of the planting season. Use of herbicides in site preparation must also include consideration of the possibility of flooding in order to prevent contamination of surface waters. Wetness may cause a moderate level of pine seedling mortality.

Woodland Management Group 4. This group includes the Rayburn soils in map unit RbB—Rayburn fine sandy loam, 1 to 5 percent slopes.

These soils are on uplands and have a high potential productivity for pine. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, southern red oak, white oak, ash, sweetgum, elm, and hickory. The 50-year site index for loblolly pine averages 90 feet (approximately 60 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield.

Access and equipment operability are poor during wet periods. Wet weather limitations may be necessary to prevent rutting and excessive erosion. Low strength makes these soils only moderately suited to use as roads and log landings. Site preparation and tree planting operations will be affected by the sticky nature of these soils when wet. Tree planting should be planned for the drier, early part of the planting season. Also, because clay occurs within 10 inches of the surface, care must be taken to assure proper planting depth; otherwise, a moderate level of seedling mortality may occur. The moderate level of runoff on these soils means precautions are necessary when using herbicides in site preparation and release in order to prevent contamination of surface waters.

Woodland Management Group 5. This group includes the Moswell soils in map units MsB—Moswell loam, 1 to 5 percent slopes, and MsE—Moswell loam, 5 to 15 percent slopes.

These high shrink-swell soils are on uplands and have a high potential productivity for pine. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, southern red oak, water oak, white oak, ash, sweetgum, elm, and hickory. The 50-year site index for loblolly pine averages between 85 and 90 feet (approximately 57 to 60 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 280 to 330 board feet (Doyle Rule) or 75 to 90 cubic feet per acre per year. Although management can substantially increase this yield, trees on these soils tend to have poor form. Therefore, a short rotation management scheme may be considered.

Access and equipment operability are poor during wet periods. Wet weather limitations may be necessary to prevent rutting and excessive erosion. Low strength and stickiness make these soils only moderately suited to use as roads and log landings. On steeper slopes, the potential for erosion is greater, site disturbance should be minimized, and control devices for roads, such as water bars, are necessary. Revegetating roads and log landings may also be necessary. Site preparation and tree planting operations will be affected by the sticky nature of these soils when wet. Site preparation should be planned for the drier part of the year. Tree planting should be planned for the drier, early part of the planting season. Mechanical tree planting on steeper slopes should be done on the contour. Also, because clay occurs within 10 inches of the surface, care must be taken to assure proper planting depth. The very slow permeability of these soils means precautions are necessary when using

herbicides in site preparation and release in order to prevent contamination of surface waters.

Woodland Management Group 6. This group includes the Austonio, Besner, Keltys, Kurth, Latex, Multey, Sawtown, and Stringtown soils in map units AbA—Alazan-Besner complex, 0 to 2 percent slopes; AuB—Austonio fine sandy loam, 1 to 3 percent slopes; AuD—Austonio fine sandy loam, 5 to 15 percent slopes; BeA—Besner fine sandy loam, 0 to 3 percent slopes; KeB—Keltys fine sandy loam, 1 to 3 percent slopes; KeD—Keltys fine sandy loam, 5 to 8 percent slopes; KuB—Kurth fine sandy loam, 1 to 3 percent slopes; KuD—Kurth fine sandy loam, 5 to 8 percent slopes; LeB—Latex fine sandy loam, 1 to 3 percent slopes; MpA—Mollville-Besner complex, 0 to 2 percent slopes; MxA—Moten-Multey complex, 0 to 2 percent slopes; SsA—Sawlit-Sawtown complex, 0 to 2 percent slopes; and StD—Stringtown fine sandy loam, 5 to 15 percent slopes.

These soils are on uplands and stream terraces (some are on mounds) and have a high potential for both pine and hardwoods. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, white oak, southern red oak, water oak, sweetgum, white ash, and elm. Longleaf pine may be found on Stringtown soils. The 50-year site index for loblolly pine averages 90 feet (60 feet on a 25-year curve), but ranges from 85 to 100 feet. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield.

The problems associated with these soils are the somewhat limited access and the equipment operability during wet periods when rutting can be a moderate concern. Short-term restrictions may be necessary during these times. Also, steeper slopes may occur in some map units, and in these areas, attention should be given to minimizing erosion during road construction and maintenance, as well as site preparation.

Woodland Management Group 7. This group includes the Letney and Lovelady soils in map units LnB—Letney loamy sand, 1 to 5 percent slopes; LvC—Lovelady loamy fine sand, 1 to 5 percent slopes; and LvD—Lovelady loamy fine sand, 5 to 8 percent slopes.

These soils are on sandy uplands and have a high potential productivity for pine. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, southern red oak, white ash, and hickory. Longleaf pine may be found on the Letney soils. The 50-year site index for loblolly pine ranges from 85 to 95 feet (approximately 57 to 64 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield.

Because these soils are loose when dry, access and equipment operability are only fair during dry periods when rutting is possible. However, these soils are well suited for access and equipment operability during wet periods. These soils are well suited to use as roads and log landings and should have little erosion problems when adequate water-control devices, such as wing ditches and water bars, are installed on the steeper slopes. Seedling mortality may be slight to moderate. Proper planting depth and compaction are important. Attention should be given to the possible leaching of fertilizers and chemicals when herbicides are used in site preparation. Care should be taken in choosing appropriate chemicals and application methods to reduce the possibility of contaminating ground water.

Woodland Management Group 8. This group includes the Hainesville soils in map unit HaA—Hainesville loamy fine sand, 0 to 2 percent slopes.

These soils are on sandy stream terraces and have a high potential productivity for pine. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, southern red oak, white ash, and hickory. The 50-year site index for loblolly pine averages 90 feet (approximately 60 feet on a 25-year curve), but ranges from 85 to 95 feet depending on slope position. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield.

Because these soils are loose when dry, access and equipment operability are poor during dry periods when rutting is possible. However, these soils are well suited for access and equipment operability during wet periods. These soils are well suited to use as roads and log landings. Seedling mortality may be moderate to severe. Proper planting depth and compaction are important. Herbaceous weed control may be needed. Attention should be given to the possible leaching of fertilizers and chemicals when herbicides are used in site preparation. Care should be taken in choosing appropriate chemicals and application methods to reduce the possibility of contaminating ground water.

Woodland Management Group 9. This group includes the Gladewater soils in map unit GwA—Gladewater clay, 0 to 1 percent slopes, frequently flooded.

These soils are on flood plains and have a high potential productivity for hardwoods. Common trees of the overstory include water oak, willow oak, green ash, sugarberry, elm, and sweetgum. Overcup oak may be present on wetter sites. The 50-year site index for

sweetgum and bottomland oaks averages 90 feet and ranges from 80 to 100 feet depending on drainage and species. The yield from an unmanaged, natural stand of sweetgum over a 50-year period is approximately 210 board feet (Doyle Rule) per acre per year. Although management can substantially increase this yield, it should also include attention to streamside management zone practices to protect water quality.

Access and equipment operability are poor for long periods due to flooding and wetness. It may be necessary to suspend harvesting and other operations during wet periods. Rutting during these operations can be severe due to the low strength of these soils. Flooding also makes these soils poorly suited to use as log landings and roads. Road construction should be limited. Planting can be difficult due to wetness and the sticky nature of these soils. Site preparation operations should be limited to the dry months, and planting should be planned for the drier part of the planting season. Use of herbicides in site preparation must also include consideration of the possibility of flooding in order to prevent the possible contamination of surface waters.

Woodland Management Group 10. This group includes the Alazan, Moten, Penning, and Sawlit soils in map units AaB—Alazan very fine sandy loam, 0 to 2 percent slopes; AbA—Alazan-Besner complex, 0 to 2 percent slopes; MxA—Moten-Multey complex, 0 to 2 percent slopes; PeB—Penning very fine sandy loam, 0 to 2 percent slopes; and SsA—Sawlit-Sawtown complex, 0 to 2 percent slopes.

These soils occur on uplands and stream terraces and have a high potential productivity for both pine and hardwoods. Common trees of the overstory include loblolly pine, water oak, white oak, cherrybark oak, ash, blackgum, and sweetgum. Shortleaf pine, as well as post oak and red oak, may occur on drier sites. The 50-year site index for loblolly pine averages 90 feet (approximately 60 feet on a 25-year curve), but can range from 85 to 95 feet. For bottomland oaks, the site index averages 80 feet. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 330 board feet (Doyle Rule) or 90 cubic feet per acre per year. Management can substantially increase this yield.

Access and equipment operability are poor during wet periods. It may be necessary to suspend harvesting and other operations during wet periods when rutting can be severe. Wetness and low strength also cause moderate problems on these soils for log landings and roads. Site preparation operations should be limited to the dry months, and planting should be planned for the drier part of the planting season. Slow drainage and the high water table must be considered when using herbicides in site preparation. Applications should not be made during wet periods.

Woodland Management Group 11. This group includes the Corrigan, Rosenwall, and Urland soils in map units CoB—Corrigan loam, 1 to 5 percent slopes; CoD—Corrigan loam, 5 to 12 percent slopes; RwB—Rosenwall fine sandy loam, 1 to 5 percent slopes; RwD—Rosenwall fine sandy loam, 5 to 15 percent slopes; and UrB—Urland fine sandy loam, 1 to 5 percent slopes.

These soils are on uplands and have a moderate potential productivity for pine. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, southern red oak, white oak, ash, sweetgum, elm, and hickory. Longleaf pine, when within its range, also occurs on some of these soils. The 50-year index for loblolly pine averages 85 feet (approximately 57 feet on a 25-year curve) and ranges from 80 to 90 feet depending on slope and slope position. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 280 board feet (Doyle Rule) or 80 cubic feet per acre per year. Management can substantially increase this yield.

Access and equipment operability are poor during wet periods. Wet weather limitations may be necessary to prevent rutting and excessive erosion. Low strength and stickiness make these soils only moderately suited to use as roads and log landings. On steeper slopes, the potential for erosion is greater, site disturbance should be minimized, and control devices for roads, such as water bars, should be installed. Revegetating roads and log landings may also be necessary. Site preparation and tree planting operations are affected by the sticky nature of these soils when wet. Tree planting should be planned for the drier, early part of the planting season. Also, because clay occurs within 10 inches of the surface, care must be taken to assure proper planting depth. Subsoiling or ripping on the flatter slopes prior to planting may be needed. On steep slopes, mechanical tree planting should be done on the contour. The moderate level of runoff on these soils means precautions are necessary when using herbicides in site preparation and release in order to prevent contamination of surface waters.

Woodland Management Group 12. This group includes the Annona, Etoile, Herty, and Kellison soils in map units AnB—Annona fine sandy loam, 1 to 3 percent slopes; EtB—Etoile loam, 1 to 3 percent slopes; HeA—Herty loam, 0 to 1 percent slopes; HeB—Herty loam, 1 to 3 percent slopes; and KcD—Kellison loam, 5 to 15 percent slopes.

These high shrink-swell soils are on stream terraces and uplands and have a moderate potential productivity for pine. Common trees of the overstory include loblolly

pine, shortleaf pine, post oak, southern red oak, water oak, white oak, ash, sweetgum, elm, and hickory. The 50-year site index for loblolly pine averages between 80 and 85 feet (approximately 55 to 57 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 280 board feet (Doyle Rule) or 80 cubic feet per acre per year. Although management can substantially increase this yield, trees on these soils tend to have poor form. Therefore, a short rotation management scheme may be considered.

Access and equipment operability are poor during wet periods. Wet weather limitations may be necessary to prevent rutting and excessive erosion. Low strength and stickiness make these soils only moderately suited to use as roads and log landings. On steeper slopes, the potential for erosion is greater, site disturbance should be minimized, and control devices for roads, such as water bars, should be installed. Revegetating roads and log landings may also be necessary. Site preparation and tree planting operations are affected by the sticky nature of these soils when wet. Site preparation should be planned for the drier part of the year. Tree planting should be planned for the drier, early part of the planting season. Mechanical tree planting on steeper slopes should be done on the contour. Also, because clay occurs within 10 inches of the surface, care must be taken to assure proper planting depth. The very slow permeability of these soils means precautions are necessary when using herbicides in site preparation and release in order to prevent contamination of surface waters. Very slow permeability may also cause a moderate level of seedling mortality.

Woodland Management Group 13. This group includes the Garner soils in map unit GaA—Garner clay, 0 to 1 percent slopes.

These high shrink-swell soils are on stream terraces and, although the Garner soil is a "blackland soil," pine trees have encroached upon them. These soils have a moderate potential productivity for pine, but the high pH may make establishment difficult. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, southern red oak, water oak, ash, elm, and hickory. The 50-year site index for loblolly pine averages 80 feet (approximately 55 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 230 board feet (Doyle Rule) or 75 cubic feet per acre per year. Although management can substantially increase this yield, trees on these soils tend to have poor form. Therefore, a short rotation management scheme may be considered.

Access and equipment operability are poor during wet periods. Wet weather limitations may be necessary to prevent rutting and excessive erosion. Low strength and stickiness make these soils only moderately suited to use as roads and log landings. Site preparation and tree planting operations are affected by the sticky nature of these soils when wet. Site preparation should be planned for the drier part of the year. Tree planting should be planned for the drier, early part of the planting season. Mechanical tree planting on steeper slopes should be done on the contour. Also, because clay occurs within 10 inches of the surface, care must be taken to assure proper planting depth. The very slow permeability of these soils means precautions are necessary when using herbicides in site preparation and release in order to prevent contamination of surface waters. Very slow permeability and slightly high pH may also cause a moderate to severe level of seedling mortality.

Woodland Management Group 14. This group includes the Laska soils in map units ClA—Colita-Laska complex, 0 to 2 percent slopes, and LaB—Laska fine sandy loam, 1 to 3 percent slopes.

These soils are on uplands and have a moderate potential productivity for pine. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, white oak, southern red oak, water oak, sweetgum, white ash, and elm. The 50-year site index for loblolly pine averages 80 feet (55 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 230 board feet (Doyle Rule) or 75 cubic feet per acre per year. Management can substantially increase this yield.

These soils have few soil-related problems. Access and equipment operability may be somewhat limited during wet periods when rutting can be a moderate concern. Short-term restrictions may be necessary during these times. Low strength makes these soils moderately suited for road construction material and to use as roads.

Woodland Management Group 15. This group includes the Tehran soils in map unit TeD—Tehran loamy sand, 5 to 15 percent slopes.

These soils are on sandy uplands and have a moderate potential productivity for pine. Common trees of the overstory include loblolly pine, longleaf pine, shortleaf pine, post oak, southern red oak, elm, and hickory. The 50-year site index for loblolly pine averages 85 feet (57 feet on a 25-year curve). The yield from a natural, unmanaged stand of loblolly pine over a 50-year period is approximately 280 board feet (Doyle Rule) or 80 cubic feet per acre per year. Management can substantially increase this yield.

Because these soils are loose when dry, access and equipment operability are very poor during dry periods when rutting is possible. However, these soils are well

suited for access and equipment operability during wet periods. These soils are well suited to use as roads and log landings, but can have erosion problems on steeper slopes. Adequate water-control devices, such as wing ditches and water bars, should be installed on the steeper slopes. Seedling mortality may be moderate. Proper planting depth and compaction are important. Herbaceous weed control may be needed. Attention should be given to the possible leaching of fertilizers and chemicals when herbicides are used in site preparation. Care should be taken in choosing appropriate chemicals and application methods to prevent the possibility of contaminating ground water.

Woodland Management Group 16. This group includes the Mollville soils in map unit MpA—Mollville-Besner complex, 0 to 2 percent slopes.

These soils are on level to depressional positions on stream terraces. Ponding of water is common during wet months. These soils have a moderate potential productivity for both pine and hardwoods. Common trees of the overstory include loblolly pine, willow oak, cherrybark oak, green ash, elm, and sweetgum. The 50-year site index for loblolly pine averages between 80 and 85 feet (approximately 55 to 57 feet on a 25-year curve), but can range from 75 to 90 feet depending on drainage. The 50-year site index for bottomland oaks ranges from 75 to 80 feet. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 250 board feet (Doyle Rule) or 80 cubic feet per acre per year. Management can substantially increase this yield.

Access and equipment operability on these soils are poor during wet periods when rutting can occur due to saturation. It may be necessary to suspend harvesting and other operations for long periods. Wetness also makes these soils poorly suited to use as log landings and roads. Low strength makes these soils moderately suited for road construction. Raising and crowning the roadbed is necessary, and care must be taken to avoid interrupting the natural drainage. Site preparation operations should be limited to the dry months, and planting should be planned for the drier part of the planting season. Poor drainage and the seasonal high water table must be considered when using herbicides in site preparation. Wetness may cause a moderate level of seedling mortality. Bedding may be needed.

Woodland Management Group 17. This group includes the Fuller soils in map unit FuA—Fuller fine sandy loam, 0 to 1 percent slopes, and FuB—Fuller fine sandy loam, 1 to 3 percent slopes.

These soils are on uplands and have a moderate potential productivity for both pine and hardwoods. Common trees of the overstory include loblolly pine, shortleaf pine, water oak, white oak, cherrybark oak, green ash, elm, and sweetgum. Shortleaf pine may occur on drier sites. The 50-year site index for loblolly pine averages 85 feet (approximately 57 feet on a 25-year curve), but can range from 80 to 95 feet depending on drainage. The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 280 board feet (Doyle Rule) or 80 cubic feet per acre per year. Management can substantially increase this yield.

Access and equipment operability on these soils are poor during wet periods due to saturation. It may be necessary to suspend harvesting and other operations during wet periods when rutting can occur. In addition, these soils are fair for access and equipment operability during dry periods due to their loose, dusty nature. Attention should be given to suitable soil moisture for site preparation operations. Wetness from the high water table also makes these soils poorly suited to use as log landings and roads. Raising and crowning the roadbed is necessary, and care must be taken to avoid interrupting the natural drainage. Poor drainage and the seasonal high water table must be considered when using herbicides in site preparation. Wetness may cause a moderate level of seedling mortality. Care must be taken to ensure proper planting depths on these soils. "J-rooting" is a common problem. These soils can be erodible due particularly to rutting or road construction. Disturbance should be minimized, and control devices for roads, such as water bars, should be installed. Revegetating roads and log landings may also be necessary.

Woodland Management Group 18. This group includes the Eastham soils in map units EaA—Eastham clay, 0 to 2 percent slopes, and EaB—Eastham clay, 2 to 5 percent slopes.

These soils are on stream terraces. The high pH makes these soils best suited for management of hardwoods only. These soils have a low potential productivity for pine. Common trees of the overstory include green ash, water oak, post oak, hackberry, and elm. In some areas, pine trees may have encroached upon these soils. The 50-year site index for water oak averages 70 feet. The high shrink-swell property of these soils causes trees to have poor form.

Access and equipment operability are poor during wet periods due to the clayey surface. Wet weather limitations may be necessary to prevent rutting and excessive erosion. Low strength and stickiness make road construction and maintenance difficult. During road design and layout, attention must be given to avoid flat areas and to avoid interrupting natural drainageways. On steeper slopes, the potential for erosion is greater, site disturbance should be minimized, and control devices for roads, such as water

bars, should be installed. Revegetating roads and log landings may also be needed. The slow permeability of these soils means precautions are necessary when using herbicides in site preparation and release in order to prevent contamination of surface waters.

Woodland Management Group 19. This group includes the Kitterll soils in map units KiB—Kitterll fine sandy loam, 1 to 5 percent slopes, and KiD—Kitterll-Browndell complex, 5 to 15 percent slopes.

These shallow soils are on uplands and have a low to moderate potential productivity for pine. Common trees of the overstory include loblolly pine, shortleaf pine, post oak, southern red oak, white oak, ash, elm, and hickory. When within its range, longleaf pine may also be present. The 50-year site index for loblolly pine averages between 70 and 75 feet (approximately 50 to 53 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 130 board feet (Doyle Rule) or 50 cubic feet per acre per year. Although management can increase this yield, trees growing on these soils tend to be of poor form.

Access and equipment operability are moderate to poor depending on slope, stoniness, and depth of soil. Stoniness and slope make these soils poorly suited to use as roads and log landings. On steeper slopes, the potential for erosion is high, site disturbance should be minimized, and these soils should be avoided when selecting road locations. If roads are built on these soils, water control devices, such as water bars, are needed. Revegetating disturbed areas may also be necessary. Mechanical operations for site preparation and tree planting should be avoided. Because clay or bedrock occurs within inches of the surface, care must be taken during tree planting to assure proper planting depth; otherwise, moderate to severe seedling mortality may occur. The high level of runoff on these soils means precautions are necessary when using herbicides in site preparation and release in order to prevent contamination of surface waters.

Woodland Management Group 20. This group includes the Colita soils in map units CaA—Colita fine sandy loam, 0 to 1 percent slopes; CaB—Colita fine sandy loam, 1 to 3 percent slopes; and ClA—Colita-Laska complex, 0 to 2 percent slopes.

These soils are on depressional to gently sloping positions on uplands and have a low to moderate potential productivity for both pine and hardwoods. Common trees of the overstory include loblolly pine, water oak, willow oak, green ash, elm, blackgum, and sweetgum. The 50-year site index for loblolly pine averages between 70 and 75 feet (approximately 50 to 53 feet on a 25-year curve). The yield from an unmanaged, natural stand of loblolly pine over a 50-year period is approximately 130 board feet (Doyle Rule) or 50 cubic feet per acre per year. Management can substantially increase this yield.

Access and equipment operability on these soils are poor for much of the year due to the presence of a high water table. It may be necessary to suspend harvesting and other operations during wet periods when rutting can occur. Wetness also makes these soils poorly suited to use as log landings and roads. Low strength makes these soils moderately suited for road construction material. Road construction must include raising and crowning the surface. Site preparation operations should be limited to the dry months, and planting should be planned for the drier part of the planting season. Poor drainage and the seasonal high water table must be considered when using herbicides in site preparation, and applications should not be made during wet periods. Wetness may cause a moderate level of pine seedling mortality.

Forest Productivity and Management

The tables in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forest management.

Forest Productivity

In table 6, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site 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. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Forest Management

In tables 7a and 7b, interpretive ratings are given for various aspects of forest management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately well suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified forest management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate,* and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for forest management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

The ratings of *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Ratings in the column *hazard of off-road or off-trail erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance; and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for

roads. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Recreation

Trinity County has the wildlife, water areas, and the aesthetic characteristics of the Pineywoods. About 90 percent of the county is used for recreational activities, including camping, swimming, boating, golfing, hunting, fishing, picnicking, and hiking (fig. 9). The county provides many opportunities for photography. It has several youth and church camps for outdoor education.

Lake Livingston, the Trinity River, the Neches River, and numerous creeks and small water impoundments provide opportunities for water recreation. In the spring, flowering dogwood, redbud, clover, and wildflowers add color to the forests and open areas.

The Davy Crockett National Forest offers vast opportunities for hunting, fishing, canoeing, and hiking in natural surroundings. There are also areas in the National Forest that are ideal for bird watching.

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for building site development,

Figure 9.—A golf course in an area of terrace soils near the Trinity River.

construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the 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 ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large

stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

Bill Deauman, zone wildlife biologist, Natural Resources Conservation Service, helped prepare this section.

Trinity County has valuable fish and wildlife resources. The Trinity and Neches Rivers, Lake Livingston, and other small streams, lakes, and water impoundments provide habitat for wildlife. The abundance of water furnishes a haven for fish, waterfowl, shorebirds, and aquatic mammals. The soils in the county are unique to east Texas. Remnants of volcanic ash deposits have left a few seasonally wet soils high in some mineral elements.

History

Early settlers found the county to be overflowing with wildlife. The Honorable David H. Hamilton, a respected citizen of Trinity County since 1853, says in the Trinity County News of October 7, 1927, referring to wildlife resources:

"It is probably not safe to enter upon a discussion of the hunting and fishing possibilities of that early day. The angler of this day would be apt to think a description of the paradise that existed at this early time merely the result of an over worked imagination, if not downright prevarication. The forests were literally filled with all kinds of game, deer, bear, panthers, wolves, bobcats—in fact every thing that one would care to hunt for pelt, fur or food. The streams were filled with fish the mere mention of which makes one long for the good old days again. Hogs were introduced to the timberlands of the county early in its development. The Piney-wood Rooter is described as having a long body and grows to a height of nearly two feet; his hair is long and when he is frightened, it stands erect on his back. He has a long head with narrow ears and snout that comes almost to point nearly a foot from his eyes. The woods are his home, and it is difficult to domesticate him."

Around 1880 the logging business entered into the virgin forest of Trinity County. The forest was

systematically cut down. By 1930, logging camps were all but closed. The "Cut Out and Get Out" system of forestry left the habitat for many species in shambles. Thousands of animals had been harvested to feed families and logging camp workers. The forest, along with much of the wildlife had been decimated. The white-tailed deer population dwindled to small remnant herds. Gone were the black bear, gray wolf, eastern turkey, cougars, buffalo, beaver, and white-tailed deer. Little is known of species of animals that may have disappeared. What had taken thousands of years to develop was devastated in a mere 50 years.

Farming made a short entry in the history of Trinity County. Cotton was king for a very short time. The soils in the county are best suited to other land uses. Depression relief began around 1935 with roads being built and trees being planted on thousands of deforested acres of the Davy Crockett National Forest. The birth of the Soil Conservation Service (currently Natural Resources Conservation Service) in the late 1930's began a new era in the history of agriculture. Trees and improved grasses were planted and gullies were repaired. In the early 1960's, the Texas Parks and Wildlife Department began releasing deer into Trinity County and neighboring Houston County. In the mid-1980's through the present, the release of eastern wild turkey by Texas Parks and Wildlife has met with limited success.

Present

Many of the soils in Trinity County are suitable for small damless pond constructions. Lake Livingston was constructed by damming the Trinity River.

Soils are generally sandy loam or loam, but are capable of holding water because of their volcanic ash origin. Ponds, small lakes, and large impoundments are

Figure 10.—A pasture with crawfish mounds in an area of Fuller fine sandy loam, 0 to 1 percent slopes.

stocked and managed for largemouth bass, channel catfish, blue catfish, and bluegill. Many ponds are stocked with channel catfish and flathead minnows to provide food and recreation. Other species found in streams include freshwater drum, flathead catfish, carp, gar, bowfin, buffalo fish, white bass, gizzard shad, various sunfish, and white and black crappie. Many of these species find their way into numerous unmanaged ponds and lakes.

The quality of water in ponds is as variable as the soils. Some ponds are acidic and require liming, while other ponds have high pH values, probably because of the inherent salts in the soils. Submerged and floating aquatic weeds pose some problems in areas of clear water. Little aquaculture exists in Trinity County. Catfish culture has been tried on a large scale, but currently there are no large producers.

Worth mentioning is a persevering little crustacean known as the prairie crawfish. These animals are adapted to the seasonal wet soils over much of the county. Their mounds and excavation wreak havoc with farm machinery and grass production (fig. 10).

The major game species in the county include white-tailed deer, bobwhite quail, mourning dove, fox, gray squirrels, and ducks. Raccoon, opossum, skunks, armadillo, cottontail rabbit, swamp rabbit, numerous rodents, and songbirds inhabit the county. Common predators are coyote, gray fox, red fox, and bobcat. Many species of reptiles and amphibians inhabit the county. The best known of these are the cottonmouth, copperhead, coral snake, timber rattler, water snake, green bullfrog, tree frog, and snapping turtle. The American alligator inhabits some wetland areas, sloughs, and lakes in the county, mostly along the Neches and Trinity Rivers.

During migration periods, ducks, such as teals, mallards, gadwalls, widgeons, shovelers, and pintails, and several species of geese use wetlands and fields for feeding, resting, and roosting. Wood ducks are found in the county throughout the year and nest in natural cavities and man-made houses.

Presently, there are three federally and/or state listed endangered species and seven threatened animal species in Trinity County. Endangered species include American peregrine falcon, brown pelican, and red cockaded woodpecker. Threatened species include arctic peregrine falcon, bald eagle, wood stork, white-faced ibis, Rafinesque's big-eared bat, timber rattlesnake, and the Louisiana pine snake. The bald eagle nests along Lake Livingston. Currently, the timber rattlesnake is being studied. More research is being done to help determine whether the snake actually is rare or just elusive. The red cockaded woodpecker is being propagated by the U.S. Forest Service. Large areas of critical habitat are being managed for the bird (fig. 11).

The growth of wildlife in the county is fairly static. Monoculture of southern yellow pines, improved grasses, and land use changes slowly diminish wildlife habitat. This is a common event throughout the southern United States. Trinity County is known for the tremendous antlers grown by white-tailed deer. This is partly due to the unique soils, wildlife management of timber companies and private landowners, and genetics. Nearly the entire county is used for hunting. Many acres are leased for hunting. Timber companies lease and manage much of their ownership for hunting.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in 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* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer,

Figure 11.—A site of improved habitat for the endangered red cockaded woodpecker in an area of Lovelady loamy fine sand, 1 to 5 percent slopes.

available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features 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, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features 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 flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife 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. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants 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.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, sage grouse, meadowlark, and lark bunting.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Construction Materials

Table 10 gives information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair,* or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of

soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In the table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 11 shows the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface

and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites

for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond

reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables 14 through 18. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 14 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given 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 the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The

estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

Table 15 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 16 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases 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. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at

saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Soil Features

Table 17 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

Table 18 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive 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 mainly of deep, well drained to excessively drained sands or gravelly sands. 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 having a layer that impedes the downward movement of water or soils of 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 clays that have a high shrink-swell potential, soils that have a 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.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Hydric Soils

In this section, hydric soils are defined and described.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the

water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 1998) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1998).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

For more specific information regarding hydric soils in the soil survey area, refer to the "Field Office Technical Guide" at the local office of the Natural Resources Conservation Service.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, active, thermic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Alazan Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Marine terraces or stream terraces
Parent material: Loamy coastal plain sediments or alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, siliceous, semiactive, thermic Aquic Glossudalfs

Associated soils: Bernaldo, Besner, and Mollville
- Bernaldo soils are in slightly higher terrace positions, are well drained, and do not have a glossic horizon
- Besner soils have a coarse-loamy control section and are in slightly higher positions, typically on mounds
- Mollville soils are in lower, wetter depressions and are poorly drained

Typical Pedon

Alazan very fine sandy loam, 0 to 2 percent slopes (fig. 12), is located from Farm Road 355 in Groveton, 1.3 miles east on U.S. Highway 287, 4.9 miles northeast on Farm Road 2262, 2.9 miles north on U.S. Forest Service Road 528 (Red Road), 2.7 miles east on U.S. Forest Service Road 568, 0.7 mile north on U.S. Forest Service Road 515, 0.5 mile west on U.S. Forest Service Road 515-A, 50 feet north in woods; USGS Crecy topographic quadrangle; latitude 31 degrees 08 minutes 56 seconds N.; longitude 95 degrees 01 minute 15 seconds W.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; weak fine subangular blocky structure; slightly hard, friable; many fine and medium roots; moderately acid; clear wavy boundary.

Bt/E1—4 to 19 inches; brownish yellow (10YR 6/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable; common fine, medium, and coarse roots; common fine distinct light brownish gray (10YR 6/2) clay depletions on surfaces of peds and common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation lining pores; strongly acid; clear wavy boundary.

Bt/E2—19 to 33 inches; 90 percent brownish yellow (10YR 6/6) loam (Bt); 10 percent light gray (10YR 7/2) fine sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; weak medium subangular blocky structure; hard, friable; common medium roots; common fine pores; few faint clay films; common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation lining pores and common fine prominent gray (10YR 6/1) clay depletions on surfaces of peds; strongly acid; gradual wavy boundary.

Bt/E3—33 to 40 inches; 80 percent brownish yellow (10YR 6/6) sandy clay loam (Bt); 20 percent light gray (10YR 7/2) sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; weak medium subangular blocky structure; hard, friable; common fine roots; common fine pores; few patchy clay films; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation lining pores and common fine distinct gray (10YR 6/1) clay depletions on surfaces of peds; strongly acid; gradual wavy boundary.

Btg/E1—40 to 53 inches; 90 percent gray (10YR 6/1) sandy clay loam (Bt); 10 percent light gray (10YR 7/2) sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds that are clay depletions resulting from aquic conditions; weak medium subangular blocky structure; hard, firm; few fine roots; few fine pores; few patchy clay films; common fine distinct yellowish red (5YR 5/8) and few fine distinct brownish yellow (10YR 6/8) masses of iron accumulation lining pores; slightly acid; clear wavy boundary.

Btg/E2—53 to 62 inches; 30 percent gray (10YR 5/1), 30 percent yellowish brown (10YR 5/8), 15 percent light gray (10YR 6/1), and 15 percent strong brown (7.5YR 5/6) clay loam (Bt); 10 percent light gray (10YR 7/2) sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds that are clay depletions resulting from aquic conditions; weak medium subangular blocky structure; hard, friable; few fine roots; few clay films; slightly acid; gradual wavy boundary.

Btg/E3—62 to 80 inches; 40 percent yellowish brown (10YR 5/8), 35 percent light gray (10YR 6/1), and 20 percent brownish yellow (10YR 6/6) sandy clay loam (Bt); 5 percent light gray (10YR 7/2) sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; weak medium subangular blocky structure; hard, friable; few clay films; slightly acid.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 18 to 25 percent
Redoximorphic features: Yellowish red or red redoximorphic concentrations occur in some pedons; redoximorphic depletions are within upper 10 inches of the argillic horizon
Other distinctive soil features: Albic intrusions and clay depletions make up more than 15 percent in 20 inches or more of the Bt/E and Btg/E horizons
Reaction: A, E (where present), and upper Bt/E horizons—very strongly acid to moderately acid; lower Bt/E and Btg/E horizons—strongly acid to slightly acid

A horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 1 to 3
Redoximorphic features—none

Texture—very fine sandy loam
Other features—none
Thickness—4 to 10 inches thick

E horizon (where present):
Color—hue of 10YR, value of 6 or 7, and chroma of 2 to 4
Redoximorphic features—iron accumulations in shades of brown or red and iron depletions in shades of gray range from none to common
Texture—very fine sandy loam or loam
Other features—none
Thickness—0 to 8 inches thick

Bt/E horizon:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4, 6, or 8
Redoximorphic features—iron accumulations in shades of red, yellow, or brown and iron depletions in shades of gray range from few to many
Texture—loam or sandy clay loam (Bt); fine sandy loam, loam, or sandy loam (E)
Other features—intrusions and streaks of albic material (E) make up 5 to 50 percent of the horizon; in most pedons, 5 to 20 percent of the matrix is brittle

Btg/E horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 or 2
Redoximorphic features—iron accumulations in shades of red, yellow, or brown and iron depletions in shades of gray range from few to many
Texture—loam, clay loam, or sandy clay loam (Bt); fine sandy loam, loam, or sandy loam (E)
Other features—intrusions and streaks of albic material (E) make up 5 to 50 percent of the horizon; in most pedons, 5 to 20 percent of the matrix is brittle

Annona Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Ancient stream terraces
Parent material: Coastal plain sediments from clayey Pleistocene age sediments
Slope range: 1 to 3 percent
Taxonomic classification: Fine, smectitic, thermic Vertic Paleudalfs
Associated soils: Austonio, Garner, and Eastham

- Austonio soils are fine-loamy in the upper part of the subsoil
- Garner and Eastham soils have micro-high and micro-low topography and are clayey throughout

Typical Pedon

Annona fine sandy loam, 1 to 3 percent slopes, is located from Farm Road 230 in Trinity, 0.65 mile south on Texas Highway 19, 0.8 mile southwest on Farm Road 1612, 0.5 mile west on private lane to gate, 0.1 mile west from gate, 0.15 mile south and west on lane, 50 feet north in woods; USGS Trinity West topographic quadrangle; latitude 30 degrees 55 minutes 24 seconds N.; longitude 95 degrees 24 minutes 15 second W.

A—0 to 4 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; slightly hard, very friable; common fine and medium roots; slightly acid; clear smooth boundary.
E—4 to 9 inches; pale brown (10YR 6/3) fine sandy loam; weak fine subangular blocky structure; slightly hard, very friable; common fine and medium roots; moderately acid; clear wavy boundary.
Bt—9 to 13 inches; yellowish brown (10YR 5/6) clay loam; few fine prominent light gray (10YR 7/2) relict iron depletions; moderate medium subangular blocky structure; very hard, very firm; few fine roots; few pressure faces; few patchy clay films; very strongly acid; clear wavy boundary.
Btss1—13 to 17 inches; yellowish red (5YR 5/8) clay; common fine prominent light gray (10YR 7/2) relict concentrations; moderate medium subangular blocky structure; extremely hard, very firm; few fine roots; common slickensides; common clay films; strongly acid; gradual wavy boundary.
Btss2—17 to 21 inches; yellowish red (5YR 5/8) clay; common medium prominent light gray (10YR 7/1) and few fine distinct red (2.5YR 4/8) relict concentrations; moderate medium angular blocky structure; extremely hard, very firm; few fine roots between ped faces; common slickensides; common clay films; strongly acid; gradual wavy boundary.
Btss3—21 to 27 inches; red (2.5YR 4/8) clay; common coarse prominent yellow (10YR 8/6), common medium faint red (2.5YR 4/6), and few fine prominent light gray (10YR 7/1) relict concentrations; moderate medium angular blocky structure; extremely hard, very firm; few fine roots between peds; common slickensides; few clay films; strongly acid; gradual wavy boundary.
Btss4—27 to 38 inches; 55 percent red (2.5YR 4/8), 35 percent yellow (10YR 8/6) and 10 percent white (10YR 8/1) clay; moderate medium angular blocky structure; extremely hard, very firm; few fine roots

between peds; common slickensides; continuous clay films; strongly acid; gradual wavy boundary.
Btss5—38 to 43 inches; white (10YR 8/1) clay; common medium prominent red (2.5YR 4/8) and common medium distinct yellow (10YR 8/6) relict concentrations; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; common slickensides; common clay films; strongly acid; gradual wavy boundary.
Btss6—43 to 52 inches; 40 percent red (2.5YR 4/8), 40 percent brownish yellow (10YR 6/6), and 20 percent white (10YR 8/1) clay; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; common slickensides; common clay films; slightly acid; gradual wavy boundary.
Btss7—52 to 80 inches; light reddish brown (2.5YR 6/4) clay; common fine prominent yellowish red (5YR 5/6) and few fine prominent white (10YR 8/1) relict iron depletions; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; few slickensides; few clay films; neutral; gradual wavy boundary.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 45 to 60 percent
Redoximorphic features: Few to many iron depletions in shades of gray; relict iron accumulations in shades of brown, red, or yellow
Other distinctive soil features: Cracks about 1/2 inch wide extend from the top of the Bt horizon into the Btss horizon for a period of 30 to 90 cumulative days in most years; slickensides are within a depth of 14 to 24 inches of the soil surface; a few pitted concretions of calcium carbonate are below a depth of 40 inches in some pedons
Reaction: A, E, Bt, and upper Btss horizons—very strongly acid to slightly acid; lower Btss horizon—moderately acid to moderately alkaline

A or Ap horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 1 to 4
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—3 to 6 inches thick

E horizon:
Color—hue of 10YR, value of 5 to 7, and chroma of 1 to 4
Redoximorphic features—none
Texture—very fine sandy loam, fine sandy loam, or loam
Other features—none
Thickness—0 to 7 inches thick

Bt horizon:
Color—hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 3 to 6, and chroma of 6 or 8
Redoximorphic features—relict iron depletions in shades of gray; relict iron concentrations in shades of brown or yellow; some pedons have a matrix with variegated colors
Texture—clay or clay loam
Other features—none
Thickness—6 to 18 inches thick

Btss horizon:
Color—hue of 2.5YR, 5YR, 7.5YR, 10YR, or 2.5Y, value of 4 to 8, and chroma of 1, 2, 3, 4, 6, or 8.
Redoximorphic features—common or many relict iron concentrations in shades of red or brown and relict iron depletions in shades of gray
Texture—clay
Other features—slickensides are within a depth of 14 to 24 inches of the soil surface
Thickness—30 to more than 60 inches thick

Austonio Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Stream terraces
Parent material: Coastal plain loamy alluvial sediments
Slope range: 0 to 15 percent
Taxonomic classification: Fine-loamy, siliceous, active, thermic Typic Hapludalfs
Associated soils: Annona, Besner, and Mollville
- Annona soils have a clayey subsoil and are in similar positions
- Besner soils have a coarse-loamy control section and are in slightly higher positions
- Mollville soils have a grayish subsoil and are in slightly lower, concave positions

Typical Pedon

Austonio fine sandy loam, 1 to 3 percent slopes, is located from Farm Road 230 in Trinity, 0.65 mile south on Texas Highway 19, 0.8 mile southwest on Farm Road 1612, 0.5 mile west on private lane to gate, 0.1 mile west from gate, 0.55 mile south and west on lane, 50 feet north of lane in woods; USGS Trinity West topographic quadrangle; latitude 30 degrees 55 minutes 20 seconds N.; longitude 95 degrees 23 minutes 46 seconds W.

A—0 to 4 inches; brown (10YR 5/3) fine sandy loam; weak very fine subangular blocky structure; slightly hard, very friable; many fine and few medium roots; few fine pores; slightly acid; clear smooth boundary.

E1—4 to 9 inches; pale brown (10YR 6/3) fine sandy loam; weak fine subangular blocky structure; slightly hard, very friable; many fine and few medium roots; few fine pores; strongly acid; clear smooth boundary.

E2—9 to 13 inches; pale brown (10YR 6/3) fine sandy loam; common fine faint light yellowish brown (10YR 6/4) mottles; weak fine subangular blocky structure; slightly hard, very friable; common fine and few medium roots; few fine pores; strongly acid; gradual wavy boundary.

Bt1—13 to 20 inches; yellowish red (5YR 5/8) sandy clay loam; common fine faint pale brown (10YR 6/3) relict iron depletions; weak coarse prismatic structure parting to moderate fine subangular blocky; very hard, friable; common fine and few medium roots; few fine pores; common clay films on surface of prisms; strongly acid; gradual wavy boundary.

Bt2—20 to 32 inches; strong brown (7.5YR 5/8) sandy clay loam; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; very hard, friable; few fine roots; common fine pores; common clay films on surface of prisms; strongly acid; gradual smooth boundary.

BCt1—32 to 38 inches; yellowish brown (10YR 5/6) fine sandy loam; few fine faint pale brown (10YR 6/3) relict iron depletions; weak coarse prismatic structure parting to moderate fine subangular blocky; very hard, friable; few fine roots; few fine pores; common clay films on surface of prisms; strongly acid; gradual wavy boundary.

BCt2—38 to 51 inches; reddish yellow (7.5YR 6/6) fine sandy loam; weak coarse prismatic structure parting to weak fine subangular blocky; very hard, friable; few fine roots; few fine pores; few medium distinct pale brown (10YR 6/3) pockets; common clay films on surface of prisms; few hard iron manganese concretions and stains; strongly acid; clear wavy boundary.

2C1—51 to 62 inches; pale brown (10YR 6/3) loamy fine sand; common medium distinct reddish yellow (7.5YR 6/6) relict concentrations; soft, single grained; very friable; very strongly acid; clear wavy boundary.

2C2—62 to 70 inches; yellowish brown (10YR 5/4) fine sandy loam; soft, very friable; common fine distinct pale brown (10YR 6/3) pockets; massive; very strongly acid; clear wavy boundary.

2C3—70 to 80 inches; strong brown (7.5YR 5/8) fine sandy loam; common medium faint brownish yellow (10YR 6/6) relict concentrations; massive; slightly hard, friable; very strongly acid.

Range in Characteristics

Solum thickness: 50 to 80 inches

Clay content in the control section: 18 to 30 percent

Redoximorphic features: Relict iron depletions and iron concentrations

Other distinctive soil features: The content decreases by 20 percent or more from the maximum within a depth of 40 to 60 inches; base saturation ranges from 60 to 90 percent in the lower part of the argillic horizon; none to few rounded quartzite or ironstone pebbles

Reaction: A and E horizons—very strongly acid to slightly acid; Bt horizon—very strongly acid to moderately acid; BCt horizon—very strongly acid or strongly acid; 2C horizon—very strongly acid to slightly acid

A horizon:
- Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4
- Redoximorphic features—none
- Texture—fine sandy loam
- Other features—none
- Thickness—4 to 14 inches thick

E horizon:
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 4
- Redoximorphic features—none
- Texture—fine sandy loam
- Other features—none
- Thickness—0 to 15 inches thick

Bt1 horizon:
- Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 or 8
- Redoximorphic features—relict iron depletions in shades of gray and relict iron concentrations in shades of red, brown, or yellow range from few to many
- Texture—loam or sandy clay loam
- Other features—none
- Thickness—16 to 28 inches thick

Bt2 horizon:
- Color—hue of 5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 6 or 8
- Redoximorphic features—relict iron depletions in shades of gray and relict iron concentrations in shades of red, brown, or yellow range from few

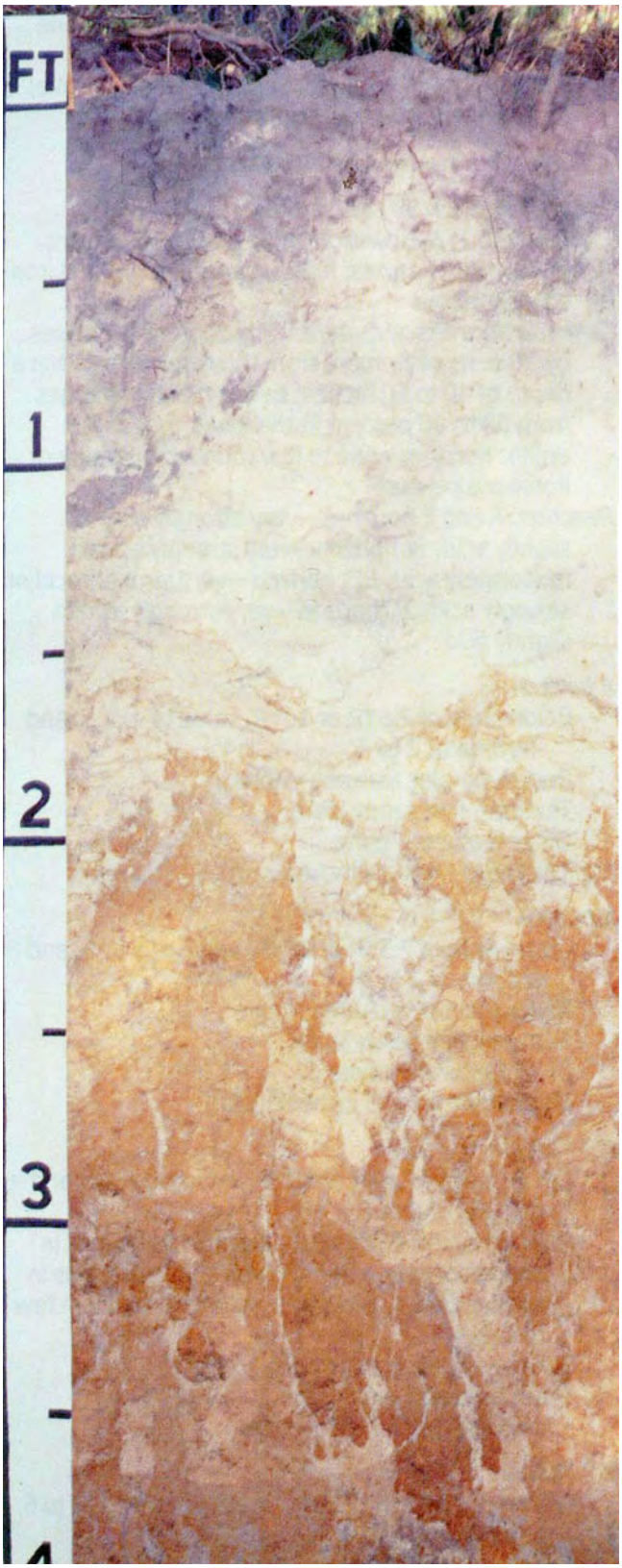


Figure 12.—Profile of Alazan fine sandy loam.

