SOIL SURVEY OF

Parker County, Texas

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

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SOIL SURVEY OF PARKER COUNTY TEXAS

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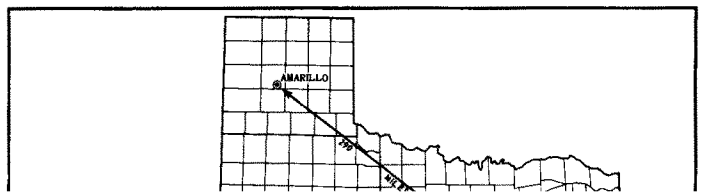
SOIL CONSERVATION SERVICE[1]

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE,
IN COOPERATION WITH THE TEXAS AGRICULTURAL EXPERIMENT STATION

PARKER COUNTY is in north-central Texas (fig. 1). It has a total area of 905 square miles, or 579,200 acres, of which 1,536 are water. Weatherford, the county seat and largest town, is located in the center of the county. The population of Weatherford, according to 1970 U.S. Census, is 11,750. Other towns in Parker County include Aledo, Azle, Cool, Millsap,



developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in this survey have been grouped into three general kinds of landscape for broad interpretative purposes. Each of the three broad groups and the soil associations in them are described on the following pages. The terms for texture used in the title of the associations apply to the texture of the surface layer. For example, in the title of association 1, the words, loamy and sandy refer to the texture of the surface layer.

Neutral to Slightly Acid Loamy and Sandy Soils on Uplands

The soils in this group are deep and moderately deep. In places they are stony, and in places eroded. Vegetation is commonly post oak and blackjack oak trees and other woody plants. Many areas are in pasture and range. Some areas are used for crops and orchards.

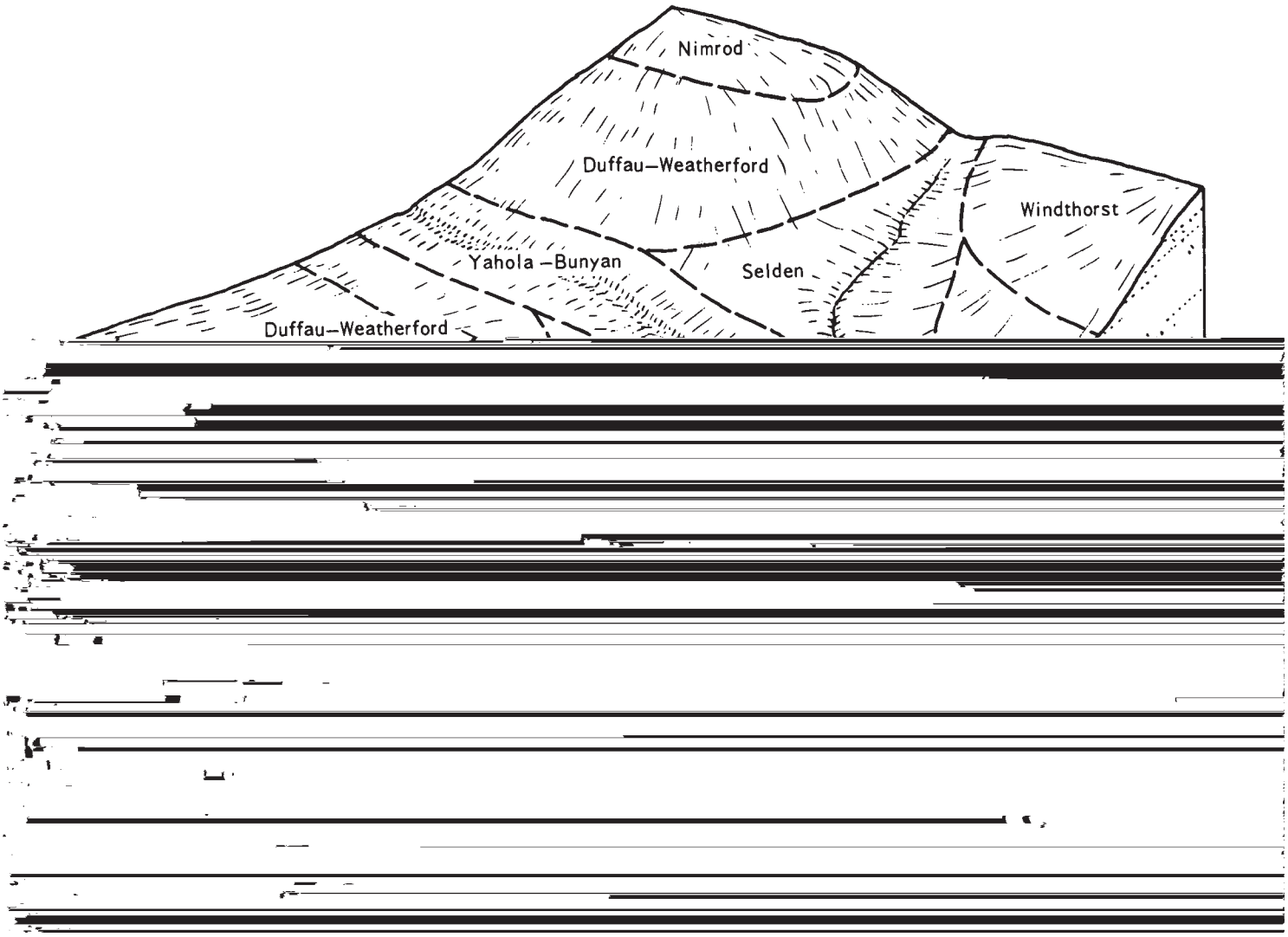
1. Windthorst-Duffau-Weatherford association