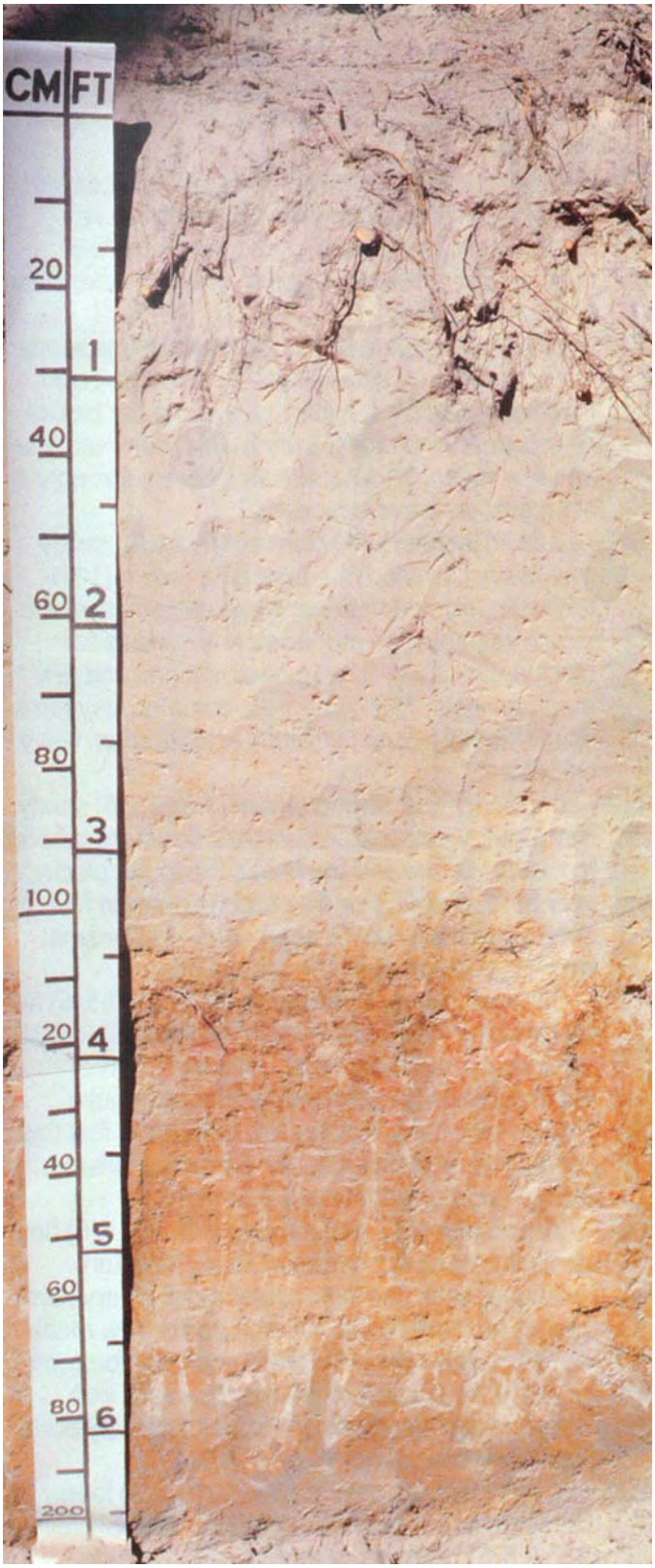


Figure 13.—Profile of Besner fine sandy loam.

to many; or the matrix is variegated in these colors
Texture—loam or sandy clay loam
Other features—none
Thickness—7 to 28 inches thick

BCt horizon:
Color—hue of 5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 6 or 8
Redoximorphic features—relict iron depletions in shades of gray and relict iron concentrations in shades of red, brown, or yellow range from few to many; or the matrix is variegated in these colors
Texture—loam or fine sandy loam
Other features—some pedons contain a few streaks or spots of albic material or uncoated sand
Thickness—14 to 36 inches thick

2C horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3, 4, 6, or 8
Redoximorphic features—relict iron depletions in shades of gray and relict iron concentrations in shades of red, brown, or yellow range from few to many; or the matrix is variegated in these colors
Texture—fine sandy loam or loamy fine sand
Other features—some pedons have a few streaks or pockets of albic material or uncoated sand
Thickness—12 to 28 inches thick

Besner Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Stream terrace
Parent material: Coastal plain alluvial sediments
Slope range: 0 to 2 percent
Taxonomic classification: Coarse-loamy, siliceous, semiactive, thermic Typic Glossudalfs
Associated soils: Alazan and Mollville

- Alazan and Mollville soils are saturated within 40 inches of the surface and are wetter
- Besner soils are on mounds in complex with Alazan or Mollville soils in low or intermound positions

Typical Pedon

Besner fine sandy loam (fig. 13), in an area of Alazan-Besner complex, 0 to 2 percent slopes, is located from Groveton, 1.3 miles east on U.S. Highway 287, 15.4 miles northeast on Farm Road 2262 to Farm Road 357 intersection, 1.1 miles north on continuation of Farm Road 2262, 0.4 mile east on U.S. Forest Service Road 510-C, 60 feet north of road in woods; USGS Diboll topographic quadrangle; latitude 31 degrees 9 minutes 42 seconds N.; longitude 94 degrees 52 minutes 42 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; soft, loose; many fine and medium roots; moderately acid; gradual wavy boundary.
E1—3 to 8 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine granular structure; slightly hard, very friable; common medium and coarse roots; moderately acid; clear wavy boundary.
E2—8 to 29 inches; light yellowish brown (10YR 6/4) fine sandy loam; few fine faint yellowish brown (10YR 5/4) iron concentrations; weak fine granular structure; slightly hard, very friable; common medium and coarse roots; moderately acid; clear wavy boundary.
Bt/E1—29 to 38 inches; 85 percent yellowish brown (10YR 5/4) loam (Bt); 15 percent light gray (10YR 7/2) fine sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; common fine distinct yellowish brown (10YR 5/8) iron concentrations; weak fine subangular blocky structure; slightly hard, very friable; common medium roots; few thin clay films; moderately acid; gradual wavy boundary.
Bt/E2—38 to 44 inches; 75 percent strong brown (7.5YR 5/8) loam (Bt); 25 percent light gray (10YR 7/2) fine sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds; common medium distinct yellowish red (5YR 4/6) iron concentrations; weak fine subangular blocky structure; slightly hard, friable; few fine roots; few thin clay films; strongly acid; gradual wavy boundary.
Bt/E3—44 to 52 inches; 90 percent yellowish brown (10YR 5/8) loam (Bt); 10 percent light gray (10YR 7/2) fine sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; common medium distinct light brownish gray (10YR 6/2) and red (2.5YR 4/8) iron concentrations; weak moderate subangular blocky structure; slightly hard, friable; few fine roots; few thin clay films; strongly acid; gradual wavy boundary.
Bt/E4—52 to 64 inches; 35 percent yellowish brown (10YR 5/8), 30 percent yellowish red (5YR 5/8), and 25 percent red (2.5YR 4/8) loam (Bt); 10 percent light gray (10YR 7/2) fine sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; weak moderate subangular blocky structure; slightly hard, friable; few fine

roots; few thin clay films; strongly acid; gradual wavy boundary.
Bt/E5—64 to 70 inches; 55 percent yellowish brown (10YR 5/8) and 35 percent light brownish gray (10YR 6/2) sandy clay loam (Bt); 10 percent light gray (10YR 7/2) fine sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds; weak fine subangular blocky structure; slightly hard, friable; few fine roots; few thin clay films; strongly acid; gradual wavy boundary.
Bt/E6—70 to 80 inches; 95 percent strong brown (7.5YR 5/8) sandy clay loam (Bt); 5 percent light gray (10YR 7/2) sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds; weak fine subangular blocky structure; slightly hard, friable; few fine roots; few thin clay films; common fine distinct light brownish gray (10YR 6/2) clay depletions on surfaces of peds; strongly acid.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 12 to 18 percent
Redoximorphic features: Iron concentrations range from few to many throughout the subsoil
Other distinctive soil features: Silt content ranges from 25 to 40 percent
Reaction: Very strongly acid to slightly acid throughout

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 or 3
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—2 to 7 inches thick

E horizon:
Color—hue of 10YR, value of 5 to 7, and chroma of 2 to 4
Redoximorphic features—iron concentrations in shades of yellow and brown and iron depletions in shades of gray range from none to common
Texture—fine sandy loam, very fine sandy loam, or loam
Other features—some pedons have a BE horizon with chroma of 6 or 8
Thickness—12 to 30 inches thick

Bt horizon (where present):
Color—hue of 2.5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 4, 6, or 8
Redoximorphic features—iron concentrations in shades of red, yellow, or brown are few or common in most pedons
Texture—fine sandy loam or loam; however, some pedons have sandy clay loam texture below a depth of 60 inches
Other features—about 5 to 20 percent of the matrix is brittle
Thickness—15 to 45 inches thick

Bt/E horizon:
Color—hue of 2.5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 4, 6, or 8
Redoximorphic features—iron concentrations in shades of red, yellow, or brown are few or common in most pedons
Texture—loam or sandy clay loam
Other features—albic streaks (E) make up 5 to 35 percent; however, some parts of the horizon have 15 percent or more albic streaks; about 5 to 20 percent of the Bt matrix is brittle
Thickness—15 to 45 inches thick

Browndell Series

Depth class: Shallow
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landscape: Upland
Landform: Side slopes
Parent material: Tuffaceous siltstone and sandstone from the Catahoula Formation
Slope range: 5 to 15 percent
Taxonomic classification: Clayey, smectitic, thermic, shallow Oxyaquic Hapludalfs
Associated soils: Corrigan, Kitterll, Letney, and Rayburn
- Corrigan soils have a solum more than 20 inches thick
- Kitterll soils do not have an argillic horizon, are shallower than 14 inches to weathered bedrock, and are in a loamy family
- Letney soils are on nearby slopes and have a thicker solum and a sandy epipedon more than 20 inches thick
- Rayburn soils are in slightly higher, convex positions and have a thicker solum

Typical Pedon

Browndell fine sandy loam, in an area of Kitterll-Browndell complex, 5 to 15 percent slopes, is located from U.S. Highway 287 in Groveton, 6.5 miles south and southwest on Farm Road 355 to Champion gate on south side of road, through gate and 1 mile south on timber company road, 150 feet west in pine plantation area; USGS Chita topographic quadrangle; latitude 30 degrees 57 minutes 51 seconds N.; longitude 95 degrees 07 minutes 56 seconds W.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; slightly hard, very friable; common fine and medium roots; moderately acid; clear smooth boundary.
E—3 to 6 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular structure; slightly hard, very friable; common fine and medium roots; moderately acid; clear wavy boundary.
Bt—6 to 16 inches; brown (10YR 5/3) clay; few medium distinct yellow (10YR 7/6) and few fine faint light brownish gray (10YR 6/2) iron concentrations; weak medium subangular blocky structure; hard, very firm; common fine roots; few apparent clay films; very strongly acid; gradual wavy boundary.
Cr—16 to 24 inches; light yellowish brown (2.5Y 6/3) weakly consolidated tuffaceous sandstone; massive; hard, hardness more than 3 on Mohs scale; faces of angular fractures coated with grayish brown (10YR 5/2) clay flows; very strongly acid.

Range in Characteristics

Solum thickness: 14 to 20 inches
Clay content in the control section: 40 to 60 percent
Redoximorphic features: Iron concentrations in shades of brown or olive are few or common in the subsoil
Other distinctive soil features: Cobbles and stones from 3 to 15 or more inches in diameter are on the surface of most pedons and cover up to 15 percent of the surface
Reaction: A, E, and Bt horizons—very strongly acid to moderately acid; Cr horizon—extremely acid to moderately acid

A horizon:
Color—hue of 10YR, value of 3 or 4, and chroma of 1 or 2
Redoximorphic features—none
Texture—fine sandy loam
Other features—gravel-size fragments of siltstone or sandstone range from none to 10 percent, by volume
Thickness—2 to 9 inches thick

E horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 1 or 2
Redoximorphic features—none
Texture—loam or fine sandy loam
Other features—none
Thickness—2 to 9 inches thick

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3
Redoximorphic features—few or common iron concentrations that are pale brown or pale olive in the upper part and brown and light brownish gray in the lower part
Texture—clay loam, clay, or silty clay
Other features—gravel-size fragments range from 0 to 15 percent, by volume
Thickness—5 to 17 inches thick

Cr horizon:
Color—pale olive, light olive gray, light gray, gray, or light brownish gray
Redoximorphic features—none
Texture—weakly consolidated tuffaceous sandstone and mudstone that is bentonitic but contains volcanic ash, volcanic glass, and other pyroclastic materials
Other features—none

Colita Series

Depth class: Deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Uplands
Parent material: Tuffaceous siltstone and shale
Slope range: 0 to 3 percent
Taxonomic classification: Fine-loamy, siliceous, active, thermic Typic Glossaqualfs
Associated soils: Corrigan, Kitterll, Laska, and Moten
- Corrigan soils have a clayey subsoil and are on nearby slopes
- Kitterll soils are on steeper slopes and have a solum less than 14 inches thick over tuffaceous sandstone
- Laska soils are on slightly convex ridges or mounds and have browner colors throughout
- Moten soils are in similar nearby landscape positions

Typical Pedon

Colita fine sandy loam, 0 to 1 percent slopes, is located from Groveton, 5.4 miles south on Farm Road 355, 4 miles south on Gerald Haynes Road (Old Onalaska Road) to "Y" intersection, 1.3 miles south on timber company road, 100 feet west of road in woods; USGS Chita topographic quadrangle; latitude 30 degrees 55 minutes 30 seconds N.; longitude 95 degrees 09 minutes 27 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; loose, very friable; common fine and medium roots; strongly acid; gradual wavy boundary.
Eg—4 to 11 inches; light brownish gray (10YR 6/2) fine sandy loam; weak fine subangular blocky structure;

loose, very friable; common fine and medium roots; strongly acid; gradual wavy boundary.
Btg/Eg1—11 to 24 inches; dark grayish brown (10YR 4/2) fine sandy loam; 25 percent light brownish gray (10YR 6/2) loamy fine sand (E) intrusions of albic material between peds that are clay depletions resulting from aquic conditions; weak fine subangular blocky structure; slightly hard, friable; few fine and medium roots; few pressure faces; few round quartzite pebbles; moderately acid; gradual wavy boundary.
Btg/Eg2—24 to 39 inches; dark grayish brown (10YR 4/2) sandy clay loam; 10 percent light brownish gray (10YR 6/2) loamy fine sand (E) intrusions of albic material between peds that are clay depletions resulting from aquic conditions; weak medium subangular blocky structure; hard, friable; few fine roots; few pressure faces; common round quartzite pebbles; moderately acid; gradual wavy boundary.
Btg—39 to 43 inches; grayish brown (10YR 5/2) sandy clay loam; weak medium subangular blocky structure; hard, firm; few fine roots; few pressure faces; few fragments of pale yellow (5Y 7/3) shale (C); moderately acid; clear smooth boundary.
Cr—43 to 65 inches; pale yellow (5Y 7/3) shale with texture of clay loam; massive; hard, firm; few dark grayish brown (10YR 4/2) coats on faces of fractures; neutral.

Range in Characteristics

Solum thickness: 40 to 60 inches
Clay content in the control section: 20 to 24 percent
Redoximorphic features: Few to many clay depletions in shades of gray and iron concentrations in shades of brown
Other distinctive soil features: Content of sand coarser than very fine sand is about 44 percent; sodium adsorption ratio is less than 10 throughout
Reaction: A, E, E/B (where present), Btg/E, and Btg horizons—very strongly acid to moderately acid; Cr horizon—neutral

A horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—7 to 20 inches thick

E horizon and E part of E/B horizon (where present):
Color—hue of 10YR, value of 6 or 7, and chroma of 1 or 2
Redoximorphic features—none to common clay depletions in shades of gray and iron concentrations in shades of brown or yellow
Texture—fine sandy loam, very fine sandy loam, or loamy very fine sand
Other features—B part of E/B horizon makes up about 10 to 40 percent, by volume, of the horizon
Thickness—6 to 25 inches thick

Btg/E horizon:
Color—hue of 10YR, value of 4 to 7, and chroma of 1 or 2
Redoximorphic features—common or many iron concentrations in shades of brown and clay depletions in shades of gray
Texture—sandy clay loam, loam, or fine sandy loam
Other features—penetrations of albic streaks into the horizon are mainly along vertical faces of peds and are 2 to 30 millimeters wide and typically extend completely through the horizon; filled crayfish burrows range from few to many
Thickness—4 to 10 inches thick

Btg horizon:
Color—hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2
Redoximorphic features—few to many iron concentrations in shades of brown and clay depletions in shades of gray
Texture—sandy clay loam, clay loam, or silty clay loam
Other features—electrical conductivity ranges from 0 to 2 mmhos/cm
Thickness—3 to 10 inches thick

Cr horizon:
Color—hue of 2.5Y or 5Y, value of 6 or 7, and chroma of 1 to 3
Redoximorphic features—none
Texture—firm, brittle tuffaceous siltstone or shale with texture of silty clay loam or clay loam
Other features—widely scattered deposits of calcium carbonate and other white salts occur in fractures in some pedons
Thickness—20 to 45 inches thick

Corrigan Series

Depth class: Moderately deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Tuffaceous siltstone and mudstone

Slope range: 1 to 12 percent
Taxonomic classification: Fine, smectitic, thermic Albaquic Hapludalfs
Associated soils: Kitterll, Letney, Rayburn, and Tehran
- Kitterll soils are in associated mid and lower, convex slope positions
- Letney and Tehran soils are on nearby slopes, have a sandy epipedon more than 20 inches thick, and have a fine-loamy control section
- Rayburn soils are in slightly higher, convex positions

Typical Pedon

Corrigan loam, 1 to 5 percent slopes, is located from U.S. Highway 287 in Groveton, 10.9 miles south and southwest on Farm Road 355 to Chita community; 2 miles southeast on Carlisle/Chita Road, 200 feet west on old lane, 20 feet north of lane in woods; USGS Chita topographic quadrangle; latitude 30 degrees 54 minutes 25 seconds N.; longitude 95 degrees 11 minutes 58 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loam; weak fine subangular blocky structure; slightly hard, friable; common fine roots; moderately acid; clear wavy boundary.
Bt1—4 to 10 inches; dark grayish brown (10YR 4/2) clay; weak fine subangular blocky structure; very hard, very firm; common fine roots; few clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations; few fine dark gray (2.5Y 4/1) iron depletions; very strongly acid; gradual wavy boundary.
Bt2—10 to 24 inches; grayish brown (10YR 5/2) clay; moderate medium subangular blocky structure; very hard, very firm; few fine roots; few fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations; few clay films on faces of peds; very strongly acid; gradual wavy boundary.
Bt3—24 to 38 inches; dark grayish brown (10YR 4/2) clay; moderate medium subangular blocky structure; very hard, very firm; few fine roots; few clay films on faces of peds; very strongly acid; clear wavy boundary.
Cr—38 to 50 inches; light yellowish brown (2.5Y 6/3) tuffaceous siltstone with texture of clay; common medium distinct brown (10YR 5/3) and common fine distinct brownish yellow (10YR 6/6) lithochromic mottles; very hard, very firm; very strongly acid.

Range in Characteristics

Solum thickness: 20 to 40 inches
Clay content in the control section: 40 to 60 percent
Redoximorphic features: Few or common iron accumulations in shades of red and brown are in the upper part of the subsoil, and iron depletions in shades of gray and olive are in the lower part
Other distinctive soil features: The COLE of the upper Bt horizon is 0.09 to 0.14, but the potential linear extensibility is less than 6 centimeters in the upper 40 inches of the soil
Reaction: A and E (where present) horizons—very strongly acid to moderately acid; Bt horizon—extremely acid to moderately acid; Cr horizon—extremely acid or very strongly acid

A horizon:
Color—hue of 10YR, value of 2 to 4, and chroma of 1 or 2
Redoximorphic features—none
Texture—loam
Other features—where moist values are less than 3.5, the horizon is less than 6 inches thick
Thickness—2 to 7 inches thick

E horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 2
Redoximorphic features—none
Texture—fine sandy loam or loam
Other features—none
Thickness—0 to 7 inches thick

Upper Bt horizon:
Color—hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 2
Redoximorphic features—few or common iron accumulations in shades of red and brown
Texture—clay or silty clay
Other features—none
Thickness—9 to 22 inches thick

Lower Bt horizon:
Color—hue of 10YR, 2.5Y, or 5Y, value of 4 to 7, and chroma of 2 to 4
Redoximorphic features—iron depletions in shades of gray and olive
Texture—clay or silty clay
Other features—none
Thickness—8 to 17 inches thick

Cr horizon:
Texture—weakly consolidated tuffaceous siltstone or mudstone that is bentonitic and contains volcanic ash, volcanic glass, or other pyroclastic materials
Other features—none
Thickness—2 to 30 inches thick

Eastham Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Stream terraces
Parent material: Coastal plain alkaline clayey sediments
Slope range: 0 to 5 percent
Taxonomic classification: Fine, smectitic, thermic Typic Hapluderts
Associated soils: Garner and Gladewater

- Garner soils are in similar or slightly lower positions and have color value of 4 or more within 12 inches of the soil surface
- Gladewater soils are in lower flood plain positions and have a very-fine control section

Typical Pedon

Eastham clay, 0 to 2 percent slopes, is located from Farm Road 230 in Trinity, 2.85 miles south on Texas Highway 19, 350 feet west of four lane right-of-way in pasture; USGS Trinity West topographic quadrangle; latitude 30 degrees 54 minutes 29 seconds N.; longitude 95 degrees 22 minutes 38 seconds W.

A1—0 to 15 inches; very dark gray (10YR 3/1) clay; moderate fine and medium angular blocky structure; very hard, very firm; many fine and medium roots; few fine vesicular and tubular pores; few quartzite pebbles; neutral; clear wavy boundary.

A2—15 to 22 inches; very dark gray (10YR 3/1) clay; few fine faint dark gray (10YR 4/1) relict iron depletions and few fine distinct strong brown (7.5YR 5/6) relict iron concentrations; moderate medium angular blocky structure; very hard, very firm; many fine and medium roots; few fine vesicular and tubular pores; few pressure faces; few quartzite pebbles; slightly acid; gradual wavy boundary.

Bss1—22 to 33 inches; dark gray (10YR 4/1) clay; common medium prominent red (2.5YR 5/8) relict iron concentrations and few medium distinct very dark gray (10YR 3/1) organic concentrations; moderate medium and coarse angular blocky structure; very hard, very firm; common fine roots; few fine vesicular and tubular pores; many slickensides; few fine masses, concretions, and threads of calcium carbonate; few quartzite pebbles; slightly acid; gradual wavy boundary.

Bss2—33 to 40 inches; gray (10YR 5/1) clay; few fine prominent strong brown (7.5YR 5/8) relict concentrations; moderate medium angular blocky structure; very hard, very firm; common fine roots; few fine vesicular and tubular pores; many slickensides that are tilted 45 to 50 degrees from horizontal; few hard iron-manganese concretions; few fine masses, concretions, and threads of calcium carbonate; few quartzite pebbles; neutral; clear wavy boundary.

Bkss—40 to 56 inches; dark grayish brown (2.5Y 4/2) clay; many fine distinct light yellowish brown (10YR 6/4) relict concentrations; moderate medium angular blocky structure; very hard, very firm; common fine roots throughout; few fine vesicular and tubular pores; many slickensides; few hard iron-manganese concretions; many fine masses and threads of calcium carbonate; weakly effervescent; moderately alkaline; clear wavy boundary.

BCkss—56 to 80 inches; dark yellowish brown (10YR 6/4) clay; common medium distinct light gray (2.5Y 7/2) relict iron depletions; moderate coarse angular blocky structure; very hard, very firm; few fine roots; few fine vesicular and tubular pores; common slickensides; few hard iron-manganese concretions; many fine concretions and masses and few fine threads of calcium carbonate; weakly effervescent; moderately alkaline; gradual wavy boundary.

Range in Characteristics

Solum thickness: More than 80 inches thick
Clay content in the control section: 40 to 60 percent
Redoximorphic features: Relict iron concentrations in shades of brown, yellow, or olive and iron depletions in shades of gray range from none to common
Other distinctive soil features: Unless cultivated, there is galgai microrelief with microknolls about 6 to 10 inches higher than microdepressions; when dry, cracks 1 to 3 inches wide extend from the surface to a depth of more than 40 inches, and the cracks are open for 60 to 90 cumulative days during most years; slickensides begin at a depth of 12 to 22 inches; the amplitude of waviness of mollic to nonmollic colors ranges from 20 inches thick on the microknolls to about 50 inches in the microdepressions
Reaction: A horizon—moderately acid to slightly alkaline; Bss horizon—moderately acid to moderately alkaline; Bkss, BCss (where present), and BCkss horizons—neutral to moderately alkaline

A horizon:
Color—hue of 10YR or 5Y, value of 2 or 3, and chroma of 1 or less
Redoximorphic features—none

Texture—clay
Other features—thickness is variable due to microrelief, ranging from 6 inches on the microknolls to 22 inches in the microdepressions
Thickness—12 to 22 inches thick

Bss and Bkss horizons:
Color—hue of 10YR, 2.5Y, or 5Y, value of 3 to 6, and chroma of 2 or less
Redoximorphic features—relict iron concentrations in shades of brown, yellow, or olive range from none to common
Texture—clay
Other features—concretions, masses, and threads of calcium carbonate range from none to common
Thickness—18 to 40 inches thick

BCss horizon (where present) and BCkss horizon:
Color—hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1, 2, 3, 4, or 6
Redoximorphic features—relict iron concentrations in shades of brown, yellow, and olive and iron depletions in shades of gray range from few to many
Texture—clay
Other features—few or common concretions, masses, and threads of calcium carbonate; none to few gypsum crystals
Thickness—10 to 26 inches thick

Etoile Series

Depth class: Deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Clayey coastal plain sediments
Slope range: 1 to 20 percent
Taxonomic classification: Fine, smectitic, thermic Vertic Hapludalfs
Associated soils: Herty and Moswell
- Herty and Moswell soils are more acid throughout the subsoil; in addition, Herty soils are grayish throughout

Typical Pedon

Etoile loam, 1 to 3 percent slopes, is located from Farm Road 355 in Groveton, 1.3 miles east on U.S. Highway 287, 10 miles northeast on Farm Road 2262, 2 miles north on Farm Road 357, 100 feet west on lane, 100 feet north in woods; USGS Apple Springs topographic quadrangle; latitude 31 degrees 08 minutes 56 seconds N.; longitude 94 degrees 57 minutes 16 seconds W.

A—0 to 4 inches; dark brown (10YR 3/3) loam; weak fine granular structure; soft, friable; common fine roots; moderately acid; clear wavy boundary.
E—4 to 7 inches; yellowish brown (10YR 5/4) loam; massive; slightly hard, friable; common fine roots; moderately acid; clear wavy boundary.
Bt1—7 to 15 inches; red (2.5YR 4/8) clay; common fine distinct brownish yellow (10YR 6/6) relict iron concentrations and common medium distinct gray (10YR 6/1) relict iron depletions; weak medium subangular blocky structure; very hard, very firm; common fine roots; few pressure faces; common clay films; strongly acid; gradual wavy boundary.
Bt2—15 to 32 inches; 35 percent red (2.5YR 4/8), 25 percent yellowish brown (10YR 5/6), 20 percent brownish yellow (10YR 6/6), and 20 percent gray (10YR 6/1) clay; weak fine angular blocky structure; very hard, very firm; few fine roots; common pressure faces; common clay films; strongly acid; gradual wavy boundary.
Btss1—32 to 38 inches; gray (10YR 6/1) clay; many medium distinct yellowish brown (10YR 5/6) and few fine prominent red relict iron concentrations; common medium faint light gray (10YR 7/1) relict iron depletions; strong fine angular blocky structure; extremely hard, extremely firm; few fine roots; common slickensides; moderately acid; clear wavy boundary.
Btss2—38 to 54 inches; 45 percent gray (10YR 6/1), 30 percent light gray (10YR 7/1), and 25 percent light olive brown (2.5Y 5/4) clay; strong fine angular blocky structure; extremely hard, extremely firm; few fine roots; common slickensides; many hard iron-manganese concretions; few ironstone pebbles; neutral; clear wavy boundary.
BCssk—54 to 58 inches; 35 percent gray (10YR 5/1), 35 percent light olive brown (2.5Y 5/4), and 30 percent yellowish brown (10YR 5/6) clay; strong fine angular blocky structure; extremely hard, extremely firm; few fine roots; common slickensides; common calcium carbonate concretions; few ironstone pebbles; slightly alkaline; clear wavy boundary.
Ck—58 to 66 inches; 25 percent light olive brown (2.5Y 5/4), 25 percent olive brown (2.5Y 4/4), 25 percent gray (10YR 5/1), and 25 percent yellowish brown (10YR 5/8) shale with texture of clay; massive; extremely hard, extremely firm; few calcium carbonate concretions; slightly alkaline; clear wavy boundary.
Cy1—66 to 72 inches; 25 percent brownish yellow (10YR 6/8), 25 percent white (10YR 8/1), 25 percent gray (10YR 6/1), and 25 percent light olive brown (2.5Y 5/4) shale with texture of clay;

massive; extremely hard, extremely firm; common gypsum crystals; slightly alkaline; gradual wavy boundary.

Cy2—72 to 80 inches; light olive gray (5Y 6/2) shale with texture of clay; common fine distinct brownish yellow (10YR 6/8) relict concentrations; massive; extremely hard, extremely firm; few gypsum crystals; moderately alkaline.

Range in Characteristics

Solum thickness: 40 to 60 inches

Clay content in the control section: 40 to 60 percent

Redoximorphic features: Relict iron depletions with chroma of 2 or less and relict iron concentrations with chroma of 3 or more are throughout the subsoil and substratum

Other distinctive soil features: Cracks 1/2 inch or more wide in the top of the argillic horizon extend to a depth of more than 12 inches for 60 to 90 cumulative days in most years; subhorizon of the argillic horizon more than 6 inches thick has slickensides and wedge-shaped peds

Reaction: A and E horizons—strongly acid to slightly acid; Bt and upper Btss horizons—strongly acid or moderately acid; lower Btss, Btkss (where present), and BC horizons—slightly acid to moderately alkaline; Ck and Cy horizons—neutral to moderately alkaline

A horizon:
- Color—hue of 10YR, value of 3 to 5, and chroma of 2 or 3
- Redoximorphic features—none
- Texture—loam
- Other features—none
- Thickness—3 to 6 inches thick

E horizon:
- Color—hue of 10YR, value of 5 or 6, and chroma of 2 to 4
- Redoximorphic features—none
- Texture—fine sandy loam, very fine sandy loam, or loam
- Other features—none
- Thickness—0 to 6 inches thick

Bt horizon:
- Color—hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 4, 6, or 8
- Redoximorphic features—relict iron concentrations in shades of red or brown and relict iron depletions in shades of gray are few or common
- Texture—clay
- Other features—none
- Thickness—4 to 12 inches thick

Btss horizon and Btkss horizon (where present):
- Color—matrix colors mainly in shades of brown, gray, or olive
- Redoximorphic features—relict iron concentrations in shades of red or yellow and relict iron depletions in shades of gray are few or common
- Texture—clay or silty clay
- Other features—calcium carbonate films, masses, or concretions range from none to few in the upper part and from few to many in the lower part of most pedons
- Thickness—20 to 45 inches thick

BC horizon:
- Color—matrix colors mainly in shades of brown, gray, or olive
- Redoximorphic features—relict iron concentrations in shades of red or yellow and relict iron depletions in shades of gray are few or common
- Texture—clay or silty clay
- Other features—calcium carbonate films, masses, or concretions range from few to many in the lower part of most pedons
- Thickness—20 to 45 inches thick

Ck and Cy horizons:
- Color—shades of gray, brown, or yellow
- Redoximorphic features—relict iron concentrations in shades of red or yellow and relict iron depletions in shades of gray are few or common
- Texture—variegated, bedded, or platy shale or marl and shale with clay loam or clay texture
- Other features—concretions, seams, and/or masses of calcium carbonate range from few to many in most pedons

Fuller Series

Depth class: Deep

Drainage class: Somewhat poorly drained

Permeability: Very slow

Landscape: Coastal plain

Landform: Uplands

Parent material: Stratified mudstone or shale

Slope range: 0 to 3 percent

Taxonomic classification: Fine-loamy, siliceous, superactive, thermic Albic Glossic Natraqualfs

Associated soils: Keltys, Kurth, and Penning

- Keltys and Kurth soils are in slightly higher landscape positions and are better drained; in addition, Keltys soils are in a coarse-loamy family, and Kurth soils have chroma of more than 2 in the Bt horizon
- Penning soils are in similar positions and have higher chroma colors in the subsoil

Typical Pedon

Fuller fine sandy loam, 1 to 3 percent slopes, is located from Pennington, 7.1 miles east on Farm Road 358, 3.5 miles northwest on U.S. Forest Service Road 502, 100 feet south on road in woods; USGS Pennington topographic quadrangle; latitude 31 degrees 14 minutes 00 seconds N.; longitude 95 degrees 08 minutes 18 seconds W.

A—0 to 7 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium granular structure; soft, friable; many fine medium and coarse roots; very strongly acid; clear smooth boundary.

Eg—7 to 27 inches; light brownish gray (10YR 6/2) fine sandy loam; weak fine granular structure; soft, friable; common fine roots; very strongly acid; gradual wavy boundary.

Btng/Eg1—27 to 35 inches; 70 percent grayish brown (10YR 5/2) loam (Bt); 30 percent light gray (10YR 7/2) sandy loam (Eg) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; weak fine subangular blocky structure; hard, friable; few fine roots; few clay films; very strongly acid; gradual wavy boundary.

Btng/Eg2—35 to 45 inches; 75 percent grayish brown (10YR 5/2) loam; 25 percent light gray (10YR 7/2) sandy loam (Eg) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; weak fine subangular blocky structure; hard, friable; common fine roots; few clay films; few pockets of white salts; few fine distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation with diffuse boundaries throughout; very strongly acid; gradual smooth boundary.

2C—45 to 65 inches; light brownish gray (2.5Y 6/2) mudstone; massive; hard, firm; few masses of white salts; very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches

Clay content in the control section: 18 to 35 percent

Redoximorphic features: Depleted matrix with iron concentrations and clay depletions

Other distinctive soil features: Sodium adsorption ratio ranges from 13 to 20 in the upper part of the control section

Reaction: A and E horizons—very strongly acid to moderately acid; Btng/E horizon—slightly acid to moderately alkaline; 2C horizon—neutral to moderately alkaline (reaction in the subsoil and substratum vary seasonally, however, and become very strongly acid during the dry parts of the year)

A horizon:

- Color—hue of 10YR, value of 3 to 5, and chroma of 2
- Redoximorphic features—none
- Texture—fine sandy loam
- Other features—aluminum saturation of the A horizon and upper E horizon ranges from 20 to 40 percent
- Thickness—3 to 8 inches thick

Eg horizon:

- Color—hue of 10YR, value of 4 to 7, and chroma of 1 or 2
- Redoximorphic features—depleted matrix with none to many iron concentrations in shades of red and brown
- Texture—fine sandy loam, very fine sandy loam, or loam
- Other features—in most pedons, the E horizon contains wavy strata of silty clay loam material that has hue of 10YR, with value of 4 or 5, and chroma of 1 or 2; sodium adsorption ratio ranges from 1 to 5 in the lower E horizon
- Thickness—18 to 40 inches thick

Btng/E horizon:

- Color—hue of 10YR, value of 3 to 5, and chroma of 1 or 2
- Redoximorphic features—depleted matrix with none to many iron concentrations in shades of red and brown
- Texture—loam, clay loam, or silty clay loam
- Other features—E part consists of intrusions of albic material or filled crayfish holes in hue of 10YR, value of 5 to 7, and chroma of 2 or 3; this gives a color pattern with yellow or olive interiors, dark gray rinds, and grayish filling between
- Thickness—6 to 20 inches thick

2C horizon:

- Color—hue of 10YR, 2.5Y, and 5Y, value of 5 to 7, and chroma of 2 to 4.
- Redoximorphic features—lithochromic mottles in shades of brown or yellow range from none to common and are mainly in the interior of peds
- Texture—conchoidally fractured mudstone that has texture of loam, clay, or clay loam
- Other features—barite and gypsum range from a few masses or crystals to less than 3 percent in most pedons; electrical conductivity ranges from 1 to 4 mmhos/cm; sodium adsorption ratio ranges from 10 to 20, but is greater than 13 in the upper part
- Thickness—6 to 15 inches thick

Garner Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Ancient stream terraces
Parent material: Clayey alluvial sediments
Slope range: 0 to 1 percent
Taxonomic classification: Fine, smectitic, thermic Oxyaquic Hapluderts
Associated soils: Annona and Eastham
- Annona and Eastham soils are in slightly higher terrace positions; in addition, Annona soils have an argillic horizon

Typical Pedon

Garner clay, 0 to 1 percent slopes, is located from Groveton, 13.8 miles south and southwest on Farm Road 355, 5.1 miles east on Farm Road 356, 200 feet north of highway in Gibbs tract, USGS Carlisle topographic quadrangle; latitude 30 degrees 51 minutes 39 seconds N.; longitude 95 degrees 11 minutes 32 seconds W.

A—0 to 3 inches; dark gray (10YR 4/1) clay; many medium distinct dark brown (10YR 3/3) and yellowish brown (10YR 5/4) iron concentrations; moderate medium subangular blocky structure; very hard, very firm; many fine and medium roots; few fine pores; common worm casts; strongly acid; clear wavy boundary.

Bw—3 to 11 inches; dark grayish brown (10YR 4/2) clay; moderate medium subangular blocky structure; extremely hard, very firm; many fine and medium roots; few fine pores; common worm casts; few slickenslides; many medium distinct brownish yellow (10YR 6/6) iron concentrations and many medium distinct light brownish gray (10YR 6/2) iron depletions; strongly acid; gradual wavy boundary.

Bss1—11 to 21 inches; light brownish gray (10YR 6/2) clay; moderate medium subangular blocky parting to moderate medium angular blocky structure; extremely hard, very firm; many fine and medium roots; few fine pores; common worm casts; many medium distinct brownish yellow (10YR 6/6) iron concentrations; common slickenslides; moderately acid; gradual wavy boundary.

Bss2—21 to 33 inches; light gray (10YR 7/1) clay; common medium distinct yellowish brown (10YR 5/8) iron concentrations; moderate medium angular blocky structure; extremely hard, very firm; common fine and medium roots; few fine pores; common worm casts; common slickensides; moderately acid; gradual wavy boundary.

Bss3—33 to 40 inches; light brownish gray (10YR 6/2) clay; common medium distinct yellowish brown (10YR 5/8) iron concentrations; moderate fine angular blocky structure; extremely hard, very firm; common fine roots; few fine pores; common worm casts; common slickensides; moderately acid; gradual wavy boundary.

Bss4—40 to 51 inches; gray (10YR 6/1) clay; common fine and medium distinct yellowish brown (10YR 5/8) iron concentrations; moderate fine angular blocky structure; extremely hard, very firm; common fine roots; few fine pores; common worm casts; common slickensides; moderately acid; clear wavy boundary.

BCss—51 to 80 inches; dark grayish brown (10YR 4/2) clay; common fine distinct yellow (10YR 7/6) iron concentrations; weak moderate subangular blocky structure; extremely hard, very firm; common fine roots; few fine pores; common worm casts; common slickensides; few streaks of pale yellow (2.5Y 7/4) C material; moderately acid.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 40 to 60 percent
Redoximorphic features: Redoximorphic features are considered to be mainly relict, and the soil does not have aquic conditions during most years
Other distinctive soil features: When dry, cracks 1/2 to more than 1 inch wide extend from the surface to a depth of more than 12 inches; depth to slickensides and/or wedge-shaped peds ranges from 10 to 24 inches; undisturbed areas have gilgai microrelief with microknolls 3 to 15 inches above the microdepressions; distance from the center of the microknoll to the center of the microdepression ranges from 4 to about 15 feet
Reaction: A horizon—strongly acid to slightly alkaline; Bw, Bss, and BCss horizons—strongly acid to moderately alkaline

A horizon:
Color—hue of 10YR, value of 3 or 4, and chroma of 1
Redoximorphic features—iron concentrations in shades of brown and iron depletions in shades of gray range from none to common
Texture—clay
Other features—none
Thickness—3 to 10 inches thick

Bw horizon:
Color—hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2
Redoximorphic features—iron concentrations in shades of brown, yellow, or red; iron depletions in shades of gray with sharp boundaries
Texture—clay
Other features—none
Thickness—0 to 12 inches thick

Bss and BCss horizons:
Color—hue of 10YR, 2.5Y, or 5Y, value of 4 to 7, and chroma of 1 or 2
Redoximorphic features—iron concentrations in shades of brown, yellow, or red and iron depletions in shades of gray with sharp boundaries range from few to a variegated matrix of these colors
Texture—clay
Other features—some pedons have few or common masses and/or concretions of calcium carbonate in the lower part; gypsum crystals are few or common in some pedons
Thickness—20 to 60 inches thick

Gladewater Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Flood plains
Parent material: Clayey alluvial sediments
Slope range: 0 to 1 percent
Taxonomic classification: Very-fine, smectitic, thermic Chromic Endoaquerts
Associated soils: Garner and Eastham
- Garner and Eastham soils have a fine-textured control section and are in higher landscape positions

Typical Pedon

Gladewater clay, 0 to 1 percent slopes, frequently flooded, is located from Farm Road 230 in Trinity, 2.5 miles south on Texas Highway 19, 1.4 miles west on farm road, 900 feet south of road in pasture; USGS Trinity West topographic quadrangle; latitude 30 degrees 54 minutes 15 seconds N.; longitude 95 degrees 23 minutes 52 seconds W.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) clay; moderate medium subangular blocky structure; very hard, very firm; common fine and medium roots; few worm casts; few fine dark brown (7.5YR 3/4) iron stains; slightly acid; clear wavy boundary.
Bssg1—11 to 25 inches; dark gray (10YR 4/1) clay; moderate medium angular blocky structure; very hard, very firm; common fine and medium roots; common slickensides; many medium prominent yellowish red (5YR 5/8) redoximorphic concentrations; moderately acid; gradual wavy boundary.
Bssg2—25 to 48 inches; dark gray (10YR 4/1) clay; moderate medium angular blocky structure; extremely hard, very firm; common fine and medium roots; common slickensides; common fine distinct yellowish brown (10YR 5/8) and common medium prominent yellowish red (5YR 5/8) redoximorphic concentrations; slightly acid; gradual wavy boundary.
Bssg3—48 to 64 inches; very dark gray (10YR 3/1) clay; moderate medium angular blocky structure; extremely hard, very firm; common fine roots; few fine faint brown redoximorphic concentrations; common slickensides; slightly acid; gradual wavy boundary.
Bssg4—64 to 80 inches; dark grayish brown (10YR 4/2) clay; moderate medium angular blocky structure; extremely hard, very firm; common fine roots; common slickensides; common medium faint dark gray (10YR 4/1) coatings along cracks; neutral.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 60 to 75 percent
Redoximorphic features: Iron depletions in shades of gray and iron concentrations in shades of brown or yellow range from few to many throughout the subsoil
Other distinctive soil features: This is a cyclic soil, and undisturbed areas have gilgai microrelief with microknolls 6 to 10 inches higher than microdepressions; distance from the center of the microknoll to the center of the microdepression ranges from about 4 to 12 feet; microknoll makes up about 20 percent, the intermediate area between the knoll and depression about 50 percent, and the microdepression about 30 percent; amplitude of waviness between the A horizon and high value colors in the lower horizons ranges from about 3 to 16 inches; chimneys of high value materials on microknolls make up less than 3 percent of the surface area; cracks 1/2 inch to 2 inches wide extend from the surface to a depth of more than 20 inches when the soil is dry, and the cracks remain open for less than 90 cumulative

days in most years; intersecting slickensides begin at a depth of 10 to 24 inches and extend throughout the solum

Reaction: A horizon—moderately acid to neutral; Bg (where present) and upper Bssg horizons—very strongly acid to slightly acid; lower Bssg horizon—very strongly acid to neutral

A or Ap horizon:
Color—hue of 10YR, value of 2 to 5, and chroma of 1 or 2
Redoximorphic features—none
Texture—clay
Other features—none

Bg horizon (where present):
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1, or value of 6 with chroma 1 or 2
Redoximorphic features—iron depletions in shades of gray and iron concentrations in shades of brown or yellow range from few to many
Texture—clay
Other features—none

Bssg horizon and BCssg horizon (where present):
Color—hue of 10YR or 2.5Y, value of 3 to 6, and chroma 1 or 2
Redoximorphic features—iron depletions in shades of gray and iron concentrations in shades of brown or yellow range from few to many
Texture—clay
Other features—gypsum crystals range from none to common in the lower part

Hainesville Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Rapid
Landscape: Coastal plain
Landform: Stream terraces
Parent material: Coastal plain sandy alluvial sediments
Slope range: 0 to 2 percent
Taxonomic classification: Thermic, coated Lamellic Quartzipsamments
Associated soils: Alazan and Austonio
- Alazan soils are in slightly lower positions and are wetter
- Austonio soils are in slightly higher positions and have a loamy argillic horizon

Typical Pedon

Hainesville loamy fine sand, 0 to 2 percent slopes, is located from Groveton, 1.3 miles east on U.S. Highway 287, 15.4 miles northeast on Farm Road 2262 to intersection with Farm Road 357, 2.2 miles north continuing on Farm Road 2262, 0.4 mile east on U.S. Forest Service Road 510-F, 0.5 mile southeast on U.S. Forest Service Road 510-G, 0.7 mile south and southeast on road in woods, 80 feet north of road in woods; USGS Diboll topographic quadrangle; latitude 31 degrees 09 minutes 28 seconds N.; longitude 94 degrees 52 minutes 17 seconds W.

A1—0 to 3 inches; dark brown (10YR 3/3) loamy fine sand; single grained; loose, very friable; many fine and medium roots; strongly acid; clear smooth boundary.
A2—3 to 7 inches; dark yellowish brown (10YR 3/4) loamy fine sand; weak coarse subangular blocky structure; loose, very friable; strongly acid; abrupt smooth boundary.
B/E—7 to 18 inches; yellowish brown (10YR 5/6) loamy fine sand; 5 percent pale brown (10YR 6/3) spots of uncoated sand (E); weak coarse subangular blocky structure; loose, very friable; common fine roots; strongly acid; gradual smooth boundary.
Bw1—18 to 33 inches; yellowish brown (10YR 5/6) loamy fine sand; weak coarse subangular blocky structure; loose, very friable; common fine roots; strongly acid; clear wavy boundary.
Bw2—33 to 38 inches; yellowish brown (10YR 6/6) loamy fine sand; weak coarse subangular blocky structure; loose, very friable; common fine roots; common medium faint yellowish brown (10YR 5/4) pockets of fine sand; very strongly acid; gradual wavy boundary.
Bw3—38 to 54 inches; yellowish brown (10YR 6/6) loamy fine sand; weak coarse subangular blocky structure; loose, very friable; common fine roots; few dark brown (7.5YR 4/4) lamellae less than 0.5 centimeters thick; very strongly acid; gradual wavy boundary.
B&E—54 to 80 inches; yellowish brown (10YR 6/6) loamy fine sand; weak coarse subangular blocky structure; loose, very friable; common fine roots; few strong brown (7.5YR 5/6) lamellae less than 0.5 centimeters thick; very strongly acid.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 10 to 18 percent
Redoximorphic features: None
Other distinctive soil features: Lamellae are within a depth of 40 to 72 inches and range from 0.1 to 2.5 centimeters thick, and the cumulative thickness is less than 6 inches (15 centimeters); the soil is dry in the moisture control section 60 to 90 cumulative days in most years; rounded quartzite or ironstone

pebbles range from very few to about 3 percent in most pedons
Reaction: Very strongly acid to slightly acid throughout

A or Ap horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 3 or 4
Redoximorphic features—none
Texture—loamy fine sand
Other features—none
Thickness—3 to 8 inches thick

E part of B/E horizon, E horizon (where present) and E part of E/B horizon (where present):
Color—hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 3 or 4
Redoximorphic features—none
Texture—fine sand or loamy fine sand
Other features—none
Thickness—0 to 15 inches thick

B part of B/E, Bw, and B&E horizons and B part of E/B horizon (where present):
Color—hue of 5YR, 7.5YR, or 10YR, value of 5 to 7, and chroma of 6 or 8
Redoximorphic features—none
Texture—fine sand or loamy fine sand
Other features—B&E horizon has lamellae
Thickness—40 to 70 inches thick

Herty Series

Depth class: Deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Coastal plain shale
Slope range: 0 to 3 percent
Taxonomic classification: Fine, smectitic, thermic Oxyaquic Vertic Hapludalfs
Associated soils: Fuller, Keltys, and Moswell
- Fuller soils are in similar landscape positions and have less than 35 percent clay throughout
- Keltys and Moswell soils are in slightly higher, better drained positions; in addition, Keltys soils have a coarse-loamy particle-size control section, and Moswell soils have a very-fine control section, are well drained, and are reddish in the upper Bt horizon

Typical Pedon

Herty loam, 1 to 3 percent slopes, is located from Groveton, 12.5 miles northwest on U.S. Highway 287, 0.4 mile north on county road, 50 feet east of road in woodland; USGS Pennington topographic quadrangle; latitude 31 degrees 08 minutes 47 seconds N.; longitude 95 degrees 12 minutes 30 seconds W.

A—0 to 3 inches; dark brown (10YR 4/3) loam; weak fine subangular blocky structure; slightly hard, friable; many coarse and medium roots; very strongly acid; clear smooth boundary.
E—3 to 8 inches; grayish brown (10YR 5/2) loam; weak fine subangular blocky structure; many coarse and medium roots; slightly hard, friable; very strongly acid; clear smooth boundary.
Bt—8 to 23 inches; dark grayish brown (10YR 4/2) clay; weak medium angular blocky structure; extremely hard, extremely firm; many coarse, medium, and fine roots; few pressure faces; few patchy clay films; very strongly acid; gradual wavy boundary.
Btss—23 to 48 inches; dark grayish brown (10YR 4/2) clay; weak medium angular blocky structure; extremely hard, extremely firm; common fine and medium roots; common slickensides; common clay films; few fine faint light brownish gray (10YR 6/2) clay depletions on surfaces of peds; strongly acid; gradual wavy boundary.
2Cy—48 to 80 inches; brown (10YR 5/3) shale with texture of clay; massive; extremely hard, extremely firm; few fine roots; 5 to 10 percent gypsum; few black iron-manganese coatings; very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches
Clay content in the control section: 35 to 45 percent
Redoximorphic features: Depleted matrix with iron concentrations throughout the subsoil; redoximorphic features are both contemporary and relict; the soil does not have aquic soil conditions in most years
Other distinctive soil features: When dry, the soil has cracks 1/2 inch wide or more in the subsoil that extend to a depth of more than 12 inches; the soil is dry in the moisture control section for 60 to 90 days in most years; depth to slickensides and/or wedge-shaped peds ranges from 12 to 26 inches; the exchangeable sodium ranges from 8 to 20 percent, and the sodium adsorption ratio ranges from 6 to 13 throughout the argillic horizon; the soil is seasonally wet in the surface layer and upper part of the subsoil
Reaction: A and E horizons—very strongly acid to moderately acid; Bt horizon—extremely acid to strongly acid; Btss horizon—extremely acid to moderately acid; 2Cy horizon—extremely acid to slightly acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3
Redoximorphic features—none
Texture—loam
Other features—none
Thickness—2 to 10 inches thick

E horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 1 to 3
Redoximorphic features—none
Texture—very fine sandy loam, loam, or silt loam
Other features—none
Thickness—0 to 10 inches thick

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2
Redoximorphic features—depleted matrix with few or common iron concentrations in shades of red or brown
Texture—clay loam, silty clay loam, silty clay, or clay
Other features—salinity ranges from nonsaline to slightly saline; gypsum crystals or crystalline masses make up 2 to 35 percent, by volume, in the lower subhorizons of most pedons
Thickness—4 to 30 inches thick

Btss horizon and BCss horizon (where present):
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2
Redoximorphic features—depleted matrix with none to common iron concentrations or depletions
Texture—clay or silty clay with clay content of 40 to 60 percent
Other features—salinity ranges from very slightly saline to moderately saline; gypsum ranges from 2 to 35 percent, by volume, and is in very fine crystalline masses or large crystals up to 10 centimeters across
Thickness—4 to 30 inches thick

2Cy horizon:
Color—hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 2 to 4
Redoximorphic features—none
Texture—shale or mudstone with texture of clay loam or clay
Other features—visible gypsum and barite crystals are in most pedons; calcite, jarosite, and natrojarosite are in some pedons
Thickness—0 to 15 inches thick

Kellison Series

Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Coastal plain shale
Slope range: 3 to 15 percent
Taxonomic classification: Fine, smectitic, thermic Vertic Hapludalfs
Associated soils: Etoile, Fuller, Herty, Keltys, Kurth, and Moswell

- Etoile soils are in flat to concave positions
- Fuller soils are in lower positions and are somewhat poorly drained
- Herty soils are in more level positions and are moderately well drained
- Keltys and Kurth soils have a loamy control section and are in similar positions
- Moswell soils have a very-fine control section and are in similar or slightly lower positions

Typical Pedon

Kellison loam, 5 to 15 percent slopes, is located from the Courthouse in Groveton, 6.35 miles northwest on U.S. Highway 287, 2 miles west on Farm Road 1280, 0.3 mile north on private lane to Champion property, 0.3 mile northwest on logging road, 50 feet south of road in pine plantation; USGS Pennington topographic quadrangle; latitude 31 degrees 07 minutes 45 seconds N.; longitude 95 degrees 14 minutes 04 seconds W.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) loam; weak medium granular structure; hard, friable; common fine and medium roots; moderately acid; clear wavy boundary.
Bt—3 to 12 inches; dark grayish brown (10YR 4/2) clay; weak medium subangular blocky structure; very hard, very firm; common fine and medium roots; few pressure faces; few patchy clay films; very strongly acid; gradual wavy boundary.
Btss—12 to 28 inches; brown (10YR 5/3) clay; moderate medium angular blocky structure; very hard, very firm; few fine roots; common slickensides; common clay films; very strongly acid; gradual wavy boundary.
Bt/C—28 to 40 inches; 95 percent brown (10YR 5/3) clay (Bt); 5 percent pale yellow (2.5Y 7/3) soft weathered shale (C) with texture of clay; weak medium subangular blocky structure; very hard, very firm; few slickensides; few clay films; very strongly acid; clear wavy boundary.