Gently sloping to sloping, deep loamy or sandy soils over weakly cemented sandstone or clay

This association is in loamy to sandy timbered areas on uplands. Many areas are eroded, and gullies are common over much of the association.

This association makes up about 42 percent of the county. It is about 34 percent Windthorst soils, 17 percent Duffau soils, 9 percent Weatherford soils, and 40 percent soils of minor extent (fig. 2).

The gently sloping to sloping Windthorst soils occupy the upper slopes of hillsides and ridges. Many of the stronger slopes are eroded. The surface layer is grayish brown fine sandy loam about 4 inches thick. The next layer is light yellowish brown fine sandy loam about 6 inches thick. Next, in sequence downward, is about 28 inches of red and yellowish red sandy clay and about 12 inches of mottled red, yellowish brown, and pale brown sandy clay loam. The underlying material is light gray clay that has coarse red and yellow mottles.



The gently sloping to sloping Duffau and Weatherford soils occupy the mid and lower positions on hillsides. Many of the stronger slopes are eroded or gullied. The Duffau soil has a surface layer of light brown loamy fine sand about 9 inches thick. The next layers are about 31 inches of red sandy clay loam, 25 inches of yellowish red sandy clay loam, and 10 inches of reddish yellow sandy clay loam. The underlying material is white weakly cemented sandstone and fine sandy loam.

The Weatherford soil has a surface layer of brown fine sandy loam about 4 inches thick. The next layer is light brown fine sandy loam about 6 inches thick. Next is 35 inches of yellowish red and reddish yellow sandy clay loam. The underlying material is pink weakly cemented sandstone.

Of minor extent in the association are Blanket, Brackett, Bosque, Bunyan, Frio, Heaton, May, Nimrod, Patilo, Selden, and Yahola soils. Blanket and May soils are on foot slopes. Brackett soils are on hills and ridges. Bosque, Bunyan, Frio, and Yahola soils are on flood plains along streams. Heaton, Nimrod, and Selden soils are on hillsides, foot slopes, and ridges. Areas of Urban land and gullied areas are also in the association.

The association is used chiefly as pasture and range, and a small acreage is used for crops. Some areas are in improved pasture, and some areas that were formerly cultivated are now idle. A small percentage of the association is used for urban development, roads, and sites for farmsteads and other structures. The

The gently sloping to sloping Bonti soils are on ridges and the upper part of side slopes. Some areas are stony, and some are eroded. The surface layer is light brown fine sandy loam about 10 inches thick. The next layer is about 22 inches of yellowish red clay. The underlying material is reddish yellow strongly cemented sandstone.

Of minor extent in the association are Hassee, Selden, Owens, Reap, and Thurber soils. Hassee, Reap, and Thurber soils are along foot slopes and in slightly depressed areas. Selden soils are along foot slopes and ridge breaks. Owens soils are mostly on hillsides.

About 75 percent of this association is used as range or pasture. A small percentage is used for crops and urban development. The trend in recent years is to establish more improved pastures.

Native vegetation was a post oak savanna of scattered trees and an understory of grasses.

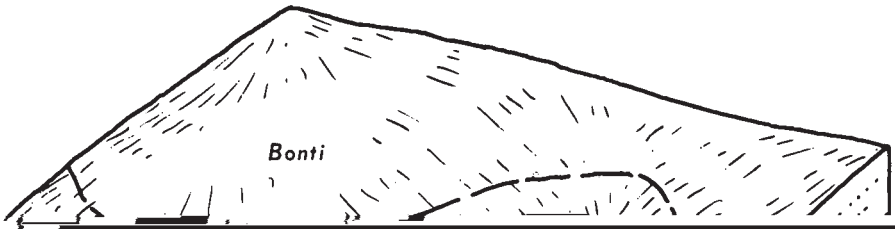
3. *Truce-Bonti association*

Gently sloping to steep, deep and moderately deep loamy soils over sandstone or shaly clay

This association is in timbered and open areas on hills and ridges. Stones and boulders are common throughout much of the area.

This association makes up 6 percent of the county. It is 47 percent Truce soils, 15 percent Bonti soils, and 38 percent soils of minor extent (fig. 3).

The gently sloping to steep Truce soils are on hills


Bonti

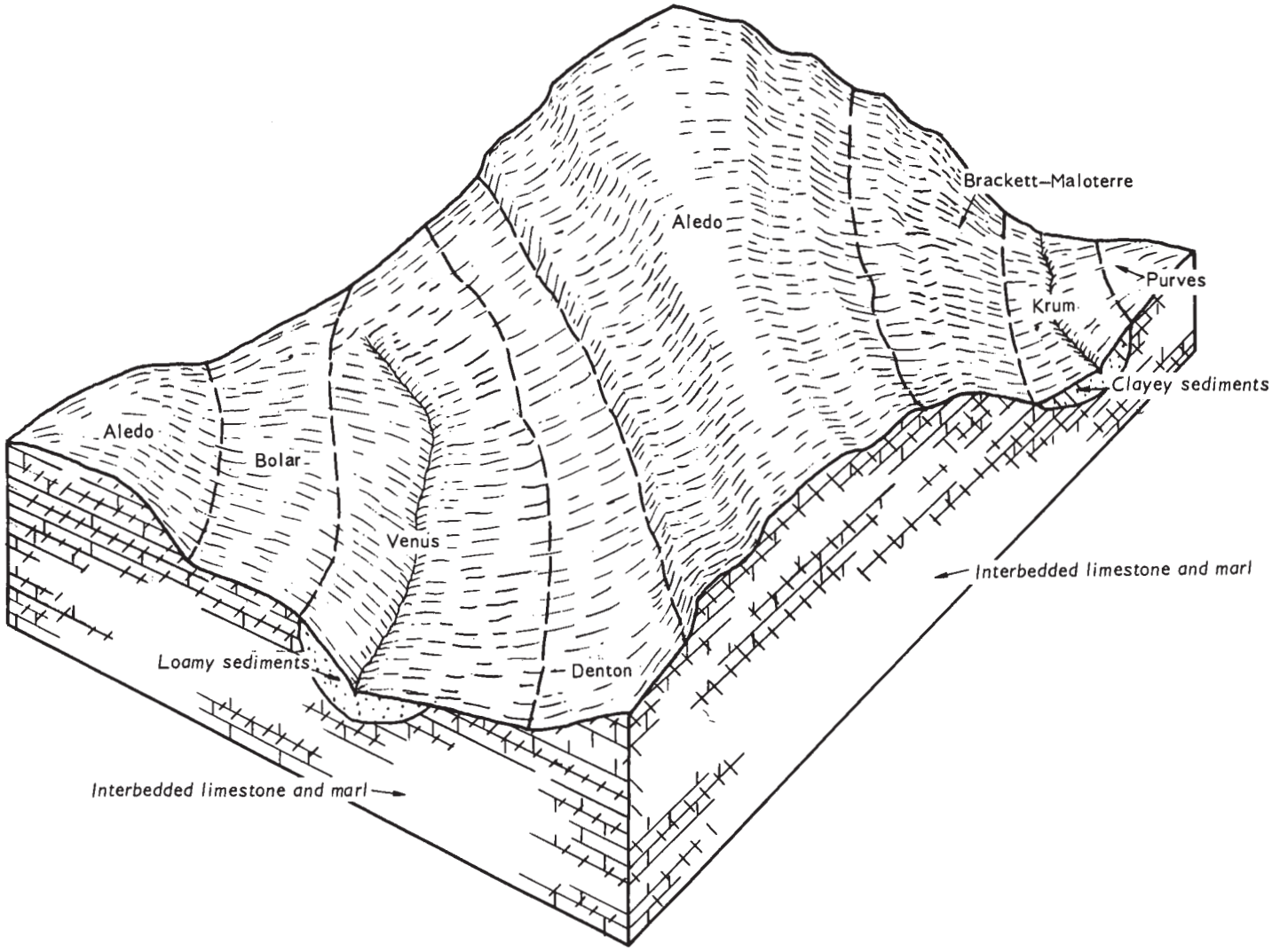


***Figure 4.*—Pattern of soils in the Aledo-Venus-Bolar association.**

5. *Hensley-Lindy association*

Nearly level to gently sloping, shallow to moderately deep loamy soils over limestone

This association is in mostly open areas on uplands. Many areas have coarse fragments on the surface.