C/B—40 to 50 inches; 90 percent pale yellow (2.5Y 7/3) soft weathered shale (C) with texture of clay; 10 percent brown (10YR 5/3) clay (B); very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches
Clay content in the control section: 45 to 60 percent
Redoximorphic features: Relict iron concentrations
Other distinctive soil features: When dry, the soil has cracks that extend from the surface to a depth of 12 inches or more for 60 to 80 days during most years; slickensides begin at a depth of 12 to 24 inches; sodium adsorption ratio ranges from 2 to 9 in the upper Bt horizon and from 2 to 12 in the lower part, and it commonly increases with depth
Reaction: A and E (where present) horizons—very strongly acid to moderately acid; Bt and Btss horizons—extremely acid to strongly acid; C horizon—very strongly acid to neutral

A horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 3
Redoximorphic features—none
Texture—loam
Other features—none
Thickness—2 to 6 inches thick

E horizon (where present):
Color—hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3
Redoximorphic features—none
Texture—very fine sandy loam or loam
Other features—none
Thickness—0 to 6 inches thick

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 or 3
Redoximorphic features—few or common relict iron concentrations in shades of red or brown
Texture—clay loam, silty clay, or clay
Other features—none
Thickness—7 to 21 inches thick

Btss horizon:
Color—hue of 10YR, 2.5Y, or 5Y, value of 3 to 7, and chroma of 2 to 4
Redoximorphic features—few or common relict iron concentrations in shades of red or brown
Texture—silty clay or clay
Other features—masses and/or crystals of gypsum, mainly in the lower part, range from none to common
Thickness—20 to 30 inches thick

C/B or C horizon:
Color—hue of 7.5YR, 10YR, 2.5Y, or 5Y, value of 3 to 7, and chroma of 1 to 3
Redoximorphic features—none
Texture—shale or shale interbedded with mudstone with texture of clay loam or clay
Other features—masses and/or crystals of gypsum range from few to many in most pedons; sodium adsorption ratio ranges from 2 to 13

Keltys Series

Depth class: Deep
Drainage class: Moderately well drained
Permeability: Slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Coastal plain mudstone
Slope range: 1 to 8 percent
Taxonomic classification: Coarse-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs
Associated soils: Fuller, Herty, Kurth, Penning, and Rosenwall
- Fuller and Penning soils are somewhat poorly drained and are in slightly lower positions
- Herty and Rosenwall soils are in similar positions and have a clayey argillic horizon
- Kurth soils are in similar positions

Typical Pedon

Keltys fine sandy loam, 1 to 3 percent slopes, is located in woodland from Pennington, 7.1 miles east on Farm Road 358, 0.8 mile northwest on U.S. Forest Service Road 502, 1 mile north on U.S. Forest Service Road 505, 100 feet west of road, USGS Crecy topographic quadrangle; latitude 31 degrees 12 minutes 57 seconds N.; longitude 95 degrees 07 minutes 29 seconds W.

A—0 to 6 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; slightly hard, very friable; common fine and medium roots; strongly acid; clear smooth boundary.
E—6 to 14 inches; pale brown (10YR 6/3) fine sandy loam; weak fine granular structure; loose, very friable; common fine roots; strongly acid; clear smooth boundary.
Bt/E—14 to 36 inches; 75 percent brownish yellow (10YR 6/6) loam (Bt); 25 percent light brownish gray (10YR 6/2) fine sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds; moderate medium subangular blocky structure; slightly hard, friable; common fine roots; few patchy clay films; very strongly acid; gradual wavy boundary.

E/Bt—36 to 56 inches; 60 percent pale brown (10YR 6/3) sandy loam (E); 40 percent brownish yellow (10YR 6/6) loam (Bt); few medium distinct reddish yellow (7.5YR 6/8) iron concentrations; moderate medium subangular blocky structure; slightly hard, friable; common fine roots; common patchy clay films; very strongly acid; abrupt wavy boundary.
2C1—56 to 62 inches; light brownish gray (2.5Y 6/2) mudstone with texture of clay loam; common medium distinct light yellowish brown (10YR 6/4) iron concentrations; massive; hard; few white spots of salts; very strongly acid; clear wavy boundary.
2C2—62 to 86 inches; light gray (2.5Y 7/2) mudstone with texture of clay loam; common medium distinct brownish yellow (10YR 6/6) lithochromic mottles; massive; hard; very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches
Clay content in the control section: 9 to 17 percent
Redoximorphic features: Iron concentrations or masses in shades of red or brown range from none to common in the subsoil
Other distinctive soil features: None
Reaction: A horizon—strongly acid to slightly acid; E horizon—strongly acid or moderately acid; Bt/E and E/Bt horizons—extremely acid to strongly acid; 2C horizon—very strongly acid to slightly acid

A horizon:
Color—hue of 10YR, value of 3 or 4, and chroma of 2 or 3
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—7 to 27 inches thick

E horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 2 or 3
Redoximorphic features—none
Texture—fine sandy loam or loamy very fine sand
Other features—none
Thickness—0 to 20 inches thick

Bt/E and E/Bt horizons:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 or 6
Redoximorphic features—none to common iron concentrations or masses in shades of red or brown
Texture—mainly fine sandy loam, but ranges to loam or sandy clay loam in the lower part
Other features—albic streaks (E) make up 15 to 50 percent, by volume; typically, albic streaks increase with depth and make up more than 50 percent in the lower part of some pedons
Thickness—10 to 30 inches thick

2C horizon:
Color—weakly consolidated sandstone or mudstone or stratified with layers of both materials
Redoximorphic features—none
Texture—sandy clay loam or clay loam
Other features—none
Thickness—0 to 12 inches thick

Kitterll Series

Depth class: Very shallow
Drainage class: Well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Uplands
Parent material: Coastal plain tuffaceous sandstone and siltstone
Slope range: 1 to 15 percent
Taxonomic classification: Loamy, siliceous, active, nonacid, thermic, shallow Typic Udorthents
Associated soils: Colita and Lovelady
- Colita soils have an argillic horizon and a solum thicker than 20 inches
- Lovelady soils have a thicker solum and a sandy epipedon more than 20 inches thick

Typical Pedon

Kitterll fine sandy loam, 1 to 5 percent slopes, is located from U.S. Highway 287 in Groveton, 6.5 miles south and southwest on Farm Road 355 to Champion gate on south side of road, through gate and 1 mile south on timber company road, 100 feet west in pine plantation area; USGS Chita topographic quadrangle; latitude 30 degrees 53 minutes 38 seconds N.; longitude 95 degrees 08 minutes 58 seconds W.

A1—0 to 6 inches; brown (10YR 4/3) fine sandy loam; massive; slightly hard, friable; common fine and medium roots; moderately acid; clear smooth boundary.
A2—6 to 12 inches; grayish brown (10YR 5/2) fine sandy loam; massive; slightly hard, friable; few fine and medium roots; strongly acid; abrupt smooth boundary.
Cr—12 to 15 inches; light yellowish brown (2.5Y 6/4) sandstone; common red (2.5YR 4/8) and yellowish red (5YR 5/6) stains on fractures.

Range in Characteristics

Solum thickness: 4 to 14 inches
Clay content in the control section: 10 to 25 percent

Redoximorphic features: None
Other distinctive soil features: None
Reaction: A horizon—strongly acid to slightly acid

A horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 2 or 3
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—4 to 14 inches thick

Cr horizon:
Color—hue of 10YR or 2.5Y
Redoximorphic features—none
Texture—strongly to weakly cemented tuffaceous siltstone, mudstone, or sandstone
Other features—none

Koury Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately slow
Landscape: Coastal plain
Landform: Flood plains
Parent material: Loamy alluvium
Slope range: 0 to 1 percent
Taxonomic classification: Coarse-silty, siliceous, superactive, thermic Oxyaquic Eutrudepts
Associated soils: Fuller, Moten, Multey, Ozias, Penning, and Pophers
- Fuller, Moten, Multey, and Penning soils have an argillic horizon and are on associated terraces or low uplands
- Pophers soils are in similar flood plain positions, are more clayey, and are somewhat poorly drained

Typical Pedon

Koury silt loam, 0 to 1 percent slopes, frequently flooded, is located from Groveton, 16 miles northeast on Texas Highway 94 to Apple Springs, from Farm Road 357-East in Apple Springs, 2.4 miles northeast continuing on Texas Highway 94, 2.2 miles southeast on Farm Road 2262, 200 feet southwest in National Forest woods; USGS Apple Springs topographic quadrangle; latitude 31 degrees 13 minutes 41 seconds N.; longitude 94 degrees 55 minutes 03 seconds W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; slightly hard, friable; common fine and medium roots; strongly acid; gradual wavy boundary.
Bw1—7 to 21 inches; grayish brown (10YR 5/2) loam; weak medium subangular blocky structure; slightly hard, friable; common fine roots; very strongly acid; gradual wavy boundary.
Bw2—21 to 32 inches; brown (10YR 5/3) loam; few fine faint dark brown (10YR 4/3) iron concentrations; weak medium subangular blocky structure; slightly hard, friable; common fine roots; very strongly acid; gradual wavy boundary.
Ab—32 to 46 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint light brownish gray (10YR 6/2) iron depletions; weak medium subangular blocky structure; slightly hard, friable; few fine roots; very strongly acid; gradual wavy boundary.
Bb1—46 to 54 inches; grayish brown (10YR 5/2) silt loam; few fine faint dark brown (10YR 5/3) iron concentrations; weak fine subangular blocky structure; slightly hard, friable; few fine roots; few fine faint light gray (10YR 7/1) iron depletions; very strongly acid; gradual wavy boundary.
Bb2—54 to 84 inches; dark grayish brown (10YR 4/2) loam; few fine distinct brown (10YR 5/3) iron concentrations; weak medium subangular blocky structure; hard, firm; few fine roots; few fine faint brownish yellow (10YR 6/6) iron concentrations lining pores; very strongly acid.

Range in Characteristics

Solum thickness: 80 inches
Clay content in the control section: 10 to 17 percent
Redoximorphic features: Iron concentrations and iron depletions throughout the subsoil
Other distinctive soil features: Base saturation ranges from 60 to 80 percent in subhorizon at a depth of 10 to 30 inches
Reaction: A horizon—extremely acid to strongly acid; Bw, Ab, and Bb horizons—extremely acid or very strongly acid

A horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 4
Redoximorphic features—none
Texture—silt loam
Other features—electrical conductivity ranges from 0 to 2 mmhos/cm
Thickness—8 to 20 inches thick

Bw horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 3 to 4
Redoximorphic features—iron concentrations in shades of red, yellow, or brown; iron depletions in shades of gray
Texture—very fine sandy loam, loam, or silt loam; some pedons have thin bedding planes of silty clay loam or clay loam

Other features—electrical conductivity ranges from 0 to 2 mmhos/cm
Thickness—5 to 15 inches thick

Ab and Bb horizons:
Color—hue of 10YR, value of 3 or 4, and chroma of 1 or 2
Redoximorphic features—depleted matrix with none to common iron concentrations in shades of brown, red, or yellow
Texture—loam, silt loam, or silty clay loam
Other features—electrical conductivity ranges from 1 to 4 mmhos/cm

Kurth Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Loamy coastal plain marine sediments
Slope range: 1 to 8 percent
Taxonomic classification: Fine-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs
Associated soils: Fuller, Herty, Keltys, Moswell, Penning, and Rosenwall

- Fuller soils have a grayish fine-loamy control section
- Herty and Penning soils are in slightly lower, wetter positions; in addition, Herty soils have higher shrink-swell potential
- Keltys, Moswell, and Rosenwall soils are in similar positions; in addition, Moswell and Rosenwall soils have a clayey control section

Typical Pedon

Typical pedon of Kurth fine sandy loam, 1 to 3 percent slopes, is located from Pennington, 7.1 miles east on Farm Road 358, 5.2 miles northwest on U.S. Forest Service Road 502, 0.4 mile west on U.S. Forest Service Road 502-A, 0.3 mile north on road in woods; USGS Pennington topographic quadrangle; latitude 31 degrees 15 minutes 15 seconds N.; longitude 95 degrees 08 minutes 04 seconds W.

A—0 to 7 inches; dark brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; loose, very friable; many medium and coarse roots; strongly acid; clear smooth boundary.
E—7 to 17 inches; pale brown (10YR 6/3) fine sandy loam; weak fine subangular blocky structure; loose, very friable; common fine roots; strongly acid; clear smooth boundary.
Bt1—17 to 30 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium prismatic structure; slightly hard, friable; common fine and medium roots; few streaks of pale brown (10YR 6/3) loamy fine sand albic material on horizontal faces of peds; common medium distinct brownish yellow (10YR 6/6) redoximorphic concentrations; few quartzite pebbles and petrified wood fragments; strongly acid; gradual wavy boundary.
Bt/E—30 to 37 inches; 75 percent yellowish brown (10YR 5/6) sandy clay loam (Bt); 25 percent light brownish gray (10YR 6/2) fine sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds; weak medium prismatic structure; slightly hard, friable; common fine and medium roots; common medium prominent red (2.5YR 5/8) redoximorphic concentrations; strongly acid; gradual wavy boundary.
2Btg—37 to 57 inches; light gray (10YR 7/2) clay loam; moderate medium prismatic structure; hard, firm; few fine roots; many coarse prominent red (2.5YR 5/8) and few fine distinct brownish yellow (10YR 6/8) redoximorphic concentrations; very strongly acid; gradual wavy boundary.
2CB—57 to 80 inches; reddish yellow (5YR 6/8) stratified soft sandstone and mudstone with texture of sandy clay loam; hard, friable; few fine roots; very strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Clay content in the control section: 20 to 30 percent
Redoximorphic features: Iron concentrations and iron depletions throughout the subsoil
Other distinctive soil features: Silt content ranges from 15 to 30 percent; base saturation ranges from 35 to 60 percent in the argillic horizon
Reaction: A horizon—strongly acid to slightly acid; E, Bt, and Bt/E horizons—strongly acid or moderately acid; 2Bt, 2CB, and 2C (where present) horizons—extremely acid to moderately acid

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 or 3
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—4 to 16 inches thick

E horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 2 to 4
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—6 to 28 inches thick

Bt/E horizon and Bt horizon (where present):
Color—hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 6 or 8; the lower part has hue of 10YR, value of 5 to 7, and chroma of 2 to 4
Redoximorphic features—iron depletions in shades of gray and masses of iron accumulation in shades of red or brown range from few to many
Texture—fine sandy loam or sandy clay loam; the texture in the lower part is sandy clay loam or clay loam
Other features—albic streaks (E) make up 10 to about 40 percent, but some subhorizons have 15 percent or more of this material
Thickness—20 to 40 inches thick

2Bt horizon:
Color—hue of 10YR, value of 5 to 7, and chroma of 1 or 2
Redoximorphic features—few to many iron concentrations in shades of red or brown
Texture—clay loam or clay
Other features—electronic conductivity ranges from 0 to 2 mmhos/cm

2CB horizon and 2C horizon (where present):
Color—mainly in shades of brown or gray with strata, streaks, or masses in these colors, or in shades of yellow or red
Redoximorphic features—none
Texture—weakly consolidated sandstone or mudstone with texture of fine sandy loam, sandy clay loam, or clay loam, or is stratified with these materials; some pedons are stratified with shale and/or siltstone
Other features—electrical conductivity ranges from 0 to 2 mmhos/cm

Laska Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately rapid
Landscape: Coastal plain
Landform: Uplands or stream terraces
Parent material: Tuffaceous siltstone and shale
Slope range: 0 to 5 percent
Taxonomic classification: Coarse-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs
Associated soils: Colita, Keltys, Moten, and Rayburn

- Colita soils have a thinner surface layer, have more than 18 percent clay in the upper part of the subsoil, and have a tuffaceous siltstone or shale substratum between 40 to 60 inches deep
- Keltys soils have intrusions of albic material penetrating the Bt horizon and have weakly consolidated sandstone or mudstone at 40 to 60 inches
- Moten soils have more grayish colors due to wetness and have more than 18 percent clay in the lower part of the solum
- Rayburn soils have reddish, clayey argillic horizons, have weakly consolidated tuffaceous siltstone and sandstone within 60 inches, and are on nearby side slopes

Typical Pedon

Laska fine sandy loam, 1 to 3 percent slopes, is located from Groveton, 13.8 miles southwest on Farm Road 355, 4.5 miles southeast on Farm Road 356, 1.8 miles north-northeast on timber road, 200 feet north of road in woods; USGS Chita topographic quadrangle; latitude 30 degrees 52 minutes 42 seconds N.; longitude 95 degrees 10 minutes 53 seconds W.

A—0 to 6 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; soft, very friable; common fine and medium roots; strongly acid; clear wavy boundary.
E1—6 to 14 inches; pale brown (10YR 6/3) fine sandy loam; weak fine granular structure; soft, very friable; common fine and medium roots; strongly acid; clear wavy boundary.
E2—14 to 24 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine subangular blocky structure; loose, very friable; few medium roots; common very fine and fine vesicular pores; common fine irregular brownish yellow (10YR 6/6) masses of iron accumulation; strongly acid; gradual wavy boundary.
Bt/E1—24 to 41 inches; strong brown (7.5YR 5/6) loam; 25 percent pale brown (10YR 6/3) loamy fine sand materials (E); common medium distinct light brownish gray (10YR 6/2) iron depletions; weak medium subangular blocky structure; slightly hard, friable; few fine roots; many very fine and fine vesicular pores; faint discontinuous yellowish brown (10YR 5/4) clay films in root channels and pores; common fine irregular yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid; clear wavy boundary.
Bt/E2—41 to 56 inches; yellowish brown (10YR 5/6) loam; 10 percent pale brown (10YR 6/3) loamy fine sand materials (E); common medium distinct light brownish gray (10YR 6/2) iron depletions; weak medium subangular blocky structure; slightly hard, friable; few fine roots; many very fine and fine vesicular pores; faint discontinuous brownish yellow (10YR 6/6) clay films in root channels and pores; common irregular strong brown (7.5YR 5/6)

masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt/E3—56 to 63 inches; strong brown (7.5YR 5/8) sandy clay loam; 5 percent pale brown (10YR 6/3) loamy fine sand materials (E); many medium distinct light brownish gray (10YR 6/2) iron depletions and common medium prominent red (2.5YR 5/8) iron concentrations; moderate medium subangular blocky structure; slightly hard, firm; slightly sticky and slightly plastic; few fine roots; common very fine and fine vesicular pores; common faint patchy yellowish brown (10YR 5/6) clay films on faces of peds and in pores; very strongly acid; clear wavy boundary.

2Cr—63 to 70 inches; 60 percent light yellowish brown (2.5Y 6/3) and olive yellow (2.5Y 6/6), 30 percent dark grayish brown (10YR 4/2), and 10 percent pale yellow (2.5Y 7/4) weathered bedrock; few medium distinct light brownish gray (2.5Y 6/2) and light gray (2.5Y 7/2) lithochromic mottles; extremely hard, extremely firm; nonsticky and nonplastic; very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches

Clay content in the control section: 8 to 15 percent

Redoximorphic features: Few to many iron depletions in shades of gray and iron concentrations in shades of brown or yellow throughout

Other distinctive soil features: Quartzite pebbles range from 0 to 5 percent; some pedons have 2C horizons of grayish soft siltstone or sandstone

Reaction: A and E horizons—extremely acid to moderately acid; Bt (where present) and Bt/E horizons—strongly acid to moderately acid; 2Bt/E (where present) and 3Btg (where present) horizons—strongly acid to slightly acid; 2Cr and 3Cr (where present) horizons—strongly acid to neutral

A horizon:
- Color—hue of 10YR, value of 3 to 5, and chroma of 1 or 2
- Redoximorphic features—none to common iron depletions in shades of gray and iron concentrations in shades of brown
- Texture—fine sandy loam
- Other features—none
- Thickness—0 to 15 inches

E horizon:
- Color—hue of 10YR, value of 5 or 6, and chroma of 3 or 4
- Redoximorphic features—few to many iron depletions in shades of gray and iron concentrations in shades of brown or yellow
- Texture—fine sandy loam, very fine sandy loam, or loamy very fine sand
- Other features—none
- Thickness—4 to 20 inches

Bt horizon (where present):
- Color—hue of 10YR, value of 4 to 6, and chroma of 2 or 3
- Redoximorphic features—few to many iron depletions in shades of gray and iron concentrations in shades of brown or yellow
- Texture—fine sandy loam or very fine sandy loam
- Other features—none
- Thickness—6 to 15 inches

Bt/E horizon:
- Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 4
- Redoximorphic features—few to many iron concentrations in shades of brown or yellow and iron depletions in shades of gray
- Texture—fine sandy loam, loam, or sandy clay loam
- Other features—albic streaks (E) make up 5 to 40 percent, but some horizons have 15 percent or more of this material
- Thickness—6 to 20 inches

2Bt/E horizon (where present):
- Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 4
- Redoximorphic features—few to many iron depletions in shades of gray and iron concentrations in shades of brown, yellow, or red
- Texture—sandy clay loam, clay loam, or loam
- Other features—albic streaks (E) make up 5 to 40 percent, but some subhorizons have 15 percent or more of this material
- Thickness—6 to 20 inches

3Btg horizon (where present):
- Color—hue of 10YR, value of 5 to 7, and chroma of 1 or 2
- Redoximorphic features—few to many iron depletions in shades of gray and iron concentrations in shades of brown, yellow, or red
- Texture—clay loam or clay
- Other features—none
- Thickness—6 to 10 inches

2Cr horizon and 3Cr horizon (where present):
- Color—hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1, 2, 3, 4, or 6
- Redoximorphic features—none to many iron depletions in shades of gray and iron concentrations in shades of brown or yellow

Texture—weathered bedrock
Other features—none
Thickness—6 or more inches

Latex Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Loamy coastal plain sediments
Slope range: 1 to 3 percent
Taxonomic classification: Fine-loamy, siliceous, semiactive, thermic Glossic Paleudalfs
Associated soils: Moswell and Sawtown

- Moswell soils are on gently sloping to moderately steep stream divides or side slopes along drainageways and have a subsoil that is clayey throughout
- Sawtown soils are in lower lying terrace positions on smooth slopes or low ridges

Typical Pedon

Latex fine sandy loam, 1 to 3 percent slopes, is located from Farm Road 355 in Groveton, 1.3 miles east on U.S. Highway 287, 15 miles northeast and north on Farm Road 2262, 2.5 miles west on U.S. Forest Service Road 509 to junction with U.S. Forest Service Road 509-D, 500 feet north in woods; USGS Apple Springs topographic quadrangle; latitude 31 degrees 10 minutes 41 seconds N.; longitude 94 degrees 54 minutes 12 seconds W.

A—0 to 3 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; slightly hard, friable; many fine and medium roots; moderately acid; clear smooth boundary.
E—3 to 10 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine subangular blocky structure; slightly hard, friable; many fine and medium roots; moderately acid; clear smooth boundary.
Bt1—10 to 16 inches; yellowish brown (10YR 5/6) sandy clay loam; common fine faint yellowish brown (10YR 5/4) iron concentrations; weak fine subangular blocky structure; hard, friable; common fine and medium roots; few clay films; few quartzite pebbles; strongly acid; gradual wavy boundary.
Bt2—16 to 33 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium distinct yellowish red (5YR 5/8) iron concentrations; weak fine subangular blocky structure; hard, firm; common fine and medium roots; few clay films; common quartzite pebbles; strongly acid; gradual wavy boundary.
Bt3—33 to 39 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium prominent red (2.5YR 4/8) iron concentrations; weak fine subangular blocky structure; hard, firm; few fine and medium roots; few clay films; strongly acid; gradual wavy boundary.
Bt4—39 to 49 inches; brownish yellow (10YR 6/8) sandy clay loam; many medium prominent red (2.5YR 4/8) iron concentrations; weak fine subangular blocky structure; hard, firm; common fine and medium roots; 3 percent pale brown (10YR 6/3) fine sandy loam pockets; common clay films; strongly acid; gradual wavy boundary.
Bt/E—49 to 58 inches; 90 percent yellowish brown (10YR 5/8) sandy clay loam (Bt); 10 percent light brownish gray (10YR 6/2) fine sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; many medium prominent red (2.5YR 4/8) iron concentrations; moderate medium subangular blocky structure; hard, firm; common fine and medium roots; common clay films; strongly acid; gradual wavy boundary.
2Bt/E1—58 to 64 inches; 55 percent yellowish brown (10YR 5/6) and 35 percent red (2.5YR 5/6) clay loam (Bt); 10 percent light brownish gray (10YR 6/2) fine sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; moderate medium subangular blocky structure; hard, firm; few fine and medium roots; few clay films; very strongly acid; gradual wavy boundary.
2Bt/E2—64 to 80 inches; variegated 50 percent yellowish brown (10YR 5/6), 35 percent red (2.5YR 4/6), and 15 percent light gray (10YR 7/2) clay loam; moderate medium subangular blocky structure; very hard, firm; few fine and medium roots; few clay films; very strongly acid.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 20 to 30 percent
Redoximorphic features: Iron concentrations range from none to common in shades of red, brown, or yellow throughout the subsoil
Other distinctive soil features: Depth to the 2Bt horizon ranges from 36 to 60 inches; petrified wood fragments less than 3 inches across range from none to few near the contact of the 2Bt horizon; base saturation ranges from 35 to 60 percent at a depth of 50 inches below the upper boundary of the Bt horizon

Reaction: A and E horizons—very strongly acid to moderately acid; Bt and Bt/E horizon—very strongly acid or strongly acid; 2Bt/E and 2Btg (where present) horizons—very strongly acid

A horizon:
- Color—hue of 10YR, value of 3 to 5, and chroma of 2 to 4; where the soil has a value of 3, the thickness is less than 6 inches
- Redoximorphic features—none
- Texture—fine sandy loam
- Other features—none
- Thickness—4 to 16 inches

E horizon:
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 or 4
- Redoximorphic features—none
- Texture—fine sandy loam, very fine sandy loam, or loam
- Other features—none
- Thickness—6 to 28 inches

EB horizon (where present):
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8
- Redoximorphic features—none
- Texture—fine sandy loam or very fine sandy loam
- Other features—none
- Thickness—0 to 10 inches

Bt horizon:
- Color—hue of 5YR, 7.5YR, or 10YR, value of 5 or 6, and chroma of 6 or 8
- Redoximorphic features—none to common iron concentrations in shades of red, brown, or yellow
- Texture—loam, clay loam, or sandy clay loam
- Other features—streaks and pockets of albic material range from 0 to 4 percent, by volume; ironstone pebbles range from 0 to 15 percent, by volume; however, in some pedons spots 6 to 10 inches in diameter contain up to 35 percent pebbles
- Thickness—3 to 10 inches

Bt/E horizon:
- Color—hue of 5YR, 7.5YR, or 10YR, value of 5 or 6, and chroma of 6 or 8
- Redoximorphic features—none to common iron concentrations in shades of red, yellow, or brown and iron depletions in shades of gray
- Texture—clay loam, loam, or sandy clay loam
- Other features—streaks and pockets of albic material (E) range from 5 to 10 percent, by volume; ironstone pebbles range from 0 to 15 percent, by volume, throughout the horizon; brittle masses of red, dark red, or yellowish red comprise up to 25 percent, by volume, in some pedons
- Thickness—10 to 28 inches

2Bt/E horizon:
- Color—hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 3 to 5, and chroma of 6 or 8
- Redoximorphic features—few to many iron concentrations in shades of brown or yellow and iron depletions in shades of gray
- Texture—clay loam or clay with 35 to 45 percent clay
- Other features—streaks and pockets of albic streaks (E) range from 5 to less than 15 percent, by volume; ironstone pebbles range from 0 to 10 percent, by volume, throughout the horizon
- Thickness—20 to 40 inches

2Btg horizon (where present):
- Color—hue of 10YR, value of 6 or 7, and chroma of 1 or 2
- Redoximorphic features—few to many iron concentrations in shades of yellow, red, or brown
- Texture—clay or silty clay
- Other features—steaks and pockets of albic material range from 0 to 4 percent, by volume; none to few slickensides less than 4 inches across
- Thickness—6 to 15 inches

Letney Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Uplands
Parent material: Sandy and loamy coastal plain sediments
Slope range: 1 to 5 percent
Taxonomic classification: Loamy, siliceous, semiactive, thermic Arenic Paleudults
Associated soils: Rayburn and Tehran
- Rayburn soils are on ridges and steep side slopes above drainageways and have a fine-textured control section
- Tehran soils are in broad ridgetop positions and in footslope positions below steep side slopes

Typical Pedon

Letney loamy sand, 1 to 5 percent slopes, is located from Farm Road 355 in Groveton, 6.6 miles east on U.S. Highway 287, 2.7 miles south on county road, 1.5

miles northeast on timber company road, 50 feet north in woods; USGS Colita topographic quadrangle; latitude 30 degrees 59 minutes 42 seconds N.; longitude 95 degrees 01 minute 07 seconds W.

A—0 to 3 inches; brown (10YR 4/3) loamy sand; single grained; loose, very friable; common fine and medium roots; moderately acid; clear smooth boundary.

E—3 to 24 inches; pale brown (10YR 6/3) loamy sand; single grained; loose, very friable; common fine and medium roots; moderately acid; clear wavy boundary.

Bt1—24 to 29 inches; brownish yellow (10YR 6/6) sandy clay loam; few fine distinct reddish yellow (7.5YR 6/8) relict iron concentrations; weak fine subangular blocky structure; slightly hard, friable; common fine and medium roots; strongly acid; gradual wavy boundary.

Bt2—29 to 33 inches; brownish yellow (10YR 6/6) sandy clay loam; common fine prominent yellowish red (5YR 5/8) and common fine and medium prominent dark red (2.5YR 3/6) relict iron concentrations; moderate medium subangular blocky structure; hard, firm; few fine and medium roots; strongly acid; gradual wavy boundary.

Bt3—33 to 43 inches; brownish yellow (10YR 6/6) sandy clay loam; common coarse prominent dark red (2.5YR 3/6) and common fine faint yellow (10YR 7/8) relict iron concentrations; moderate medium subangular blocky structure; hard, firm; few fine roots; strongly acid; gradual wavy boundary.

Bt4—43 to 80 inches; red (2.5YR 5/8) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) relict iron concentrations; weak medium subangular blocky structure; hard, firm; few fine roots; few pockets of sand grains coated on ped surfaces; strongly acid.

Range in Characteristics

Solum thickness: 60 to more than 80 inches
Clay content in the control section: 18 to 32 percent
Redoximorphic features: Depletions with chroma of 2 or less are 60 inches or more below the surface
Other distinctive soil features: Base saturation ranges from 15 to 30 percent; coarse and very coarse sand comprises 10 to 25 percent of the sand fraction
Reaction: Very strongly acid to moderately acid throughout

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 to 3
Redoximorphic features—none
Texture—loamy sand
Other features—none
Thickness—3 to 10 inches thick

E horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 or 3
Redoximorphic features—none
Texture—loamy sand or sand
Other features—none
Thickness—11 to 32 inches thick

Upper Bt horizon:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 or 6
Redoximorphic features—relict iron concentrations in shades of yellowish red, brown, and gray
Texture—sandy clay loam, but ranges to sandy loam in some places
Other features—contains up to 5 percent, by volume, plinthite; some pedons contain up to 10 percent, by volume, quartzite gravel
Thickness—20 to 45 inches thick

Lower Bt horizon:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8
Redoximorphic features—wetness-related iron concentrations and iron depletions are below a depth of 60 inches
Texture—sandy clay loam, but ranges to sandy loam in some places
Other features—some pedons have many small white and purple shale fragments and masses of clay
Thickness—20 to 45 inches thick

Lovelady Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Uplands
Parent material: Sandy and loamy coastal plain sediments
Slope range: 1 to 8 percent
Taxonomic classification: Loamy, mixed, semiactive, thermic Arenic Glossudalfs
Associated soils: Fuller, Keltys, Kurth, and Penning

- Fuller and Penning soils are in lower, wetter landscape positions and have colors with chroma of 2 or less in the upper part of the argillic horizon

- Keltys and Kurth soils are in similar positions; in addition, Keltys soils have a coarse-loamy control section, and Kurth soils do not have a sandy epipedon

Typical Pedon

Lovelady loamy fine sand, 1 to 5 percent slopes, is located from Pennington, 7.1 miles east on Farm Road 358, 3.6 miles northwest on U.S. Forest Service Road 502, 0.3 mile east on road in woods to U.S. Forest Service boundary, 200 feet north of road in woods; USGS Pennington topographic quadrangle; latitude 31 degrees 14 minutes 52 seconds N.; longitude 95 degrees 07 minutes 37 seconds W.

A—0 to 6 inches; brown (10YR 5/3) loamy fine sand; weak medium granular structure; loose; common fine and medium roots; moderately acid; clear smooth boundary.

E1—6 to 23 inches; pale brown (10YR 6/3) loamy fine sand; single grained; loose; common fine and medium roots; moderately acid; clear wavy boundary.

E2—23 to 32 inches; light yellowish brown (10YR 6/4) loamy fine sand; single grained; loose; common fine and medium roots; moderately acid; clear wavy boundary.

Bt/E1—32 to 51 inches; 75 percent yellowish brown (10YR 5/8) sandy clay loam; 25 percent pale brown (10YR 6/3) fine sand (E) intrusions of albic material 15 to 25 millimeters wide between peds; common medium distinct red (2.5YR 4/8) iron concentrations; moderate medium subangular blocky structure; hard, friable; common fine roots; common clay films; strongly acid; gradual wavy boundary.

Bt/E2—51 to 55 inches; 30 percent dark red (2.5YR 3/6), 30 percent grayish brown (10YR 5/2), and 15 percent brownish yellow (10YR 6/6) sandy clay loam; 25 percent pale brown (10YR 6/3) fine sand (E) intrusions of albic material 15 to 25 millimeters wide between peds; moderate medium subangular blocky structure; hard, friable; common fine roots; common clay films; strongly acid; gradual wavy boundary.

2Bt—55 to 80 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; hard, friable; few fine roots; few clay films; 2 percent streaks of pale brown (10YR 6/3) fine sandy loam albic material; very strongly acid.

Range in Characteristics

Solum thickness: 60 to more than 80 inches

Clay content in the control section: 20 to 35 percent

Redoximorphic features: Iron concentrations are throughout the subsoil, and iron depletions with chroma of 2 or less are in the lower part

Other distinctive soil features: Rounded quartzite pebbles and smooth fragments of petrified wood, typically less than 3 inches across the long axis, range from few to about 5 percent in the A, E, and Bt/E horizons of most pedons; these fragments also form a discontinuous stone line at the contact of the 2Bt horizon

Reaction: A, E, and Bt/E horizons—very strongly acid to moderately acid; 2Bt horizon and 2Bt/E, 2CB, and 2C horizons (where present)—extremely acid to strongly acid

A horizon:
- Color—hue of 10YR, value of 3 to 5, and chroma of 2 or 3
- Redoximorphic features—none
- Texture—loamy fine sand; clay content ranges from 2 to 8 percent and silt content ranges from 7 to 21 percent
- Other features—none
- Thickness—3 to 14 inches thick

E horizon:
- Color—hue of 10YR, value of 5 to 7, and chroma of 3 or 4
- Redoximorphic features—none to common iron concentrations in shades of brown, red, or yellow
- Texture—loamy sand or loamy fine sand
- Other features—none
- Thickness—10 to 26 inches

Bt/E horizon:
- Color—hue of 5YR, 7.5YR, or 10YR, value of 5 or 6, and chroma of 4, 6, or 8
- Redoximorphic features—few to many iron concentrations in shades of red, brown, or yellow
- Texture—fine sandy loam or sandy clay loam
- Other features—albic streaks (E) make up 5 to 30 percent; however, some parts of this horizon that are 4 inches or more thick contain 15 percent or more albic material
- Thickness—10 to 35 inches

2Bt horizon:
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2
- Redoximorphic features—few to many iron concentrations in shades of red, brown, or yellow; none to common iron depletions in shades of gray; some pedons have a variegated matrix of these colors

Texture—fine sandy loam, sandy clay loam, sandy clay, or clay loam
Other features—some pedons have a mottled matrix of these colors
Thickness—10 to 30 inches

2Bt/E horizon (where present):
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2
Redoximorphic features—few to many iron concentrations in shades of red, brown, or yellow; none to common iron depletions in shades of gray; some pedons have a variegated matrix of these colors
Texture—fine sandy loam, sandy clay loam, sandy clay, or clay loam
Other features—some pedons have a mottled matrix of these colors; the upper part typically has about 2 to 10 percent albic streaks
Thickness—10 to 30 inches

2CB and 2C horizons (where present):
Color—matrix colors mainly in shades of gray or brown
Redoximorphic features—few to many iron concentrations in shades of brown, yellow, or red; none to common iron depletions in shades of gray
Texture—sandstone or stratified layers of mudstone and shale with texture of fine sandy loam, sandy clay loam, or sandy clay
Other features—none

Mollville Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landscape: Coastal plain
Landform: Stream terraces
Parent material: Stratified loamy alluvial sediments
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, siliceous, superactive, thermic Typic Glossaqualfs
Associated soils: Besner, Hainesville, and Sawtown
- Besner soils are on adjoining mounds and are well drained
- Hainesville soils are in slightly higher positions on terraces or on adjoining low ridges or mounds and are sandy throughout
- Sawtown soils are in similar or slightly higher positions on terraces and are well drained

Typical Pedon

Mollville loam, in an area of Mollville-Besner complex, 0 to 2 percent slopes, is located from Groveton, 22.2 miles northeast on Texas Highway 94 to entrance of Boggy Slough Hunting Club, 2.25 miles northwest on primary road, 3.9 miles north, northwest, and southwest on adjoining road (which runs just east of Green Tree reservoir), 0.55 mile north on adjoining road, 0.4 mile northeast on land in woods, 25 feet south of lane; USGS Wells SW topographic quadrangle; latitude 31 degrees 19 minutes 45 seconds N.; longitude 94 degrees 56 minutes 07 seconds W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; slightly hard, friable; many fine, medium and coarse roots; strongly acid; clear wavy boundary.
Btg/Eg1—5 to 12 inches; 95 percent grayish brown (10YR 5/2) loam (Btg); 5 percent light gray (10YR 7/2) fine sand streaks (Eg); weak fine subangular blocky structure; slightly hard, friable; many fine and medium roots; few clay films; few fine prominent strong brown (7.5YR 4/6) iron stains around roots; strongly acid; clear wavy boundary.
Btg/Eg2—12 to 30 inches; 70 percent grayish brown (10YR 5/2) clay loam (Btg); 30 percent light gray (10YR 7/2) fine sand (Eg) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; moderate medium subangular blocky structure; slightly hard, friable; common medium and coarse roots; few clay films on ped faces; common coarse prominent light olive brown (2.5Y 5/6) and common fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations; moderately acid; gradual wavy boundary.
Btg/Eg3—30 to 47 inches; 80 percent grayish brown (10YR 5/2) clay loam (Btg); 20 percent light gray (10YR 7/2) fine sandy loam (Eg) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; moderate medium subangular blocky structure; very hard, firm; common medium and coarse roots; few clay films on ped faces; few fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations and few strong brown (7.5YR 4/6) root stains; moderately acid; abrupt wavy boundary.
Btg/Eg4—47 to 64 inches; 95 percent grayish brown (10YR 5/2) clay loam; 5 percent streaks of light brownish gray (10YR 6/2) fine sandy loam (Eg); moderate medium subangular blocky structure; hard, firm; common medium and coarse roots; few pale brown (10YR 6/3) fine sand pockets; few clay films on ped faces; common fine distinct strong brown (7.5YR 4/6) redoximorphic concentrations; slightly alkaline; clear wavy boundary.

2Btg/C—64 to 72 inches; 90 percent grayish brown (10YR 5/2) clay loam(B); 10 percent light gray (2.5Y 7/2) fine sandy loam (C); weak medium subangular blocky structure; very hard, very firm; few fine roots; few clay films on ped faces; common fine distinct strong brown (7.5YR 4/6) redoximorphic concentrations; slightly alkaline; clear wavy boundary.
2Cg—72 to 80 inches; grayish brown (10YR 5/2) fine sandy loam; common medium distinct pale yellow (2.5Y 7/3) and yellowish brown (10YR 5/6) redoximorphic concentrations; slightly alkaline.

Range in Characteristics

Solum thickness: 40 to more than 80 inches; typically, when the solum is less than 60 inches thick, the soil is underlain by a sandy 2C horizon
Clay content in the control section: 20 to 35 percent
Redoximorphic features: Depleted matrix with few to many iron concentrations in shades of brown, yellow, or red throughout
Other distinctive soil features: Salinity ranges from nonsaline to slightly saline; sodium adsorption ratio ranges from 2 to 10 throughout the argillic horizon; about 20 to 40 percent of the sand fraction is coarser than very fine sand; the soil is dry in the moisture control section for 50 cumulative days or more in most years
Reaction: A, Eg (where present), and upper Btg/E horizons—very strongly acid to moderately acid; lower Btg/E and 2Btg/C horizons—very strongly acid to slightly alkaline; 2C horizon—strongly acid to slightly alkaline

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 1 or 2
Redoximorphic features—none
Texture—loam
Other features—none
Thickness—2 to 8 inches

Eg horizon (where present):
Color—hue of 10YR, value of 1 to 3 units greater than the A horizon, and chroma of 1 or 2
Redoximorphic features—none
Texture—fine sandy loam, very fine sandy loam, loam, or silt loam
Other features—depleted matrix with none to common iron concentrations in shades of brown or yellow
Thickness—4 to 14 inches

Btg/E horizon:
Color—hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2
Redoximorphic features—depleted matrix with few to many iron concentrations in shades of brown, yellow, or red
Texture—loam, sandy clay loam, or clay loam
Other features—albic material (E) in the form of vertical intrusions or pockets make up 15 to about 35 percent of the control section and has hue of 10YR, value of 5 to 8, and chroma of 1 or 2
Thickness—8 to 24 inches

2Btg/C and 2C horizons:
Color—hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4
Redoximorphic features—depleted matrix or iron depletions with few to many iron concentrations in shades of brown or yellow
Texture—loamy fine sand or fine sandy loam, or stratified with these textures; the average clay content ranges from 3 to about 12 percent
Other features—some pedons do not have a 2C horizon but have a loamy substratum with texture of loam, sandy clay loam, or clay loam to a depth of 80 inches or more

Moswell Series

Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Residuum from shale
Slope range: 1 to 15 percent
Taxonomic classification: Very-fine, smectitic, thermic Vertic Hapludalfs
Associated soils: Etoile
- Etoile soils contain less acid in the subsoil and substratum and have a fine-textured control section

Typical Pedon

Moswell loam, 1 to 5 percent slopes, is located from Pennington, 7.1 miles east on Farm Road 358, 4 miles northwest on U.S. Forest Service Road 502, 0.5 mile east on U.S. Forest Service Road 504, 0.2 mile south on road in woods; USGS Pennington topographic quadrangle; latitude 31 degrees 14 minutes 06 seconds N.; longitude 95 degrees 07 minutes 43 seconds W.

A—0 to 4 inches; brown (10YR 4/3) loam; weak medium granular structure; slightly hard, very friable; common fine roots; strongly acid; clear wavy boundary.
E—4 to 9 inches; pale brown (10YR 6/3) loam; few fine faint yellowish brown (10YR 5/4) relict iron

concentrations; weak medium granular structure; slightly hard, very friable; common fine and medium roots; strongly acid; clear smooth boundary.

Bt—9 to 15 inches; red (2.5YR 4/6) clay; common medium distinct brown (10YR 5/3) and few fine faint gray (10YR 5/1) relict iron concentrations; moderate fine subangular blocky structure; very hard, very firm; common fine roots; common fine pores; common fine clay films; very strongly acid; clear smooth boundary.

Btss1—15 to 32 inches; 35 percent yellowish red (5YR 4/6), 35 percent red (2.5YR 4/6), and 30 percent light brownish gray (10YR 6/2) clay; moderate medium subangular blocky structure; very hard, very firm; common fine roots; common slickensides; common clay films; very strongly acid; clear wavy boundary.

Btss2—32 to 45 inches; grayish brown (10YR 5/2) clay; few fine faint brownish yellow (10YR 6/6) relict iron concentrations; weak medium subangular blocky structure; very hard, very firm; common fine roots; common slickensides; common clay films; common hard black concretions; strongly acid; gradual smooth boundary.

C1—45 to 53 inches; light brownish gray (2.5Y 6/2) shale with texture of clay; massive; very hard, very firm; strongly acid; gradual wavy boundary.

C2—53 to 80 inches; horizontally bedded layers of light brownish gray (2.5Y 6/2) and gray (10YR 5/1) shale with texture of clay; platy structure; very hard, very firm; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches
Clay content in the control section: 60 to 65 percent
Redoximorphic features: Relict iron concentrations
Other distinctive soil features: Depth to slickensides ranges from 10 to 20 inches; when dry, the subsoil has cracks 1/2 inch wide that extend to a depth of more than 12 inches, and the cracks are open for less than 90 cumulative days in most years; the salinity ranges from very slight to moderate from the mid part of the subsoil into the C horizon
Reaction: A and E horizons—very strongly acid to moderately acid; Bt, Btss, and C horizons—extremely acid to strongly acid

A horizon:
- Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4
- Redoximorphic features—none
- Texture—loam
- Other features—none
- Thickness—1 to 7 inches thick

E horizon:
- Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4
- Redoximorphic features—none to few relict iron concentrations in shades of brown
- Texture—fine sandy loam, very fine sandy loam, or loam
- Other features—none
- Thickness—0 to 5 inches thick

Bt horizon:
- Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8
- Redoximorphic features—none to common relict iron concentrations in shades of brown or yellow
- Texture—clay
- Other features—none
- Thickness—4 to 18 inches thick

Btss horizon:
- Color—variegated in shades of gray, red, yellow, and brown; or has a matrix in hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 3; or hue of 5YR, value of 3 to 5, and chroma of 2, 3, 4, 6, or 8
- Redoximorphic features—none to common relict iron concentrations in shades of brown or yellow
- Texture—clay
- Other features—common or many crystals or masses of gypsum; gypsum makes up 5 to 15 percent of the lower subhorizon of most pedons; barite masses are few or common in most pedons; sodium adsorption ratio ranges from 4 to 12
- Thickness—10 to 40 inches thick

C horizon:
- Color—variable, but are mainly in shades of olive, brown, or yellow
- Redoximorphic features—none
- Texture—shale with texture of clay
- Other features—crystals or masses of gypsum, barite, jarosite, and natrojarosite are in most pedons; sodium adsorption ratio ranges from 4 to 16 in most pedons
- Thickness—5 to 20 inches thick

Moten Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landscape: Coastal plain
Landform: Stream terraces
Parent material: Loamy coastal plain alluvial sediments from the Yegua Formation

Slope range: 0 to 2 percent
Taxonomic classification: Coarse-loamy, siliceous, active, thermic Aquic Glossudalfs
Associated soils: Fuller, Keltys, Multey, and Rosenwall
- Fuller and Keltys soils are in higher upland positions
- Keltys and Multey soils have a glossic horizon with matrix chroma of 3 or more; in addition, Multey soils are in slightly higher associated mound positions on the landscape
- Rosenwall soils are in higher nearby landscape positions and have a very-fine particle-size control section

Typical Pedon

Moten silt loam, in an area of Moten-Multey complex, 0 to 2 percent slopes, is located from Pennington, 6.8 miles east on Farm Road 358, 350 feet south in woods; USGS Pennington topographic quadrangle; latitude 31 degrees 12 minutes 06 seconds N.; longitude 95 degrees 07 minutes 32 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; hard, friable; common fine and medium roots; strongly acid; clear smooth boundary.
E—3 to 11 inches; pale brown (10YR 6/3) silt loam; weak fine subangular blocky structure; hard, friable; common fine roots; common fine distinct dark yellowish brown (10YR 4/4) and few fine distinct yellowish brown (10YR 5/6) redoximorphic concentrations; strongly acid; gradual wavy boundary.
E/Bt—11 to 20 inches; 80 percent light brownish gray (10YR 6/2) silt loam (E); 20 percent grayish brown (10YR 5/2) loam (Bt); weak fine subangular blocky structure; slightly hard, very friable; few fine roots; few discontinuous clay films; few fine faint yellowish brown (10YR 5/6) redoximorphic concentrations; very strongly acid; gradual wavy boundary.
Bt/E1—20 to 31 inches; 55 percent grayish brown (10YR 5/2) loam; 45 percent pale brown (10YR 6/3) silt loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; weak medium subangular blocky structure; hard, friable; few fine roots; few discontinuous clay films; very strongly acid; clear wavy boundary.
Bt/E2—31 to 45 inches; 85 percent grayish brown (10YR 5/2) loam; 15 percent pale brown (10YR 6/3) silt loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; moderate medium subangular blocky structure; slightly hard, friable; few fine roots; common discontinuous clay films; very strongly acid; clear wavy boundary.
Btg—45 to 61 inches; 90 percent grayish brown (10YR 5/2) loam; 10 percent light yellowish brown (2.5Y 6/4) clay loam (C); weak fine subangular blocky structure; hard, friable; few fine roots; common discontinuous clay films; slightly acid; abrupt wavy boundary.
C—61 to 80 inches; grayish brown (2.5Y 5/2) and pale yellow (2.5Y 7/4) clay loam; massive; neutral.

Range in Characteristics

Solum thickness: 60 to 80 inches
Clay content in the control section: 12 to 18 percent
Redoximorphic features: Redoximorphic concentrations or masses in shades of brown, red, or yellow range from none in the upper part to few to many in the lower part
Other distinctive soil features: Silt content of 30 to 55 percent
Reaction: A, E, E/Bt, and Bt/E horizons—very strongly acid to moderately acid; 2Bt/C and 2C horizons—strongly acid to neutral

A horizon:
Color—hue of 10YR, value of 3 or 4, and chroma of 2 or 3
Redoximorphic features—none
Texture—silt loam
Other features—none
Thickness—3 to 7 inches thick

E and E/Bt horizons:
Color—hue of 10YR, value of 5 or 6, and chroma of 2 or 3
Redoximorphic features—none to common iron concentrations or masses
Texture—fine sandy loam, loam, or silt loam
Other features—none
Thickness—16 to 35 inches thick

Bt/E horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1 or 2
Redoximorphic features—iron concentrations or masses in shades of brown, red, or yellow range from none to common in the upper part and few to many in the lower part
Texture—fine sandy loam, loam, or silt loam
Other features—albic material (E) on the surface of peds or in streaks and spots of the matrix range from 10 to 35 percent; electrical conductivity ranges from 1 to 4 mmhos/cm; common or many crayfish krotovina in some parts of the glossic horizon
Thickness—10 to 20 inches thick

Btg horizon:
Color—hue of 10YR, value of 3 to 6, and chroma of 2
Redoximorphic features—redoximorphic depletions in shades of brown, yellow, and gray
Texture—fine sandy loam, loam, or silt loam
Other features—none

C horizon:
Color—variable
Redoximorphic features—none
Texture—fine sandy loam to clay loam; some pedons have strata of clay or silty clay
Other features—none

Multey Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Stream terraces
Parent material: Alluvial wind modified sediments from the Yegua Formation
Slope range: 0 to 2 percent
Taxonomic classification: Coarse-loamy, siliceous, active, thermic Typic Glossudalfs
Associated soils: Fuller, Keltys, Kurth, and Moten
- Fuller, Keltys, and Kurth soils have a solum less than 80 inches thick over a sandstone or mudstone substratum; in addition, Fuller soils are somewhat poorly drained and are in similar positions, and Keltys and Kurth soils are in higher upland positions
- Moten soils are moderately well drained and are in slightly lower intermound positions

Typical Pedon

Multey fine sandy loam, in an area of Moten-Multey complex, 0 to 2 percent slopes, is located from Pennington, 6.8 miles east on Farm Road 358, 375 feet south in woods; USGS Pennington topographic quadrangle; latitude 31 degrees 12 minutes 07 seconds N.; longitude 95 degrees 07 minutes 31 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; soft, friable; common fine roots; strongly acid; clear smooth boundary.
E1—4 to 26 inches; pale brown (10YR 6/3) fine sandy loam; few fine faint brownish yellow (10YR 6/6) iron concentrations; weak fine granular structure; loose, very friable; common fine roots; strongly acid; gradual wavy boundary.
E/Bt—26 to 35 inches; 70 percent pale brown (10YR 6/3) fine sandy loam (E); 30 percent brownish yellow (10YR 6/6) loam (B); weak fine subangular blocky structure; slightly hard, friable; few fine roots; strongly acid; gradual wavy boundary.
Bt/E1—35 to 49 inches; 80 percent yellowish brown (10YR 5/4) loam (Bt); 20 percent pale brown (10YR 6/3) sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; few fine prominent strong brown (7.5YR 4/6) iron concentrations; weak fine subangular blocky structure; slightly hard, friable; few fine roots; few clay films; strongly acid; gradual wavy boundary.
Bt/E2—49 to 80 inches; 75 percent yellowish brown (10YR 5/6) loam (Bt); 25 percent pale brown (10YR 6/3) sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds; moderate medium subangular blocky structure; hard, friable; few fine roots; few clay films; strongly acid.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 10 to 18 percent
Redoximorphic features: Iron concentrations in the subsurface and subsoil
Other distinctive soil features: Base saturation ranges from 40 to 60 percent at a depth of 72 inches below the soil surface
Reaction: A horizon—strongly acid to slightly acid; E horizon—very strongly acid to slightly acid; E/Bt horizon—very strongly acid or strongly acid; Bt/E and BCt (where present) horizons—very strongly acid to moderately alkaline

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 or 3
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—3 to 7 inches thick

E horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 2 or 3
Redoximorphic features—some pedons contain iron concentrations in the lower part that have hue of 10YR, value of 5 or 6, and chroma of 6 or 8
Texture—fine sandy loam, very fine sandy loam, or loam
Other features—none
Thickness—16 to 30 inches thick

E/Bt and upper Bt/E horizons:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8 (Bt); interiors of peds have masses with hue of 2.5YR or 5YR, value of 4 to

6, and chroma of 6 or 8; the lower Bt/E horizon has colors with chroma of 2 or 3 in some pedons
Redoximorphic features—none to common iron concentrations in shades of brown
Texture—fine sandy loam, very fine sandy loam, and loam
Other features—albic streaks (E) make up 15 to 85 percent of the matrix; electrical conductivity ranges from 0 to 4 mmhos/cm
Thickness—10 to 45 inches thick

Lower Bt/E horizon:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2, 3, 4, 6, or 8 (Bt); interiors of peds have masses with hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 6 or 8
Redoximorphic features—none to common iron concentrations in shades of brown
Texture—sandy clay loam, fine sandy loam, and loam
Other features—albic streaks (E) make up 15 to 85 percent of the matrix; electrical conductivity ranges from 0 to 4 mmhos/cm
Thickness—10 to 45 inches thick

BCt horizon (where present):
Color—shades of brown or gray
Redoximorphic features—none to common iron concentrations in shades of brown
Texture—fine sandy loam, very fine sandy loam, loam, or sandy clay loam
Other features—electrical conductivity ranges from 1 to 4 mmhos/cm
Thickness—10 to 30 inches thick

Ozias Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Flood plains
Parent material: Acid clayey alluvium
Slope range: 0 to 1 percent
Taxonomic classification: Fine, smectitic, thermic Aeric Dystraquerts
Associated soils: Koury and Pophers
- Koury and Pophers soils are in similar flood plain positions and have less than 35 percent clay throughout the solum; in addition, Koury soils are moderately well drained

Typical Pedon

Ozias clay, in an area of Ozias-Pophers complex, 0 to 1 percent slopes, frequently flooded, is located from Groveton, 16 miles northeast on Texas Highway 94 to Farm Road 357-East in Apple Springs, 6.1 miles continuing northeast on Texas Highway 94, 0.5 mile south on timber company road, 0.15 mile southeast on pipeline/former tram, 0.7 mile south and southwest on logging lane, 200 feet west of lane in woods; USGS Wells SW topographic quadrangle; latitude 31 degrees 16 minutes 06 seconds N.; longitude 94 degrees 53 minutes 35 seconds W.

Oi—2 to 0 inches; dark brown (7.5YR 3/2) fibric material; clear smooth boundary.
A—0 to 9 inches; dark grayish brown (10YR 4/2) clay; moderate coarse angular blocky structure; extremely hard, extremely firm; few prominent discontinuous dark red (2.5YR 3/6) iron stains on faces of peds and in pores; common medium and coarse prominent strong brown (7.5YR 5/6) and common medium and coarse prominent reddish yellow (7.5YR 6/8) redoximorphic concentrations; very strongly acid; clear wavy boundary.
Bssg1—9 to 31 inches; grayish brown (10YR 5/2) clay; moderate fine prismatic structure parting to moderate medium angular blocky; extremely hard, extremely firm; common fine and medium roots; common fine and medium pores; common slickensides; common soft masses and very hard concretions of iron-manganese; many coarse and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; few prominent strong brown (7.5YR 5/8) root stains; extremely acid; gradual wavy boundary.
Bssg2—31 to 44 inches; grayish brown (10YR 5/2) clay; moderate fine prismatic structure parting to moderate fine angular blocky; extremely hard, extremely firm; common fine and few medium roots; common fine and medium pores; common intersecting slickensides; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; few strong brown (7.5YR 5/8) root stains; very strongly acid; gradual wavy boundary.
Bg1—44 to 58 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium angular blocky structure; very hard, very firm; common fine and few medium roots; common fine pores; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.
Bg2—58 to 70 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium angular blocky structure; very hard, very firm; few fine and medium roots; common fine pores; few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bg3—70 to 84 inches; dark gray (10YR 4/1) clay; weak coarse angular blocky structure; extremely hard, extremely firm; few fine and medium roots; few fine pores; few fine and medium prominent strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 40 to 60 percent
Redoximorphic features: Depleted matrix with few or common iron concentrations in shades of brown, yellow, or red throughout
Other distinctive soil features: This is a cyclic soil with gilgai microrelief and microknolls 6 to 10 inches higher than microdepressions; distance from the center of the microknoll to the center of the microdepression ranges from about 4 to 12 feet; cracks at least 1 centimeter wide extend from the surface to a depth of more than 12 inches when the soil is dry, and the cracks are open for less than 90 cumulative days in most years; intersecting slickensides begin at a depth of 14 to 30 inches and extend for more than 20 inches; electrical conductivity ranges from 4 to 12 mmhos/cm in part of the particle-size control section; gypsum crystals are mainly below a depth of 40 inches and are few or common in some pedons
Reaction: A horizon—extremely acid or very strongly acid; Bssg, Bg, and Bw (where present) horizons—extremely acid to moderately acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3
Redoximorphic features—depleted matrix with none to common iron concentrations in shades of red, brown, or yellow
Texture—clay
Other features—electrical conductivity ranges from 0 to 4 mmhos/cm in forest or natural areas and from 2 to 8 in cleared areas
Thickness—4 to 18 inches thick

Bssg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2
Redoximorphic features—depleted matrix with few to many iron concentrations in shades of brown, yellow, or red; some subhorizons have a variegated matrix of these colors
Texture—silty clay loam, silty clay, or clay
Other features—common or many slickensides; electrical conductivity ranges from 1 to 8 mmhos/cm to a depth of about 40 inches and 2 to 16 mmhos/cm to 80 inches
Thickness—20 to 60 inches thick

Bg horizon and Bw horizon (where present):
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3
Redoximorphic features—depleted matrix or iron depletions with few or common iron concentrations in shades of brown, yellow, or red
Texture—sandy clay loam, clay loam, or clay
Other features—none to few pressure faces and small slickensides; electrical conductivity ranges from 1 to 8 mmhos/cm, but is typically less than 4
Thickness—0 to 14 inches thick

Penning Series

Depth class: Deep
Drainage class: Moderately well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Uplands
Parent material: Residuum from stratified shale
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, siliceous, active, thermic Aquic Glossudalfs
Associated soils: Fuller, Keltys, Kurth, Moten, and Mollville
- Fuller soils are in similar or slightly lower positions and have a grayish subsoil
- Keltys and Kurth soils are in slightly higher positions
- Moten and Mollville soils have a grayish subsoil and are in slightly lower, wetter positions

Typical Pedon

Penning very fine sandy loam, 0 to 2 percent slopes, is located from Pennington, 4.8 miles east on Farm Road 358, 0.5 mile south on county road, 0.4 mile southeast on farm lane, 0.3 mile north on road in woods, 50 feet east of road; USGS Pennington topographic quadrangle; latitude 31 degrees 08 minutes 17 seconds N.; longitude 95 degrees 08 minutes 36 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak fine granular structure; slightly hard, friable; common fine and medium roots; few fine pores; moderately acid; clear smooth boundary.
E1—3 to 8 inches; pale brown (10YR 6/3) very fine sandy loam; weak fine granular structure; slightly hard, friable; common fine roots; common fine pores; common fine distinct light gray (10YR 6/1)

iron depletions and few yellowish brown (10YR 5/6) iron stains around roots; strongly acid; gradual wavy boundary.

E2—8 to 15 inches; pale brown (10YR 6/3) very fine sandy loam; weak fine granular structure; slightly hard, friable; common fine roots; common fine pores; common fine distinct brownish yellow (10YR 6/6) iron concentrations and light brownish gray (10YR 6/2) iron depletions; strongly acid; gradual wavy boundary.

Bt/E1—15 to 25 inches; 85 percent brownish yellow (10YR 6/6) loam (Bt); 15 percent pale brown (10YR 6/3) sandy loam (E) intrusions of albic material 10 to 15 millimeters wide between peds and on surfaces of peds that are clay depletions resulting from aquic conditions; weak fine subangular blocky structure; slightly hard, friable; common fine roots; common fine pores; few patchy clay films; common fine prominent light gray (10YR 6/1) clay depletions resulting from aquic conditions; strongly acid; gradual wavy boundary.

Bt/E2—25 to 36 inches; 75 percent brownish yellow (10YR 6/6) loam (Bt); 25 percent light gray (10YR 7/1) fine sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; moderate fine subangular blocky structure; slightly hard, friable; common fine roots; few fine pores; few patchy clay films; common fine distinct brownish yellow (10YR 6/8) irregularly shaped masses of iron accumulation with diffuse boundaries throughout and common medium distinct light brownish gray (10YR 6/2) clay depletions on surfaces of peds; very strongly acid; gradual wavy boundary.

Bt/E3—36 to 48 inches; 70 percent brownish yellow (10YR 6/8) loam (Bt); 30 percent light gray (10YR 7/1) sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; moderate medium subangular blocky structure; hard, firm; few fine roots; few fine pores; few patchy clay films; few fine prominent dark yellowish brown (10YR 4/4) irregularly shaped masses of iron accumulation with diffuse boundaries throughout and common medium distinct light gray (10YR 6/1) clay depletions on surfaces of peds; very strongly acid; clear wavy boundary.

Bt/E4—48 to 58 inches; 70 percent grayish brown (10YR 5/2) loam; 30 percent light gray (10YR 7/1) fine sandy loam (E) intrusions of albic material 15 to 25 millimeters wide between peds that are clay depletions resulting from aquic conditions; moderate fine subangular blocky structure; hard, firm; few fine roots; few fine pores; few clay films; common fine prominent brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation with diffuse boundaries throughout; moderately acid; clear wavy boundary.

2C—58 to 72 inches; pale yellow (2.5Y 7/3) mudstone with texture of clay loam; few fine distinct grayish brown (10YR 5/2) lithochromic mottles; massive; neutral.

Range in Characteristics

Solum thickness: 40 to 60 inches

Clay content in the control section: 18 to 25 percent

Redoximorphic features: Iron concentrations in shades of brown, yellow, or red and iron depletions in shades of gray are few or common; in some pedons, the lower part has a variegated matrix of these colors

Other distinctive soil features: None

Reaction: A and E horizons—very strongly acid to moderately acid; Bt/E horizon—very strongly acid to slightly acid; 2C horizon—very strongly acid to neutral

A horizon:

- Color—hue of 10YR, value of 3 or 4, and chroma of 1 to 3
- Redoximorphic features—none
- Texture—very fine sandy loam
- Other features—none
- Thickness—3 to 10 inches thick

E horizon:

- Color—hue of 10YR, value of 5 or 6, and chroma of 2 to 4
- Redoximorphic features—iron concentrations in shades of brown or yellow; iron depletions in shades of gray
- Texture—very fine sandy loam or loam
- Other features—none
- Thickness—10 to 30 inches thick

Bt/E horizon:

- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2, 3, 4, 6, or 8
- Redoximorphic features—iron concentrations in shades of brown, yellow, or red and iron depletions in shades of gray are few or common; in some pedons, the lower part has a variegated matrix of these colors
- Texture—very fine sandy loam, loam, or sandy clay loam
- Other features—albic streaks (E) make up 5 to about 25 percent; however, some parts of this horizon that is 4 inches or more thick contains

15 percent or more albic streaks; electrical conductivity ranges from 0 to 4 mmhos/cm; typically, electrical conductivity increases with depth
Thickness—20 to 40 inches thick

2C horizon:
Color—matrix colors in shades of gray or brown
Redoximorphic features—iron concentrations or strata in shades of brown, yellow, or red and iron depletions in shades of gray range from few to many
Texture—shale, mudstone, or stratified layers of these materials with strata of siltstone and sandstone in some pedons; texture is mainly clay, but some pedons are clay loam
Other features—electrical conductivity ranges from 2 to 8 mmhos/cm

Pophers Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landscape: Coastal plain
Landform: Flood plains
Parent material: Loamy and silty alluvium
Slope range: 0 to 1 percent
Taxonomic classification: Fine-silty, siliceous, active, acid, thermic Fluvaquentic Endoaquepts
Associated soils: Fuller, Koury, and Ozias
- Fuller soils are on associated uplands and have a natric horizon
- Koury and Ozias soils are in similar flood plain positions; in addition, Koury soils have a coarse-silty particle-size control section, and Ozias soils have a fine-textured control section

Typical Pedon

Pophers silty clay loam, 0 to 1 percent slopes, frequently flooded, is located from Pennington, 7.1 miles east on Farm Road 358, 2.3 miles north on county road, 0.1 mile east on adjoining county road, 0.1 mile north on road in woods; USGS Pennington topographic quadrangle; latitude 31 degrees 13 minutes 47 seconds N.; longitude 95 degrees 09 minutes and 45 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silty clay loam; weak fine granular structure; friable, slightly hard; many roots of all sizes; strongly acid; gradual wavy boundary.
Bg1—4 to 10 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; firm, hard; many roots of all sizes; few fine faint yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation with diffuse boundaries throughout and dark grayish brown (10YR 4/2) stains along root channels; strongly acid; gradual wavy boundary.
Bg2—10 to 30 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; firm, hard; few fine and medium roots; few fine faint light gray (10YR 6/1) clay depletions on surfaces of peds; very strongly acid; gradual wavy boundary.
Bg3—30 to 44 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; firm, hard; few fine and medium roots; few fine distinct dark yellowish brown (10YR 3/4) irregularly shaped masses of iron accumulation with diffuse boundaries throughout; strongly acid; gradual wavy boundary.
Bg4—44 to 80 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm, hard; few fine and medium roots; few fine distinct dark yellowish brown (10YR 3/4) irregularly shaped masses of iron accumulation with diffuse boundaries throughout; few white spots; strongly acid; gradual wavy boundary.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 20 to 30 percent
Redoximorphic features: Iron concentrations in shades of red, brown, or yellow range from few to many; iron depletions range from none to common
Other distinctive soil features: The soil is nonsaline to very slightly saline throughout the upper 40 inches and very slightly saline to slightly saline below; sodium adsorption ratio ranges to 12 in the upper 40 inches and from 4 to 16 below that
Reaction: A horizon—very strongly acid to moderately acid; Bg and Bgb (where present) horizons—extremely acid to strongly acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3
Redoximorphic features—none
Texture—silty clay loam
Other features—none
Thickness—4 to 16 inches thick

Bg horizon and Bgb horizon (where present):
Color—hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, and chroma of 1 or 2
Redoximorphic features—few to many iron concentrations in shades of red, brown, or yellow; none to common iron depletions in shades of gray

Texture—loam, silt loam, silty clay loam, or clay loam
Other features—dominant subhorizons between a depth of 10 and 30 inches have value of 4 or 5 and chroma of 2; iron-manganese masses and concretions range from few to 5 percent, by volume, in most pedons; gypsum crystals in spots or masses range from few to 10 percent, by volume, mainly in the lower subhorizons
Thickness—20 to 40 inches thick

Rayburn Series

Depth class: Moderately deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Residuum from tuffaceous siltstone and sandstone
Slope range: 1 to 5 percent
Taxonomic classification: Fine, smectitic, thermic, Vertic Hapludalfs
Associated soils: Corrigan, Kitterll, and Letney

- Corrigan soils are in slightly lower, plane and concave positions or in similar side slope positions
- Kitterll soils are in associated convex, mid and lower slope positions and have a solum less than 20 inches thick
- Letney soils have a sandy epipedon 20 to 40 inches thick and have a loamy control section

Typical Pedon

Rayburn fine sandy loam, 1 to 5 percent slopes, is located from Groveton, 5.6 miles south on Farm Road 355, 4.6 miles south and southeast on Gerald Haynes Road (formerly Old Onalaska Road), 0.5 mile west on road in woods, 1.2 miles south on road in woods, 100 feet west of road in woods; USGS Chita topographic quadrangle; latitude 30 degrees 54 minutes 16 seconds N.; longitude 95 degrees 08 minutes 01 second W.

A—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; soft, very friable; common fine roots; very strongly acid; clear smooth boundary.
Btss1—4 to 11 inches; yellowish red (5YR 5/6) clay; moderate medium angular blocky structure; very hard, very firm; few fine roots; common slickensides; few clay films; very strongly acid; gradual wavy boundary.
Btss2—11 to 16 inches; red (2.5YR 5/6) clay; common medium distinct dark red (2.5YR 3/6) and few fine distinct yellow (10YR 7/6) and light brownish gray (10YR 6/2) iron depletions; moderate medium angular blocky structure; very hard, very firm; few fine roots; common slickensides; common clay films; very strongly acid; gradual wavy boundary.
Btss3—16 to 20 inches; light brownish gray (10YR 6/2) clay; common medium prominent red (2.5YR 4/8) and dark brown (7.5YR 4/4) iron concentrations; moderate medium angular blocky structure; very hard, very firm; few fine roots; common slickensides; common clay films; very strongly acid; gradual wavy boundary.
Btss4—20 to 29 inches; light brownish gray (10YR 6/2) silty clay; weak medium angular blocky structure; very hard, very firm; few fine roots; common slickensides; common clay films; extremely acid; clear wavy boundary.
Cr—29 to 45 inches; pale yellow (2.5Y 7/3) tuffaceous sandstone; common medium distinct yellow (2.5Y 8/6) and light brownish gray (10YR 6/2) lithochromic mottles; massive; very hard, very firm; extremely acid.

Range in Characteristics

Solum thickness: 20 to 40 inches
Clay content in the control section: 40 to 60 percent
Redoximorphic features: Common or many relict iron concentrations in shades of red and brown in the upper part; few or common wetness-related iron depletions in shades of gray and iron concentrations in shades of yellow and brown in the lower part
Other distinctive soil features: Base saturation ranges from 35 to 60 percent above the paralithic contact; the COLE is 0.09 to 0.14 in the Bt horizon
Reaction: A and E (where present) horizons—very strongly acid to moderately acid; Btss, BC, and CR horizons—extremely acid to strongly acid

A horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 1 to 3
Redoximorphic features—none
Texture—fine sandy loam
Other features—where moist, value of 3 or less and horizon is less than 6 inches thick
Thickness—3 to 10 inches thick

E horizon (where present):
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3
Redoximorphic features—none
Texture—loamy fine sand, fine sandy loam, or loam
Other features—none
Thickness—0 to 5 inches thick

Upper Btss horizon:
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3, 4, 6, or 8
Redoximorphic features—common to many relict concentrations in shades of red and brown in the upper part
Texture—clay
Other features—Btss1 horizon commonly contains up to 70 percent clay
Thickness—7 to 15 inches thick

Lower Btss horizon and BC horizon (where present):
Color—hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 2 or 3
Redoximorphic features—iron depletions in shades of gray and iron concentrations in shades of yellow and brown are few or common
Texture—clay or silty clay
Other features—none
Thickness—7 to 20 inches thick

Cr horizon:
Color—variable
Redoximorphic features—none
Texture—weakly consolidated tuffaceous siltstone and sandstone that is bentonitic, but contains volcanic ash, volcanic glass, and other pyroclastic material
Other features—none

The Rayburn soils in Trinity County are taxadjuncts to the Rayburn series because they typically are moderately deep to tuffaceous sandstone. This difference, however, does not significantly affect the use, management, or interpretations of the soils.

Rosenwall Series

Depth class: Moderately deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Residuum from interbedded shale and mudstone
Slope range: 1 to 15 percent
Taxonomic classification: Very-fine, mixed, active, thermic Typic Hapludults
Associated soils: Fuller, Herty, Keltys, Kurth, and Moswell
- Fuller soils are in slightly lower positions and are slightly wetter
- Herty soils are in lower positions and have a grayish argillic horizon
- Keltys and Kurth soils are in higher areas
- Moswell soils are in similar landscape positions

Typical Pedon

Rosenwall fine sandy loam, 1 to 5 percent slopes (fig. 14), is located from Farm Road 355 in Groveton, 1.3 miles east on U.S. Highway 287, 9.9 miles northeast on Farm Road 2262, 1.9 miles south on timber company/county road, 1.5 miles east and southeast on adjoining road to "Y" intersection, 0.3 mile east on adjoining road, 0.4 mile north on pipeline, 50 feet west in woods; USGS Trevat topographic quadrangle; latitude 31 degrees 05 minutes 48 seconds N.; longitude 94 degrees 56 minutes 49 seconds W.

A—0 to 5 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; slightly hard,

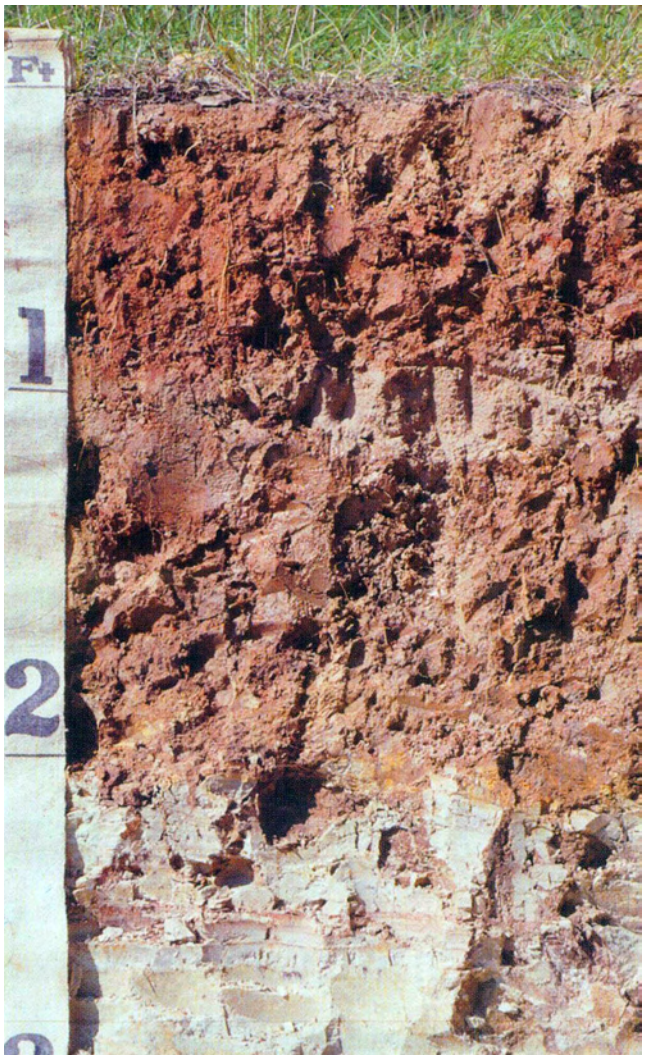


Figure 14.—Profile of Rosenwall fine sandy loam.

friable; many fine and medium roots; few round quartzite pebbles; moderately acid; clear wavy boundary.
E—5 to 8 inches; brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure; slightly hard, friable; many fine and medium roots; few round quartzite pebbles; strongly acid; abrupt wavy boundary.
Bt1—8 to 15 inches; dark red (2.5YR 3/6) clay; moderate fine subangular blocky structure; very hard, very firm; common fine roots; common clay films; few round quartzite pebbles; very strongly acid; gradual wavy boundary.
Bt2—15 to 19 inches; dark red (2.5YR 3/6) clay; common medium distinct gray (10YR 5/1) relict concentrations; moderate fine subangular blocky structure; very hard, very firm; common fine roots; common clay films; few round quartzite pebbles; very strongly acid; clear wavy boundary.
Bt3—19 to 24 inches; gray (10YR 5/1) clay; many medium prominent dark red (2.5YR 3/6) relict iron concentrations; moderate medium subangular blocky structure; very hard, very firm; common fine roots; common clay films; very strongly acid; abrupt wavy boundary.
Cr1—24 to 39 inches; layered pale yellow (2.5Y 7/4), dark gray (10YR 4/1), dark red (2.5YR 3/6), and yellowish red (5YR 5/8) shale and mudstone with texture of clay; massive; very hard, very firm; extremely acid; clear wavy boundary.
Cr2—39 to 58 inches; layered olive yellow (2.5Y 6/6), dark grayish brown (10YR 4/2), and strong brown (7.5YR 5/8) shale and mudstone with texture of clay; massive; very hard, very firm; extremely acid.

Range in Characteristics

Solum thickness: 20 to 40 inches
Clay content in the control section: 60 to 75 percent
Redoximorphic features: Relict iron accumulations in shades of red, yellow, and brown and iron depletions in shades of gray are in the subsoil
Other distinctive soil features: None to few quartzite pebbles throughout the solum
Reaction: A and E horizons—very strongly acid to slightly acid; Bt and BC (where present) horizons—very strongly acid to moderately acid; Cr horizon—extremely acid or very strongly acid

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 or 3
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—3 to 12 inches thick

E horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 3 or 4
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—0 to 7 inches thick

Bt1 horizon:
Color—hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 3, 4, 6, or 8
Redoximorphic features—none to common dark red, strong brown, or light brownish gray relict iron concentrations and depletions
Texture—clay
Other features—none
Thickness—4 to 8 inches thick

Bt2 horizon:
Color—hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 3 to 5, and chroma of 2, 3, 4, 6, or 8
Redoximorphic features—relict iron concentrations and depletions in shades of red, gray, yellow, and brown
Texture—clay
Other features—none
Thickness—4 to 8 inches thick

Bt3 horizon:
Color—hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 1 to 4
Redoximorphic features—relict iron concentrations and depletions in shades of red, brown, and yellow
Texture—clay
Other features—none
Thickness—5 to 8 inches thick

BC or B|C horizons (where present):
Color—hue of 5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 1 to 4
Redoximorphic features—none
Texture—stratified clay with fragments of shale, shaly clay, or sandstone
Other features—strata range from 1/4 inch to 1 or more inches thick
Thickness—0 to 8 inches thick

Cr horizon:
Color—variable
Redoximorphic features—none
Texture—weakly to strongly cemented sandstone or siltstone interbedded with shale or loamy sediments
Other features—none

Sawlit Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Very slow
Landscape: Coastal plain
Landform: Stream terraces
Parent material: Loamy over clayey alluvial sediments
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, siliceous, active, thermic Aquic Glossudalfs
Associated soils: Alazan, Latex, and Sawtown

- Alazan soils are typically in slightly lower positions and do not have a clayey 2Bt horizon
- Latex soils are well drained and are in similar landscape positions
- Sawtown soils do not have redoximorphic depletions within the upper 10 inches of the argillic horizon, are well drained, have a thicker epipedon, and are on adjoining mounds

Typical Pedon

Sawlit loam, in an area of Sawlit-Sawtown complex, 0 to 2 percent slopes, is located from Apple Springs, 6.2 miles northeast on Texas Highway 94 to the entrance of South Boggy Slough Hunting Club, 2.25 miles northwest on primary road, 0.8 mile north on adjoining road (toward Green Tree reservoir), 0.4 mile east on Holumbec hunting stand lane, 150 feet south of road in woods; USGS Wells SW topographic quadrangle; latitude 31 degrees 18 minutes 35 seconds N.; longitude 94 degrees 57 minutes 26 seconds W.

A—0 to 3 inches; brown (10YR 5/3) loam; weak fine subangular blocky structure; slightly hard, very friable; common fine and medium roots; few fine, medium, and coarse pores; very strongly acid; clear smooth boundary.

E—3 to 7 inches; pale brown (10YR 6/3) loam; weak fine subangular blocky structure; slightly hard, very friable; few fine and medium roots; few fine and medium pores; few dark grayish brown worm casts; common yellowish brown (10YR 5/6) iron stains along some root channels; very strongly acid; clear smooth boundary.

Bt—7 to 11 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; hard, friable; few fine and medium roots; common fine and few medium pores; common dark grayish brown worm casts; few thin clay films on surfaces of peds; few grayish brown (10YR 5/2) iron depletions along some pores and root channels; very strongly acid; gradual smooth boundary.

Bt/E1—11 to 19 inches; yellowish brown (10YR 5/8) sandy clay loam; 20 percent pale brown (10YR 6/3) fine sandy loam (E) intrusions of albic material along surfaces of prisms that are clay depletions resulting from aquic conditions; moderate medium subangular blocky structure; very hard, firm; few fine and medium roots; few fine and medium pores; few dark grayish brown worm casts; few thin clay films on surfaces of peds; common fine and medium grayish brown (10YR 5/2) clay depletions on surfaces of peds; very strongly acid; gradual wavy boundary.

Bt/E2—19 to 29 inches; strong brown (7.5YR 5/6) clay loam; 10 percent pale brown (10YR 6/3) fine sandy loam (E) intrusions of albic material along surfaces of prisms that are clay depletions resulting from aquic conditions; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; few fine and medium roots; few coarse and common fine and medium pores; common thin clay films on surfaces of prisms; many fine and medium prominent yellowish red (5YR 4/6) redoximorphic concentrations and common fine and medium distinct grayish brown (10YR 5/2) redoximorphic depletions; very strongly acid; clear smooth boundary.

2Bt1—29 to 39 inches; grayish brown (10YR 5/2) clay; many medium and coarse prominent red (2.5YR 4/8) iron concentrations; moderate medium angular blocky structure; very hard, very firm; few pressure faces; common thin clay films on surfaces of some peds; very strongly acid; gradual wavy boundary.

2Bt2—39 to 61 inches; light brownish gray (10YR 6/2) clay; many medium distinct yellowish brown (10YR 5/8) iron concentrations; moderate medium angular blocky structure; very hard, very firm; few pressure faces; common thin clay films on surfaces of some peds; very strongly acid; gradual wavy boundary.

2BC—61 to 80 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct brownish yellow (10YR 6/8) iron concentrations; very hard, firm; few pressure faces; few thin clay films on surfaces of some peds; very strongly acid.

Range in Characteristics

Solum thickness: More than 80 inches thick
Clay content in the control section: 25 to 35 percent
Redoximorphic features: Iron concentrations in shades of red or brown and iron depletions or clay depletions in shades of gray
Other distinctive soil features: Base saturation ranges from 45 to 75 percent at 50 inches below the top of the argillic horizon; depth to the 2Bt horizon ranges from 26 to 40 inches

Reaction: A, E, Bt, and Bt/E horizons—very strongly acid to moderately acid; 2Bt and 2BC horizons—extremely acid to strongly acid

A horizon:
- Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3
- Redoximorphic features—none to few brown or red coatings along root channels
- Texture—loam
- Other features—none to few rounded ironstone and/or quartzite pebbles
- Thickness—3 to 8 inches thick

E horizon:
- Color—hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 or 4
- Redoximorphic features—coatings along root channels range from none to common with colors in shades of brown or red
- Texture—fine sandy loam, very fine sandy loam, or loam
- Other features—none to few rounded ironstone and/or quartzite pebbles
- Thickness—0 to 15 inches thick

Bt horizon:
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8
- Redoximorphic features—iron depletions or clay depletions in shades of gray and iron concentrations in shades of red, yellow, or brown are few or common, mainly in the lower part
- Texture—loam, sandy clay loam, or clay loam
- Other features—rounded ironstone and/or quartzite pebbles range from 0 to 4 percent
- Thickness—8 to 20 inches thick

Bt/E horizon:
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8
- Redoximorphic features—iron depletions or clay depletions in shades of gray; iron concentrations in shades of red or brown
- Texture—loam, sandy clay loam, or clay loam
- Other features—albic streaks (E) range from 15 to 35 percent; brittle spots range from 0 to 15 percent; rounded ironstone and/or quartzite pebbles range from 0 to 4 percent
- Thickness—8 to 24 inches thick

2Bt horizon:
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1, 2, 3, 4, or 6
- Redoximorphic features—iron concentrations in shades of red, brown, or yellow and iron depletions in shades of gray range from few to many; or the matrix is variegated in these colors
- Texture—clay loam or clay with 35 to 50 percent clay
- Other features—albic streaks range from 0 to 4 percent; clay content is less than 35 percent below a depth of 60 inches in some pedons with a texture of clay loam or sandy clay loam
- Thickness—20 to 30 inches thick

2BC horizon:
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1, 2, 3, 4, or 6
- Redoximorphic features—iron concentrations in shades of red, brown, or yellow and iron depletions in shades of gray range from few to many; or the matrix is variegated in these colors
- Texture—fine sandy loam, sandy clay loam, or clay loam
- Other features—albic streaks range from 0 to 4 percent; clay content is less than 35 percent below a depth of 60 inches in some pedons with a texture of clay loam or sandy clay loam
- Thickness—20 to 30 inches thick

Sawtown Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Steam terraces
Parent material: Loamy and clayey alluvial sediments
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, siliceous, active, thermic Typic Glossudalfs
Associated soils: Alazan, Latex, and Sawlit
- Alazan and Sawlit soils are in lower, slightly wetter positions and have aquic conditions within a depth of 20 inches
- Latex soils are in similar or slightly lower positions and do not have a glossic horizon

Typical Pedon

Sawtown fine sandy loam, in an area of Sawlit-Sawtown complex, 0 to 2 percent slopes, is located from Apple Springs, 6.2 miles northeast on Texas Highway 94 to the entrance of South Boggy Slough Hunting Club, 2.25 miles northwest on primary road, 0.8 mile north on adjoining road (toward Green Tree reservoir), 0.4 mile east on Holumbec hunting stand lane, 50 feet south of road in woods; USGS Wells SW topographic quadrangle; latitude 31 degrees 12

minutes 34 seconds N.; longitude 94 degrees 54 minutes and 22 seconds W.

A—0 to 5 inches; dark brown (10YR 5/3) fine sandy loam; weak fine subangular blocky structure; hard, very friable; common fine and medium roots; few fine and medium pores; very strongly acid; clear smooth boundary.

E—5 to 8 inches; pale brown (10YR 6/3) fine sandy loam; weak fine subangular blocky structure; hard, very friable; common fine and medium roots; few fine and medium pores; very strongly acid; clear smooth boundary.

Bt1—8 to 18 inches; brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; hard, friable; common fine and few medium roots; common fine and few medium pores; few thin clay films on surfaces of peds; about 3 percent pale brown (10YR 6/3) streaks; very strongly acid; clear smooth boundary.

Bt/E1—18 to 26 inches; brownish yellow (10YR 6/6) sandy clay loam; 15 percent pale brown (10YR 6/3) fine sandy loam (E) on ped faces; moderate medium subangular blocky structure; common medium distinct red (2.5YR 4/8) iron concentrations; hard, friable; common fine and few medium roots; common fine and few medium pores; few thin clay films on surfaces of peds; few fine and medium hard iron-manganese concretions; very strongly acid; gradual wavy boundary.

Bt/E2—26 to 36 inches; yellowish brown (10YR 5/8) sandy clay loam; 20 percent pale brown (10YR 6/3) fine sandy loam (E) on ped faces; moderate medium subangular blocky structure; common medium distinct red (2.5YR 4/8) iron concentrations; hard, friable; common fine and few medium roots; common fine and few medium pores; few thin clay films on surfaces of peds; few fine and medium hard iron-manganese concretions; very strongly acid; gradual wavy boundary.

Bt/E3—36 to 43 inches; 45 percent strong brown (7.5YR 5/6) and brownish yellow (10YR 6/6), 35 percent pale brown (10YR 6/3), 15 percent red (2.5YR 4/8), and 5 percent gray (10YR 6/1) sandy clay loam; moderate medium subangular blocky structure; hard, friable; common fine and few medium roots; common fine and few medium pores; few thin clay films on surfaces of peds; few fine and medium hard iron-manganese concretions; very strongly acid; gradual wavy boundary.

2Bt1—43 to 56 inches; gray (10YR 5/1) clay loam; many coarse prominent red (2.5YR 4/8) and common medium distinct yellowish brown (10YR 5/6) iron concentrations; moderate medium subangular blocky structure; very hard, firm; few fine roots; few thin clay films on surfaces of prisms; very strongly acid; gradual wavy boundary.

2Bt2—56 to 65 inches; grayish brown (10YR 5/2) clay loam; common medium distinct strong brown (7.5YR 5/6) iron concentrations; moderate medium subangular blocky structure; hard, firm; few fine roots; few fine pores; few thin clay films on surfaces of prisms; very strongly acid; gradual wavy boundary.

2BC—65 to 80 inches; light brownish gray (10YR 6/2) sandy clay loam; common coarse distinct strong brown (7.5YR 5/8) iron concentrations; weak fine subangular blocky structure; hard, friable; few fine roots; very strongly acid.

Range in Characteristics

Solum thickness: More than 80 inches

Clay content in the control section: 18 to 27 percent

Redoximorphic features: Iron concentrations in shades of red, brown, or yellow range from none to common in the lower part of the subsoil

Other distinctive soil features: Base saturation ranges from 45 to 80 percent at 50 inches below the top of the argillic horizon; depth to the clayey 2Bt horizon ranges from 40 to 60 inches

Reaction: A horizon—very strongly acid to slightly acid; E horizon—very strongly acid to moderately acid; Bt and Bt/E horizons—extremely acid to moderately acid; 2Bt and 2BC horizons—extremely acid to slightly acid

A horizon:

Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3

Redoximorphic features—none

Texture—fine sandy loam

Other features—none to few rounded ironstone or quartzite pebbles

Thickness—3 to 12 inches thick

E horizon:

Color—hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 4

Redoximorphic features—none

Texture—fine sandy loam, very fine sandy loam, or loam

Other features—none to few rounded ironstone or quartzite pebbles

Thickness—10 to 28 inches thick

Bt horizon:

Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4, 6, or 8

Redoximorphic features—none to common iron concentrations in shades of red, brown, or yellow
Texture—loam, sandy clay loam, or clay loam
Other features—rounded ironstone or quartzite pebbles range from none to about 4 percent
Thickness—18 to 40 inches thick

Bt/E horizon:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4, 6, or 8
Redoximorphic features—none to common iron concentrations in shades of red, brown, or yellow
Texture—loam, sandy clay loam, or clay loam
Other features—contains 5 to 15 percent albic streaks; rounded ironstone or quartzite pebbles range from none to about 4 percent
Thickness—18 to 40 inches thick

2Bt horizon:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2
Redoximorphic features—iron concentrations in shades of red, brown, or yellow and iron depletions in shades of gray range from few to many; or the matrix is variegated in these colors
Texture—clay loam or clay
Other features—gypsum crystals and/or fine masses of barite range from none to common
Thickness—10 to 30 inches thick

2BC horizon:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 or 2
Redoximorphic features—iron concentrations in shades of red, brown, or yellow and iron depletions in shades of gray range from few to many; or the matrix is variegated in these colors
Texture—fine sandy loam, sandy clay loam, or clay loam
Other features—gypsum crystals and/or fine masses of barite range from none to common

Stringtown Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Coastal plain
Landform: Uplands
Parent material: Weakly consolidated loamy marine sediments
Slope range: 5 to 15 percent
Taxonomic classification: Fine-loamy, siliceous, semiactive, thermic Typic Hapludults
Associated soils: Letney and Tehran
- Letney and Tehran soils have a sandy epipedon more than 20 inches thick and are in slightly higher landscape positions

Typical Pedon

Stringtown fine sandy loam, 5 to 15 percent slopes, is located from U.S. Highway 287 in Groveton, 10.7 miles south-southwest on Farm Road 355 to Chita community, 2.5 miles south on Carlisle/Chita Road, 1 mile southeast on road in woods, 300 feet north on old adjoining road in woods, 120 feet east in pine plantation; USGS Chita topographic quadrangle; latitude 30 degrees 53 minutes 34 seconds N.; longitude 95 degrees 11 minutes 02 seconds W.

A—0 to 5 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; soft, very friable; common fine and medium roots; moderately acid; gradual smooth boundary.
E—5 to 10 inches; pale brown (10YR 6/3) fine sandy loam; weak fine granular structure; soft, very friable; common fine and medium roots; moderately acid; clear smooth boundary.
Bt1—10 to 18 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium distinct red (2.5YR 5/8) relict iron concentrations; moderate medium subangular blocky structure; hard, friable; common fine roots; few pressure faces; common clay films; 1 percent rounded rock fragments; strongly acid; gradual wavy boundary.
Bt2—18 to 25 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (10R 4/8) relict iron concentrations; moderate medium subangular blocky structure; hard, friable; common fine roots; few pressure faces; common clay films; strongly acid; gradual wavy boundary.
Bt3—25 to 31 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/8) and common medium distinct light gray (10YR 7/2) lithochromic mottles; moderate medium subangular blocky structure; hard, friable; common fine roots; few pressure faces; common clay films; strongly acid; gradual wavy boundary.
Bt4—31 to 42 inches; 35 percent strong brown (7.5YR 5/8), 35 percent red (2.5YR 4/8) and 30 percent light gray (10YR 7/2) sandy clay loam; weak fine subangular blocky structure; hard, friable; common fine roots; few pressure faces; common clay films; strongly acid; gradual wavy boundary.
Bt5—42 to 51 inches; 45 percent yellowish brown (10YR 5/8), 30 percent light gray (10YR 7/1), and 25 percent red (2.5YR 4/8) sandy clay loam; weak

fine subangular blocky structure; hard, friable; few fine roots; few pressure faces; few clay films; strongly acid; gradual wavy boundary.
BC1—51 to 68 inches; 35 percent brownish yellow (10YR 6/8), 35 percent red (2.5YR 4/6), and 30 percent light gray (10YR 7/2) fine sandy loam; weak fine subangular blocky structure; hard, friable; few fine roots; strongly acid; gradual wavy boundary.
BC2—68 to 80 inches; 45 percent strong brown (7.5YR 5/8), 30 percent light gray (10YR 7/2), and 25 percent brownish yellow (10YR 6/8) fine sandy loam; weak fine subangular blocky structure; hard, friable; few fine roots; strongly acid.

Range in Characteristics

Solum thickness: 60 to more than 80 inches
Clay content in the control section: 18 to 35 percent
Redoximorphic features: Relict iron concentrations and lithochromic mottles in shades of red, yellow, and brown in the Bt1 and Bt2 horizons; gray colors are lithochromic and are due to weathered shale fragments
Other distinctive soil features: Ironstone pebbles and angular fragments make up 1 to 20 percent, by volume, of the A and E horizons; a few ironstone cobbles up to 6 inches across occur in some pedons; plinthite makes up 1 to 4 percent, by volume, of the lower Bt horizon; base saturation ranges from 25 to 35 percent
Reaction: A and E horizons—very strongly acid to slightly acid; Bt and BC horizons—very strongly acid to moderately acid

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 to 4
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—2 to 6 inches thick

E horizon:
Color—hue of 10YR, value of 5 or 6, and chroma of 3 or 4
Redoximorphic features—none
Texture—fine sandy loam, loamy fine sand, gravelly fine sandy loam, or gravelly loamy fine sand
Other features—none
Thickness—4 to 6 inches thick

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8
Redoximorphic features—relict iron concentrations in shades of red, yellow, and brown (Bt1 and Bt2); gray colors are lithochromic
Texture—sandy clay loam or clay loam
Other features—generally contains 1 to 15 percent, by volume, of pebbles and flattened fragments of ironstone
Thickness—18 to 37 inches thick

BC horizon:
Color—Variegated in shades of yellow, red, and gray
Redoximorphic features—none
Texture—fine sandy loam or sandy clay loam that commonly contains fragments of weathered shale and sandstone
Other features—none
Thickness—6 to 10 inches thick

C horizon (where present):
Color—shades of gray, red, and brown
Redoximorphic features—none
Texture—sandy clay loam with strata of soft shale and sandstone
Other features—none

The Stringtown soils in Trinity County are taxadjuncts to the Stringtown series because they typically have a significant clay decrease in the lower part of the subsoil, and they do not have a stratified, shaley substratum within a depth of 60 inches. This difference, however, does not significantly affect the use, management, or interpretations of the soils.

Tehran Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid
Landscape: Coastal plain
Landform: Uplands
Parent material: Sandy and loamy sediments
Slope range: 5 to 15 percent
Taxonomic classification: Loamy, siliceous, semiactive, thermic Grossarenic Paleudults
Associated soils: Corrigan, Letney, and Rayburn
- Corrigan and Rayburn soils are on ridges and in steep side slope positions in nearby areas and have a clayey control section
- Letney soils are in broad ridgetop positions and on the upper part of side slopes

Typical Pedon

Tehran loamy sand, 5 to 15 percent slopes, is located from Farm Road 355 in Groveton, 6.6 miles east on

U.S. Highway 287; 2.7 miles south on county road, 1.7 miles northeast on timber company road, 400 feet northwest on power line right-of-way, 100 feet east in woods; USGS Colita topographic quadrangle; latitude 30 degrees 59 minutes 46 seconds N.; longitude 95 degrees 08 minutes 01 second W.

A—0 to 8 inches; brown (10YR 4/3) loamy sand; single grained; loose, very friable; many fine and medium roots; moderately acid; gradual smooth boundary.

E1—8 to 17 inches; pale brown (10YR 6/3) loamy sand; single grained; loose, very friable; common fine roots; moderately acid; gradual smooth boundary.

E2—17 to 34 inches; pale brown (10YR 6/3) loamy sand; common medium faint light yellowish brown (10YR 6/4) iron stains; single grained; loose, very friable; few fine roots; moderately acid; gradual wavy boundary.

E3—34 to 45 inches; light yellowish brown (10YR 6/4) loamy sand; common medium distinct yellowish red (5YR 5/6) iron stains; loose, very friable; few fine roots; moderately acid; clear wavy boundary.

Bt1—45 to 60 inches; red (2.5YR 4/8) sandy clay loam; weak medium subangular blocky structure; hard, friable; few fine roots; common clay films; strongly acid; gradual wavy boundary.

Bt2—60 to 67 inches; 65 percent red (2.5YR 4/8) and 35 percent yellowish red (5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; hard, friable; few fine roots; few pockets of very pale brown (10YR 7/3) clean sand; common clay films; strongly acid; gradual wavy boundary.

Bt3—67 to 80 inches; 70 percent red (2.5YR 4/8) and 30 percent yellowish red (5YR 5/8) sandy loam; weak fine subangular blocky structure; hard, friable; few fine roots; pockets of very pale brown clean sand; common clay films; strongly acid.

Range in Characteristics

Solum thickness: More than 60 inches
Clay content in the control section: 18 to 32 percent
Redoximorphic features: Common relict iron concentrations in shades of yellow, red, and brown and relict iron depletions in shades of gray are in the lower part of the solum
Other distinctive soil features: Base saturation ranges from 15 to 30 percent at 72 inches below the surface; 10 to 25 percent of the sand fraction is coarse or very coarse sand
Reaction: Very strongly acid to moderately acid throughout

A horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 4
Redoximorphic features—none
Texture—loamy sand
Other features—none
Thickness—3 to 6 inches thick

E horizon:
Color—hue of 10YR, value of 5 to 7, and chroma of 3 or 4
Redoximorphic features—none
Texture—loamy sand or sand
Other features—quartzite gravel ranges from 0 to 10 percent, by volume
Thickness—40 to 60 inches thick

Bt horizon:
Color—hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 4 to 7, and chroma of 4, 6, or 8
Redoximorphic features—relict iron accumulations are common in shades of yellow, red, and brown; iron depletions with chroma of 2 or less are 60 inches or more below the surface
Texture—sandy clay loam, but ranges to sandy loam in some pedons
Other features—quartzite gravel ranges from 0 to 10 percent and plinthite from 0 to 5 percent, by volume
Thickness—10 to 23 inches thick

Urland Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderately slow
Landscape: Coastal plain
Landform: Uplands
Parent material: Stratified sandstone and clayey coastal plain sediments of Pleistocene age
Slope range: 1 to 5 percent
Taxonomic classification: Clayey, mixed, active, thermic Typic Hapludults
Associated soils: Moswell and Stringtown
- Moswell soils have base saturation greater than 35 percent in the lower part of the profile
- Stringtown soils contain less than 35 percent clay in the upper part of the argillic horizon and are in steeper or more convex side slope positions

Typical Pedon

Urland fine sandy loam, 1 to 5 percent slopes, is located from Farm Road 355 in Groveton, 1.3 miles east on U.S. Highway 287, 10 miles northeast on Farm Road 2262, 3.2 miles north on Farm Road 357, 0.25 mile east on Zion Cemetery road, 50 feet north of road in woods; USGS Apple Springs topographic quadrangle; latitude

31 degrees 09 minutes 46 seconds N.; longitude 94 degrees 57 minutes 30 seconds W.

A—0 to 2 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; soft, very friable; many fine roots; about 5 percent ironstone pebbles; slightly acid; clear smooth boundary.
AB—2 to 5 inches; yellowish red (5YR 5/6) fine sandy loam; weak fine granular structure; soft, very friable; common fine roots; about 5 percent iron stone pebbles; slightly acid; clear wavy boundary.
Bt1—5 to 14 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; hard, firm; common fine roots; continuous clay films; very strongly acid; gradual wavy boundary.
Bt2—14 to 22 inches; red (2.5YR 4/8) clay; few medium distinct red (2.5YR 5/6) relict concentrations; moderate medium subangular blocky structure; hard, firm; common fine roots; continuous clay films; very strongly acid; gradual wavy boundary.
Bt3—22 to 43 inches; red (2.5YR 4/8) clay loam; common medium prominent brownish yellow (10YR 6/6) relict iron concentrations; moderate medium subangular blocky structure; hard, firm; common fine roots; continuous clay films; very strongly acid; gradual wavy boundary.
Bt/C—43 to 58 inches; 90 percent red (2.5YR 4/8) sandy clay loam (Bt); 10 percent horizontal gray weathered shale fragments (C); few medium prominent red (2.5YR 4/6) relict iron concentrations; weak medium subangular blocky structure; hard, firm; few fine roots; few clay films; few pockets of weathered glauconitic material; very strongly acid; clear wavy boundary.
C/Bt—58 to 72 inches; 95 percent yellowish brown (10YR 5/8) soft sandstone (C) with texture of fine sandy loam; 5 percent red (2.5YR 4/6) masses of sandy clay loam (Bt); massive; hard, firm; few fine roots; very strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches
Clay content in the control section: 35 to 55 percent
Redoximorphic features: None to common relict iron concentrations in shades of brown and red in the subsoil
Other distinctive soil features: Base saturation ranges from 15 to 35 percent
Reaction: A, E (where present), and AB horizons—strongly acid to slightly acid; Bt, Bt/C, and C/Bt horizons—very strongly acid to strongly acid

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 to 4
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—2 to 8 inches thick

E horizon (where present):
Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 4
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—0 to 10 inches thick

AB horizon:
Color—hue of 5YR, value of 4 or 5, and chroma of 4, 6, or 8
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—0 to 5 inches thick

Upper Bt horizon:
Color—hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4, 6, or 8
Redoximorphic features—none to common relict concentrations in shades of brown and red
Texture—clay, clay loam, or sandy clay
Other features—contains from 0 to about 10 percent, by volume, of ironstone pebbles
Thickness—10 to 25 inches thick

Lower Bt horizon:
Color—hue of 2.5YR, 5YR, or 7.5YR, value of 4 or 5, and chroma of 4, 6, or 8
Redoximorphic features—common or many relict concentrations in shades of red, yellow, and brown
Texture—clay, clay loam, or sandy clay
Other features—none
Thickness—10 to 25 inches thick

Bt/C horizon:
Color—hue of 2.5YR, 5YR, or 7.5YR, value of 4 or 5, and chroma of 4, 6, or 8
Redoximorphic features—common or many relict concentrations in shades of red, yellow, and brown
Texture—Sandy clay loam, clay loam, or sandy loam
Other features—none

C/Bt horizon:
Color—shades of red, brown, yellow, gray, white, and pink

Redoximorphic features—none
Texture—stratified or interbedded soft sandstone with clayey and loamy soil materials
Other features—none

Woden Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landscape: Coastal plain
Landform: Stream terraces
Parent material: Alluvial sediments
Slope range: 1 to 4 percent
Taxonomic classification: Coarse-loamy, siliceous, semiactive, thermic Typic Paleudalfs
Associated soils: Austonio, Besner, Hainesville, and Latex

- Austonio and Latex soils have a fine-loamy control section
- Besner soils have a coarse-loamy control section and a glossic horizon
- Hainesville soils are commonly in slightly lower positions and are sandy throughout

Typical Pedon

Woden fine sandy loam, 1 to 4 percent slopes, is located from Loop 304 in Crockett, Texas, 25.5 miles northeast through Weches on Texas Highway 21, 0.3 mile north of the intersection of Texas Highway 21 and U.S. Forest Service Road 511 in pasture; USGS Weches topographic quadrangle; latitude 31 degrees 33 minutes 41 seconds N.; longitude 95 degrees 10 minutes 46 seconds W.

Ap—0 to 5 inches; dark brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; slightly hard, very friable; many fine roots; strongly acid; clear smooth boundary.
E—5 to 12 inches; brown (10YR 5/3) fine sandy loam; weak medium subangular blocky structure; slightly hard, very friable; many fine roots; strongly acid; clear smooth boundary.
Bt1—12 to 25 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; slightly hard, very friable; common fine roots; many fine pores; few clay films; slightly acid; gradual smooth boundary.
Bt2—25 to 36 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; slightly hard, very friable; common fine roots; many fine pores; few clay films; slightly acid; clear smooth boundary.
Bt3—36 to 52 inches; yellowish red (5YR 5/6) fine sandy loam; weak medium subangular blocky structure; slightly hard, friable; common fine roots; many fine pores; common clay films; clay bridges on sand grains; slightly acid; clear wavy boundary.
Bt4—52 to 62 inches; yellowish red (5YR 4/6) fine sandy loam; weak subangular blocky structure; slightly hard, friable; common fine roots; many fine pores; common clay films; sand grains coated and bridged with clay; slightly acid; gradual smooth boundary.
Bt5—62 to 74 inches; yellowish red (5YR 5/8) loam; moderate medium subangular blocky structure; hard, friable; common fine roots; common fine pores; common clay films; slightly acid; gradual smooth boundary.
Bt6—74 to 80 inches; strong brown (7.5YR 5/8) fine sandy loam; moderate medium subangular blocky structure; slightly hard, friable; few fine roots; few fine pores; few clay films; slightly acid.

Range in Characteristics

Solum thickness: More than 80 inches
Clay content in the control section: 12 to 18 percent
Redoximorphic features: None
Other distinctive soil features: None to few rounded ironstone and quartzite pebbles throughout
Reaction: Strongly acid to slightly acid throughout

A horizon:
Color—hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 3 to 5, and chroma of 2, 3, 4, 6, or 8
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—4 to 10 inches thick

E horizon:
Color—hue of 5YR, 7.5YR, or 10YR, value of 5 to 7, and chroma of 2 to 4
Redoximorphic features—none
Texture—fine sandy loam
Other features—none
Thickness—0 to 10 inches thick

Bt horizon:
Color—hue of 2.5YR, 5YR, or 7.5YR, value of 4 or 5, and chroma of 6 or 8
Redoximorphic features—none to few brown, red, or yellow relict iron concentrations
Texture—fine sandy loam or loam
Other features—few streaks or spots of uncoated sand are in the lower part of some pedons
Thickness—more than 80 inches thick

Formation of the Soils

In this section, the factors of soil formation are described and related to the formation of the soils in Trinity County. Also, the surface geology of the county is described.

Factors of Soil Formation

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The nature of any soil at a given site is the result of the interaction of five general factors—parent material, climate, plants and animals, relief, and time. Climate and plants and animals have an effect on parent material that is modified by relief over time. Theoretically, if all these factors were identical at different sites, the soils at these sites would be identical. Differences among the soils are caused by variations in one or more of these factors.

Parent Material

Parent material is the unconsolidated mass from which a soil forms. Parent material, in conjunction with climate, biota, topography, and time has a major influence on the chemical and mineral composition of soil. The ultimate source of mineral parent material is from weathered sedimentary, igneous, or metamorphic rock. The organic fraction of parent material is derived mainly from decomposition of vegetation.

Water, wind, and gravity have been the primary transport and depositional agents of geologic strata and parent materials in Trinity County. Continental and marine sediments were laid down during the Tertiary and Quarternary periods. Tertiary age strata are continental fluvial, deltaic, lagoonal and shallow marine, and wind-transported volcanic ash sediments deposited during the Eocene, Oligocene, and Miocene epochs. Quaternary age sediments were deposited during the Pleistocene and Holocene epochs on higher fluviatile terrace levels along rivers and other major streams. Holocene age sediments include modern alluvial deposits on flood plains and the lowest terrace level along the Trinity River, Neches River, and smaller streams.

Trinity County upland soils are developed from parent materials that are essentially weathered residuum from underlying Tertiary age sedimentary bedrock. Soils on steeper slopes are affected in varying degrees by creep, or mass movement of soil down slopes. This movement has not, however, been significant enough to destroy the residual effects of the parent material. Conversely, Pleistocene terrace and Holocene flood plain soils and their parent materials are not necessarily a product of the underlying bedrock. These alluvial soils formed in parent materials transported and deposited by rivers and smaller streams in Trinity County.

Climate

Trinity County has a warm, moist, humid, subtropical climate that is characterized by moderate to heavy rainfall. The rainfall promotes rapid formation of soils throughout the county. Summers are hot and humid. Winters are mild. Rainfall is uniform over the county; however, it is modified locally by runoff caused by steepness of slope. As a result, most of the soils in the survey area are deep. Most differences between the soils, however, cannot be attributed to the climate because it has always been uniform throughout the survey area.

Plant and Animal Life

In Trinity County, plants, insects, micro-organisms, crayfish, earthworms, and other forms of living organisms have contributed to the development of the soils. Increased organic matter and nitrogen in the soil, gains or losses in plant nutrients, and changes in structure and porosity are caused by plant and animal life.

Vegetation, dominantly trees, has had a great effect on soil formation in the county. The soils that formed under trees are generally low in content of organic matter and light in color. Some of the upland and terrace soils under grass vegetation are medium in organic matter content.

Relief

Relief is the relative position and elevation of natural or man-made features that define the surface configuration of an area. The relief within Trinity County ranges from nearly level to steep. The nearly level areas consist of flood plains and fluvial terraces. Some broad interfluves are nearly level to gently sloping. Slopes adjacent to drainageways are generally strongly sloping to moderately steep. A few hills and slopes are steep.

Relief affects soil formation through its influence on surface runoff, soil moisture penetration depths, and drainage. If other factors remain constant, the degree of soil profile development depends on the amount, depth, and penetration of soil moisture. The more often a soil is subjected to a wetting and drying cycle, the greater and more distinct the soil development. As slope gradient increases, especially in excess of 8 percent, the water penetration depth significantly decreases. Soil formation is retarded because less water is available for soil moisture. Less water for soil moisture is due to enhanced surface runoff, which is an effect of greater gradient.

Time

A great length of time is required for the formation of soils with distinct horizons. The differences in the length of time that the parent material has been in place are commonly reflected in the degree of development of soil horizons. Young soils have very little horizon development, and old soils have well expressed horizons.

Koury and Pophers soils are young soils. They are on flood plains where sediment is continuously added. These soils have little soil horizon development.

Advanced stages of development are evident in many of the soils in Trinity County. The Urland soils, for example, were formed over a longer period of time and have been leached of most bases and have distinct horizonation and clay movement in the profile.

Surface Geology

Max Bircket, soil geomorphologist, Natural Resources Conservation Service, helped prepare this section.

Trinity County is located within the West Gulf Coastal Plain section of the Coastal Plain physiographic province. The topography in Trinity County is generally subdued. Low hills and cuestas parallel the outcrops of relatively erosion-resistant geologic formations. The Catahoula Formation and the formations in the Jackson Group are the substrata for the Kisatchie Escarpment, which extends eastward into Louisiana and southwestward into Texas.

The Beaumont and Palestine sheets of the geologic atlas of Texas and the geologic map of Texas depict the geologic outcrops in Trinity County. The older formations outcropping in Trinity County are Tertiary age strata deposited during the Eocene, Oligocene, and Miocene epochs. Tertiary outcrops are located on interfluves of major streams and become progressively younger along a traverse from north to south. Younger Quaternary age sediment is stream terrace and flood plain substrate deposited during the Pleistocene and Holocene epochs. The youngest geologic unit in the county is Holocene alluvium on the Neches River, Trinity River, and flood plains of smaller streams.

Tertiary strata and Quaternary fluvial sediment are the sources of soil parent materials in Trinity County. Claystone, siltstone, shale, and sandstone strata are overlain by clayey, loamy, and sandy soils, respectively. Fluvial sediment is the parent material for clayey to gravelly soils. Consequently, the general soil map depicts the general location and areal extent of Tertiary outcrops and of Quaternary fluvial deposition and related stream patterns.

Tertiary Formations and Associated Soils

Tertiary formations outcropping on the West Gulf Coastal Plain are generally in coast paralleling bands. The strike of these formations in Trinity County is in an east-west direction. Formational dip at the outcrop is toward the Gulf of Mexico at angles only slightly greater than the current land surface slope. Contacts between formations are unconformable; the overlying formation was deposited on the eroded surface of the underlying formation. Differential erosion has subsequently resulted in numerous outliers and inliers. These geologic characteristics and predominantly forest vegetation have greatly complicated determination of formational contacts and soils mapping.

There are no faults mapped in Tertiary formation outcrops in Trinity County.

Depositional environment, in conjunction with sediment origins and time, determines lithic and mineral characteristics of the sediments, which eventually are the source of soil parent materials. Ancient rising and lowering of sea level, transgressions and regressions of water over the land area, respectively, affected the depositional environment of sediment. Tertiary strata outcropping in Trinity County are the result of a dominantly regressing sea. This scenario is manifested by Jackson Group formations that were deposited in shallow marine, deltaic, and

fluvial depositional environments. A shallow marine environment produced sandy calcareous shale and glauconite, a green iron silicate; a deltaic environment has resulted in sandy siltstone, shale, and fine-grained sandstone; a fluvial depositional environment produced sandstone and conglomerate with lesser amounts of claystone, siltstone, and lignite.

With the exception of volcanic ash and tuff, Tertiary strata outcropping in Trinity County originated in a paleo-fluvial system that has been superseded by the modern Trinity River and Neches River systems. The extinct Chita-Corrigan fluvial system transported dominantly siliceous sediment indigenous to its drainage area. The ash originated from volcanoes erupting in northern Mexico, southwest Texas, and southern New Mexico. Prevailing winds transported the airborne ash eastward where it descended to ground-surface. The ash then became a component of the sediment loads in the Chita-Corrigan fluvial system and other paleo-fluvial systems flowing into the Gulf of Mexico. Most of the older Eocene ash has weathered to smectitic clay or consolidated to tuff.

Claiborne Group

The Eocene age Yegua Formation is the youngest formation in the Claiborne Group and the oldest formation outcropping in Trinity County. The Yegua Formation outcrop is in the northern part of the county and is dominantly claystone, siltstone, shale, sandstone, and lignite. These strata were laid down in fluvial and deltaic depositional environments. The clay and finer silt size sediments were deposited in interdistributary, crevasse-splay, and delta-front environments. The coarser sand sediments were deposited in distributary and delta-plain environments. Lignitic materials accumulated in abandoned distributary channels, distributary swamps, and marshes. Volcanic ash is interbedded with the fluvial and deltaic sediment. Most of the ash in the Yegua Formation has weathered to smectites.

The Fuller-Kurth-Keltys general soil map unit is largely confined to the Yegua Formation outcrop. The C horizon of the major soils in this unit developed from the finer grained clay, silt, and shale deltaic facies of the Yegua Formation.

Jackson Group

The younger Jackson Group was deposited over the Claiborne Group. The Jackson Group, which has the largest outcrop area in the county, is divided into four formations. From oldest to youngest, they are the Eocene age Cadell Formation, Wellborn Formation, and Manning Formation, and the Eocene-Oligocene age Whitsett Formation. Jackson Group formations, from oldest to youngest, were deposited in shallow marine-prodelta to continental-fluvial depositional environments, respectively. All four formations are lignitic and contain fossil wood and smectites weathered from pyroclastics. The Whitsett Formation, however, contains relatively more volcanic ash, tuff, and smectite.

The Cadell Formation was deposited in a shallow marine-prodelta depositional environment over the Yegua Formation. Clay, mudstone, and shale are the dominant sources of parent materials from the Cadell Formation. Glauconite, an indicator of a shallow marine depositional environment, is also present in various amounts. Weathered glauconite, an iron oxide, in parent materials imparts a characteristic dark maroon to light red color to the soil. Soils developed over the Cadell Formation are in the Kurth-Colita-Lovelady general soil map unit.

The Wellborn Formation was deposited in a delta-front depositional environment, and the Manning Formation was laid down in a delta-plain depositional environment. Both formations are mostly quartz sandstone and mudstone, are lignitic, and contain fossil wood. The Wellborn Formation, in contrast to the Manning Formation, is glauconitic and contains very fine-grained sandstone. Also, the Wellborn Formation outcrop is significantly narrower, indicating a relatively lesser thickness.

Similar soils have developed on the Wellborn Formation and the Manning Formation because of lithologic similarities. The Herty-Moswell and the Kurth-Colita-Lovelady general soil map units are mapped on both formations. Herty and Moswell soils have developed in silt and clay parent materials. Kurth, Colita, and Lovelady soils have developed in dominantly sandy and silty parent materials.

The Whitsett Formation was laid down in a fluvial depositional environment. It contains more quartz sand, volcanic ash, and smectites than the older Jackson Group formations. Lithologically, it is predominantly light-colored sand, sandy clay, and green tuffaceous clay. Soils in the Kurth-Colita-Lovelady general soil map unit are mapped over the Whitsett Formation.

Catahoula Formation

The Miocene age Catahoula Formation crops out in the south-central portion of the county over the Whitsett Formation. The Catahoula Formation was deposited in a continental-fluvial depositional environment. It is mainly sandstone and mudstone interbedded with large amounts of weathered volcanic ash and tuff. The ash is predominantly tiny glass shards, which are a source of siliceous cement in the sandstone. The Catahoula Formation is essentially a

source of noncalcareous parent materials. Soils in the Colita-Laska-Corrigan general soil map unit are mapped over the Catahoula Formation.

Fleming Formation

The Fleming Formation is Miocene in age and crops out over the Catahoula Formation. The outcrop is of limited extent, located east of the community of Carlisle in the extreme southern sector of the county (Barnes, 1968a). Lithologically, it is mostly fluviatile clay with subordinate beds of sandstone. The clay and sandstone are commonly calcareous. The sandstone is medium grained, thick bedded, locally cross-bedded, and locally abundant with quartz and chert gravel.

Eastham and Garner soils are mapped over the Fleming Formation in Trinity County.

Quaternary Formations, Sediments, and Associated Soils

Pleistocene age sediments are on the various fluviatile terrace levels along the Trinity and Neches Rivers. These sediments, the remnants of ancient flood plains, are not extensive in Trinity County. Stream channel entrenchment and other erosion processes have left the older flood plain sediments as substrate for relict terraces above and on the periphery of younger Holocene flood plains. Consequently, the locations of these fluvial sediments and associated soil parent materials are determined by stream channel location.

Holocene age sediments include alluvial deposits on modern flood plains along the Trinity and Neches Rivers and smaller streams in the county. Lake Livingston, however, inundates a significant area of the Trinity River and White Creek flood plains in Trinity County.

Beaumont Formation

The Pleistocene age Beaumont Formation was deposited on flood plains and delta plains of coalescing streams draining into the Gulf of Mexico. It was deposited at a high sea level stage, probably during the Sangamon Interglacial Stage. Only a small area of the Beaumont Formation outcrop is mapped in Trinity County. It represents an upstream flood plain deposit now in a relict terrace position on the north side of Lake Livingston. The Beaumont Formation is the oldest terrace substrate in Trinity County. The formation is dominantly clay with silt and sand. The clay was deposited as interdistributary, channel fill, and overbank muds. Sand and silt were laid down as meanderbelt, levee, crevasse-splay, and distributary deposits along old aggraded stream channels.

Gladewater and Pophers soils are mapped over the Beaumont Formation in Trinity County.

Fluviatile Terrace Substrate

Flood plain deposition postdating the Beaumont Formation occurred during Pleistocene time in Trinity County. Subsequent erosion, stream channel incisement, and flood plain dissection have left only remnants of once broad extensive flood plains. The remnants are now fluviatile terraces along valley walls and adjacent to the outer periphery of younger Holocene flood plain alluvium. Fluviatile terraces in Trinity County are in the vicinity of the confluence of Tantabogue Creek and White Rock Creek and two isolated areas west of the Neches River. Soil parent materials under the terraces are mostly sand, silt, and clay.

Koury, Pophers, and Ozias soils are mapped on fluviatile terraces in Trinity County.

Deweyville Formation

The late Pleistocene to early Holocene age Deweyville Formation is the youngest terrace substrate above the modern Holocene age flood plain. Five isolated terrace remnants are mapped in the extreme southern sector of the county (Barnes, 1968a and 1968b). In addition to its topographic position immediately above and adjacent to the modern flood plain, the Deweyville Formation can be delineated from younger Holocene alluvium by its coarser gravel and sand. The formation is composed of fluvial sand, silt, clay, and gravel.

Austonio, Eastham, and Hainesville soils are mapped over the Deweyville Formation in Trinity County.

Holocene Age Alluvium

Holocene age alluvium consists of flood plain deposits along the Neches River, Trinity River, and smaller streams in the county. These unconsolidated deposits, or soil parent materials, are composed of gravel, sand, clay, silt, and locally abundant organic sediments.

Alazan, Besner, Hainesville, Sawlit, and Sawtown soils are mapped on the Neches River flood plain in Trinity County.

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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.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Anaerobic. A situation in which molecular oxygen is virtually absent from the environment.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Artificial hydric soil. A soil that meets the definition of a hydric soil as a result of an artificially induced hydrologic regime and did not meet the definition before the artificial measures were applied.

Aspect. The direction in which a slope faces.

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 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

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.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

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 depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse textured soil. Sand or loamy sand.

COLE (coefficient of linear extensibility). See Linear extensibility.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

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 that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

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.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in

the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

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 wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drained. A condition in which ground or surface water has been removed by artificial means.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep. *Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

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.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry 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 soil. Sandy clay, silty clay, or clay.

Flooded. A condition in which the soil surface is temporarily covered with flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from the high tides, or any combination of sources.

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

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Frequently flooded, ponded, saturated. A frequency class in which flooding, ponding, or saturation is likely to occur often under usual weather conditions (more than 50 percent chance in any year, or more than 50 times in 100 years).

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.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water. Water filling all the unblocked pores of the material below the water table.

Growing season. The portion of the year when soil temperatures are above biologic zero at 50 centimeters (19.7").

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon 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.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

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 overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Hydrophytic vegetation. Plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

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.

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of

chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

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

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

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.

Long duration. A duration class in which inundation for a single event ranges from 7 days to 1 month.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

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

Mottling, soil. Irregular spots of different colors that vary in number and size. 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).

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

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

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Parent material. The unconsolidated organic and mineral material in which soil forms.

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 movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

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

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly drained. Water is removed from the soil so slowly that the soil is saturated periodically during the growing season or remains wet for long periods.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

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

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure 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 degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly 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

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

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

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

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.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

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.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

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.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

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. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 1 percent
Very gently sloping	1 to 3 percent
Gently sloping	3 to 5 percent
Moderately sloping	5 to 8 percent
Strongly sloping	8 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 45 percent
Very steep	45 percent and higher

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's

surface. It 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, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

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

Somewhat poorly drained. Water is removed slowly enough that the soil is wet for significant periods during the growing season.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

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

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

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. 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 and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or 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 loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

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

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Very long duration. A duration class in which inundation for a single event is greater than 1 month.

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.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Water table. The upper surface of ground water where the water is at atmospheric pressure.

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 ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Groveton, Texas)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	60.1	36.6	48.3	79	14	105	3.61	1.55	5.37	6	0.3
February	64.2	39.0	51.6	83	16	134	3.17	1.78	4.41	5	0.0
March	72.4	46.0	59.2	87	24	293	3.56	1.48	5.32	5	0.0
April	79.1	53.7	66.4	90	33	487	3.40	1.16	5.25	4	0.0
May	84.6	60.9	72.8	93	44	693	4.84	2.15	7.13	5	0.0
June	90.4	67.5	78.9	98	53	868	4.57	1.77	6.91	5	0.0
July	93.8	70.6	82.2	102	61	989	3.22	1.34	4.82	5	0.0
August	94.3	69.6	82.0	103	59	992	3.11	1.45	4.54	4	0.0
September	88.7	64.3	76.5	99	45	796	4.22	2.50	5.75	5	0.0
October	81.2	53.7	67.5	93	33	540	3.33	1.24	5.08	4	0.0
November	71.5	44.7	58.1	86	23	265	3.94	2.02	5.62	5	0.0
December	63.2	37.5	50.3	79	15	119	4.12	2.29	5.74	5	0.0
Yearly:											
Average	78.6	53.7	66.2	---	---	---	---	---	---	---	---
Extreme	108	1	---	104	10	---	---	---	---	---	---
Total	---	---	---	---	---	6,281	45.10	34.49	53.31	58	0.3

* 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 (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Groveton, Texas)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 26	March 19	April 7
2 years in 10 later than--	February 19	March 11	March 31
5 years in 10 later than--	February 5	February 25	March 17
First freezing temperature in fall:			
1 year in 10 earlier than--	November 21	November 5	October 26
2 years in 10 earlier than--	November 29	November 12	November 1
5 years in 10 earlier than--	December 14	November 27	November 11

Table 3.--Growing Season

(Recorded in the period 1961-90 at Groveton, Texas)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	279	241	211
8 years in 10	290	252	221
5 years in 10	311	274	239
2 years in 10	331	295	257
1 year in 10	342	307	266

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AaB	Alazan very fine sandy loam, 0 to 2 percent slopes	4,666	1.0
AbA	Alazan-Besner complex, 0 to 2 percent slopes	1,055	0.2
AnB	Annona fine sandy loam, 1 to 3 percent slopes	2,359	0.5
AuB	Austonio fine sandy loam, 1 to 3 percent slopes	1,306	0.3
AuD	Austonio fine sandy loam, 5 to 15 percent slopes	1,354	0.3
BeA	Besner fine sandy loam, 0 to 3 percent slopes	400	*
CaA	Colita fine sandy loam, 0 to 1 percent slopes	1,772	0.4
CaB	Colita fine sandy loam, 1 to 3 percent slopes	11,094	2.4
ClA	Colita-Laska complex, 0 to 2 percent slopes	6,815	1.5
CoB	Corrigan loam, 1 to 5 percent slopes	1,441	0.3
CoD	Corrigan loam, 5 to 12 percent slopes	3,143	0.7
EaA	Eastham clay, 0 to 2 percent slopes	772	0.2
EaB	Eastham clay, 2 to 5 percent slopes	773	0.2
EtB	Etoile loam, 1 to 3 percent slopes	914	0.2
FuA	Fuller fine sandy loam, 0 to 1 percent slopes	7,518	1.6
FuB	Fuller fine sandy loam, 1 to 3 percent slopes	104,020	22.8
GaA	Garner clay, 0 to 1 percent slopes	1,689	0.4
GwA	Gladewater clay, 0 to 1 percent slopes, frequently flooded	1,199	0.3
HaA	Hainesville loamy fine sand, 0 to 2 percent slopes	1,580	0.3
HeA	Herty loam, 0 to 1 percent slopes	1,488	0.3
HeB	Herty loam, 1 to 3 percent slopes	11,738	2.6
KcD	Kellison loam, 5 to 15 percent slopes	3,627	0.8
KeB	Keltys fine sandy loam, 1 to 3 percent slopes	41,197	9.0
KeD	Keltys fine sandy loam, 5 to 8 percent slopes	3,988	0.9
KiB	Kitterll fine sandy loam, 1 to 5 percent slopes	247	*
KiD	Kitterll-Browndell complex,5 to 15 percent slopes	985	0.2
Kp	Koury silt loam, 0 to 1 percent slopes, frequently flooded	37,928	8.3
KuB	Kurth fine sandy loam, 1 to 3 percent slopes	40,990	9.0
KuD	Kurth fine sandy loam, 5 to 8 percent slopes	7,112	1.6
LaB	Laska fine sandy loam, 1 to 3 percent slopes	3,629	0.8
LeB	Latex fine sandy loam, 1 to 3 percent slopes	2,209	0.5
LnB	Letney loamy sand, 1 to 5 percent slopes	1,832	0.4
LvC	Lovelady loamy fine sand, 1 to 5 percent slopes	11,161	2.4
LvD	Lovelady loamy fine sand, 5 to 8 percent slopes	3,903	0.9
MpA	Mollville-Besner complex, 0 to 2 percent slopes	1,484	0.3
MsB	Moswell loam, 1 to 5 percent slopes	12,203	2.7
MsE	Moswell loam, 5 to 15 percent slopes	2,076	0.5
MxA	Moten-Multey complex, 0 to 2 percent slopes	39,656	8.7
Oz	Ozias-Pophers complex, 0 to 1 percent slopes, frequently flooded	8,958	2.0
PeB	Penning very fine sandy loam, 0 to 2 percent slopes	20,118	4.4
Po	Pophers silty clay loam, 0 to 1 percent slopes, frequently flooded	13,810	3.0
RbB	Rayburn fine sandy loam, 1 to 5 percent slopes	1,265	0.3
RwB	Rosenwall fine sandy loam, 1 to 5 percent slopes	6,905	1.5
RwD	Rosenwall fine sandy loam, 5 to 15 percent slopes	8,118	1.8
SsA	Sawlit-Sawtown complex, 0 to 2 percent slopes	683	0.1
StD	Stringtown fine sandy loam, 5 to 15 percent slopes	1,349	0.3
TeD	Tehran loamy sand, 5 to 15 percent slopes	530	0.1
UrB	Urland fine sandy loam, 1 to 5 percent slopes	77	*
W	Water areas greater than 40 acres in size	13,218	2.9
WnB	Woden fine sandy loam, 1 to 4 percent slopes	254	*
	Total	456,608	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Bahiagrass	Common bermudagrass	Improved bermudagrass
		AUM*	AUM*	AUM*
AaB:				
Alazan	2w	6.00	5.00	7.00
AbA:				
Alazan	2w	6.00	5.00	7.00
Besner	2e	7.00	---	9.00
AnB:				
Annona	3e	5.00	---	5.00
AuB:				
Austonio	3e	8.00	7.00	9.00
AuD:				
Austonio	6e	6.00	5.00	7.00
BeA:				
Besner	2e	7.00	---	9.00
CaA:				
Colita	3w	6.00	4.50	5.50
CaB:				
Colita	3w	6.00	4.50	5.50
ClA:				
Colita	3w	6.00	4.50	5.50
Laska	2w	7.00	7.00	9.00
CoB:				
Corrigan	4e	4.50	4.00	---
CoD:				
Corrigan	4e	4.50	4.00	---
EaA:				
Eastham	2e	---	---	6.00
EaB:				
Eastham	3e	---	---	6.00
EtB:				
Etoile	4e	5.00	---	5.00
FuA:				
Fuller	3w	9.00	3.00	4.00
FuB:				
Fuller	3e	9.00	3.00	4.00
GaA:				
Garner	3w	5.00	---	6.00
GwA:				
Gladewater	5w	---	2.00	2.00

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Bahiagrass	Common bermudagrass	Improved bermudagrass
		AUM*	AUM*	AUM*
HaA:				
Hainesville	3s	---	---	7.50
HeA:				
Herty	3w	5.00	4.00	5.00
HeB:				
Herty	3e	5.00	4.00	5.00
KcD:				
Kellison	6e	2.00	2.00	3.00
KeB:				
Keltys	2e	9.00	7.00	10.00
KeD:				
Keltys	4e	6.00	6.00	9.00
KiB:				
Kitterll	7s	---	---	---
KiD:				
Kitterll	7s	---	---	---
Browndell	6e	---	---	4.00
Kp:				
Koury	5w	9.00	7.00	10.00
KuB:				
Kurth	2e	9.00	6.00	10.00
KuD:				
Kurth	4e	9.00	6.00	10.00
LaB:				
Laska	2w	7.00	7.00	9.00
LeB:				
Latex	2e	8.00	7.00	10.00
LnB:				
Letney	3s	6.50	---	6.00
LvC:				
Lovelady	2e	5.00	4.00	5.00
LvD:				
Lovelady	4e	4.00	3.00	4.00
MpA:				
Mollville	4w	4.00	4.00	---
Besner	2e	7.00	---	9.00
MsB:				
Moswell	4e	---	4.00	5.00
MsE:				
Moswell	6e	---	3.00	4.00

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Bahiagrass	Common bermudagrass	Improved bermudagrass
		AUM*	AUM*	AUM*
MxA:				
Moten	2w	4.00	4.00	5.00
Multey	2s	7.00	7.00	8.00
Oz:				
Ozias	5w	3.00	3.00	3.00
Pophers	5w	---	---	---
PeB:				
Penning	2w	6.00	---	7.00
Po:				
Pophers	5w	4.00	4.00	4.00
RbB:				
Rayburn	4e	---	---	5.00
RwB:				
Rosenwall	4e	---	4.00	5.00
RwD:				
Rosenwall	6e	---	4.00	4.00
SsA:				
Sawlit	2w	6.00	5.00	7.00
Sawtown	2e	7.00	6.00	9.00
StD:				
Stringtown	6e	6.00	5.00	7.00
TeD:				
Tehran	6e	5.00	---	5.00
UrB:				
Urland	3e	8.00	6.00	10.00
W.				
Water				
WnB:				
Woden	2e	7.00	---	9.00

* 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 30 days.

Table 6.--Forest Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available.)

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber (cu ft/ac)	
AaB:				
Alazan	loblolly pine	95	143	loblolly pine, slash pine, sweetgum
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	---	---	
AbA:				
Alazan	loblolly pine	95	143	loblolly pine, slash pine, sweetgum
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	---	---	
Besner	loblolly pine	93	143	loblolly pine, slash pine, sweetgum
	shortleaf pine	85	143	
	southern red oak	---	---	
	sweetgum	---	---	
AnB:				
Annona	loblolly pine	78	114	loblolly pine
	shortleaf pine	70	114	
AuB:				
Austonio	loblolly pine	88	129	loblolly pine
	shortleaf pine	84	143	
	southern red oak	---	---	
	sweetgum	---	---	
AuD:				
Austonio	loblolly pine	88	129	loblolly pine
BeA:				
Besner	loblolly pine	93	143	loblolly pine, slash pine, sweetgum
	shortleaf pine	85	143	
	southern red oak	---	---	
	sweetgum	---	---	
CaA, CaB:				
Colita	loblolly pine	79	114	loblolly pine, slash pine
	longleaf pine	82	100	
	southern red oak	---	---	
	sweetgum	---	---	
ClA:				
Colita	loblolly pine	79	114	loblolly pine, slash pine
	longleaf pine	82	100	
	southern red oak	---	---	
	sweetgum	---	---	
Laska	loblolly pine	90	129	loblolly pine, slash pine
	shortleaf pine	80	129	
	slash pine	90	157	
CoB, CoD:				
Corrigan	loblolly pine	84	114	loblolly pine, longleaf pine, shortleaf pine
	longleaf pine	80	100	
	shortleaf pine	70	114	
EaA:				
Eastham	water oak	77	72	water oak
	willow oak	77	72	

Table 6.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
EaB:				
Eastham	water oak	70	57	pecan
EtB:				
Etoile	loblolly pine	77	100	loblolly pine
	shortleaf pine	66	100	
FuA, FuB:				
Fuller	loblolly pine	84	114	loblolly pine,
	shortleaf pine	73	114	slash pine, water
	sweetgum	84	86	oak
GaA:				
Garner	loblolly pine	80	114	loblolly pine
	shortleaf pine	---	---	
	southern red oak	---	---	
	sweetgum	---	---	
	willow oak	---	---	
GwA:				
Gladewater	water oak	85	86	water oak
	willow oak	85	86	
HaA:				
Hainesville	loblolly pine	96	143	loblolly pine,
	shortleaf pine	88	143	shortleaf pine
HeA, HeB:				
Herty	loblolly pine	80	114	loblolly pine,
	post oak	---	---	slash pine
	shortleaf pine	70	114	
	southern red oak	70	57	
	water oak	80	72	
KcD:				
Kellison	loblolly pine	75	100	loblolly pine
	post oak	---	---	
	shortleaf pine	65	100	
	southern red oak	65	43	
	water oak	75	72	
KeB:				
Keltys	loblolly pine	85	114	loblolly pine
	shortleaf pine	76	114	
	southern red oak	---	---	
	sweetgum	---	---	
KeD:				
Keltys	loblolly pine	85	114	---
	shortleaf pine	76	114	
KiD:				
Kitterll.				
Browndell	loblolly pine	60	72	loblolly pine,
	longleaf pine	50	29	longleaf pine,
	shortleaf pine	50	72	shortleaf pine
Kp:				
Koury	loblolly pine	108	172	loblolly pine,
	sweetgum	100	143	slash pine,
	water oak	90	86	sweetgum, water
				oak

Table 6.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
KuB, KuD:				
Kurth	loblolly pine	90	129	loblolly pine,
	shortleaf pine	80	129	sweetgum, water
	southern red oak	80	57	oak
	sweetgum	90	100	
	water oak	80	72	
LaB:				
Laska	loblolly pine	90	129	loblolly pine,
	shortleaf pine	80	129	slash pine
	slash pine	90	157	
LeB:				
Latex	hickory	---	---	loblolly pine
	loblolly pine	91	129	
	shortleaf pine	86	143	
	slash pine	100	186	
	southern red oak	95	72	
	sweetgum	95	114	
LnB:				
Letney	loblolly pine	86	129	loblolly pine,
	longleaf pine	81	100	slash pine
	shortleaf pine	---	---	
LvC, LvD:				
Lovelady	loblolly pine	95	143	loblolly pine,
	shortleaf pine	80	129	shortleaf pine,
	southern red oak	80	57	slash pine,
	sweetgum	90	100	sweetgum
MpA:				
Mollville	loblolly pine	82	114	loblolly pine,
	sweetgum	80	86	sweetgum, water
	water oak	80	72	oak
	willow oak	80	72	
Besner	loblolly pine	93	143	loblolly pine,
	shortleaf pine	85	143	slash pine,
	southern red oak	---	---	sweetgum
	sweetgum	---	---	
MsB:				
Moswell	loblolly pine	84	114	loblolly pine
	shortleaf pine	76	114	
	southern red oak	---	---	
	sweetgum	---	---	
MsE:				
Moswell	loblolly pine	80	114	---
	shortleaf pine	75	114	
MxA:				
Moten	loblolly pine	88	129	loblolly pine
	shortleaf pine	70	114	
	water oak	80	72	
Multey	loblolly pine	86	129	loblolly pine
	southern red oak	80	57	
	sweetgum	90	100	

Table 6.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber (cu ft/ac)	
Oz:				
Ozias	green ash	---	---	green ash, green ash, green ash
	overcup oak	---	---	
	sweetgum	102	143	
	water oak	100	100	
	willow oak	100	100	
	winged elm	---	---	
Pophers	green ash	---	---	green ash, sweetgum, water oak
	sugarberry	---	---	
	water oak	107	100	
PeB:				
Penning	loblolly pine	88	129	loblolly pine
	shortleaf pine	81	129	
	sweetgum	---	---	
Po:				
Pophers	green ash	---	---	green ash, sweetgum, water oak
	sugarberry	---	---	
	water oak	107	100	
RbB:				
Rayburn	loblolly pine	87	129	loblolly pine, slash pine
	longleaf pine	74	86	
	shortleaf pine	---	---	
RwB, RwD:				
Rosenwall	loblolly pine	76	100	loblolly pine, slash pine
	shortleaf pine	68	100	
SsA:				
Sawlit	loblolly pine	90	129	loblolly pine
	shortleaf pine	---	---	
	sweetgum	---	---	
Sawtown	loblolly pine	80	129	loblolly pine, slash pine
	shortleaf pine	90	129	
StD:				
Stringtown	loblolly pine	81	114	loblolly pine, slash pine
	longleaf pine	73	86	
	southern red oak	---	---	
	sweetgum	---	---	
TeD:				
Tehran	loblolly pine	83	114	loblolly pine, slash pine
	longleaf pine	---	---	
	shortleaf pine	---	---	
UrB:				
Urland	loblolly pine	86	129	loblolly pine, slash pine
	shortleaf pine	79	129	
WnB:				
Woden	loblolly pine	95	143	loblolly pine, slash pine
	shortleaf pine	87	143	
	southern red oak	---	---	
	sweetgum	---	---	

Table 7a.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard		Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:													
Alazan	90	Moderate Strength	0.50	Moderately suited Strength	0.50	Severe Strength	1.00	Slight		Slight		Moderately suited Strength	0.50
AbA:													
Alazan	60	Moderate Strength	0.50	Moderately suited Strength	0.50	Severe Strength	1.00	Slight		Slight		Moderately suited Strength	0.50
Besner	30	Moderate Strength	0.50	Moderately suited Strength	0.50	Severe Strength	1.00	Slight		Slight		Moderately suited Strength	0.50
AnB:													
Annona	90	Moderate Strength	0.50	Moderately suited Strength	0.50	Severe Strength	1.00	Slight		Slight		Moderately suited Strength	0.50
AuB:													
Austonio	90	Moderate Strength	0.50	Moderately suited Strength	0.50	Severe Strength	1.00	Slight		Slight		Moderately suited Strength	0.50
AuD:													
Austonio	90	Moderate Strength	0.50	Moderately suited Slope Strength	0.50 0.50	Severe Strength	1.00	Slight		Moderate Slope/erodibility	0.62	Moderately suited Slope Strength	0.50 0.50
BeA:													
Besner	90	Moderate Strength	0.50	Moderately suited Strength	0.50	Severe Strength	1.00	Slight		Slight		Moderately suited Strength	0.50
CaA, CaB:													
Colita	90	Moderate Strength	0.50	Moderately suited Wetness Strength	0.50 0.50	Severe Strength	1.00	Slight		Slight		Moderately suited Wetness Strength	0.50 0.50
ClA:													
Colita	45	Moderate Strength	0.50	Moderately suited Wetness Strength	0.50 0.50	Severe Strength	1.00	Slight		Slight		Moderately suited Wetness Strength	0.50 0.50
Laska	35	Slight		Well suited		Moderate Strength	0.50	Slight		Slight		Well suited	

Table 7a.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard		Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CoB:													
Corrigan	100	Moderate		Poorly suited		Severe		Slight		Moderate		Poorly suited	
		Stickiness/slope	0.50	Wetness	1.00	Strength	1.00			Slope/erodibility	0.33	Wetness	1.00
		Strength	0.50	Strength	0.50							Strength	0.50
CoD:													
Corrigan	100	Moderate		Poorly suited		Severe		Slight		Moderate		Poorly suited	
		Strength	0.50	Wetness	1.00	Strength	1.00			Slope/erodibility	0.89	Wetness	1.00
				Strength	0.50							Strength	0.50
				Slope	0.50							Slope	0.50
EaA:													
Eastham	90	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50
		Stickiness/slope	0.50	Stickiness	0.50							Stickiness	0.50
EaB:													
Eastham	90	Moderate		Moderately suited		Severe		Slight		Moderate		Moderately suited	
		Stickiness/slope	0.50	Strength	0.50	Strength	1.00			Slope/erodibility	0.44	Strength	0.50
		Strength	0.50	Stickiness	0.50							Stickiness	0.50
EtB:													
Etoile	90	Moderate		Moderately suited		Severe		Slight		Moderate		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00			Slope/erodibility	0.33	Strength	0.50
FuA, FuB:													
Fuller	90	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Wetness	0.50	Strength	1.00					Wetness	0.50
				Strength	0.50							Strength	0.50
GaA:													
Garner	90	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Stickiness/slope	0.50	Strength	0.50	Strength	1.00					Strength	0.50
		Strength	0.50										
GwA:													
Gladewater	100	Severe		Poorly suited		Severe		Slight		Slight		Poorly suited	
		Flooding	1.00	Flooding	1.00	Strength	1.00					Flooding	1.00
		Strength	0.50	Strength	0.50							Strength	0.50
		Stickiness/slope	0.50	Stickiness	0.50							Stickiness	0.50

Table 7a.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard		Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HaA:													
Hainesville	90	Slight		Well suited		Moderate		Slight		Slight		Well suited	
						Strength	0.50						
HeA, HeB:													
Herty	90	Moderate		Poorly suited		Severe		Slight		Slight		Poorly suited	
		Strength	0.50	Wetness	1.00	Strength	1.00					Wetness	1.00
				Strength	0.50							Strength	0.50
KcD:													
Kellison	90	Moderate		Moderately suited		Severe		Moderate		Severe		Moderately suited	
		Strength	0.50	Slope	0.50	Strength	1.00	Slope/erodibility	0.24	Slope/erodibility	1.00	Slope	0.50
				Strength	0.50							Strength	0.50
KeB:													
Keltys	90	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50
KeD:													
Keltys	90	Moderate		Moderately suited		Severe		Slight		Moderate		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00			Slope/erodibility	0.78	Strength	0.50
				Slope	0.50							Slope	0.50
KiB:													
Kitterll	90	Moderate		Moderately suited		Severe		Slight		Moderate		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00			Slope/erodibility	0.33	Strength	0.50
KiD:													
Kitterll	50	Moderate		Moderately suited		Severe		Slight		Moderate		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00			Slope/erodibility	0.33	Strength	0.50
Browndell	40	Moderate		Poorly suited		Severe		Moderate		Severe		Poorly suited	
		Stickiness/slope	0.50	Wetness	1.00	Strength	1.00	Slope/erodibility	0.24	Slope/erodibility	1.00	Wetness	1.00
		Strength	0.50	Slope	0.50							Slope	0.50
				Strength	0.50							Strength	0.50
Kp:													
Koury	90	Severe		Poorly suited		Severe		Slight		Slight		Poorly suited	
		Flooding	1.00	Flooding	1.00	Strength	1.00					Flooding	1.00
		Strength	0.50	Strength	0.50							Strength	0.50

Table 7a.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard		Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KuB:													
Kurth	90	Slight		Well suited		Moderate		Slight		Slight		Well suited	
						Strength	0.50						
KuD:													
Kurth	90	Slight		Moderately suited		Moderate		Slight		Moderate		Moderately suited	
				Slope	0.50	Strength	0.50			Slope/erodibility	0.78	Slope	0.50
LaB:													
Laska	90	Slight		Well suited		Moderate		Slight		Slight		Well suited	
						Strength	0.50						
LeB:													
Latex	90	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50
LnB:													
Letney	90	Slight		Well suited		Moderate		Slight		Slight		Well suited	
						Strength	0.50						
LvC:													
Lovelady	90	Slight		Well suited		Moderate		Slight		Slight		Well suited	
						Strength	0.50						
LvD:													
Lovelady	90	Slight		Moderately suited		Moderate		Slight		Moderate		Moderately suited	
				Slope	0.50	Strength	0.50			Slope/erodibility	0.44	Slope	0.50
MpA:													
Mollville	45	Moderate		Poorly suited		Severe		Slight		Slight		Poorly suited	
		Strength	0.50	Ponding	1.00	Strength	1.00					Ponding	1.00
				Wetness	1.00							Wetness	1.00
				Strength	0.50							Strength	0.50
Besner	40	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50
MsB:													
Moswell	90	Moderate		Moderately suited		Severe		Slight		Moderate		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00			Slope/erodibility	0.33	Strength	0.50

Table 7a.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard		Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MsE:													
Moswell	90	Moderate		Moderately suited		Severe		Moderate		Severe		Moderately suited	
		Stickiness/slope	0.50	Slope	0.50	Strength	1.00	Slope/erodibility	0.24	Slope/erodibility	1.00	Slope	0.50
		Strength	0.50	Strength	0.50							Strength	0.50
MxA:													
Moten	50	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50
				Wetness	0.50							Wetness	0.50
Multey	40	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50
Oz:													
Ozias	55	Severe		Poorly suited		Severe		Slight		Slight		Poorly suited	
		Flooding	1.00	Flooding	1.00	Strength	1.00					Flooding	1.00
		Strength	0.50	Wetness	1.00							Wetness	1.00
		Stickiness/slope	0.50	Strength	0.50							Strength	0.50
				Stickiness	0.50							Stickiness	0.50
Pophers	35	Severe		Poorly suited		Severe		Slight		Slight		Poorly suited	
		Flooding	1.00	Flooding	1.00	Strength	1.00					Flooding	1.00
		Strength	0.50	Strength	0.50							Strength	0.50
				Wetness	0.50							Wetness	0.50
PeB:													
Penning	90	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50
Po:													
Pophers	90	Severe		Poorly suited		Severe		Slight		Slight		Poorly suited	
		Flooding	1.00	Flooding	1.00	Strength	1.00					Flooding	1.00
		Strength	0.50	Strength	0.50							Strength	0.50
				Wetness	0.50							Wetness	0.50
RbB:													
Rayburn	90	Moderate		Moderately suited		Severe		Slight		Moderate		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00			Slope/erodibility	0.33	Strength	0.50
		Stickiness/slope	0.50										
RwB:													
Rosenwall	90	Moderate		Moderately suited		Severe		Slight		Moderate		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00			Slope/erodibility	0.33	Strength	0.50

Table 7a.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard		Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RwD:													
Rosenwall	90	Moderate		Moderately suited		Severe		Moderate		Severe		Moderately suited	
		Stickiness/slope	0.50	Slope	0.50	Strength	1.00	Slope/erodibility	0.24	Slope/erodibility	1.00	Slope	0.50
		Strength	0.50	Strength	0.50							Strength	0.50
SsA:													
Sawlit	45	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50
Sawtown	40	Slight		Moderately suited		Severe		Slight		Slight		Moderately suited	
				Strength	0.50	Strength	1.00					Strength	0.50
StD:													
Stringtown	90	Moderate		Moderately suited		Severe		Slight		Severe		Moderately suited	
		Strength	0.50	Slope	0.50	Strength	1.00			Slope/erodibility	1.00	Slope	0.50
				Strength	0.50							Strength	0.50
TeD:													
Tehran	90	Slight		Moderately suited		Moderate		Slight		Moderate		Moderately suited	
				Slope	0.50	Strength	0.50			Slope/erodibility	0.62	Slope	0.50
UrB:													
Urland	100	Moderate		Well suited		Moderate		Slight		Moderate		Well suited	
		Strength	0.50			Strength	0.50			Slope/erodibility	0.33		
W.													
Water													
WnB:													
Woden	90	Moderate		Moderately suited		Severe		Slight		Slight		Moderately suited	
		Strength	0.50	Strength	0.50	Strength	1.00					Strength	0.50

Table 7b.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment		Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:													
Alazan-------	90	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
AbA:													
Alazan-------	60	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
Besner-------	30	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
AnB:													
Annona-------	90	Poorly suited Stickiness	0.75	Poorly suited Stickiness	0.75	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		Low	
AuB:													
Austonio-----	90	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
AuD:													
Austonio-----	90	Well suited		Moderately suited Slope	0.50	Moderately suited Strength	0.50	Well suited		Well suited		Low	
BeA:													
Besner-------	90	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
CaA, CaB:													
Colita-------	90	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		High Wetness	1.00
ClA:													
Colita-------	45	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		High Wetness	1.00
Laska--------	35	Poorly suited Restrictive layer	0.75	Well suited		Well suited		Well suited		Well suited		Low	

Table 7b.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment		Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CoB:													
Corrigan	100	Poorly suited Stickiness	0.75	Poorly suited Stickiness	0.75	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		High Wetness	1.00
CoD:													
Corrigan	100	Well suited		Moderately suited Slope	0.50	Moderately suited Strength	0.50	Well suited		Well suited		High Wetness	1.00
EaA:													
Eastham	90	Poorly suited Stickiness	0.75	Poorly suited Stickiness	0.75	Moderately suited Strength Stickiness	0.50 0.50	Poorly suited Stickiness	0.50	Well suited		Low	
EaB:													
Eastham	90	Poorly suited Stickiness	0.75	Poorly suited Stickiness	0.75	Moderately suited Strength Stickiness	0.50 0.50	Poorly suited Stickiness	0.50	Well suited		Moderate Soil reaction	0.50
EtB:													
Etoile	90	Poorly suited Stickiness Restrictive layer	0.75 0.75	Poorly suited Stickiness	0.75	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		Low	
FuA, FuB:													
Fuller	90	Poorly suited Restrictive layer	0.75	Well suited		Moderately suited Strength	0.50	Well suited		Well suited		High Wetness	1.00
GaA:													
Garner	90	Poorly suited Stickiness	0.75	Poorly suited Stickiness	0.75	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		Low	
GwA:													
Gladewater	100	Poorly suited Stickiness	0.75	Poorly suited Stickiness	0.75	Moderately suited Strength Stickiness	0.50 0.50	Poorly suited Stickiness	0.50	Well suited		High Wetness	1.00
HaA:													
Hainesville	90	Well suited		Well suited		Well suited		Well suited		Well suited		Low	

Table 7b.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment		Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HeA, HeB:													
Herty	90	Poorly suited		Moderately suited		Moderately suited		Well suited		Well suited		High	
		Restrictive layer	0.75	Stickiness	0.50	Strength	0.50					Wetness	1.00
		Stickiness	0.50										
KcD:													
Kellison	90	Poorly suited		Moderately suited		Moderately suited		Poorly suited		Well suited		Moderate	
		Restrictive layer	0.75	Stickiness	0.50	Strength	0.50	Stickiness	0.50			Salinity	0.50
		Stickiness	0.50	Slope	0.50								
KeB:													
Keltys	90	Poorly suited		Well suited		Moderately suited		Well suited		Well suited		Low	
		Restrictive layer	0.75			Strength	0.50						
KeD:													
Keltys	90	Poorly suited		Moderately suited		Moderately suited		Well suited		Well suited		Low	
		Restrictive layer	0.75	Slope	0.50	Strength	0.50						
KiB:													
Kitterll	90	Well suited		Well suited		Moderately suited		Well suited		Well suited		Low	
						Strength	0.50						
KiD:													
Kitterll	50	Moderately suited		Well suited		Moderately suited		Well suited		Well suited		Low	
		Restrictive layer	0.50			Strength	0.50						
Browndell	40	Poorly suited		Poorly suited		Moderately suited		Poorly suited		Well suited		High	
		Stickiness	0.75	Stickiness	0.75	Strength	0.50	Stickiness	0.50			Wetness	1.00
				Slope	0.50								
				Rock fragments	0.50								
Kp:													
Koury	90	Well suited		Well suited		Moderately suited		Well suited		Well suited		Moderate	
						Strength	0.50					Soil reaction	0.50
KuB:													
Kurth	90	Poorly suited		Well suited		Well suited		Well suited		Well suited		Low	
		Restrictive layer	0.75										

Table 7b.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment		Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KuD:													
Kurth--------	90	Poorly suited Restrictive layer	0.75	Moderately suited Slope	0.50	Well suited		Well suited		Well suited		Low	
LaB:													
Laska--------	90	Poorly suited Restrictive layer	0.75	Well suited		Well suited		Well suited		Well suited		Low	
LeB:													
Latex--------	90	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
LnB:													
Letney-------	90	Well suited		Well suited		Well suited		Well suited		Well suited		Low	
LvC:													
Lovelady-----	90	Well suited		Well suited		Well suited		Well suited		Well suited		Low	
LvD:													
Lovelady-----	90	Well suited		Moderately suited Slope	0.50	Well suited		Well suited		Well suited		Low	
MpA:													
Mollville----	45	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		High Wetness	1.00
Besner-------	40	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
MsB:													
Moswell------	90	Poorly suited Stickiness Restrictive layer	0.75 0.75	Poorly suited Stickiness	0.75	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		Low	
MsE:													
Moswell------	90	Poorly suited Stickiness Restrictive layer	0.75 0.75	Poorly suited Stickiness Slope	0.75 0.50	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		Low	

Table 7b.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment		Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MxA:													
Moten	50	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
Multey	40	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
Oz:													
Ozias	55	Moderately suited Stickiness	0.50	Moderately suited Stickiness	0.50	Moderately suited Strength Stickiness	0.50 0.50	Poorly suited Stickiness	0.50	Well suited		High Wetness Salinity Soil reaction	1.00 0.50 0.50
Pophers	35	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		High Wetness	1.00
PeB:													
Penning	90	Poorly suited Restrictive layer	0.75	Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
Po:													
Pophers	90	Moderately suited Stickiness	0.50	Moderately suited Stickiness	0.50	Moderately suited Strength	0.50	Well suited		Well suited		High Wetness	1.00
RbB:													
Rayburn	90	Poorly suited Stickiness	0.75	Poorly suited Stickiness	0.75	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		Low	
RwB:													
Rosenwall	90	Poorly suited Stickiness	0.75	Poorly suited Stickiness	0.75	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		Low	
RwD:													
Rosenwall	90	Poorly suited Stickiness	0.75	Poorly suited Stickiness Slope	0.75 0.50	Moderately suited Strength	0.50	Poorly suited Stickiness	0.50	Well suited		Low	
SsA:													
Sawlit	45	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	
Sawtown	40	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	

Table 7b.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment		Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StD:													
Stringtown---	90	Well suited		Moderately suited Slope	0.50	Moderately suited Strength	0.50	Well suited		Well suited		Low	
TeD:													
Tehran-------	90	Well suited		Moderately suited Slope	0.50	Well suited		Well suited		Well suited		Low	
UrB:													
Urland-------	100	Poorly suited Restrictive layer Stickiness	0.75 0.50	Moderately suited Stickiness	0.50	Well suited		Well suited		Well suited		Low	
W. Water													
WnB:													
Woden--------	90	Well suited		Well suited		Moderately suited Strength	0.50	Well suited		Well suited		Low	

Table 8.--Recreation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds		Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:													
Alazan	90	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Depth to saturated zone	0.44	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19
AbA:													
Alazan	60	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Depth to saturated zone	0.44	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19
Besner	30	Not limited		Not limited		Not limited		Not limited		Not limited		Not limited	
AnB:													
Annona	90	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability Slope	1.00 0.01	Not limited		Not limited		Not limited	
AuB:													
Austonio	90	Not limited		Not limited		Somewhat limited Slope	0.01	Not limited		Not limited		Not limited	
AuD:													
Austonio	90	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00	Not limited		Not limited		Somewhat limited Slope	0.16
BeA:													
Besner	90	Not limited		Not limited		Somewhat limited Slope	0.01	Not limited		Not limited		Not limited	
CaA, CaB:													
Colita	90	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.94	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.94
ClA:													
Colita	45	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.94	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.94

Table 8.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds		Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ClA:													
Laska	35	Somewhat limited		Somewhat limited		Somewhat limited		Not limited		Not limited		Somewhat limited	
		Depth to saturated zone	0.08	Depth to saturated zone	0.03	Depth to saturated zone	0.08					Depth to saturated zone	0.03
CoB:													
Corrigan	100	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00					Depth to bedrock	0.42
						Depth to bedrock	0.01						
						Slope	0.13						
CoD:													
Corrigan	100	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00					Depth to bedrock	0.01
		Slope	0.01	Slope	0.01	Slope	1.00					Slope	0.01
						Depth to bedrock	0.01						
EaA:													
Eastham	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00						
						Slope	0.01						
EaB:													
Eastham	90	Very limited		Very limited		Very limited		Not limited		Not limited		Not limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00						
						Slope	0.05						
EtB:													
Etoile	90	Very limited		Very limited		Very limited		Not limited		Not limited		Not limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00						
						Slope	0.13						

Table 8.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds		Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FuA:													
Fuller	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Depth to saturated zone	1.00	Sodium content	1.00	Depth to saturated zone	1.00					Depth to saturated zone	1.00
		Sodium content	1.00	Depth to saturated zone	1.00	Sodium content	1.00						
FuB:													
Fuller	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Depth to saturated zone	1.00	Sodium content	1.00	Depth to saturated zone	1.00					Depth to saturated zone	1.00
		Sodium content	1.00	Depth to saturated zone	1.00	Sodium content	1.00						
						Slope	0.01						
GaA:													
Garner	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00						
GwA:													
Gladewater	100	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Too clayey	1.00	Restricted permeability	1.00	Flooding	1.00	Flooding	0.40	Flooding	0.40	Flooding	1.00
		Restricted permeability	1.00	Flooding	0.40	Restricted permeability	1.00						
HaA:													
Hainesville	90	Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.08	Too sandy	0.08	Too sandy	0.08	Too sandy	0.08	Too sandy	0.08	Droughty	0.69
HeA:													
Herty	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00						

Table 8.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds		Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HeB:													
Herty	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00						
						Slope	0.01						
KcD:													
Kellison	90	Very limited		Very limited		Very limited		Not limited		Not limited		Somewhat limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00					Slope	0.16
		Slope	0.16	Slope	0.16	Slope	1.00						
KeB:													
Keltys	90	Somewhat limited		Somewhat limited		Somewhat limited		Not limited		Not limited		Not limited	
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94						
						Slope	0.01						
KeD:													
Keltys	90	Somewhat limited		Somewhat limited		Very limited		Not limited		Not limited		Not limited	
		Restricted permeability	0.94	Restricted permeability	0.94	Slope	1.00						
						Restricted permeability	0.94						
KiB:													
Kitterll	90	Very limited		Very limited		Very limited		Not limited		Not limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00					Depth to bedrock	1.00
						Slope	0.13					Droughty	1.00
KiD:													
Kitterll	50	Very limited		Very limited		Very limited		Not limited		Not limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00					Depth to bedrock	1.00
						Slope	0.13					Droughty	1.00
Browndell	40	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00	Restricted permeability	1.00					Depth to saturated zone	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00					Droughty	0.94
		Slope	0.16	Slope	0.16	Slope	1.00					Slope	0.16
						Content of large stones	0.03					Content of large stones	0.03

Table 8.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds		Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kp:													
Koury	90	Very limited Flooding Restricted permeability	 1.00 0.26	Somewhat limited Flooding Restricted permeability	 0.40 0.26	Very limited Flooding Restricted permeability	 1.00 0.26	Somewhat limited Flooding	 0.40	Somewhat limited Flooding	 0.40	Very limited Flooding	 1.00
KuB:													
Kurth	90	Somewhat limited Restricted permeability	 0.26	Somewhat limited Restricted permeability	 0.26	Somewhat limited Restricted permeability Slope	 0.26 0.01	Not limited		Not limited		Not limited	
KuD:													
Kurth	90	Somewhat limited Restricted permeability	 0.26	Somewhat limited Restricted permeability	 0.26	Very limited Slope Restricted permeability	 1.00 0.26	Not limited		Not limited		Not limited	
LaB:													
Laska	90	Somewhat limited Depth to saturated zone	 0.08	Somewhat limited Depth to saturated zone	 0.03	Somewhat limited Depth to saturated zone Slope	 0.08 0.01	Not limited		Not limited		Somewhat limited Depth to saturated zone	 0.03
LeB:													
Latex	90	Not limited		Not limited		Somewhat limited Slope	 0.01	Not limited		Not limited		Not limited	
LnB:													
Letney	90	Somewhat limited Too sandy	 0.28	Somewhat limited Too sandy	 0.28	Somewhat limited Too sandy Slope	 0.28 0.13	Somewhat limited Too sandy	 0.28	Somewhat limited Too sandy	 0.28	Not limited	
LvC:													
Lovelady	90	Somewhat limited Too sandy	 0.03	Somewhat limited Too sandy	 0.03	Somewhat limited Slope Too sandy	 0.13 0.03	Somewhat limited Too sandy	 0.03	Somewhat limited Too sandy	 0.03	Somewhat limited Droughty	 0.10
LvD:													
Lovelady	90	Somewhat limited Too sandy	 0.03	Somewhat limited Too sandy	 0.03	Very limited Slope Too sandy	 1.00 0.03	Somewhat limited Too sandy	 0.03	Somewhat limited Too sandy	 0.03	Somewhat limited Droughty	 0.29

Table 8.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds		Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MpA:													
Mollville	45	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability	0.94						
Besner	40	Not limited		Not limited		Somewhat limited		Not limited		Not limited		Not limited	
						Slope	0.01						
MsB:													
Moswell	90	Very limited		Very limited		Very limited		Not limited		Not limited		Not limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00						
						Slope	0.13						
MsE:													
Moswell	90	Very limited		Very limited		Very limited		Not limited		Not limited		Somewhat limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00					Slope	0.16
		Slope	0.16	Slope	0.16	Slope	1.00						
MxA:													
Moten	50	Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.86	Depth to saturated zone	0.48	Depth to saturated zone	0.86	Depth to saturated zone	0.11	Depth to saturated zone	0.11	Depth to saturated zone	0.48
		Restricted permeability	0.26	Restricted permeability	0.26	Restricted permeability	0.26						
Multey	40	Not limited		Not limited		Not limited		Not limited		Not limited		Not limited	
Oz:													
Ozias	55	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Restricted permeability	1.00	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00	Restricted permeability	1.00	Too clayey	1.00	Too clayey	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	1.00	Depth to saturated zone	1.00	Flooding	0.40	Flooding	0.40	Too clayey	1.00
		Too clayey	1.00	Flooding	0.40	Too clayey	1.00					Salinity	0.01
		Salinity	0.01	Salinity	0.01	Salinity	0.01						

Table 8.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds		Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Oz:													
Pophers	35	Very limited		Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.75	Flooding	1.00	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Flooding	1.00
		Depth to saturated zone	1.00	Flooding	0.40	Depth to saturated zone	1.00	Flooding	0.40	Flooding	0.40	Depth to saturated zone	0.75
		Restricted permeability	0.26	Restricted permeability	0.26	Restricted permeability	0.26						
PeB:													
Penning	90	Not limited		Not limited		Not limited		Not limited		Not limited		Not limited	
Po:													
Pophers	90	Very limited		Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.75	Flooding	1.00	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Flooding	1.00
		Depth to saturated zone	1.00	Flooding	0.40	Depth to saturated zone	1.00	Flooding	0.40	Flooding	0.40	Depth to saturated zone	0.75
		Restricted permeability	0.26	Restricted permeability	0.26	Restricted permeability	0.26						
RbB:													
Rayburn	90	Very limited		Very limited		Very limited		Not limited		Not limited		Not limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00						
						Slope	0.13						
RwB:													
Rosenwall	90	Very limited		Very limited		Very limited		Not limited		Not limited		Somewhat limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00					Depth to bedrock	0.90
						Depth to bedrock	0.90					Droughty	0.66
						Slope	0.13						
RwD:													
Rosenwall	90	Very limited		Very limited		Very limited		Not limited		Not limited		Somewhat limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00					Depth to bedrock	0.65
		Slope	0.16	Slope	0.16	Slope	1.00					Droughty	0.35
						Depth to bedrock	0.65					Slope	0.16
SsA:													
Sawlit	45	Very limited		Very limited		Very limited		Not limited		Not limited		Not limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00						
Sawtown	40	Not limited		Not limited		Not limited		Not limited		Not limited		Not limited	

Table 8.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds		Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StD:													
Stringtown	90	Somewhat limited		Somewhat limited		Very limited		Not limited		Not limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	1.00					Slope	0.16
TeD:													
Tehran	90	Somewhat limited		Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	1.00	Too sandy	0.12	Too sandy	0.12	Droughty	0.34
		Too sandy	0.12	Too sandy	0.12	Too sandy	0.12					Slope	0.16
UrB:													
Urland	100	Somewhat limited		Somewhat limited		Somewhat limited		Not limited		Not limited		Not limited	
		Restricted permeability	0.26	Restricted permeability	0.26	Restricted permeability	0.26						
						Slope	0.13						
W.													
Water													
WnB:													
Woden	90	Not limited		Not limited		Somewhat limited		Not limited		Not limited		Not limited	
						Slope	0.13						

Table 9.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
AaB:												
Alazan	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
AbA:												
Alazan	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Besner	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
AnB:												
Annona	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
AuB:												
Austonio	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
AuD:												
Austonio	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
BeA:												
Besner	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
CaA, CaB:												
Colita	Poor	Fair	Fair	Fair	Fair	---	Fair	Poor	Fair	Fair	Poor	---
ClA:												
Colita	Poor	Fair	Fair	Fair	Fair	---	Fair	Poor	Fair	Fair	Poor	---
Laska	Fair	Fair	Fair	Poor	Fair	---	Fair	Poor	Fair	Fair	Poor	---
CoB, CoD:												
Corrigan	Fair	Fair	Good	Good	Good	---	Fair	Very poor	Fair	Good	Very poor	---
EaA:												
Eastham	Fair	Fair	Fair	Fair	---	Fair	Poor	Poor	Fair	Fair	Poor	---
EaB:												
Eastham	Fair	Fair	Fair	Fair	---	Fair	Poor	Very poor	Fair	Fair	Poor	---
EtB:												
Etoile	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
FuA, FuB:												
Fuller	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
GaA:												
Garner	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor	Fair
GwA:												
Gladewater	Poor	Fair	Fair	Fair	---	---	Poor	Good	Fair	Fair	Fair	---
HaA:												
Hainesville	Fair	Fair	Good	Poor	Poor	---	Very poor	Very poor	Fair	Fair	Very poor	---

Table 9.--Wildlife Habitat-Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
HeA, HeB:												
Herty	Fair	Good	Good	Good	Good	---	Fair	Poor	Good	Good	Poor	---
KcD:												
Kellison	Poor	Poor	Fair	Good	Fair	---	Poor	Poor	Fair	Good	Poor	---
KeB:												
Keltys	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
KeD:												
Keltys	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
KiB:												
Kitterll	Very poor	Very poor	Poor	Poor	Poor	---	Very poor	Very poor	Very poor	Poor	Very poor	---
KiD:												
Kitterll	Very poor	Very poor	Poor	Poor	Poor	---	Very poor	Very poor	Very poor	Poor	Very poor	---
Browndell	Poor	Poor	Fair	Fair	Fair	---	Poor	Poor	Poor	Fair	Poor	---
Kp:												
Koury	Fair	Fair	Fair	Good	Fair	---	Fair	Fair	Fair	Good	Fair	---
KuB:												
Kurth	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
KuD:												
Kurth	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
LaB:												
Laska	Fair	Fair	Fair	Poor	Fair	---	Fair	Poor	Fair	Fair	Poor	---
LeB:												
Latex	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
LnB:												
Letney	Poor	Fair	Fair	Fair	Fair	---	Very poor	Very poor	Fair	Fair	Very poor	---
LvC, LvD:												
Lovelady	Poor	Fair	Good	Good	Good	---	Poor	Very poor	Fair	Good	Very poor	---
MpA:												
Mollville	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Besner	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
MsB:												
Moswell	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
MsE:												
Moswell	Good	Good	Good	Good	Good	---	Very poor	Very poor	Good	Fair	Very poor	---

Table 9.--Wildlife Habitat-Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
MxA:												
Moten	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Multey	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Very poor	---
Oz:												
Ozias	Poor	Fair	Fair	Fair	Very poor	---	Fair	Good	Fair	Fair	Good	---
Pophers	Fair	Fair	Fair	Good	Poor	---	Fair	Fair	Fair	Good	Fair	---
PeB:												
Penning	Fair	Good	Good	Good	Good	---	Poor	Fair	Good	Good	Fair	---
Po:												
Pophers	Fair	Fair	Fair	Good	Poor	---	Fair	Fair	Fair	Good	Fair	---
RbB:												
Rayburn	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
RwB:												
Rosenwall	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Poor	---
RwD:												
Rosenwall	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
SsA:												
Sawlit	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Sawtown	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
StD:												
Stringtown	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
TeD:												
Tehran	Poor	Fair	Fair	Fair	Fair	---	Very poor	Very poor	Fair	Fair	Very poor	---
UrB:												
Urland	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
W.												
Water												
WnB:												
Woden	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---

Table 10.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:											
Alazan	90	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.54	Depth to saturated zone	0.53	Depth to saturated zone	0.53
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60				
						No water erosion limitation	0.99				
AbA:											
Alazan	60	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.54	Depth to saturated zone	0.53	Depth to saturated zone	0.53
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60				
						No water erosion limitation	0.99				
Besner	30	Poor		Fair		Fair		Good		Good	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.68				
		Thickest layer	0.00	Thickest layer	0.01	Low content of organic matter	0.88				
AnB:											
Annona	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60				
						Too acid	0.68				
						No water erosion limitation	0.99				
AuB:											
Austonio	90	Poor		Fair		Fair		Good		Fair	
		Bottom layer	0.00	Thickest layer	0.00	Too acid	0.32			Too acid	0.98
		Thickest layer	0.00	Bottom layer	0.09	Low content of organic matter	0.60				

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AuD:											
Austonio	90	Poor		Fair		Fair		Good		Fair	
		Bottom layer	0.00	Thickest layer	0.00	Too acid	0.32			Slope	0.84
		Thickest layer	0.00	Bottom layer	0.09	Low content of organic matter	0.60			Too acid	0.98
BeA:											
Besner	90	Poor		Fair		Fair		Good		Good	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.68				
		Thickest layer	0.00	Thickest layer	0.01	Low content of organic matter	0.88				
CaA:											
Colita	90	Poor		Fair							
		Bottom layer	0.00	Bottom layer	0.00	Fair		Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.02	Too acid	0.54	Depth to saturated zone	0.04	Depth to saturated zone	0.04
						Low content of organic matter	0.75	Depth to bedrock	0.07	Too acid	0.98
						No water erosion limitation	0.99				
CaB:											
Colita	90	Poor		Fair							
		Bottom layer	0.00	Bottom layer	0.00	Fair		Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.02	Too acid	0.54	Depth to saturated zone	0.04	Depth to saturated zone	0.04
						Low content of organic matter	0.75	Depth to bedrock	0.39	Too acid	0.98
						No water erosion limitation	0.99				
ClA:											
Colita	45	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.54	Depth to saturated zone	0.04	Depth to saturated zone	0.04
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.75	Depth to bedrock	0.07	Too acid	0.98
						No water erosion limitation	0.99				
Laska	35	Poor		Fair		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.20	Depth to saturated zone	0.76	Depth to saturated zone	0.76
		Thickest layer	0.00	Thickest layer	0.01	Low content of organic matter	0.68	Depth to bedrock	0.95	Too acid	0.76

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CoB:											
Corrigan	100	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.12			Depth to saturated zone	0.00
						Low content of organic matter	0.88	Depth to bedrock	0.00		
								Shrink-swell	0.12	Too acid	0.59
						Water erosion	0.90			Depth to bedrock	0.99
						Droughty	0.99				
						Depth to bedrock	0.99				
CoD:											
Corrigan	100	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.12			Depth to saturated zone	0.00
						Droughty	0.86	Depth to bedrock	0.00		
						Low content of organic matter	0.88	Shrink-swell	0.43	Too acid	0.59
										Depth to bedrock	0.99
						Water erosion	0.90				
						Depth to bedrock	0.99				
EaA:											
Eastham	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60				
EaB:											
Eastham	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.88				
EtB:											
Etoile	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.68	Depth to bedrock	0.99		
						Too acid	0.74				
						Water erosion	0.90				
FuA:											
Fuller	90	Poor		Poor		Fair		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.54	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Thickest layer	0.00	Thickest layer	0.00	Water erosion	0.68				
								Depth to bedrock	0.12	Too acid	0.98
								Shrink-swell	0.84		

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FuB:											
Fuller	90	Poor		Poor		Fair		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.54	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Thickest layer	0.00	Thickest layer	0.00	Water erosion	0.68	Depth to bedrock	0.16	Too acid	0.98
								Shrink-swell	0.87		
GaA:											
Garner	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.68				
GwA:											
Gladewater	100	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60	Depth to saturated zone	0.91	Depth to saturated zone	0.91
						Too acid	0.68				
HaA:											
Hainesville	90	Poor		Fair		Poor		Good		Good	
		Bottom layer	0.00	Bottom layer	0.10	Wind erosion	0.00				
		Thickest layer	0.00	Thickest layer	0.11	Too acid	0.68				
						Low content of organic matter	0.88				
						Droughty	0.98				
HeA:											
Herty	90	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.08			Depth to saturated zone	0.00
						Sodium content	0.10	Shrink-swell	0.12		
						Low content of organic matter	0.18	Depth to bedrock	0.29	Sodium content	0.10
							0.18			Too acid	0.76
						Water erosion	0.90			Salinity	0.88
HeB:											
Herty	90	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.08			Depth to saturated zone	0.00
						Low content of organic matter	0.18	Shrink-swell	0.12		
								Depth to bedrock	0.39	Sodium content	0.10
						Sodium content	0.22			Too acid	0.76
						Water erosion	0.90			Salinity	0.88

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KcD:											
Kellison	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.08	Shrink-swell	0.12	Too acid	0.50
						Low content of organic matter	0.60			Sodium content	0.78
										Slope	0.84
						Water erosion	0.68			Salinity	0.88
						Sodium content	0.78				
KeB:											
Keltys	90	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.08	Depth to bedrock	0.95	Too acid	0.50
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.75				
KeD:											
Keltys	90	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.08	Depth to bedrock	0.82	Too acid	0.50
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.75				
KiB:											
Kitterll	90	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Thickest layer	0.00	Thickest layer	0.00	Depth to bedrock	0.00				
						Too acid	0.84				
						No water erosion limitation	0.99				
KiD:											
Kitterll	50	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Thickest layer	0.00	Thickest layer	0.00	Depth to bedrock	0.00				
						Too acid	0.84				
						No water erosion limitation	0.99				
Browndell	40	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Droughty	0.00	Depth to saturated zone	0.00	Depth to bedrock	0.00
						Depth to bedrock	0.00			Depth to saturated zone	0.00
						Too acid	0.54	Shrink-swell	0.12		
						Low content of organic matter	0.75			Slope	0.84
										Too acid	0.98
						Water erosion	0.90				

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kp:											
Koury	90	Poor		Poor		Fair		Good		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.03			Too acid	0.32
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.18				
						Water erosion	0.68				
KuB:											
Kurth	90	Poor		Poor		Fair		Fair		Good	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.08	Shrink-swell	0.94		
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60	Depth to bedrock	0.98		
KuD:											
Kurth	90	Poor		Fair		Fair		Fair		Good	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.08	Depth to bedrock	0.46		
		Thickest layer	0.00	Thickest layer	0.06	Low content of organic matter	0.60	Shrink-swell	0.98		
LaB:											
Laska	90	Poor		Fair		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.20	Depth to saturated zone	0.76	Depth to saturated zone	0.76
		Thickest layer	0.00	Thickest layer	0.01	Low content of organic matter	0.68			Too acid	0.76
LeB:											
Latex	90	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.32	Shrink-swell	0.86	Too acid	0.88
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60				
						No water erosion limitation	0.99				
LnB:											
Letney	90	Poor		Fair		Poor		Good		Fair	
		Bottom layer	0.00	Bottom layer	0.02	Wind erosion	0.00			Too sandy	0.50
		Thickest layer	0.00	Thickest layer	0.16	Low content of organic matter	0.18			Too acid	0.98
						Too sandy	0.50				
						Too acid	0.54				

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LvC, LvD:											
Lovelady	90	Poor		Fair		Poor		Good		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Wind erosion	0.00			Too sandy	0.94
		Thickest layer	0.00	Thickest layer	0.11	Too acid	0.54			Too acid	0.98
						Low content of organic matter	0.60				
						Too sandy	0.94				
MpA:											
Mollville	45	Poor		Fair		Fair		Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Thickest layer	0.00	Bottom layer	0.03	Too acid	0.54	Shrink-swell	0.87	Sodium content	0.90
						Sodium content	0.90				
						No water erosion limitation	0.99				
Besner	40	Poor		Fair		Fair		Good		Good	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.68				
		Thickest layer	0.00	Thickest layer	0.01						
MsB:											
Moswell	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.08	Depth to bedrock	0.16	Too acid	0.50
						Sodium content	0.60			Sodium content	0.60
						Low content of organic matter	0.68			Salinity	0.88
						No water erosion limitation	0.99				
MsE:											
Moswell	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.12	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.08	Depth to bedrock	0.29	Too acid	0.50
						Sodium content	0.60			Sodium content	0.60
						Low content of organic matter	0.68			Slope	0.84
						No water erosion limitation	0.99			Salinity	0.88

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MxA:											
Moten	50	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.54	Depth to saturated zone	0.29	Depth to saturated zone	0.29
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60			Too acid	0.98
						No water erosion limitation	0.99				
Multey	40	Poor		Poor		Fair		Good		Good	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.32				
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.60				
Oz:											
Ozias	55	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.03				
						Sodium content	0.60	Shrink-swell	0.12	Too clayey	0.00
										Salinity	0.00
										Sodium content	0.60
										Too acid	0.76
Pophers	35	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.08	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.68	Shrink-swell	0.87	Too acid	0.50
						Sodium content	0.78			Sodium content	0.78
						No water erosion limitation	0.99				
PeB:											
Penning	90	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.54	Depth to saturated zone	0.98	Depth to saturated zone	0.98
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.68	Depth to bedrock	0.99		
						No water erosion limitation	0.99				
Po:											
Pophers	90	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.08	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.68	Shrink-swell	0.87	Too acid	0.50
						Sodium content	0.78			Sodium content	0.78
						No water erosion limitation	0.99				

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RbB:											
Rayburn	90	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.08	Shrink-swell	0.82	Too acid	0.50
						Low content of organic matter	0.18				
						Droughty	0.41				
						Water erosion	0.90				
RwB:											
Rosenwall	90	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Droughty	0.00	Shrink-swell	0.12	Depth to bedrock	0.10
						Depth to bedrock	0.10			Too acid	0.98
						Too acid	0.54				
						Low content of organic matter	0.88				
						Water erosion	0.90				
RwD:											
Rosenwall	90	Poor		Poor		Poor		Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Droughty	0.01	Shrink-swell	0.12	Depth to bedrock	0.35
						Depth to bedrock	0.35			Slope	0.84
						Too acid	0.54			Too acid	0.98
						Low content of organic matter	0.88				
						Water erosion	0.90				
SsA:											
Sawlit	45	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.08	Shrink-swell	0.42	Depth to saturated zone	0.98
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.75	Depth to saturated zone	0.98	Too acid	0.98
						No water erosion limitation	0.99				
Sawtown	40	Poor		Poor		Fair		Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Too acid	0.20	Shrink-swell	0.66	Too acid	0.76
		Thickest layer	0.00	Thickest layer	0.00	Low content of organic matter	0.88				
						No water erosion limitation	0.99				

Table 10.--Construction Materials

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class	Value	Rating class	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StD:											
Stringtown	90	Poor		Poor		Fair		Good		Fair	
		Bottom layer	0.00	Bottom layer	0.00	Low content of organic matter	0.24			Slope	0.84
		Thickest layer	0.00	Thickest layer	0.00					Rock fragments	0.88
						Too acid	0.54			Too acid	0.98
TeD:											
Tehran	90	Poor		Fair		Poor		Good		Fair	
		Bottom layer	0.00	Bottom layer	0.06	Wind erosion	0.00			Too sandy	0.78
		Thickest layer	0.00	Thickest layer	0.12	Too acid	0.54			Slope	0.84
						Too sandy	0.78			Too acid	0.98
						Low content of organic matter	0.88				
UrB:											
Urland	100	Poor		Poor		Poor		Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00	Too clayey	0.00	Shrink-swell	0.87	Too clayey	0.00
		Thickest layer	0.00	Thickest layer	0.00	Too acid	0.32	Depth to bedrock	0.99	Too acid	0.88
						Low content of organic matter	0.60				
						No water erosion limitation	0.99				
W.											
Water											
WnB:											
Woden	90	Poor		Poor		Fair		Good		Good	
		Bottom layer	0.00	Bottom layer	0.00	Low content of organic matter	0.60				
		Thickest layer	0.00	Thickest layer	0.00						
						Too acid	0.84				

Table 11.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:													
Alazan	90	Somewhat limited Depth to saturated zone	0.44	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Somewhat limited Depth to saturated zone	0.19
AbA:													
Alazan	60	Somewhat limited Depth to saturated zone	0.44	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Somewhat limited Depth to saturated zone	0.19
Besner	30	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited		Not limited		Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
AnB:													
Annona	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Not limited	
AuB:													
Austonio	90	Somewhat limited Shrink-swell	0.50	Not limited		Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
AuD:													
Austonio	90	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Slope	0.16	Very limited Slope Shrink-swell	1.00 0.50	Somewhat limited Shrink-swell Slope	0.50 0.16	Very limited Cutbanks cave Slope	1.00 0.16	Somewhat limited Slope	0.16
BeA:													
Besner	90	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited		Not limited		Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
CaA, CaB:													
Colita	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.94	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Somewhat limited Depth to saturated zone	0.94

Table 11.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ClA:													
Colita	45	Very limited		Very limited		Very limited		Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00	Depth to saturated zone	0.94
										Cutbanks cave	0.10		
Laska	35	Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.08	Depth to saturated zone	1.00	Depth to saturated zone	0.08	Depth to saturated zone	0.03	Depth to saturated zone	1.00	Depth to saturated zone	0.03
										Cutbanks cave	0.10		
CoB:													
Corrigan	100	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	0.50	Depth to bedrock	0.01
				Depth to soft bedrock	0.01					Cutbanks cave	0.10		
										Depth to soft bedrock	0.01		
CoD:													
Corrigan	100	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	0.50	Depth to bedrock	0.01
		Slope	0.01	Depth to soft bedrock	0.01	Slope	1.00	Slope	0.01	Depth to soft bedrock	0.01	Slope	0.01
				Slope	0.01					Cutbanks cave	0.10		
EaA:													
Eastham	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
										Too clayey	0.50		
EaB:													
Eastham	90	Very limited		Very limited		Very limited		Very limited		Very limited		Not limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Cutbanks cave	1.00		
						Slope	0.01			Too clayey	0.50		
EtB:													
Etoile	90	Very limited		Very limited		Very limited		Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	0.50		
										Cutbanks cave	0.10		

Table 11.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FuA, FuB:													
Fuller	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
				Shrink-swell	1.00					Cutbanks cave	0.10	Depth to saturated zone	1.00
GaA:													
Garner	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
										Too clayey	0.88		
GwA:													
Gladewater	100	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Shrink-swell	1.00	Too clayey	1.00	Too clayey	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Flooding	1.00	Cutbanks cave	1.00	Flooding	1.00
				Depth to saturated zone	1.00					Depth to saturated zone	1.00		
										Flooding	0.80		
HaA:													
Hainesville	90	Not limited		Not limited		Not limited		Not limited		Very limited		Somewhat limited	
										Cutbanks cave	1.00	Droughty	0.69
HeA, HeB:													
Herty	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	0.88		
										Cutbanks cave	0.10		
KcD:													
Kellison	90	Very limited		Very limited		Very limited		Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	0.97	Slope	0.16
		Slope	0.16	Slope	0.16	Slope	1.00	Slope	0.16	Slope	0.16		
										Cutbanks cave	0.10		
KeB:													
Keltys	90	Not limited		Somewhat limited		Not limited		Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.95					Depth to saturated zone	0.95		
										Cutbanks cave	0.10		

Table 11.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KeD:													
Keltys	90	Not limited		Somewhat limited		Somewhat limited		Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.95	Slope	0.86			Depth to saturated zone	0.95		
										Cutbanks cave	0.10		
KiB:													
Kitterll	90	Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
										Cutbanks cave	0.10	Droughty	1.00
KiD:													
Kitterll	50	Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
										Cutbanks cave	0.10	Droughty	1.00
Browndell	40	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to soft bedrock	1.00	Depth to saturated zone	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00	Depth to soft bedrock	1.00	Too clayey	0.50	Droughty	0.94
		Slope	0.16	Slope	0.16	Depth to soft bedrock	1.00	Slope	0.16	Slope	0.16	Slope	0.16
										Cutbanks cave	0.10	Content of large stones	0.03
Kp:													
Koury	90	Very limited		Very limited		Very limited		Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.95	Flooding	1.00
				Depth to saturated zone	0.95					Flooding	0.80		
										Cutbanks cave	0.10		
KuB:													
Kurth	90	Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50	Shrink-swell	0.50	Depth to saturated zone	0.95		
				Shrink-swell	0.50					Cutbanks cave	0.10		
KuD:													
Kurth	90	Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to saturated zone	0.95	Slope	0.86	Shrink-swell	0.50	Depth to saturated zone	0.95		
				Shrink-swell	0.50	Shrink-swell	0.50			Cutbanks cave	0.10		

Table 11.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LaB:													
Laska	90	Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.08	Depth to saturated zone	1.00	Depth to saturated zone	0.08	Depth to saturated zone	0.03	Depth to saturated zone	1.00	Depth to saturated zone	0.03
										Cutbanks cave	0.10		
LeB:													
Latex	90	Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to saturated zone	0.73	Shrink-swell	0.50	Shrink-swell	0.50	Depth to saturated zone	0.73		
				Shrink-swell	0.50					Too clayey	0.12		
										Cutbanks cave	0.10		
LnB:													
Letney	90	Not limited		Not limited		Not limited		Not limited		Very limited		Not limited	
										Cutbanks cave	1.00		
LvC:													
Lovelady	90	Not limited		Somewhat limited		Not limited		Not limited		Very limited		Somewhat limited	
				Depth to saturated zone	0.95					Cutbanks cave	1.00	Droughty	0.10
										Depth to saturated zone	0.95		
LvD:													
Lovelady	90	Not limited		Somewhat limited		Somewhat limited		Not limited		Very limited		Somewhat limited	
				Depth to saturated zone	0.95	Slope	0.86			Cutbanks cave	1.00	Droughty	0.29
				Shrink-swell	0.50					Depth to saturated zone	0.95		
MpA:													
Mollville	45	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00	Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50	Cutbanks cave	0.10		
Besner	40	Not limited		Somewhat limited		Not limited		Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.15					Depth to saturated zone	0.15		
										Cutbanks cave	0.10		
MsB:													
Moswell	90	Very limited		Very limited		Very limited		Very limited		Very limited		Not limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	1.00		
										Cutbanks cave	0.10		

Table 11.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MsE:													
Moswell	90	Very limited		Very limited		Very limited		Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	1.00	Slope	0.16
		Slope	0.16	Slope	0.16	Slope	1.00	Slope	0.16	Slope	0.16		
										Cutbanks cave	0.10		
MxA:													
Moten	50	Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.86	Depth to saturated zone	1.00	Depth to saturated zone	0.86	Depth to saturated zone	0.48	Depth to saturated zone	1.00	Depth to saturated zone	0.48
				Shrink-swell	0.50					Cutbanks cave	0.10		
Multey	40	Not limited		Somewhat limited		Not limited		Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.16					Depth to saturated zone	0.16		
										Cutbanks cave	0.10		
Oz:													
Ozias	55	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.80	Too clayey	1.00
										Too clayey	0.50	Salinity	0.01
Pophers	35	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Flooding	0.80	Depth to saturated zone	0.75
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50	Cutbanks cave	0.10		
PeB:													
Penning	90	Not limited		Somewhat limited		Not limited		Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.99					Depth to saturated zone	0.99		
										Cutbanks cave	0.10		
Po:													
Pophers	90	Very limited		Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Flooding	0.80	Depth to saturated zone	0.75
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50	Cutbanks cave	0.10		

Table 11.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RbB:													
Rayburn	90	Very limited		Very limited		Very limited		Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Depth to saturated zone	0.82		
				Depth to saturated zone	0.82					Too clayey	0.50		
										Cutbanks cave	0.10		
RwB:													
Rosenwall	90	Very limited		Very limited		Very limited		Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	1.00	Depth to bedrock	0.90
				Depth to soft bedrock	0.90					Depth to soft bedrock	0.90	Droughty	0.66
										Cutbanks cave	0.10		
RwD:													
Rosenwall	90	Very limited		Very limited		Very limited		Very limited		Very limited		Somewhat limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00	Too clayey	1.00	Depth to bedrock	0.65
		Slope	0.16	Depth to soft bedrock	0.64	Slope	1.00	Slope	0.16	Depth to soft bedrock	0.64	Droughty	0.35
				Slope	0.16					Slope	0.16	Slope	0.16
										Cutbanks cave	0.10		
SsA:													
Sawlit	45	Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	0.50	Depth to saturated zone	0.99		
				Depth to saturated zone	0.99					Cutbanks cave	0.10		
										Too clayey	0.03		
Sawtown	40	Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50	Depth to saturated zone	0.47		
				Depth to saturated zone	0.47					Cutbanks cave	0.10		
										Too clayey	0.03		
StD:													
Stringtown	90	Somewhat limited		Somewhat limited		Very limited		Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	1.00	Slope	0.16	Slope	0.16	Slope	0.16
										Cutbanks cave	0.10		
TeD:													
Tehran	90	Somewhat limited		Somewhat limited		Very limited		Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	1.00	Slope	0.16	Cutbanks cave	1.00	Droughty	0.34
										Slope	0.16	Slope	0.16

Table 11.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings		Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
UrB:													
Urland	100	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50	Somewhat limited Shrink-swell	 0.50	Somewhat limited Too clayey Cutbanks cave	 0.12 0.10	Not limited	
W.													
Water													
WnB:													
Woden	90	Not limited		Not limited		Not limited		Not limited		Somewhat limited Cutbanks cave	 0.10	Not limited	

Table 12.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:											
Alazan	90	Very limited Depth to saturated zone Restricted permeability	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86
AbA:											
Alazan	60	Very limited Depth to saturated zone Restricted permeability	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86
Besner	30	Somewhat limited Restricted permeability Depth to saturated zone	0.50 0.40	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Not limited	
AnB:											
Annona	90	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.01	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
AuB:											
Austonio	90	Somewhat limited Restricted permeability	0.50	Very limited Seepage Slope	1.00 0.01	Very limited Seepage	1.00	Not limited		Somewhat limited Seepage	0.50
AuD:											
Austonio	90	Somewhat limited Restricted permeability Slope	0.50 0.16	Very limited Slope Seepage	1.00 0.50	Very limited Seepage Slope	1.00 0.16	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16
BeA:											
Besner	90	Somewhat limited Restricted permeability Depth to saturated zone	0.50 0.40	Very limited Seepage Slope	1.00 0.01	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Not limited	

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CaA:											
Colita	90	Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	0.98	Depth to soft bedrock	0.93	Depth to saturated zone	1.00	Seepage	1.00	Depth to bedrock	0.93
		Restricted permeability	0.50					Depth to bedrock	0.93		
CaB:											
Colita	90	Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	0.86	Depth to soft bedrock	0.61	Depth to saturated zone	1.00	Seepage	1.00	Depth to bedrock	0.61
		Restricted permeability	0.50					Depth to bedrock	0.61		
ClA:											
Colita	45	Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	0.98	Depth to soft bedrock	0.90	Depth to saturated zone	1.00	Seepage	1.00	Seepage	0.50
		Restricted permeability	0.50					Depth to bedrock	0.93	Depth to bedrock	0.93
Laska	35	Very limited		Very limited		Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.68
		Depth to bedrock	0.47	Seepage	1.00	Depth to bedrock	1.00	Seepage	1.00	Seepage	0.50
				Depth to soft bedrock	0.05	Seepage	1.00	Depth to bedrock	0.05	Depth to bedrock	0.05
CoB:											
Corrigan	100	Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Slope	0.09	Depth to saturated zone	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Restricted permeability	1.00			Too clayey				Hard to compact	1.00
										Depth to bedrock	1.00
CoD:											
Corrigan	100	Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Slope	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Restricted permeability	1.00			Too clayey	1.00	Slope	0.01	Hard to compact	1.00
		Slope	0.01			Slope	0.01			Depth to bedrock	1.00
										Slope	0.01

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EaA:											
Eastham	90	Very limited		Somewhat limited		Very limited		Not limited		Very limited	
		Restricted permeability	1.00	Slope	0.01	Too clayey	1.00			Too clayey	1.00
										Hard to compact	1.00
EaB:											
Eastham	90	Very limited		Somewhat limited		Very limited		Not limited		Very limited	
		Restricted permeability	1.00	Slope	0.33	Too clayey	1.00			Too clayey	1.00
										Hard to compact	1.00
EtB:											
Etoile	90	Very limited		Somewhat limited		Very limited		Somewhat limited		Very limited	
		Restricted permeability	1.00	Slope	0.09	Too clayey	1.00	Depth to bedrock	0.01	Too clayey	1.00
		Depth to bedrock	0.36	Depth to soft bedrock	0.01	Depth to bedrock	1.00			Hard to compact	1.00
										Depth to bedrock	0.01
FuA:											
Fuller	90	Very limited		Somewhat limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	0.88	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50	Sodium content	1.00	Depth to bedrock	0.88	Sodium content	1.00
						Depth to bedrock	1.00			Hard to compact	1.00
		Depth to bedrock	0.96							Depth to bedrock	0.88
FuB:											
Fuller	90	Very limited		Somewhat limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Seepage	0.50	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.01	Sodium content	1.00	Depth to bedrock	0.84	Sodium content	1.00
				Depth to soft bedrock	0.84	Depth to bedrock	1.00			Hard to compact	1.00
		Depth to bedrock	0.94							Depth to bedrock	0.84
GaA:											
Garner	90	Very limited		Not limited		Very limited		Not limited		Very limited	
		Restricted permeability	1.00			Too clayey	1.00			Too clayey	1.00
										Hard to compact	1.00
GwA:											
Gladewater	100	Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Restricted permeability	1.00	Depth to saturated zone	0.83	Too clayey	1.00	Depth to saturated zone	0.17	Hard to compact	1.00
		Depth to saturated zone	1.00			Depth to saturated zone	0.84			Depth to saturated zone	0.44

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HaA:											
Hainesville	90	Very limited		Very limited		Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00	Seepage	1.00	Seepage	1.00	Seepage	1.00
						Too sandy	1.00			Too sandy	0.50
HeA:											
Herty	90	Very limited		Somewhat limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to bedrock	0.71	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Too clayey	1.00	Depth to bedrock	0.71	Too clayey	1.00
						Depth to bedrock	1.00			Hard to compact	1.00
		Depth to bedrock	0.89							Depth to bedrock	0.71
HeB:											
Herty	90	Very limited		Somewhat limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	0.61	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.01	Too clayey	1.00	Depth to bedrock	0.61	Too clayey	1.00
						Depth to bedrock	1.00			Hard to compact	1.00
		Depth to bedrock	0.86							Depth to bedrock	0.61
KcD:											
Kellison	90	Very limited		Very limited		Very limited		Somewhat limited		Very limited	
		Restricted permeability	1.00	Slope	1.00	Too clayey	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00	Slope	0.16	Hard to compact	1.00
		Slope	0.16			Slope	0.16			Depth to bedrock	1.00
										Slope	0.16
KeB:											
Keltys	90	Very limited		Very limited		Very limited		Somewhat limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00	Depth to bedrock	0.05	Depth to saturated zone	0.11
		Depth to saturated zone	1.00	Seepage	0.50	Depth to saturated zone	0.47			Depth to bedrock	0.05
		Depth to bedrock	0.47	Depth to soft bedrock	0.05						
				Slope	0.01						
KeD:											
Keltys	90	Very limited		Very limited		Very limited		Somewhat limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00	Depth to bedrock	0.18	Depth to saturated zone	0.11
		Depth to saturated zone	1.00	Slope	1.00	Depth to saturated zone	0.47			Depth to bedrock	0.18
		Depth to bedrock	0.63	Seepage	0.50						
				Depth to soft bedrock	0.18						

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KiB:											
Kitterll	90	Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
				Slope	0.09						
KiD:											
Kitterll	50	Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
				Slope	0.09						
Browndell	40	Very limited		Very limited		Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Depth to saturated zone	1.00	Slope	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slope	0.16			Too clayey	1.00	Slope	0.16	Too clayey	1.00
						Slope	0.16			Hard to compact	1.00
										Slope	0.16
Kp:											
Koury	90	Very limited		Very limited		Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.09
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Restricted permeability	1.00								
KuB:											
Kurth	90	Very limited		Very limited		Very limited		Somewhat limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00	Depth to bedrock	0.02	Too clayey	0.50
		Depth to saturated zone	1.00	Seepage	0.50	Too clayey	0.50			Depth to saturated zone	0.11
		Depth to bedrock	0.41	Depth to soft bedrock	0.02	Depth to saturated zone	1.00			Depth to bedrock	0.02
				Slope	0.01						
KuD:											
Kurth	90	Very limited		Very limited		Very limited		Somewhat limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00	Depth to bedrock	0.54	Depth to bedrock	0.54
		Depth to saturated zone	1.00	Slope	1.00	Depth to saturated zone	0.47			Depth to saturated zone	0.11
				Seepage	0.50						

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LaB:											
Laska	90	Very limited		Very limited		Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.68
		Restricted permeability	0.72	Seepage	1.00	Depth to bedrock	1.00	Seepage	1.00	Seepage	0.50
				Slope	0.01	Seepage	1.00				
LeB:											
Latex	90	Very limited		Somewhat limited		Somewhat limited		Not limited		Not limited	
		Restricted permeability	1.00	Depth to saturated zone	0.92	Depth to saturated zone	0.02				
		Depth to saturated zone	1.00	Seepage	0.50						
				Slope	0.01						
LnB:											
Letney	90	Not limited		Very limited		Very limited		Very limited		Somewhat limited	
				Seepage	1.00	Seepage	1.00	Seepage	1.00	Seepage	0.50
				Slope	0.09						
LvC:											
Lovelady	90	Very limited		Very limited		Somewhat limited		Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00	Depth to saturated zone	0.44	Seepage	1.00	Hard to compact	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00					Depth to saturated zone	0.09
		Filtering capacity	1.00	Slope	0.09						
LvD:											
Lovelady	90	Very limited		Very limited		Somewhat limited		Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00	Too clayey	0.50	Seepage	1.00	Hard to compact	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.44			Depth to saturated zone	0.09
		Filtering capacity	1.00	Slope	1.00						
MpA:											
Mollville	45	Very limited		Very limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Seepage	1.00			Too clayey	0.50
						Too clayey	0.50				

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MpA:											
Besner	40	Somewhat limited		Very limited		Very limited		Very limited		Not limited	
		Restricted permeability	0.50	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Depth to saturated zone	0.40	Slope	0.01			Seepage	1.00		
MsB:											
Moswell	90	Very limited		Somewhat limited		Very limited		Somewhat limited		Very limited	
		Restricted permeability	1.00	Slope	0.09	Too clayey	1.00	Depth to bedrock	0.84	Too clayey	1.00
						Depth to bedrock	1.00			Hard to compact	1.00
										Depth to bedrock	0.84
MsE:											
Moswell	90	Very limited		Very limited		Very limited		Somewhat limited		Very limited	
		Restricted permeability	1.00	Slope	1.00	Depth to bedrock	1.00	Depth to bedrock	0.71	Too clayey	1.00
		Slope	0.16			Too clayey	1.00	Slope	0.16	Hard to compact	1.00
						Slope	0.16			Depth to bedrock	0.71
										Slope	0.16
MxA:											
Moten	50	Very limited		Somewhat limited		Very limited		Somewhat limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	0.96
		Depth to saturated zone	1.00	Depth to saturated zone	0.06	Too clayey	0.50				
MxA:											
Multey	40	Somewhat limited		Very limited		Very limited		Very limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	0.21
		Depth to saturated zone	0.43			Seepage	1.00	Seepage	1.00		
Oz:											
Ozias	55	Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00			Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Depth to saturated zone	1.00			Too clayey	1.00			Too clayey	1.00

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Oz:											
Pophers	35	Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Depth to saturated zone		Depth to saturated zone		Depth to saturated zone		Too clayey	0.50
		Depth to saturated zone	1.00								
PeB:											
Penning	90	Very limited		Very limited		Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	1.00	Depth to bedrock	1.00	Depth to saturated zone	0.04	Depth to saturated zone	0.25
		Depth to saturated zone	1.00	Depth to saturated zone	0.96	Depth to saturated zone	0.68	Depth to bedrock	0.01	Depth to bedrock	0.01
Po:											
Pophers	90	Very limited		Very limited		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Restricted permeability	1.00								
RbB:											
Rayburn	90	Very limited		Somewhat limited		Very limited		Somewhat limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.42	Too clayey	1.00			Hard to compact	1.00
		Depth to bedrock	0.78	Slope	0.09	Depth to saturated zone	0.09			Depth to bedrock	1.00
RwB:											
Rosenwall	90	Very limited		Very limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Slope	0.09	Too clayey	1.00			Hard to compact	1.00
										Depth to bedrock	1.00
RwD:											
Rosenwall	90	Very limited		Very limited		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
		Depth to bedrock	1.00	Slope	1.00	Too clayey	1.00	Slope	0.16	Hard to compact	1.00
		Slope	0.16			Slope	0.16			Depth to bedrock	1.00
										Slope	0.16

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons		Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SsA:											
Sawlit	45	Very limited		Somewhat limited		Very limited		Somewhat limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	0.96	Too clayey	1.00	Depth to saturated zone	0.04	Hard to compact	1.00
		Depth to saturated zone	1.00	Seepage	0.50	Depth to saturated zone	0.68			Too clayey	1.00
										Depth to saturated zone	0.25
Sawtown	40	Very limited		Somewhat limited		Not limited		Not limited		Not limited	
		Restricted permeability	1.00	Seepage	0.50						
		Depth to saturated zone	0.94	Depth to saturated zone	0.39						
StD:											
Stringtown	90	Very limited		Very limited		Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	1.00	Slope	1.00	Slope	0.16	Slope	0.16	Slope	0.16
		Slope	0.16	Seepage	0.50						
TeD:											
Tehran	90	Somewhat limited		Very limited		Very limited		Very limited		Very limited	
		Slope	0.16	Seepage	1.00	Too sandy	1.00	Seepage	1.00	Seepage	1.00
				Slope	1.00	Seepage	1.00	Slope	0.16	Too sandy	0.50
						Slope	0.16			Slope	0.16
UrB:											
Urland	100	Very limited		Somewhat limited		Very limited		Somewhat limited		Very limited	
		Restricted permeability	1.00	Seepage	0.50	Too clayey	1.00	Depth to bedrock	0.01	Too clayey	1.00
				Slope	0.09	Depth to bedrock	1.00			Hard to compact	1.00
										Depth to bedrock	0.01
W.											
Water											
WnB:											
Woden	90	Not limited		Very limited		Very limited		Very limited		Somewhat limited	
				Seepage	1.00	Seepage	1.00	Seepage	1.00	Seepage	0.50
				Slope	0.09						

Table 13.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:							
Alazan	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Cutbanks cave	0.10
				Piping	0.50	Deep to water	0.01
AbA:							
Alazan	60	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Cutbanks cave	0.10
				Piping	0.73	Deep to water	0.01
Besner	30	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
				Seepage	0.01		
AnB:							
Annona	90	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.93	Deep to water	1.00
AuB:							
Austonio	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.09	Deep to water	1.00
AuD:							
Austonio	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
				Seepage	0.09		
BeA:							
Besner	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
				Seepage	0.01		
CaA:							
Colita	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
		Depth to bedrock	0.01				
				Piping	1.00		
				Thin layer	0.34		
				Seepage	0.02		
CaB:							
Colita	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
		Depth to bedrock	0.01				
				Piping	1.00		
				Thin layer	0.16		
				Seepage	0.02		
ClA:							
Colita	45	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
		Depth to bedrock	0.01				
				Piping	1.00		
				Thin layer	0.34		

Table 13.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ClA:							
Laska	35	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Piping	1.00	Cutbanks cave	0.10
		Depth to bedrock	0.01	Thin layer	1.00	Deep to water	0.02
				Depth to saturated zone	0.95		
				Seepage	0.01		
CoB:							
Corrigan	100	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.02	Depth to saturated zone	1.00	Deep to water	1.00
		Seepage	0.02	Hard to pack	1.00		
				Thin layer	0.56		
CoD:							
Corrigan	100	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.02	Depth to saturated zone	1.00	Deep to water	1.00
		Seepage	0.02	Hard to pack	0.74		
				Thin layer	0.56		
EaA, EaB:							
Eastham	90	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Deep to water	1.00
EtB:							
Etoile	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.01	Hard to pack	1.00	Deep to water	1.00
				Thin layer	1.00		
FuA, FuB:							
Fuller	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Depth to saturated zone	1.00	Deep to water	1.00
		Depth to bedrock	0.01	Piping	1.00		
				Thin layer	1.00		
GaA:							
Garner	90	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Deep to water	1.00
GwA:							
Gladewater	100	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Deep to water	1.00
				Depth to saturated zone	0.84		
HaA:							
Hainesville	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.11	Deep to water	1.00
HeA, HeB:							
Herty	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.01	Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	1.00		
				Piping	0.90		
KcD:							
Kellison	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.01	Thin layer	1.00	Deep to water	1.00
				Piping	0.90		

Table 13.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KeB:							
Keltys	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.01	Thin layer	1.00	Deep to water	1.00
				Depth to saturated zone	0.46		
				Seepage	0.01		
KeD:							
Keltys	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.01	Thin layer	1.00	Deep to water	1.00
				Depth to saturated zone	0.46		
				Seepage	0.01		
KiB:							
Kitterll	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.69	Thin layer	1.00	Deep to water	1.00
		Seepage	0.02	Piping	1.00		
KiD:							
Kitterll	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.78	Piping	1.00		
Browndell	40	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.61	Depth to saturated zone	1.00	Deep to water	1.00
		Seepage	0.02	Thin layer	1.00		
				Hard to pack	0.80		
Kp:							
Koury	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.03	Piping	1.00	Slow refill	0.97
				Depth to saturated zone	0.43	Deep to water	0.25
						Cutbanks cave	0.10
KuB:							
Kurth	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.01	Piping	0.86		
				Depth to saturated zone	0.46		
KuD:							
Kurth	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.01	Piping	0.99		
				Depth to saturated zone	0.46		
				Seepage	0.06		
LaB:							
Laska	90	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Piping	1.00	Cutbanks cave	0.10
				Thin layer	1.00	Deep to water	0.02
				Depth to saturated zone	0.95		
				Seepage	0.01		

Table 13.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LeB:							
Latex	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Depth to saturated zone	0.02	Deep to water	1.00
LnB:							
Letney	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.16	Deep to water	1.00
LvC, LvD:							
Lovelady	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.43	Deep to water	1.00
				Seepage	0.11		
MpA:							
Mollville	45	Not limited		Very limited		Somewhat limited	
				Ponding	1.00	Cutbanks cave	0.10
				Depth to saturated zone	1.00		
				Piping	0.83		
				Seepage	0.03		
Besner	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
				Seepage	0.01		
MsB, MsE:							
Moswell	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.01	Hard to pack	1.00	Deep to water	1.00
				Thin layer	1.00		
MxA:							
Moten	50	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	1.00		
Multey	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
Oz:							
Ozias	55	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	1.00		
Pophers	35	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.03	Depth to saturated zone	1.00	Slow refill	0.97
				Piping	0.78	Cutbanks cave	0.10
						Salty water	0.06
PeB:							
Penning	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
		Depth to bedrock	0.01	Thin layer	1.00		
				Depth to saturated zone	0.68		

Table 13.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Po:							
Pophers	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.03	Depth to saturated zone	1.00	Slow refill	0.97
						Cutbanks cave	0.10
				Piping	0.22		
RbB:							
Rayburn	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Thin layer	0.46	Deep to water	1.00
		Depth to bedrock	0.01	Depth to saturated zone	0.09		
RwB:							
Rosenwall	90	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.30	Thin layer	0.98	Deep to water	1.00
		Seepage	0.02	Hard to pack	0.90		
RwD:							
Rosenwall	90	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.17	Thin layer	0.91	Deep to water	1.00
		Seepage	0.02	Hard to pack	0.90		
SsA:							
Sawlit	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Depth to saturated zone	0.68	Deep to water	1.00
Sawtown	40	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.01	Deep to water	1.00
StD:							
Stringtown	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Deep to water	1.00
TeD:							
Tehran	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.12	Deep to water	1.00
UrB:							
Urland	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.01	Piping	0.01		
W.							
Water							
WnB:							
Woden	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00

Table 14.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO	3-10 inches	4	10	40	200		
		In				Pct					Pct	
AaB:												
Alazan	A, E	0-4	Very fine sandy loam	ML, CL-ML	A-4	0	100	96-100	90-100	51-80	0-25	NP-7
	Bt/E	4-80	Loam, sandy clay loam	CL	A-4, A-6	0	100	96-100	90-100	51-85	25-40	8-22
AbA:												
Alazan	A, E	0-18	Very fine sandy loam	ML, CL-ML	A-4	0	100	96-100	90-100	51-80	0-25	NP-7
	Bt/E	18-80	Loam, sandy clay loam	CL	A-4, A-6	0	100	96-100	90-100	51-85	25-40	8-22
Besner	A, E1	0-8	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	100	95-100	90-100	29-66	0-25	NP-7
	E2	8-29	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	100	95-100	90-100	29-66	0-25	NP-7
	Bt	29-38	Loam, fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	100	95-100	80-100	29-66	0-25	NP-7
	Bt/E	38-80	Loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	100	95-100	80-100	36-75	18-30	6-15
AnB:												
Annona	A, E	0-9	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	95-100	95-100	75-100	45-75	16-30	NP-7
	Bt, Btss	9-43	Clay, clay loam	CH	A-7	0	95-100	95-100	90-100	75-95	51-70	30-45
	Btss	43-80	Clay	CL, CH	A-7	0	95-100	95-100	90-100	75-95	41-65	25-45
AuB:												
Austonio	A	0-4	Fine sandy loam	CL, ML, SC, SM	A-4	0	90-100	90-100	85-95	36-55	20-28	3-10
	E	4-13	Fine sandy loam	CL, ML, SM, SC	A-4	0	90-100	90-100	85-95	36-55	20-28	3-10
	Bt	13-32	Loam, sandy clay loam	CL	A-6	0	100	95-100	90-100	51-75	26-40	12-24
	BCt	32-51	Fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-4	0	98-100	95-100	80-100	40-70	0-28	NP-7
	2C	51-80	Loamy fine sand, fine sandy loam	SM, SC-SM	A-2-4, A-4	0	95-100	95-100	85-100	15-45	0-25	NP-5
AuD:												
Austonio	A	0-3	Fine sandy loam	CL, ML, SC, SM	A-4	0	90-100	90-100	85-95	36-55	20-28	3-10
	E	3-12	Fine sandy loam	SM, CL, ML, SC	A-4	0	90-100	90-100	85-95	36-55	20-28	3-10
	Bt	12-30	Loam, sandy clay loam	CL	A-6	0	100	95-100	90-100	51-75	26-40	12-24
	BCt	30-68	Fine sandy loam, loam	ML, SC-SM, CL-ML, SM	A-4	0	98-100	95-100	80-100	40-70	0-28	NP-7
	2C	68-80	Loamy fine sand, fine sandy loam	SC-SM, SM	A-2-4, A-4	0	95-100	95-100	85-100	15-45	0-25	NP-5

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO	3-10 inches	4	10	40	200		
		In				Pct					Pct	
BeA:												
Besner	A, E1	0-8	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-2-4, A-4	0	100	95-100	90-100	29-66	0-25	NP-7
	E2	8-29	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	100	95-100	90-100	29-66	0-25	NP-7
	Bt	29-38	Loam, fine sandy loam	SC-SM, SM, ML, CL-ML	A-2-4, A-4	0	100	95-100	80-100	29-66	0-25	NP-7
	Bt/E	38-80	Loam, sandy clay loam	CL-ML, SC, CL, SC-SM	A-4, A-6	0	100	95-100	80-100	36-75	18-30	6-15
CaA:												
Colita	A, Eg	0-11	Fine sandy loam	SM, SC-SM, CL-ML, ML	A-4	0	100	100	70-100	40-60	16-25	NP-7
	Btg/E1	11-24	Fine sandy loam, loamy very fine sand, very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	100	100	70-95	40-65	15-25	NP-7
	Btg/E2	24-39	Fine sandy loam, sandy clay loam	ML, SC, SM, CL	A-4, A-6	0	100	100	70-90	36-55	12-30	2-14
	Btg	39-43	Sandy clay loam, clay loam, silty clay loam	CL, CL-ML	A-4, A-6	0	100	100	80-100	51-95	20-40	6-20
	Cr	43-65	Bedrock			---	---	---	---	---	---	---
CaB:												
Colita	A	0-11	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	100	100	70-100	40-60	16-25	NP-7
	E, E/B	11-21	Fine sandy loam, loamy very fine sand, very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	100	100	70-95	40-65	15-25	NP-7
	Btg/E	21-40	Fine sandy loam, sandy clay loam	CL, ML, SC, SM	A-4, A-6	0	100	100	70-90	36-55	12-30	2-14
	Btg	40-48	Sandy clay loam, clay loam, silty clay loam	CL, CL-ML	A-4, A-6	0	100	100	80-100	51-95	20-40	6-20
	Cr	48-65	Bedrock			---	---	---	---	---	---	---

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO		4	10	40	200		
		In				Pct					Pct	
ClA:												
Colita--------	A	0-11	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	100	100	70-100	40-60	16-25	NP-7
	E, E/B	11-28	Fine sandy loam, loamy very fine sand, very fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	100	100	70-95	40-65	15-25	NP-7
	Btg/E	28-37	Fine sandy loam, sandy clay loam, loam	ML, SM, SC, CL	A-4, A-6	0	100	100	70-90	36-55	12-30	2-14
	Btg	37-43	Sandy clay loam, clay loam, silty clay loam	CL-ML, CL	A-4, A-6	0	100	100	80-100	51-95	20-40	6-20
	Cr	43-65	Bedrock			---	---	---	---	---	---	---
Laska---------	A, E	0-37	Fine sandy loam	SM	A-4	0	98-100	98-100	69-85	40-55	12-16	1-3
	Bt, Bt/E1	37-43	Fine sandy loam, loam	SC-SM, CL-ML, SM	A-4	0	98-100	98-100	69-95	40-75	14-23	2-7
	Bt/E2, BC	43-56	Loam, sandy clay loam, fine sandy loam	SC-SM, CL, SC, CL-ML	A-6, A-2-4, A-4	0	98-100	98-100	69-85	34-75	14-34	2-13
	Cr	56-65	Bedrock			---	---	---	---	---	---	---
CoB:												
Corrigan------	A, E	0-4	Loam	ML, SC-SM, CL-ML, SM	A-4	0	100	100	70-100	36-55	21-30	2-7
	Bt	4-38	Clay, silty clay	CH	A-7	0	100	100	90-100	65-95	52-76	30-50
	Cr	38-50	Bedrock			---	---	---	---	---	---	---
CoD:												
Corrigan------	A, E	0-13	Loam	CL-ML, ML, SC-SM, SM	A-4	0	100	100	70-100	36-55	21-30	2-7
	Bt	13-36	Clay, silty clay	CH	A-7	0	100	100	90-100	65-95	52-76	30-50
	Cr	36-55	Bedrock			---	---	---	---	---	---	---
EaA:												
Eastham-------	A1	0-15	Clay	CL, CH	A-7-6	0	95-100	95-100	85-100	80-99	45-60	28-40
	A2, Bss	15-40	Clay	CH	A-7-6	0	95-100	95-100	85-100	80-99	51-72	34-48
	Bkss	40-80	Clay	CH	A-7-6	0	95-100	95-100	80-98	70-98	60-84	40-60
EaB:												
Eastham-------	A1	0-5	Clay	CH, CL	A-7-6	0-1	95-100	95-100	85-100	80-99	45-60	28-40
	A2, Bss	5-21	Silty clay, clay	CH	A-7-6	0-1	95-100	95-100	85-100	80-99	51-72	34-48
	Bkss, BC	21-80	Silty clay, clay	CH	A-7-6	0-1	95-100	95-100	85-100	80-99	51-72	34-48
EtB:												
Etoile--------	A, E	0-7	Loam	CL-ML, ML	A-4	0	98-100	98-100	85-95	51-85	16-30	NP-7
	Bt, Btss1	7-38	Clay	CH	A-7-6	0	98-100	98-100	85-100	75-98	51-76	35-50
	Btss2	38-58	Clay	CH	A-7-6	0	98-100	98-100	80-100	75-98	51-76	35-50
	Ck, Cy	58-80	Clay, clay loam	CH	A-7-6	0	98-100	98-100	80-100	75-98	51-76	35-50

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO		4	10	40	200		
		In				Pct					Pct	
FuA:												
Fuller	A	0-4	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	98-100	98-100	95-100	40-60	16-25	NP-7
	Eg	4-26	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-4	0	98-100	98-100	95-100	40-60	16-25	NP-7
	Btng/E	26-44	Loam, clay loam, silty clay loam	CH, CL	A-6, A-7-6	0	98-100	98-100	95-100	51-75	35-60	15-40
	2C	44-66	Loam, clay loam, clay	CH, CL	A-6, A-7	0	95-100	95-100	90-100	70-95	36-65	17-41
FuB:												
Fuller	A	0-7	Fine sandy loam	SM, CL-ML, ML, SC-SM	A-4	0	98-100	98-100	95-100	40-60	16-25	NP-7
	Eg	7-27	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-4	0	98-100	98-100	95-100	40-60	16-25	NP-7
	Btng/E	27-45	Loam, clay loam, silty clay loam	CH, CL	A-6, A-7-6	0	98-100	98-100	95-100	51-75	35-60	15-40
	2C	45-65	Loam, clay loam, clay	CH, CL	A-6, A-7	0	95-100	95-100	90-100	70-95	36-65	17-41
GaA:												
Garner	Ap	0-3	Clay	CL, CH	A-6, A-7-6	0	95-100	95-100	67-100	65-100	34-58	18-37
	Bw, Bss	3-80	Clay	CH	A-7-6	0	95-100	95-100	85-100	80-100	51-75	31-51
GwA:												
Gladewater	Ap	0-11	Clay	CH, CL	A-7	0	100	100	90-100	80-95	48-75	25-50
	Bg, Bssg1	11-64	Clay	CH	A-7	0	100	100	95-100	90-100	51-75	30-50
	Bssg2	64-80	Clay	CH	A-7	0	100	100	95-100	90-100	51-75	30-50
HaA:												
Hainesville	A	0-7	Loamy fine sand	SC-SM, SM	A-2-4	0	98-100	95-100	85-100	15-35	0-25	NP-7
	Bw, Bw/E	7-80	Fine sand, loamy fine sand	SC-SM, SM	A-2-4, A-4	0	98-100	95-100	80-100	13-45	0-25	NP-7
HeA:												
Herty	A, E	0-8	Loam	CL-ML, CL	A-4, A-6	0	98-100	98-100	95-100	51-90	18-35	4-15
	Bt	8-18	Silty clay, clay loam, clay, silty clay loam	CL	A-6, A-7-6	0	98-100	98-100	95-100	75-95	30-50	15-32
	Btss	18-47	Clay, silty clay	CL, CH	A-6, A-7-6	0	98-100	98-100	95-100	75-95	36-53	20-35
	2Cy	47-80	Clay loam, clay	CH	A-7-6	0	95-100	95-100	90-100	65-95	51-75	30-50
HeB:												
Herty	A, E	0-8	Loam	CL-ML, CL	A-4, A-6	0	98-100	98-100	95-100	51-90	18-35	4-15
	Bt	8-23	Silty clay, clay loam, clay, silty clay loam	CL	A-6, A-7-6	0	98-100	98-100	95-100	75-95	30-50	15-32
	Btss	23-48	Clay, silty clay	CH, CL	A-6, A-7-6	0	98-100	98-100	95-100	75-95	36-53	20-35
	2Cy	48-80	Clay loam, clay	CH	A-7-6	0	95-100	95-100	90-100	65-95	51-75	30-50

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO	3-10 inches	4	10	40	200		
		In				Pct					Pct	
KcD:												
Kellison------	A, E	0-3	Loam	CL, CL-ML	A-4, A-6	0	98-100	98-100	95-100	51-90	18-35	4-15
	Bt	3-12	Clay loam, silty clay, clay	CL, CH	A-6, A-7-6	0	100	98-100	90-100	70-95	36-53	20-35
	Btss	12-40	Silty clay, clay	CL, CH	A-6, A-7-6	0	100	98-100	90-100	75-95	36-60	20-40
	C, C/B	40-50	Clay loam, clay	CH, CL	A-7-6	0	98-100	95-100	90-100	70-95	48-75	28-50
KeB:												
Keltys--------	A	0-6	Fine sandy loam	SM, SC-SM, CL-ML, ML	A-4	0	98-100	98-100	85-100	36-61	16-30	1-8
	E	6-14	Fine sandy loam, loamy very fine sand	CL-ML, ML, SC-SM, SM	A-4	0	98-100	98-100	85-100	36-61	16-30	1-8
	Bt/E, E/B	14-56	Fine sandy loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-4	0	98-100	98-100	85-100	36-61	20-30	4-10
	2C	56-86	Sandy clay loam, clay loam	SC, CL	A-6, A-7	0	95-100	95-100	85-100	45-80	34-46	14-25
KeD:												
Keltys--------	A	0-8	Fine sandy loam	CL-ML, SC-SM, SM, ML	A-4	0	98-100	98-100	85-100	36-61	16-30	1-8
	E	8-17	Fine sandy loam, loamy very fine sand	SM, SC-SM, ML, CL-ML	A-4	0	98-100	98-100	85-100	36-61	16-30	1-8
	Bt/E, E/B	17-53	Fine sandy loam, sandy clay loam, loam	SC-SM, SC, CL-ML, CL	A-4	0	98-100	98-100	85-100	36-61	20-30	4-10
	2C	53-80	Sandy clay loam, clay loam	SC, CL	A-6, A-7	0	95-100	95-100	85-100	45-80	34-46	14-25
KiB:												
Kitterll------	A	0-15	Fine sandy loam	SM, SC-SM, CL-ML, ML	A-4	0	90-100	90-100	60-90	36-65	16-25	NP-7
	Cr	15-26	Bedrock			---	---	---	---	---	---	---
KiD:												
Kitterll------	A	0-12	Fine sandy loam	SM, ML, CL-ML, SC-SM	A-4	0	90-100	90-100	60-90	36-65	16-25	NP-7
	Cr	12-15	Bedrock			---	---	---	---	---	---	---
Browndell-----	A, E	0-6	Fine sandy loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0-15	90-100	85-100	70-85	40-55	21-30	4-11
	Bt	6-16	Clay, silty clay	CH	A-7	0	85-100	85-100	80-100	75-95	52-76	30-50
	Cr	16-24	Bedrock			---	---	---	---	---	---	---
Kp:												
Koury---------	A	0-7	Silt loam	CL, CL-ML, ML	A-4	0	98-100	98-100	95-100	55-95	20-31	3-10
	Bw, Bg	7-32	Loam, silt loam, very fine sandy loam	CL, CL-ML, ML	A-4, A-6	0	98-100	98-100	95-100	65-95	20-31	3-11
	Ab, Bb	32-84	Loam, silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0	98-100	98-100	95-100	65-95	20-40	4-20

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO	3-10 inches	4	10	40	200		
		In				Pct					Pct	
KuB:												
Kurth	A	0-7	Fine sandy loam	SM, SC-SM	A-2-4, A-4	0	98-100	98-100	85-100	25-50	16-30	NP-7
	E	7-17	Fine sandy loam	SC-SM, SM	A-2-4, A-4	0	98-100	98-100	85-100	25-50	16-30	NP-7
	Bt/E	17-37	Fine sandy loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	98-100	96-100	85-100	40-80	23-38	7-15
	2Btg	37-57	Clay loam, clay	CL	A-6, A-7	0	98-100	96-100	85-100	60-90	38-47	15-20
	2C, 2CB	57-79	Fine sandy loam, sandy clay loam, clay loam	CL, CL-ML, SC-SM, SC	A-4, A-6	0	98-100	95-100	85-100	40-70	21-34	6-13
KuD:												
Kurth	A	0-2	Fine sandy loam	SM, SC-SM	A-2-4, A-4	0	98-100	98-100	85-100	25-50	16-30	NP-7
	E	2-22	Fine sandy loam	SM, SC-SM	A-2-4, A-4	0	98-100	98-100	85-100	25-50	16-30	NP-7
	Bt/E	22-37	Fine sandy loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	98-100	96-100	85-100	40-80	23-38	7-15
	2Btg	37-49	Clay loam, clay	CL	A-6, A-7	0	98-100	96-100	85-100	60-90	38-47	15-20
	2C, 2CB	49-80	Fine sandy loam, sandy clay loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	98-100	95-100	85-100	40-70	21-34	6-13
LaB:												
Laska	A, E	0-24	Fine sandy loam	SM	A-4	0	98-100	98-100	69-85	40-55	12-16	1-3
	Bt, Bt/E1	24-41	Fine sandy loam, loam	SC-SM, SM, CL-ML	A-4	0	98-100	98-100	69-95	40-75	14-23	2-7
	Bt/E2, BC	41-63	Loam, sandy clay loam, fine sandy loam	SC, CL, CL-ML, SC-SM	A-6, A-2-4, A-4	0	98-100	98-100	69-85	34-75	14-34	2-13
	2Cr	63-70	Bedrock			---	---	---	---	---	---	---
LeB:												
Latex	A, E	0-10	Fine sandy loam	CL-ML, SC, SC-SM, SM	A-4	0	99-100	96-100	90-100	45-75	19-30	2-9
	Bt	10-49	Loam, clay loam, sandy clay loam	CL, CL-ML	A-4, A-6	0	99-100	95-100	90-100	51-80	20-40	6-25
	Bt/E	49-58	Loam, clay loam, sandy clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0-2	75-100	64-98	62-95	41-80	20-40	6-25
	2Bt/E	58-80	Clay, silty clay, clay loam	CL, CH	A-7-6	0	99-100	95-100	90-100	75-98	41-70	20-43
LnB:												
Letney	A, E	0-24	Loamy sand	SP-SM, SM	A-2	0	95-100	95-100	50-75	10-30	16-20	NP-3
	Bt	24-80	Sandy clay loam, sandy loam	SC-SM, SC	A-4, A-6	0	95-100	95-100	65-90	36-50	20-40	5-20

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO		4	10	40	200		
		In				Pct					Pct	
LvC:												
Lovelady------	A	0-6	Loamy fine sand	SM	A-2-4	0-1	95-100	95-100	65-95	15-35	0-20	NP-3
	E	6-32	Loamy sand, loamy fine sand	SM	A-2-4	0-1	95-100	95-100	65-95	15-35	0-20	NP-3
	Bt/E	32-55	Fine sandy loam, sandy clay loam	CL, SC, SC-SM	A-4, A-6	0-2	98-100	90-100	70-95	35-60	20-40	5-20
	2Bt	55-80	Fine sandy loam, sandy clay loam, sandy clay, clay loam	CH, CL, SC	A-6, A-7	0-1	90-100	90-100	75-99	35-60	26-52	11-30
LvD:												
Lovelady------	A	0-4	Loamy fine sand	SM	A-2-4	0-1	95-100	95-100	65-95	15-35	0-20	NP-3
	E	4-38	Loamy sand, loamy fine sand	SM	A-2-4	0-1	95-100	95-100	65-95	15-35	0-20	NP-3
	Bt/E	38-42	Fine sandy loam, sandy clay loam	CL, SC, SC-SM	A-4, A-6	0-2	98-100	90-100	70-95	35-60	20-40	5-20
	2Bt	42-79	Fine sandy loam, sandy clay loam, sandy clay, clay loam	SC, CH, CL	A-6, A-7	0-1	90-100	90-100	75-99	35-60	26-52	11-30
MpA:												
Mollville-----	A, Eg	0-5	Loam	CL, CL-ML, ML	A-4, A-6	0	100	100	85-100	50-80	20-35	3-15
	Btg/E	5-72	Sandy clay loam, loam, clay loam	CL, SC	A-4, A-6	0	100	100	90-100	45-75	25-40	8-22
	2Cg	72-80	Loamy fine sand, fine sandy loam	SM, CL-ML, ML, SC-SM	A-2-4, A-4	0	95-100	95-100	70-95	15-68	0-25	NP-6
Besner--------	A, E1	0-24	Fine sandy loam	SC-SM, SM, CL-ML, ML	A-2-4, A-4	0	100	95-100	90-100	29-66	0-25	NP-7
	E2	24-36	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	100	95-100	90-100	29-66	0-25	NP-7
	Bt	36-48	Loam, fine sandy loam	SM, CL-ML, ML, SC-SM	A-2-4, A-4	0	100	95-100	80-100	29-66	0-25	NP-7
	Bt/E	48-85	Loam, sandy clay loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0	100	95-100	80-100	36-75	18-30	6-15
MsB:												
Moswell-------	A, E	0-9	Loam	ML	A-4	0	97-100	95-100	80-95	51-70	0-30	NP-7
	Bt	9-15	Clay	CH	A-7	0	97-100	95-100	90-100	85-99	65-95	35-65
	Btss	15-45	Clay	CH	A-7	0	97-100	95-100	90-100	85-99	70-95	40-65
	Cy, C	45-80	Clay	CH	A-7	0	97-100	95-100	90-100	85-99	70-95	55-70
MsE:												
Moswell-------	A, E	0-6	Loam	ML	A-4	0	97-100	95-100	80-95	51-70	0-30	NP-7
	Bt	6-16	Clay	CH	A-7	0	97-100	95-100	90-100	85-99	65-95	35-65
	Btss	16-47	Clay	CH	A-7	0	97-100	95-100	90-100	85-99	70-95	40-65
	Cy, C	47-80	Clay	CH	A-7	0	97-100	95-100	90-100	85-99	70-95	55-70

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	3-10 inches	4	10	40	200		
		In				Pct					Pct	
MxA:												
Moten	A	0-3	Silt loam	SM, SC-SM, ML, CL-ML	A-4	0	98-100	98-100	95-100	40-65	0-20	NP-7
	E, E/Bt	3-20	Fine sandy loam, loam, silt loam	SM, ML	A-4	0	98-100	98-100	95-100	40-65	0-30	NP-7
	Bt/E	20-45	Fine sandy loam, loam, silt loam	CL, CL-ML	A-4, A-6	0	98-100	98-100	90-100	51-80	18-30	4-12
	2C, 2Bt/C	45-80	Very fine sandy loam, silt loam, clay loam	CL-ML, SC, SC-SM, CL	A-4, A-6, A-7	0	98-100	98-100	85-100	40-90	20-50	5-20
Multey	A	0-4	Fine sandy loam	SM, ML	A-4	0	98-100	98-100	90-100	40-60	0-30	NP-7
	E	4-26	Fine sandy loam, very fine sandy loam, loam	SM, ML	A-4	0	98-100	98-100	90-100	40-60	0-30	NP-7
	E/Bt	26-35	Fine sandy loam, very fine sandy loam, loam	CL, SC-SM, SC, CL-ML	A-4, A-6	0	98-100	98-100	90-100	45-65	22-34	5-15
	Bt/E	35-80	Fine sandy loam, sandy clay loam, loam	CL, ML, SC-SM, CL-ML	A-2-4, A-2-6, A-4, A-6	0	98-100	95-100	60-100	30-80	20-40	3-18
Oz:												
Ozias	A	0-9	Clay	CL, CH	A-7	0	99-100	98-100	97-100	85-100	45-70	20-40
	Bssg	9-44	Silty clay loam, silty clay, clay	CL, CH	A-7	0	99-100	98-100	97-100	85-100	45-70	20-40
	Bg	44-84	Sandy clay, clay loam, clay	SC, CH	A-7-6	0	99-100	98-100	83-100	44-95	51-76	29-49
Pophers	A	0-18	Silty clay loam	CL	A-6, A-7	0	98-100	98-100	96-100	85-100	25-45	11-25
	Bg	18-47	Silty clay loam, silt loam, loam	CL	A-6, A-7	0	98-100	98-100	96-100	80-98	25-45	11-29
	Bgb	47-80	Silty clay loam, clay loam, silt loam	CL	A-6, A-7	0	98-100	98-100	96-100	80-98	25-49	12-30
PeB:												
Penning	A	0-3	Very fine sandy loam	CL, CL-ML, ML	A-4	0	100	95-100	90-100	60-85	16-25	3-10
	E	3-15	Very fine sandy loam, loam	CL, CL-ML, ML	A-4	0	100	95-100	90-100	60-85	16-25	3-10
	Bt/E	15-48	Very fine sandy loam, loam, sandy clay loam	CL-ML, CL	A-4, A-6	0	98-100	95-100	90-100	65-90	20-35	4-15
	Bt/E	48-58	Loam, sandy clay loam	CL-ML, CL	A-4, A-6, A-7-6	0	98-100	95-100	90-100	65-90	25-45	6-22
	2C	58-72	Clay loam, clay	CL, CH	A-7-6	0	98-100	95-100	90-100	70-99	41-65	22-40

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO		4	10	40	200		
		In				Pct					Pct	
Po:												
Pophers	A	0-4	Silty clay loam	CL	A-6, A-7	0	98-100	98-100	96-100	85-100	25-45	11-25
	Bg	4-80	Silty clay loam, silt loam, loam	CL	A-6, A-7	0	98-100	98-100	96-100	80-98	25-45	11-29
RbB:												
Rayburn	A, E	0-4	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	100	100	70-99	25-65	16-25	NP-7
	Btss	4-29	Clay, silty clay	CH	A-7	0	100	100	90-100	75-95	51-80	25-50
	Cr	29-45	Bedrock			---	---	---	---	---	---	---
RwB:												
Rosenwall	A, E	0-8	Fine sandy loam	CL-ML, SM, SC-SM, ML	A-4	0	95-100	95-100	75-95	45-70	16-30	NP-7
	Bt	8-24	Clay	CH	A-7	0	95-100	95-100	90-100	75-95	60-75	30-41
	Cr	24-58	Bedrock			---	---	---	---	---	---	---
RwD:												
Rosenwall	A, E	0-3	Fine sandy loam	CL-ML, SM, SC-SM, ML	A-4	0	95-100	95-100	75-95	45-70	16-30	NP-7
	Bt	3-28	Clay	CH	A-7	0	95-100	95-100	90-100	75-95	60-75	30-41
	Cr	28-45	Bedrock			---	---	---	---	---	---	---
SsA:												
Sawlit	A, E	0-7	Loam	CL-ML, CL, ML	A-4	0	96-100	95-100	85-100	51-75	18-30	NP-10
	Bt	7-11	Loam, sandy clay loam, clay loam	CL, CL-ML	A-4, A-6	0	96-100	95-100	85-100	60-85	20-40	5-20
	Bt/E	11-29	Loam, sandy clay loam, clay loam	CL, CL-ML	A-4, A-6	0	96-100	95-100	85-100	65-90	24-40	6-22
	2Bt	29-61	Clay loam, clay	CL, CH	A-6, A-7-6	0	96-100	95-100	85-100	65-95	39-65	20-45
	2BC	61-80	Loam, sandy clay loam, clay loam	CL, CL-ML	A-4, A-6	0	96-100	95-100	85-100	65-90	24-40	6-22
Sawtown	A	0-5	Fine sandy loam	SC-SM, SM, ML	A-4	0	95-100	95-100	85-100	45-75	0-25	NP-4
	E	5-8	Fine sandy loam, very fine sandy loam, loam	ML, SC-SM, SM, CL-ML	A-4	0	95-100	95-100	85-100	45-80	0-25	NP-6
	Bt, Bt/E	8-43	Loam, sandy clay loam, clay loam	CL-ML, CL	A-4, A-6	0	95-100	95-100	90-100	55-85	24-40	6-22
	2Bt	43-65	Clay loam, clay	CH, CL	A-6, A-7-6	0	95-100	95-100	90-100	65-95	39-65	20-45
	2BC	65-80	Fine sandy loam, sandy clay loam, clay loam	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	55-85	24-40	6-22
StD:												
Stringtown	A, E	0-10	Fine sandy loam	CL-ML, SC-SM, SM, ML	A-4	0-1	90-100	85-100	70-85	36-55	16-30	NP-7
	Bt, BC	10-51	Sandy clay loam, clay loam, fine sandy loam	SC, CL	A-4, A-6	0-1	80-100	70-100	65-100	36-65	20-40	8-20
	C	51-80	Variable			---	---	---	---	---	---	---

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Horizon	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO		4	10	40	200		
		In				Pct					Pct	
TeD:												
Tehran	A, E	0-45	Loamy sand	SM	A-2-4	0	95-100	95-100	50-80	15-30	16-20	NP-3
	Bt	45-80	Sandy clay loam, sandy loam	SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	95-100	95-100	60-80	24-50	20-37	5-16
UrB:												
Urland	A, E, AB	0-5	Fine sandy loam	SM	A-4	0-2	85-100	85-98	65-90	36-50	0-25	NP-4
	Bt	5-43	Clay, sandy clay, clay loam	CH, CL, MH, ML	A-7-6	0	95-100	85-100	85-99	51-75	41-60	15-30
	Bt/C	43-58	Sandy clay loam, clay loam, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	95-100	85-100	85-99	36-70	20-40	4-20
	C	58-72	Variable			---	---	---	---	---	---	---
W.												
Water												
WnB:												
Woden	A, E	0-12	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-4	0	98-100	98-100	70-85	40-65	0-23	NP-7
	Bt	12-80	Fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-4	0	98-100	98-100	70-85	40-65	0-23	NP-7

Table 15.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Horizon	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
AaB:													
Alazan-------	A, E	0-4	5-15	1.40-1.65	1.98-5.95	0.11-0.16	0.0-2.9	0.5-2.0	.37	.32	5	3	86
	Bt/E	4-80	18-25	1.45-1.70	0.57-1.98	0.12-0.18	0.0-2.9	0.1-1.0	.37	.28			
AbA:													
Alazan-------	A, E	0-18	5-15	1.40-1.65	1.98-5.95	0.11-0.16	0.0-2.9	0.5-2.0	.37	.32	5	3	86
	Bt/E	18-80	18-25	1.45-1.70	0.57-1.98	0.12-0.18	0.0-2.9	0.1-1.0	.37	.28			
Besner-------	A, E1	0-8	4-15	1.20-1.40	1.98-5.95	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	E2	8-29	4-17	1.20-1.40	1.98-5.95	0.11-0.16	0.0-2.9	0.5-1.0	.24	.24			
	Bt	29-38	8-18	1.30-1.50	0.57-1.98	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
	Bt/E	38-80	10-25	1.30-1.50	0.57-1.98	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
AnB:													
Annona-------	A,E	0-9	5-18	1.20-1.40	0.57-1.98	0.11-0.15	0.0-2.9	0.1-2.0	.37	.37	5	3	86
	Bt, Btss	9-43	40-60	1.30-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-1.0	.32	.32			
	Btss	43-80	40-60	1.30-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-1.0	.32	.32			
AuB:													
Austonio-----	A	0-4	5-15	1.25-1.40	1.98-5.95	0.11-0.15	0.0-2.9	0.5-2.0	.20	.20	5	3	86
	E	4-13	5-15	1.25-1.40	1.98-5.95	0.11-0.15	0.0-2.9	0.1-1.0	.32	.32			
	Bt	13-32	18-30	1.35-1.60	0.57-1.98	0.12-0.16	3.0-5.9	0.1-1.0	.32	.32			
	BCt	32-51	5-18	1.35-1.60	0.57-1.98	0.12-0.16	0.0-2.9	0.1-1.0	.32	.32			
	2C	51-80	3-15	1.45-1.65	1.98-5.95	0.07-0.12	0.0-2.9	0.1-1.0	.20	.20			
AuD:													
Austonio-----	A	0-3	5-15	1.25-1.40	1.98-5.95	0.11-0.15	0.0-2.9	0.5-2.0	.20	.20	5	3	86
	E	3-12	5-15	1.25-1.40	1.98-5.95	0.11-0.15	0.0-2.9	0.1-1.0	.32	.32			
	Bt	12-30	18-30	1.35-1.60	0.57-1.98	0.12-0.16	3.0-5.9	0.1-1.0	.32	.32			
	BCt	30-68	5-18	1.35-1.60	0.57-1.98	0.12-0.16	0.0-2.9	0.1-1.0	.32	.32			
	2C	68-80	3-15	1.45-1.65	1.98-5.95	0.07-0.12	0.0-2.9	0.1-1.0	.20	.20			
BeA:													
Besner-------	A, E1	0-8	4-15	1.20-1.40	1.98-5.95	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	E2	8-29	4-17	1.20-1.40	1.98-5.95	0.11-0.16	0.0-2.9	0.5-1.0	.24	.24			
	Bt	29-38	8-18	1.30-1.50	0.57-1.98	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
	Bt/E	38-80	10-25	1.30-1.50	0.57-1.98	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
CaA:													
Colita-------	A, Eg	0-11	5-15	1.40-1.60	1.98-5.95	0.11-0.15	0.0-2.9	0.5-2.0	.37	.37	4	3	86
	Btg/E1	11-24	5-15	1.50-1.70	1.98-5.95	0.09-0.18	0.0-2.9	0.3-1.0	.37	.37			
	Btg/E2	24-39	18-30	1.50-1.70	0.57-1.98	0.12-0.17	0.0-2.9	0.3-1.0	.37	.37			
	Btg	39-43	20-35	1.50-1.60	0.57-1.98	0.13-0.20	3.0-5.9	0.3-1.0	.32	.32			
	Cr	43-65	---	1.20-1.40	0.20-1.98	---	---	0.3-1.0	---	---			
CaB:													
Colita-------	A	0-11	5-15	1.40-1.60	1.98-5.95	0.11-0.15	0.0-2.9	0.5-2.0	.37	.37	4	3	86
	E, E/B	11-21	5-15	1.50-1.70	1.98-5.95	0.09-0.18	0.0-2.9	0.3-1.0	.37	.37			
	Btg/E	21-40	18-30	1.50-1.70	0.57-1.98	0.12-0.17	0.0-2.9	0.3-1.0	.37	.37			
	Btg	40-48	20-35	1.50-1.60	0.57-1.98	0.13-0.20	3.0-5.9	0.3-1.0	.32	.32			
	Cr	48-65	---	1.20-1.40	0.20-1.98	---	---	0.3-1.0	---	---			
ClA:													
Colita-------	A	0-11	5-15	1.40-1.60	1.98-5.95	0.11-0.15	0.0-2.9	0.5-2.0	.37	.37	4	3	86
	E, E/B	11-28	5-15	1.50-1.70	1.98-5.95	0.09-0.18	0.0-2.9	0.3-1.0	.37	.37			
	Btg/E	28-37	18-30	1.50-1.70	0.57-1.98	0.12-0.17	0.0-2.9	0.3-1.0	.37	.37			
	Btg	37-43	20-35	1.50-1.60	0.57-1.98	0.13-0.20	3.0-5.9	0.3-1.0	.32	.32			
	Cr	43-65	---	1.20-1.40	0.20-1.98	---	---	0.3-1.0	---	---			

Table 15.--Physical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
ClA:													
Laska---------	A, E	0-37	5-10	1.30-1.50	1.98-5.95	0.11-0.15	0.0-2.9	0.2-1.0	.32	.32	5	3	86
	Bt, Bt/E1	37-43	8-18	1.30-1.50	1.98-5.95	0.11-0.15	0.0-2.9	0.2-1.0	.32	.32			
	Bt/E2, BC	43-56	8-30	1.35-1.60	1.98-5.95	0.07-0.15	0.0-2.9	0.2-1.0	.32	.32			
	Cr	56-65	---	1.20-1.40	0.20-1.98	---	---	0.3-1.0	---	---			
CoB:													
Corrigan-----	A, E	0-4	5-15	1.20-1.45	0.57-1.98	0.11-0.15	0.0-2.9	0.5-3.0	.43	.43	3	3	86
	Bt	4-38	40-60	1.20-1.35	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	Cr	38-50	---	---	0.06-0.57	---	---	---	---	---			
CoD:													
Corrigan-----	A, E	0-13	5-15	1.20-1.45	0.57-1.98	0.11-0.15	0.0-2.9	0.5-3.0	.43	.43	3	3	86
	Bt	13-36	40-60	1.20-1.35	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	Cr	36-55	---	---	0.06-0.57	---	---	---	---	---			
EaA:													
Eastham------	A1	0-15	40-60	1.25-1.45	0.00-0.06	0.12-0.18	6.0-8.9	1.0-3.0	.32	.32	5	4	86
	A2, Bss	15-40	40-60	1.30-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.5-2.0	.32	.32			
	Bkss	40-80	40-60	1.35-1.55	0.00-0.06	0.12-0.18	6.0-8.9	0.1-1.0	.32	.32			
EaB:													
Eastham------	A1	0-5	35-45	1.25-1.45	0.00-0.06	0.12-0.17	6.0-8.9	1.0-3.0	.32	.32	5	4	86
	A2, Bss	5-21	40-60	1.30-1.45	0.00-0.06	0.12-0.17	6.0-8.9	1.0-3.0	.32	.32			
	Bkss, BC	21-80	40-60	1.30-1.45	0.00-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
EtB:													
Etoile-------	A,E	0-7	10-25	1.35-1.55	0.57-1.98	0.12-0.17	0.0-2.9	0.3-2.0	.43	.43	5	5	86
	Bt, Btss1	7-38	40-60	1.35-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.2-1.0	.32	.32			
	Btss2	38-58	40-60	1.35-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.32	.32			
	Ck, Cy	58-80	40-60	1.35-1.60	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.32	.32			
FuA:													
Fuller-------	A	0-4	3-15	1.20-1.35	0.57-1.98	0.12-0.18	0.0-2.9	1.0-3.0	.49	.49	3	3	86
	Eg	4-26	3-15	1.40-1.65	0.57-1.98	0.10-0.17	0.0-2.9	0.5-2.0	.49	.49			
	Btng/E	26-44	18-35	1.30-1.55	0.00-0.06	0.11-0.20	6.0-8.9	0.1-1.0	.37	.37			
	2C	44-66	20-50	1.20-1.45	0.00-0.06	0.12-0.20	6.0-8.9	0.1-1.0	.37	.37			
FuB:													
Fuller-------	A	0-7	3-15	1.20-1.35	0.57-1.98	0.12-0.18	0.0-2.9	1.0-3.0	.49	.49	3	3	86
	Eg	7-27	3-15	1.40-1.65	0.57-1.98	0.10-0.17	0.0-2.9	0.5-2.0	.49	.49			
	Btng/E	27-45	18-35	1.30-1.55	0.00-0.06	0.11-0.20	6.0-8.9	0.1-1.0	.37	.37			
	2C	45-65	20-50	1.20-1.45	0.00-0.06	0.12-0.20	6.0-8.9	0.1-1.0	.37	.37			
GaA:													
Garner-------	Ap	0-3	40-55	1.20-1.45	0.06-0.20	0.12-0.17	6.0-8.9	1.0-4.0	.32	.32	5	4	86
	Bw, Bss	3-80	50-60	1.30-1.50	0.00-0.06	0.12-0.17	6.0-8.9	0.2-1.0	.32	.32			
GwA:													
Gladewater---	Ap	0-11	50-75	1.20-1.40	0.06-0.20	0.15-0.20	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	Bg, Bssg1	11-64	60-75	1.20-1.40	0.00-0.06	0.15-0.18	9.0-25.0	0.1-1.0	.32	.32			
	Bssg2	64-80	60-75	1.20-1.40	0.00-0.06	0.15-0.18	9.0-25.0	0.1-1.0	.32	.32			
HaA:													
Hainesville--	A	0-7	3-8	1.50-1.70	5.95-19.98	0.05-0.10	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	Bw, Bw/E	7-80	2-10	1.50-1.70	5.95-19.98	0.04-0.10	0.0-2.9	0.5-1.0	.20	.20			
HeA:													
Herty--------	A, E	0-8	6-15	1.20-1.40	0.57-1.98	0.12-0.18	0.0-2.9	0.5-2.0	.43	.49	5	3	86
	Bt	8-18	35-45	1.40-1.60	0.06-0.20	0.12-0.18	6.0-8.9	0.1-1.0	.37	.37			
	Btss	18-47	40-70	1.20-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	2Cy	47-80	35-70	1.15-1.35	0.00-0.06	0.10-0.16	6.0-8.9	0.1-0.4	.37	.37			

Table 15.--Physical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
HeB:													
Herty	A, E	0-8	6-15	1.20-1.40	0.57-1.98	0.12-0.18	0.0-2.9	0.5-2.0	.43	.49	5	3	86
	Bt	8-23	35-45	1.40-1.60	0.06-0.20	0.12-0.18	6.0-8.9	0.1-1.0	.37	.37			
	Btss	23-48	40-70	1.20-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	2Cy	48-80	35-70	1.15-1.35	0.00-0.06	0.10-0.16	6.0-8.9	0.1-0.4	.37	.37			
KcD:													
Kellison	A, E	0-3	8-12	1.20-1.40	0.57-1.98	0.11-0.15	0.0-2.9	1.0-4.0	.49	.49	5	3	86
	Bt	3-12	35-50	1.35-1.55	0.00-0.06	0.12-0.17	6.0-8.9	0.5-2.0	.37	.37			
	Btss	12-40	45-70	1.40-1.60	0.00-0.06	0.12-0.17	6.0-8.9	0.1-1.0	.37	.37			
	C, C/B	40-50	35-70	1.45-1.65	0.00-0.06	0.08-0.12	6.0-8.9	0.1-0.5	.37	.37			
KeB:													
Keltys	A	0-6	4-8	1.30-1.50	0.57-1.98	0.10-0.18	0.0-2.9	0.5-2.0	.32	.32	4	3	86
	E	6-14	4-8	1.35-1.60	0.57-1.98	0.10-0.18	0.0-2.9	0.3-1.0	.32	.32			
	Bt/E, E/B	14-56	6-20	1.40-1.65	0.06-0.20	0.11-0.18	0.0-2.9	0.3-1.0	.32	.32			
	2C	56-86	25-38	1.50-1.70	0.00-0.06	0.06-0.10	0.0-2.9	0.3-1.0	.43	.43			
KeD:													
Keltys	A	0-8	4-8	1.30-1.50	0.57-1.98	0.10-0.18	0.0-2.9	0.5-2.0	.32	.32	4	3	86
	E	8-17	4-8	1.35-1.60	0.57-1.98	0.10-0.18	0.0-2.9	0.3-1.0	.32	.32			
	Bt/E, E/B	17-53	6-20	1.40-1.65	0.06-0.20	0.11-0.18	0.0-2.9	0.3-1.0	.32	.32			
	2C	53-80	25-38	1.50-1.70	0.00-0.06	0.06-0.10	0.0-2.9	0.3-1.0	.43	.43			
KiB:													
Kitterll	A	0-15	10-25	1.40-1.65	0.57-1.98	0.11-0.17	0.0-2.9	0.5-2.0	.37	.37	1	3	86
	Cr	15-26	---	---	0.06-0.57	---	---	---	---	---			
KiD:													
Kitterll	A	0-12	10-25	1.40-1.65	0.57-1.98	0.11-0.17	0.0-2.9	0.5-2.0	.37	.37	1	3	86
	Cr	12-15	---	---	0.06-0.57	---	---	---	---	---			
Browndell	A, E	0-6	8-20	1.20-1.40	0.57-1.98	0.11-0.15	0.0-2.9	0.5-1.0	.43	.32	2	3	86
	Bt	6-16	40-60	1.30-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.3-1.0	.32	.32			
	Cr	16-24	---	---	0.06-0.57	---	---	---	---	---			
Kp:													
Koury	A	0-7	6-17	1.40-1.60	0.20-0.57	0.12-0.18	0.0-2.9	0.5-1.0	.49	.49	5	6	48
	Bw, Bg	7-32	6-17	1.45-1.65	0.20-0.57	0.12-0.18	0.0-2.9	0.1-0.5	.49	.49			
	Ab, Bb	32-84	6-35	1.45-1.65	0.20-0.57	0.12-0.20	0.0-2.9	0.1-0.5	.49	.49			
KuB:													
Kurth	A	0-7	3-10	1.30-1.45	0.57-1.98	0.10-0.16	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	E	7-17	3-10	1.35-1.50	0.57-1.98	0.10-0.15	0.0-2.9	0.1-1.0	.28	.28			
	Bt/E	17-37	18-35	1.50-1.65	0.57-1.98	0.11-0.17	3.0-5.9	0.1-1.0	.32	.32			
	2Btg	37-57	35-45	1.45-1.60	0.20-0.57	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	2C, 2CB	57-79	15-30	1.60-1.70	0.06-0.20	0.09-0.14	0.0-2.9	0.1-1.0	.32	.32			
KuD:													
Kurth	A	0-2	3-10	1.30-1.45	0.57-1.98	0.10-0.16	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	E	2-22	3-10	1.35-1.50	0.57-1.98	0.10-0.15	0.0-2.9	0.1-1.0	.28	.28			
	Bt/E	22-37	18-35	1.50-1.65	0.57-1.98	0.11-0.17	3.0-5.9	0.1-1.0	.32	.32			
	2Btg	37-49	35-45	1.45-1.60	0.20-0.57	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	2C, 2CB	49-80	15-30	1.60-1.70	0.06-0.20	0.09-0.14	0.0-2.9	0.1-1.0	.32	.32			
LaB:													
Laska	A, E	0-24	5-10	1.30-1.50	1.98-5.95	0.11-0.15	0.0-2.9	0.2-1.0	.32	.32	5	3	86
	Bt, Bt/E1	24-41	8-18	1.30-1.50	1.98-5.95	0.11-0.15	0.0-2.9	0.2-1.0	.32	.32			
	Bt/E2, BC	41-63	8-30	1.35-1.60	1.98-5.95	0.07-0.15	0.0-2.9	0.2-1.0	.32	.32			
	2Cr	63-70	---	1.20-1.40	0.20-1.98	---	---	0.3-1.0	---	---			

Table 15.--Physical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
LeB:													
Latex---------	A, E	0-10	2-18	1.28-1.45	1.98-5.95	0.11-0.16	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	Bt	10-49	18-35	1.28-1.45	0.57-1.98	0.11-0.18	3.0-5.9	0.1-1.0	.32	.32			
	Bt/E	49-58	18-35	1.30-1.45	0.57-1.98	0.13-0.18	3.0-5.9	0.1-1.0	.32	.32			
	2Bt/E	58-80	35-55	1.30-1.65	0.06-0.20	0.12-0.17	6.0-8.9	0.1-1.0	.32	.32			
LnB:													
Letney-------	A, E	0-24	2-8	1.50-1.65	5.95-19.98	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	Bt	24-80	18-35	1.55-1.70	1.98-5.95	0.12-0.17	0.0-2.9	0.1-0.5	.24	.24			
LvC:													
Lovelady-----	A	0-6	2-8	1.35-1.50	5.95-19.98	0.05-0.10	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	E	6-32	2-8	1.35-1.55	5.95-19.98	0.05-0.10	0.0-2.9	0.1-1.0	.20	.20			
	Bt/E	32-55	15-30	1.30-1.45	0.57-1.98	0.10-0.15	0.0-2.9	0.1-1.0	.32	.32			
	2Bt	55-80	18-40	1.35-1.65	0.20-0.57	0.13-0.17	3.0-5.9	0.1-1.0	.32	.32			
LvD:													
Lovelady-----	A	0-4	2-8	1.35-1.50	5.95-19.98	0.05-0.10	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	E	4-38	2-8	1.35-1.55	5.95-19.98	0.05-0.10	0.0-2.9	0.1-1.0	.20	.20			
	Bt/E	38-42	15-30	1.30-1.45	0.57-1.98	0.10-0.15	0.0-2.9	0.1-1.0	.32	.32			
	2Bt	42-79	18-40	1.35-1.65	0.20-0.57	0.13-0.17	3.0-5.9	0.1-1.0	.32	.32			
MpA:													
Mollville----	A, Eg	0-5	16-20	1.40-1.65	0.20-0.57	0.15-0.20	0.0-2.9	0.5-1.0	.37	.37	5	5	56
	Btg/E	5-72	20-35	1.50-1.69	0.06-0.20	0.12-0.17	3.0-5.9	0.0-0.5	.32	.32			
	2Cg	72-80	3-12	1.50-1.65	1.98-5.95	0.07-0.11	0.0-2.9	0.0-0.5	.20	.20			
Besner-------	A, E1	0-24	4-15	1.20-1.40	1.98-5.95	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	E2	24-36	4-17	1.20-1.40	1.98-5.95	0.11-0.16	0.0-2.9	0.5-1.0	.24	.24			
	Bt	36-48	8-18	1.30-1.50	0.57-1.98	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
	Bt/E	48-85	10-25	1.30-1.50	0.57-1.98	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
MsB:													
Moswell------	A, E	0-9	5-15	1.25-1.40	0.57-1.98	0.13-0.18	0.0-2.9	0.5-3.0	.37	.49	5	5	56
	Bt	9-15	60-70	1.20-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.2-2.0	.32	.32			
	Btss	15-45	60-70	1.20-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.2-1.0	.32	.32			
	Cy, C	45-80	60-75	1.20-1.40	0.00-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.32	.32			
MsE:													
Moswell------	A, E	0-6	5-15	1.25-1.40	0.57-1.98	0.13-0.18	0.0-2.9	0.5-3.0	.37	.49	5	5	56
	Bt	6-16	60-70	1.20-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.2-2.0	.32	.32			
	Btss	16-47	60-70	1.20-1.40	0.00-0.06	0.12-0.18	6.0-8.9	0.2-1.0	.32	.32			
	Cy, C	47-80	60-75	1.20-1.40	0.00-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.32	.32			
MxA:													
Moten--------	A	0-3	6-12	1.40-1.65	0.57-1.98	0.11-0.15	0.0-2.9	1.0-3.0	.37	.37	5	3	86
	E, E/Bt	3-20	6-12	1.40-1.65	0.57-1.98	0.13-0.18	0.0-2.9	0.1-1.0	.37	.37			
	Bt/E	20-45	12-18	1.40-1.65	0.20-0.57	0.13-0.20	0.0-2.9	0.1-1.0	.37	.37			
	2C, 2Bt/C	45-80	15-40	1.30-1.60	0.06-0.20	0.12-0.20	3.0-5.9	0.1-1.0	.32	.32			
Multey-------	A	0-4	4-10	1.30-1.50	0.57-1.98	0.11-0.15	0.0-2.9	1.0-3.0	.32	.32	5	3	86
	E	4-26	4-10	1.30-1.50	0.57-1.98	0.11-0.15	0.0-2.9	0.1-1.0	.32	.32			
	E/Bt	26-35	8-18	1.40-1.60	0.57-1.98	0.13-0.17	0.0-2.9	0.1-1.0	.32	.32			
	Bt/E	35-80	8-35	1.40-1.65	0.57-5.95	0.10-0.17	0.0-2.9	0.1-1.0	.28	.28			
Oz:													
Ozias--------	A	0-9	40-60	1.20-1.40	0.00-0.06	0.12-0.16	6.0-8.9	1.0-4.0	.32	.32	5	4	86
	Bssg	9-44	35-60	1.25-1.50	0.00-0.06	0.12-0.16	6.0-8.9	1.0-2.0	.32	.32			
	Bg	44-84	35-60	1.25-1.50	0.00-0.06	0.12-0.16	6.0-8.9	1.0-2.0	.32	.32			

Table 15.--Physical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
Oz:													
Pophers------	A	0-18	27-40	1.20-1.40	0.20-0.57	0.13-0.20	3.0-5.9	0.5-2.0	.32	.49	5	7	38
	Bg	18-47	15-35	1.30-1.50	0.20-0.57	0.13-0.20	3.0-5.9	0.2-1.0	.37	.49			
	Bgb	47-80	20-40	1.35-1.65	0.06-0.20	0.13-0.20	3.0-5.9	0.2-1.0	.37	.49			
PeB:													
Penning------	A	0-3	8-15	1.30-1.45	1.98-5.95	0.10-0.15	0.0-2.9	0.5-2.0	.37	.37	4	5	56
	E	3-15	8-15	1.30-1.50	1.98-5.95	0.10-0.15	0.0-2.9	0.2-1.0	.37	.37			
	Bt/E	15-48	15-24	1.35-1.55	0.57-1.98	0.13-0.17	0.0-2.9	0.2-1.0	.32	.32			
	Bt/E	48-58	18-26	1.40-1.65	0.57-1.98	0.13-0.17	3.0-5.9	0.2-1.0	.32	.32			
	2C	58-72	30-50	1.40-1.69	0.00-0.06	0.08-0.12	6.0-8.9	0.2-1.0	.32	.32			
Po:													
Pophers------	A	0-4	27-40	1.20-1.40	0.20-0.57	0.13-0.20	3.0-5.9	0.5-2.0	.32	.49	5	7	38
	Bg	4-80	15-35	1.30-1.50	0.20-0.57	0.13-0.20	3.0-5.9	0.2-1.0	.37	.49			
RbB:													
Rayburn------	A, E	0-4	8-20	1.20-1.40	0.57-1.98	0.11-0.15	0.0-2.9	0.5-1.0	.43	.43	4	3	86
	Btss	4-29	40-60	1.30-1.50	0.00-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	Cr	29-45	---	---	0.06-0.57	---	---	---	---	---			
RwB:													
Rosenwall----	A, E	0-8	8-20	1.40-1.60	1.98-5.95	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	3	3	86
	Bt	8-24	60-75	1.40-1.60	0.00-0.06	0.08-0.14	6.0-8.9	0.5-1.0	.32	.32			
	Cr	24-58	---	---	0.06-0.57	---	---	---	---	---			
RwD:													
Rosenwall----	A, E	0-3	8-20	1.40-1.60	1.98-5.95	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	3	3	86
	Bt	3-28	60-75	1.40-1.60	0.00-0.06	0.08-0.14	6.0-8.9	0.5-1.0	.32	.32			
	Cr	28-45	---	---	0.06-0.57	---	---	---	---	---			
SsA:													
Sawlit-------	A, E	0-7	6-18	1.35-1.50	1.98-5.95	0.11-0.16	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	Bt	7-11	18-30	1.35-1.50	0.57-1.98	0.13-0.18	0.0-2.9	0.3-1.0	.37	.37			
	Bt/E	11-29	20-35	1.30-1.55	0.57-1.98	0.13-0.18	3.0-5.9	0.3-1.0	.37	.37			
	2Bt	29-61	35-50	1.20-1.45	0.00-0.06	0.12-0.17	6.0-8.9	0.3-1.0	.32	.32			
	2BC	61-80	20-35	1.30-1.55	0.57-1.98	0.13-0.18	3.0-5.9	0.3-1.0	.37	.37			
Sawtown------	A	0-5	4-10	1.35-1.50	1.98-5.95	0.10-0.16	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	E	5-8	4-12	1.35-1.50	1.98-5.95	0.11-0.16	0.0-2.9	0.5-1.0	.37	.37			
	Bt, Bt/E	8-43	15-30	1.30-1.55	0.57-1.98	0.11-0.16	3.0-5.9	0.5-1.0	.32	.32			
	2Bt	43-65	35-50	1.20-1.45	0.00-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
	2BC	65-80	15-30	1.30-1.55	0.57-1.98	0.11-0.16	3.0-5.9	0.5-1.0	.32	.32			
StD:													
Stringtown---	A, E	0-10	8-18	1.20-1.40	0.57-1.98	0.11-0.15	0.0-2.9	0.5-1.0	.32	.28	3	3	86
	Bt, BC	10-51	18-35	1.35-1.55	0.57-1.98	0.15-0.20	0.0-2.9	0.2-0.5	.28	.32			
	C	51-80	---	---	0.06-0.57	---	---	0.1-0.5	---	---			
TeD:													
Tehran-------	A, E	0-45	2-8	1.50-1.65	5.95-19.98	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20	5	1	250
	Bt	45-80	18-32	1.55-1.70	1.98-5.95	0.12-0.17	0.0-2.9	0.1-0.5	.24	.24			
UrB:													
Urland-------	A, E, AB	0-5	5-18	1.20-1.40	1.98-5.95	0.10-0.15	0.0-2.9	0.1-1.0	.37	.28	4	3	86
	Bt	5-43	35-55	1.30-1.50	0.20-0.57	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	Bt/C	43-58	17-40	1.35-1.55	0.57-1.98	0.12-0.17	3.0-5.9	0.1-1.0	.32	.32			
	C	58-72	---	---	0.06-0.57	---	---	0.1-1.0	---	---			

Table 15.--Physical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
		In	Pct	g/cc	In/hr	In/in	Pct	Pct	Kw	Kf	T		
W. Water													
WnB: Woden	A, E	0-12	5-15	1.25-1.40	1.98-5.95	0.11-0.16	0.0-2.9	0.5-2.0	.20	.20	5	3	86
	Bt	12-80	8-18	1.35-1.60	1.98-5.95	0.12-0.18	0.0-2.9	0.1-1.0	.20	.20			

Table 16.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Horizon	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
		In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
AaB:									
Alazan--------	A, E	0-4	---	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	Bt/E	4-80	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
AbA:									
Alazan--------	A, E	0-18	---	2.0-10	4.5-6.0	0	0	0.0-2.0	0
	Bt/E	18-80	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
Besner--------	A, E1	0-8	2.0-5.0	---	4.5-6.5	0	0	0	0
	E2	8-29	2.0-5.0	---	4.5-6.5	0	0	0	0
	Bt	29-38	3.0-10	---	4.5-6.5	0	0	0	0
	Bt/E	38-80	3.0-10	---	4.5-6.5	0	0	0	0
AnB:									
Annona--------	A, E	0-9	10-20	---	4.5-6.5	0	0	0.0-2.0	0
	Bt, Btss	9-43	20-40	---	4.5-6.5	0	0	0.0-2.0	0
	Btss	43-80	20-40	---	5.6-8.4	0-5	0-2	0.0-2.0	0
AuB:									
Austonio------	A	0-4	5.0-12	---	4.5-6.5	0	0	0.0-2.0	0
	E	4-13	5.0-12	---	4.5-6.5	0	0	0.0-2.0	0
	Bt	13-32	---	10-20	4.5-6.0	0	0	0.0-2.0	0
	BCt	32-51	---	7.0-15	4.5-5.5	0	0	0.0-2.0	0
	2C	51-80	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
AuD:									
Austonio------	A	0-3	5.0-12	---	4.5-6.5	0	0	0.0-2.0	0
	E	3-12	5.0-12	---	4.5-6.5	0	0	0.0-2.0	0
	Bt	12-30	---	10-20	4.5-6.0	0	0	0.0-2.0	0
	BCt	30-68	---	7.0-15	4.5-5.5	0	0	0.0-2.0	0
	2C	68-80	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
BeA:									
Besner--------	A, E1	0-8	2.0-5.0	---	4.5-6.5	0	0	0	0
	E2	8-29	2.0-5.0	---	4.5-6.5	0	0	0	0
	Bt	29-38	3.0-10	---	4.5-6.5	0	0	0	0
	Bt/E	38-80	3.0-10	---	4.5-6.5	0	0	0	0
CaA:									
Colita--------	A, Eg	0-11	---	1.0-5.0	4.5-6.0	0	0	0	0
	Btg/E1	11-24	---	1.0-5.0	4.5-6.0	0	0	0	0
	Btg/E2	24-39	---	3.0-10	4.5-6.0	0	0	0.0-2.0	0-4
	Btg	39-43	---	5.0-15	4.5-6.0	0	0-2	0.0-2.0	0-4
	Cr	43-65	---	---	---	---	---	---	---
CaB:									
Colita--------	A	0-11	---	1.0-5.0	4.5-6.0	0	0	0	0
	E, E/B	11-21	---	1.0-5.0	4.5-6.0	0	0	0	0
	Btg/E	21-40	---	3.0-10	4.5-6.0	0	0	0.0-2.0	0-4
	Btg	40-48	---	5.0-15	4.5-6.0	0	0-2	0.0-2.0	0-4
	Cr	48-65	---	---	---	---	---	---	---
ClA:									
Colita--------	A	0-11	---	1.0-5.0	4.5-6.0	0	0	0	0
	E, E/B	11-28	---	1.0-5.0	4.5-6.0	0	0	0	0
	Btg/E	28-37	---	3.0-10	4.5-6.0	0	0	0.0-2.0	0-4
	Btg	37-43	---	5.0-15	4.5-6.0	0	0-2	0.0-2.0	0-4
	Cr	43-65	---	---	---	---	---	---	---

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
		In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
ClA:									
Laska	A, E	0-37	---	2.0-5.0	3.5-6.0	0	0	0.0-2.0	0
	Bt, Bt/E1	37-43	---	4.0-8.0	4.5-6.0	0	0	0.0-2.0	0
	Bt/E2, BC	43-56	2.0-8.0	---	4.5-7.3	0	0	0.0-2.0	0
	Cr	56-65	---	---	---	---	---	---	---
CoB:									
Corrigan	A, E	0-4	---	15-25	4.5-6.0	0	0	0	0
	Bt	4-38	---	25-40	3.6-5.5	0-2	0	0.0-2.0	0-4
	Cr	38-50	---	---	---	---	---	---	---
CoD:									
Corrigan	A, E	0-13	---	15-25	4.5-6.0	0	0	0	0
	Bt	13-36	---	25-40	3.6-5.5	0-2	0	0.0-2.0	0-4
	Cr	36-55	---	---	---	---	---	---	---
EaA:									
Eastham	A1	0-15	40-60	---	5.6-7.8	0-3	0	0.0-2.0	0
	A2, Bss	15-40	40-60	---	5.6-8.4	0-5	0-2	0.0-2.0	0-2
	Bkss	40-80	40-60	---	6.6-8.4	2-10	0-4	0.0-4.0	0-4
EaB:									
Eastham	A1	0-5	30-40	---	7.4-8.4	0-3	0	0	0
	A2, Bss	5-21	35-60	---	7.9-8.4	0-3	0	0	0
	Bkss, BC	21-80	35-60	---	7.9-8.4	0-5	0-2	0.0-2.0	0-5
EtB:									
Etoile	A, E	0-7	3.0-10	---	5.1-6.5	0	0	0	0
	Bt, Btss1	7-38	40-60	---	5.1-6.0	0	0	0	0
	Btss2	38-58	40-60	---	6.1-8.4	0-5	0	0	0
	Ck, Cy	58-80	40-60	---	6.6-8.4	5-15	0-2	0.0-2.0	0
FuA:									
Fuller	A	0-4	---	1.0-5.0	4.5-6.0	0	0	0.0-2.0	1-5
	Eg	4-26	---	1.0-5.0	4.5-6.0	0	0	0.0-2.0	1-5
	Btng/E	26-44	10-25	---	6.1-8.4	0	0	1.0-4.0	10-20
	2C	44-66	10-25	---	6.6-8.4	0	0-2	1.0-4.0	10-25
FuB:									
Fuller	A	0-7	---	1.0-5.0	4.5-6.0	0	0	0.0-2.0	1-5
	Eg	7-27	---	1.0-5.0	4.5-6.0	0	0	0.0-2.0	1-5
	Btng/E	27-45	10-25	---	6.1-8.4	0	0	1.0-4.0	10-20
	2C	45-65	10-25	---	6.6-8.4	0	0-2	1.0-4.0	10-25
GaA:									
Garner	Ap	0-3	30-50	---	5.1-7.8	0	0	0	0
	Bw, Bss	3-80	40-55	---	5.1-8.4	0-10	0-2	0.0-4.0	0-4
GwA:									
Gladewater	Ap	0-11	35-60	---	5.6-7.3	0	0	0.0-2.0	0
	Bg, Bssg1	11-64	30-50	---	4.5-6.5	0	0-5	0.0-2.0	0
	Bssg2	64-80	30-50	---	4.5-7.3	0	0-5	0.0-2.0	0
HaA:									
Hainesville	A	0-7	1.0-6.0	---	4.5-6.5	0	0	0.0-2.0	0
	Bw, Bw/E	7-80	1.0-6.0	---	4.5-6.5	0	0	0.0-2.0	0
HeA:									
Herty	A, E	0-8	---	3.0-12	4.5-6.0	0	0	0.0-2.0	0-4
	Bt	8-18	---	15-25	3.5-5.5	0	0-2	0.0-4.0	6-13
	Btss	18-47	---	20-40	3.5-6.0	0	2-35	2.0-8.0	8-13
	2Cy	47-80	---	20-40	3.5-6.5	0	2-35	4.0-8.0	8-13

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
		In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
HeB:									
Herty	A, E	0-8	---	3.0-12	4.5-6.0	0	0	0.0-2.0	0-4
	Bt	8-23	---	15-25	3.5-5.5	0	0-2	0.0-4.0	6-13
	Btss	23-48	---	20-40	3.5-6.0	0	2-35	2.0-8.0	8-13
	2Cy	48-80	---	20-40	3.5-6.5	0	2-35	4.0-8.0	8-13
KcD:									
Kellison	A, E	0-3	---	5.0-10	4.5-6.0	0	0	0.0-2.0	0
	Bt	3-12	---	30-45	3.5-5.5	0	0-2	0.0-4.0	2-9
	Btss	12-40	---	35-50	3.5-5.5	0-2	0-5	2.0-8.0	2-12
	C, C/B	40-50	30-45	---	4.5-7.3	0-2	2-12	2.0-8.0	2-13
KeB:									
Keltys	A	0-6	1.0-5.0	---	5.1-6.5	0	0	0.0-2.0	0
	E	6-14	1.0-5.0	---	5.1-6.0	0	0	0.0-2.0	0
	Bt/E, E/B	14-56	---	5.0-15	3.5-5.5	0	0	0.0-2.0	0-2
	2C	56-86	10-35	---	4.5-6.5	0	0-2	0.0-4.0	0-4
KeD:									
Keltys	A	0-8	1.0-5.0	---	5.1-6.5	0	0	0.0-2.0	0
	E	8-17	1.0-5.0	---	5.1-6.0	0	0	0.0-2.0	0
	Bt/E, E/B	17-53	---	5.0-15	3.5-5.5	0	0	0.0-2.0	0-2
	2C	53-80	10-35	---	4.5-6.5	0	0-2	0.0-4.0	0-4
KiB:									
Kitterll	A	0-15	3.0-15	---	5.1-6.5	0	0	0.0-2.0	0
	Cr	15-26	---	---	---	---	---	---	---
KiD:									
Kitterll	A	0-12	3.0-15	---	5.1-6.5	0	0	0.0-2.0	0
	Cr	12-15	---	---	---	---	---	---	---
Browndell	A, E	0-6	1.0-5.0	---	4.5-6.5	0	0	0	0
	Bt	6-16	---	25-45	4.5-6.0	0	0	0.0-4.0	0-4
	Cr	16-24	---	---	---	---	---	---	---
Kp:									
Koury	A	0-7	---	5.0-15	3.5-5.5	0	0	0.0-2.0	0-2
	Bw, Bg	7-32	---	5.0-15	3.5-5.0	0	0-2	0.0-2.0	2-6
	Ab, Bb	32-84	---	5.0-15	3.5-5.0	0	0-2	1.0-4.0	4-12
KuB:									
Kurth	A	0-7	1.0-5.0	---	5.1-6.5	0	0	0	0
	E	7-17	1.0-5.0	---	5.1-6.0	0	0	0	0
	Bt/E	17-37	5.0-15	---	5.1-6.0	0	0	0	0
	2Btg	37-57	---	20-40	3.5-5.5	0	0-2	0.0-2.0	0
	2C, 2CB	57-79	---	10-25	3.5-5.5	0	0-2	0.0-2.0	0-2
KuD:									
Kurth	A	0-2	1.0-5.0	---	5.1-6.5	0	0	0	0
	E	2-22	1.0-5.0	---	5.1-6.0	0	0	0	0
	Bt/E	22-37	5.0-15	---	5.1-6.0	0	0	0	0
	2Btg	37-49	---	20-40	3.5-5.5	0	0-2	0.0-2.0	0
	2C, 2CB	49-80	---	10-25	3.5-5.5	0	0-2	0.0-2.0	0-2
LaB:									
Laska	A, E	0-24	---	2.0-5.0	3.5-6.0	0	0	0.0-2.0	0
	Bt, Bt/E1	24-41	---	4.0-8.0	4.5-6.0	0	0	0.0-2.0	0
	Bt/E2, BC	41-63	2.0-8.0	---	4.5-7.3	0	0	0.0-2.0	0
	2Cr	63-70	---	---	---	---	---	---	---

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
		In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
LeB:									
Latex	A, E	0-10	---	2.0-15	4.5-6.0	0	0	0	0
	Bt	10-49	---	2.0-15	4.5-5.5	0	0	0	0
	Bt/E	49-58	---	2.0-15	4.5-5.5	0	0	0	0
	2Bt/E	58-80	---	12-40	4.5-5.0	0	0	0	0
LnB:									
Letney	A, E	0-24	---	1.0-3.0	4.5-6.0	0	0	0.0-2.0	0
	Bt	24-80	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0
LvC:									
Lovelady	A	0-6	---	1.0-5.0	4.5-6.0	0	0	0	0
	E	6-32	---	1.0-5.0	4.5-6.0	0	0	0	0
	Bt/E	32-55	---	5.0-15	4.5-6.0	0	0	0	0
	2Bt	55-80	---	5.0-20	3.6-5.5	0	0	0	0
LvD:									
Lovelady	A	0-4	---	1.0-5.0	4.5-6.0	0	0	0	0
	E	4-38	---	1.0-5.0	4.5-6.0	0	0	0	0
	Bt/E	38-42	---	5.0-15	4.5-6.0	0	0	0	0
	2Bt	42-79	---	5.0-20	3.6-5.5	0	0	0	0
MpA:									
Mollville	A, Eg	0-5	---	5.0-15	4.5-6.0	0	0	0.0-2.0	0-2
	Btg/E	5-72	---	15-25	4.5-7.8	0	0	0.0-4.0	2-10
	2Cg	72-80	5.0-10	---	5.1-7.8	0-2	0-3	0.0-4.0	2-10
Besner	A, E1	0-24	2.0-5.0	---	4.5-6.5	0	0	0	0
	E2	24-36	2.0-5.0	---	4.5-6.5	0	0	0	0
	Bt	36-48	3.0-10	---	4.5-6.5	0	0	0	0
	Bt/E	48-85	3.0-10	---	4.5-6.5	0	0	0	0
MsB:									
Moswell	A, E	0-9	---	5.0-18	4.5-6.0	0	0	0.0-2.0	0
	Bt	9-15	---	30-45	3.5-5.5	0	0	0.0-2.0	0-4
	Btss	15-45	---	30-45	3.5-5.5	0	5-15	2.0-8.0	4-12
	Cy, C	45-80	---	30-45	3.5-5.5	0	0-5	2.0-8.0	4-12
MsE:									
Moswell	A, E	0-6	---	5.0-18	4.5-6.0	0	0	0.0-2.0	0
	Bt	6-16	---	30-45	3.5-5.5	0	0	0.0-2.0	0-4
	Btss	16-47	---	30-45	3.5-5.5	0	5-15	2.0-8.0	4-12
	Cy, C	47-80	---	30-45	3.5-5.5	0	0-5	2.0-8.0	4-12
MxA:									
Moten	A	0-3	---	1.0-5.0	4.5-6.0	0	0	0.0-2.0	0
	E, E/Bt	3-20	---	1.0-5.0	4.5-6.0	0	0	0.0-2.0	0
	Bt/E	20-45	---	3.0-10	4.5-6.0	0	0	1.0-4.0	0-4
	2C, 2Bt/C	45-80	5.0-15	---	5.1-7.3	0	0	1.0-4.0	0-6
Multey	A	0-4	1.0-5.0	---	5.1-6.5	0	0	0	0
	E	4-26	1.0-5.0	---	4.5-6.5	0	0	0	0
	E/Bt	26-35	---	5.0-10	4.5-5.5	0	0	0	0
	Bt/E	35-80	5.0-10	---	4.5-8.4	0	0	1.0-4.0	1-6
Oz:									
Ozias	A	0-9	---	25-45	3.6-5.0	0	0	0.0-8.0	0-4
	Bssg	9-44	25-45	---	3.6-6.0	0	0-4	0.0-16.0	2-14
	Bg	44-84	25-45	---	3.6-6.0	0	0-4	0.0-16.0	2-14
Pophers	A	0-18	---	15-28	4.5-6.0	0	0-2	0.0-4.0	0-4
	Bg	18-47	---	7.0-20	3.5-5.5	0	0-4	0.0-4.0	2-12
	Bgb	47-80	---	7.0-25	3.5-5.5	0	2-6	4.0-8.0	4-16

Table 16.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Horizon	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
		In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
PeB:									
Penning	A	0-3	---	5.0-10	4.5-6.0	0	0	0	0
	E	3-15	---	5.0-10	4.5-6.0	0	0	0	0
	Bt/E	15-48	5.0-15	---	4.5-6.5	0	0	0.0-2.0	0
	Bt/E	48-58	5.0-20	---	4.5-6.5	0	0	0.0-4.0	2-6
	2C	58-72	10-35	---	4.5-7.3	0	0	2.0-8.0	4-10
Po:									
Pophers	A	0-4	---	15-28	4.5-6.0	0	0-2	0.0-4.0	0-4
	Bg	4-80	---	7.0-20	3.5-5.5	0	0-4	0.0-4.0	2-12
RbB:									
Rayburn	A, E	0-4	---	1.0-7.0	4.5-6.0	0	0	0	0
	Btss	4-29	---	25-35	3.5-5.5	0	0	0	0
	Cr	29-45	---	---	---	---	---	---	---
RwB:									
Rosenwall	A, E	0-8	1.0-5.0	---	4.5-6.5	0	0	0	0
	Bt	8-24	---	25-35	4.5-6.0	0	0	0	0
	Cr	24-58	---	---	---	---	---	---	---
RwD:									
Rosenwall	A, E	0-3	1.0-5.0	---	4.5-6.5	0	0	0	0
	Bt	3-28	---	25-35	4.5-6.0	0	0	0	0
	Cr	28-45	---	---	---	---	---	---	---
SsA:									
Sawlit	A, E	0-7	---	10-22	4.5-6.0	0	0	0	0
	Bt	7-11	---	20-40	4.5-6.0	0	0	0	0
	Bt/E	11-29	---	20-40	4.5-6.0	0	0	0	0
	2Bt	29-61	---	35-50	3.5-5.5	0	0-5	0	0-4
	2BC	61-80	---	20-40	3.5-5.5	0	0	0	0
Sawtown	A	0-5	4.0-8.0	---	4.5-6.5	0	0	0	0
	E	5-8	---	4.0-10	4.5-6.0	0	0	0	0
	Bt, Bt/E	8-43	---	10-20	3.6-6.0	0	0	0	0
	2Bt	43-65	---	20-40	3.6-6.5	0	0-5	0.0-4.0	0-4
	2BC	65-80	---	10-20	3.6-6.5	0	0	0	0
StD:									
Stringtown	A, E	0-10	1.0-5.0	---	4.5-6.5	0	0	0	0
	Bt, BC	10-51	---	10-20	4.5-6.0	0	0	0	0
	C	51-80	---	---	---	---	---	---	---
TeD:									
Tehran	A, E	0-45	---	1.0-3.0	4.5-6.0	0	0	0	0
	Bt	45-80	---	5.0-15	4.5-6.0	0	0	0	0
UrB:									
Urland	A, E, AB	0-5	3.0-10	---	5.1-6.5	0	0	0.0-2.0	0
	Bt	5-43	---	15-25	4.5-5.5	0	0	0.0-2.0	0
	Bt/C	43-58	---	10-20	4.5-5.5	0	0	0.0-2.0	0
	C	58-72	---	---	---	---	---	---	---
W.									
Water									
WnB:									
Woden	A, E	0-12	1.0-5.0	---	5.1-6.5	0	0	0	0
	Bt	12-80	3.0-12	---	5.1-6.5	0	0	0	0

Table 17.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
AaB:					
Alazan	---	---	None	High	Moderate
AbA:					
Alazan	---	---	None	High	Moderate
Besner	---	---	None	Low	Moderate
AnB:					
Annona	---	---	None	High	Moderate
AuB, AuD:					
Austonio	---	---	None	Moderate	Moderate
BeA:					
Besner	---	---	None	Low	Moderate
CaA, CaB:					
Colita	Bedrock (paralithic)	40-60	None	High	Moderate
ClA:					
Colita	Bedrock (paralithic)	40-60	None	High	Moderate
Laska	---	---	None	Moderate	High
CoB, CoD:					
Corrigan	Bedrock (paralithic)	20-40	None	High	High
EaA, EaB:					
Eastham	---	---	None	High	Low
EtB:					
Etoile	---	---	None	High	Moderate
FuA, FuB:					
Fuller	---	---	None	High	High
GaA:					
Garner	---	---	None	High	Low
GwA:					
Gladewater	---	---	None	High	Moderate
HaA:					
Hainesville	---	---	None	Low	Moderate
HeA, HeB:					
Herty	---	---	None	High	High
KcD:					
Kellison	---	---	None	High	High
KeB, KeD:					
Keltys	---	---	None	High	High

Table 17.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
KiB:					
Kitterll	Bedrock (paralithic)	4-14	None	Low	Moderate
KiD:					
Kitterll	Bedrock (paralithic)	4-14	None	Low	Moderate
Browndell	Bedrock (paralithic)	14-20	None	High	High
Kp:					
Koury	---	---	None	High	High
KuB, KuD:					
Kurth	---	---	None	High	Moderate
LaB:					
Laska	---	---	None	Moderate	High
LeB:					
Latex	---	---	None	Moderate	High
LnB:					
Letney	---	---	None	Low	High
LvC, LvD:					
Lovelady	---	---	None	High	Moderate
MpA:					
Mollville	---	---	None	High	High
Besner	---	---	None	Low	Moderate
MsB, MsE:					
Moswell	---	---	None	High	High
MxA:					
Moten	---	---	None	High	Moderate
Multey	---	---	None	High	Moderate
Oz:					
Ozias	---	---	None	High	High
Pophers	---	---	None	High	High
PeB:					
Penning	---	---	None	High	High
Po:					
Pophers	---	---	None	High	High
RbB:					
Rayburn	Bedrock (paralithic)	40-60	None	High	High
RwB, RwD:					
Rosenwall	Bedrock (paralithic)	20-40	None	High	High

Table 17.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
SsA:					
Sawlit	---	---	None	High	High
Sawtown	---	---	None	Moderate	Moderate
StD:					
Stringtown	---	---	None	Moderate	High
TeD:					
Tehran	---	---	None	Low	High
UrB:					
Urland	---	---	None	High	High
W.					
Water					
WnB:					
Woden	---	---	None	Moderate	Moderate

Table 18.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit (Ft)	Water table: Lower limit (Ft)	Ponding: Surface water depth (Ft)	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
AaB:									
Alazan	C								
		Jan-Apr	1.5-2.5	>6.0	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None
AbA:									
Alazan	C								
		Jan-Apr	1.5-2.5	>6.0	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None
Besner	B								
		Jan-Feb	4.0-6.0	>6.0	---	---	None	---	None
		Mar-Dec	---	---	---	---	None	---	None
AnB:									
Annona	D								
		Jan-Dec	---	---	---	---	None	---	None
AuB, AuD:									
Austonio	B								
		Jan-Dec	---	---	---	---	None	---	None
BeA:									
Besner	B								
		Jan-Feb	4.0-6.0	>6.0	---	---	None	---	None
		Mar-Dec	---	---	---	---	None	---	None
CaA, CaB:									
Colita	D								
		Jan-Apr	0.5-2.0	2.5-4.5	---	---	None	---	None
		May-Oct	---	---	---	---	None	---	None
		Nov-Dec	0.5-2.0	2.5-4.5	---	---	None	---	None
ClA:									
Colita	D								
		Jan-Apr	0.5-2.0	2.5-4.5	---	---	None	---	None
		May-Oct	---	---	---	---	None	---	None
		Nov-Dec	0.5-2.0	2.5-4.5	---	---	None	---	None
Laska	B								
		Jan-Apr	1.5-3.0	>6.0	---	---	None	---	None
		May-Nov	---	---	---	---	None	---	None
		Dec	1.5-3.0	>6.0	---	---	None	---	None
CoB, CoD:									
Corrigan	D								
		Jan-Mar	0.5-1.0	1.0-1.5	---	---	None	---	None
		Apr-Nov	---	---	---	---	None	---	None
		Dec	0.5-1.0	1.0-1.5	---	---	None	---	None
EaA, EaB:									
Eastham	D								
		Jan-Dec	---	---	---	---	None	---	None

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
EtB:									
Etoile	D								
		Jan-Dec	---	---	---	---	None	---	None
FuA, FuB:									
Fuller	D								
		Jan-Apr	0.5-1.5	2.0-4.5	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None
GaA:									
Garner	D								
		Jan-Dec	---	---	---	---	None	---	None
GwA:									
Gladewater	D								
		Jan-May	1.5-3.5	2.0-4.0	---	---	None	Very long	Frequent
		Jun-Oct	---	---	---	---	None	---	None
		Nov-Dec	1.5-3.5	2.0-4.0	---	---	None	Very long	Frequent
HaA:									
Hainesville	A								
		Jan-Dec	---	---	---	---	None	---	None
HeA, HeB:									
Herty	D								
		Jan-Apr	0.5-1.0	0.5-2.0	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None
KcD:									
Kellison	D								
		Jan-Dec	---	---	---	---	None	---	None
KeB, KeD:									
Keltys	B								
		Jan-Apr	2.5-3.5	3.5-5.0	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None
KiB:									
Kitterll	D								
		Jan-Dec	---	---	---	---	None	---	None
KiD:									
Kitterll	D								
		Jan-Dec	---	---	---	---	None	---	None
Browndell	D								
		Jan-Mar	0.5-1.3	1.0-1.7	---	---	None	---	None
		Apr-Dec	---	---	---	---	None	---	None
Kp:									
Koury	B								
		Jan-Apr	2.5-3.5	>6.0	---	---	None	Brief	Frequent
		May	---	---	---	---	None	Brief	Frequent
		Jun-Nov	---	---	---	---	None	---	None
		Dec	2.5-3.5	>6.0	---	---	None	---	None
KuB, KuD:									
Kurth	C								
		Jan-Apr	2.5-3.5	3.5-5.0	---	---	None	---	None
		May-Nov	---	---	---	---	None	---	None
		Dec	2.5-3.5	3.5-5.0	---	---	None	---	None

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
LaB:									
Laska	B								
		Jan-Apr	1.5-3.0	>6.0	---	---	None	---	None
		May-Nov	---	---	---	---	None	---	None
		Dec	1.5-3.0	>6.0	---	---	None	---	None
LeB:									
Latex	C								
		Jan-Apr	3.0-4.5	3.5-5.0	---	---	None	---	None
		May-Nov	---	---	---	---	None	---	None
		Dec	3.0-4.5	3.5-5.0	---	---	None	---	None
LnB:									
Letney	A								
		Jan-Dec	---	---	---	---	None	---	None
LvC, LvD:									
Lovelady	B								
		Jan-Apr	2.0-4.0	2.5-4.5	---	---	None	---	None
		May-Nov	---	---	---	---	None	---	None
		Dec	2.0-4.0	2.5-4.5	---	---	None	---	None
MpA:									
Mollville	D								
		Jan-Jun	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
		Jul-Oct	---	---	---	---	None	---	None
		Nov-Dec	0.0	>6.0	0.0-0.5	Long	Frequent	---	None
Besner	B								
		Jan-Feb	4.0-6.0	>6.0	---	---	None	---	None
		Mar-Dec	---	---	---	---	None	---	None
MsB, MsE:									
Moswell	D								
		Jan-Dec	---	---	---	---	None	---	None
MxA:									
Moten	C								
		Jan-Apr	1.0-2.5	5.0-6.0	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None
Multey	B								
		Jan-Apr	4.0-6.0	>6.0	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None
Oz:									
Ozias	D								
		Jan-May	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		Jun-Oct	---	---	---	---	None	---	None
		Nov	0.0-1.5	0.5-2.0	---	---	None	---	None
		Dec	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
Pophers	C								
		Jan-May	1.0-2.0	>6.0	---	---	None	Long	Frequent
		Jun	---	---	---	---	None	Long	Frequent
		Jul-Nov	---	---	---	---	None	---	None
		Dec	1.0-2.0	>6.0	---	---	None	---	None
PeB:									
Penning	B								
		Jan-Apr	1.5-4.0	2.5-5.0	---	---	None	---	None
		May-Dec	---	---	---	---	None	---	None

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Po:									
Pophers	C								
		Jan-May	1.0-2.0	>6.0	---	---	None	Long	Frequent
		Jun	---	---	---	---	None	Long	Frequent
		Jul-Nov	---	---	---	---	None	---	None
		Dec	1.0-2.0	>6.0	---	---	None	---	None
RbB:									
Rayburn	D								
		Jan-Feb	2.5-4.5	3.5-5.0	---	---	None	---	None
		Mar-Nov	---	---	---	---	None	---	None
		Dec	2.5-4.5	3.5-5.0	---	---	None	---	None
RwB, RwD:									
Rosenwall	D								
		Jan-Dec	---	---	---	---	None	---	None
SsA:									
Sawlit	C								
		Jan-May	2.0-3.5	2.5-3.5	---	---	None	---	None
		Jun-Dec	---	---	---	---	None	---	None
Sawtown	C								
		Jan-May	3.5-5.0	4.0-5.5	---	---	None	---	None
		Jun-Dec	---	---	---	---	None	---	None
StD:									
Stringtown	B								
		Jan-Dec	---	---	---	---	None	---	None
TeD:									
Tehran	A								
		Jan-Dec	---	---	---	---	None	---	None
UrB:									
Urland	C								
		Jan-Dec	---	---	---	---	None	---	None
W.									
Water									
WnB:									
Woden	B								
		Jan-Dec	---	---	---	---	None	---	None

Table 19.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Alazan	Fine-loamy, siliceous, semiactive, thermic Aquic Glossudalfs
Annona	Fine, smectitic, thermic Vertic Paleudalfs
Austonio	Fine-loamy, siliceous, active, thermic Typic Hapludalfs
Besner	Coarse-loamy, siliceous, semiactive, thermic Typic Glossudalfs
Browndell	Clayey, smectitic, thermic, shallow Oxyaquic Hapludalfs
Colita	Fine-loamy, siliceous, active, thermic Typic Glossaqualfs
Corrigan	Fine, smectitic, thermic Albaquic Hapludalfs
Eastham	Fine, smectitic, thermic Typic Hapluderts
Etoile	Fine, smectitic, thermic Vertic Hapludalfs
Fuller	Fine-loamy, siliceous, superactive, thermic Albic Glossic Natraqualfs
Garner	Fine, smectitic, thermic Oxyaquic Hapluderts
Gladewater	Very-fine, smectitic, thermic Chromic Endoaquerts
Hainesville	Thermic, coated Lamellic Quartzipsamments
Herty	Fine, smectitic, thermic Oxyaquic Vertic Hapludalfs
Kellison	Fine, smectitic, thermic Vertic Hapludalfs
Keltys	Coarse-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs
Kitterll	Loamy, siliceous, active, nonacid, thermic, shallow Typic Udorthents
Koury	Coarse-silty, siliceous, superactive, thermic Oxyaquic Eutrudepts
Kurth	Fine-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs
Laska	Coarse-loamy, siliceous, semiactive, thermic Oxyaquic Glossudalfs
Latex	Fine-loamy, siliceous, semiactive, thermic Glossic Paleudalfs
Letney	Loamy, siliceous, semiactive, thermic Arenic Paleudults
Lovelady	Loamy, mixed, semiactive, thermic Arenic Glossudalfs
Mollville	Fine-loamy, siliceous, superactive, thermic Typic Glossaqualfs
Moswell	Very-fine, smectitic, thermic Vertic Hapludalfs
Moten	Coarse-loamy, siliceous, active, thermic Aquic Glossudalfs
Multey	Coarse-loamy, siliceous, active, thermic Typic Glossudalfs
Ozias	Fine, smectitic, thermic Aeric Dystraquerts
Penning	Fine-loamy, siliceous, active, thermic Aquic Glossudalfs
Pophers	Fine-silty, siliceous, active, acid, thermic Fluvaquentic Endoaquepts
*Rayburn	Fine, smectitic, thermic Vertic Hapludalfs
Rosenwall	Very-fine, mixed, active, thermic Typic Hapludults
Sawlit	Fine-loamy, siliceous, active, thermic Aquic Glossudalfs
Sawtown	Fine-loamy, siliceous, active, thermic Typic Glossudalfs
*Stringtown	Fine-loamy, siliceous, semiactive, thermic Typic Hapludults
Tehran	Loamy, siliceous, semiactive, thermic Grossarenic Paleudults
Urland	Clayey, mixed, active, thermic Typic Hapludults
Woden	Coarse-loamy, siliceous, semiactive, thermic Typic Paleudalfs

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