This association makes up 2 percent of the county. Owens and Truce soils are on breaks and hills. Thurber soils are on lower slopes and in slight depressions.

This association is used mostly as range. A few small fields are cultivated.

Native vegetation was scattered live oak and elm trees and an understory of grasses.

bottom land. It is a long, narrow band of alluvial soils and includes the Brazos River. Some areas are flooded

thick. The next layer is reddish yellow very fine sandy

This association is mostly along major drains of the county on bottom land and upland areas. Where flooding is not a problem, it is mostly suited to cultivation.

This association makes up 4 percent of the county. It is 58 percent Frio soils, 40 percent Krum soils, and 2 percent soils of minor extent.

Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers

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

Soil	Acres	Percent
Duffau and Weatherford soils, 2 to 8 percent slopes, severely eroded	9,620	1.7
Frio clay loam, occasionally flooded	8,220	1.4
Frio clay loam, frequently flooded	6,290	1.1
Hardeman very fine sandy loam, 0 to 2 percent slopes	820	.1
Hardeman very fine sandy loam, 6 to 12 percent slopes	710	.1

cium carbonate equivalent; calcareous; moderately alkaline; abrupt, wavy boundary.

R—16 to 20 inches, fractured indurated limestone.

The A horizon is dark grayish brown, grayish brown, very dark grayish brown, dark brown, or brown and is 8 to 20 inches thick. The A11 horizon is clay loam, loam, gravelly clay loam, or gravelly loam and contains 5 to 40 percent limestone fragments. The A12 horizon is gravelly loam, gravelly clay loam, very gravelly loam, or very gravelly clay loam, and it contains 50 to 80 percent limestone fragments. The R horizon is strongly cemented to indurated limestone.

ALE—Aledo association, undulating. This association occupies limestone areas on uplands. Slopes are complex, and topography is benched. Slopes range from 1 to 8 percent but are dominantly 2 to 8 percent. Areas are irregular in shape and cover 25 to more than 1,000 acres. The Aledo soils in this association are 40 are being planted to improved grasses for pasture, and some areas are used as range.

Representative profile of Bastrop fine sandy loam, 0 to 1 percent slopes, in a cultivated field 12 miles southwest of Weatherford. From the Brazos River bridge on Farm Road 1543 at Dennis, east on paved county road 1.5 miles, then 0.5 mile south on dirt road, 150 feet east of road:

Ap—0 to 12 inches, brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; weak, fine, subangular blocky structure; hard, friable; slightly acid; abrupt, smooth boundary.

B21t—12 to 35 inches, yellowish-red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate, fine, subangular blocky structure; very hard, friable; few thin clay films; few pores; slightly acid; gradual, wavy boundary.

B22t—35 to 50 inches, yellowish red (5YR 5/6) sandy clay

Figure 6.—**Peanuts growing on cultivated area of Bastrop fine sandy loam, 0 to 1 percent slopes.**

level to undulating areas of Yahola fine sandy loam and soils that are similar to Norwood and Hardeman soils, but have a fine sandy loam surface layer. Also included are areas of Truce and Duffau soils along ridges; a few small areas of Bastrop soils that have a loamy fine sand surface layer; small areas of Bastrop fine sandy loam that have a slope of less than 1 percent; and small eroded areas.

Most of the acreage is used for crops. Improved pasture has been established in some areas. In cultivated areas the hazards of water erosion and soil blowing are slight. Capability unit IIe–3; Sandy Loam range site; pasture group 8C.

BaC2—Bastrop fine sandy loam, 2 to 5 percent slopes, eroded. This gently sloping soil is on uplands near the Brazos River. Areas are mostly cultivated fields, many of which are no longer farmed. They are dissected by small drains or gullies and show evidence of sheet erosion. Gullies 100 to 300 feet apart are 5 to 30 feet wide and a few inches to 5 feet deep and are mostly crossable with farm machinery. Mapped areas follow slope contours above associated streams. They are irregular in shape and average 30 acres in size.

The surface layer is brown fine sandy loam about 8 inches thick. Some of the lower layer has been mixed with the plowed layer in most places. The next layer is reddish-brown sandy clay loam about 17 inches thick. Below this is 40 inches of yellowish-red sandy clay loam. The underlying material is light-brown sandy clay loam.

Included with this soil in mapping are small areas of uneroded Bastrop soil and a few areas in which the depth to the underlying material is less than 60 inches. Included in slightly higher parts of the landscape are areas of Duffau, Truce, and Windthorst soils.

Most of the acreage was once cultivated, but is now used for established grass or is idle. The hazard of water erosion is moderate. Capability unit IIIe–1; Sandy Loam range site; pasture group 8C.

Blanket Series

The Blanket series consists of deep, gently sloping, noncalcareous loamy soils on uplands. These soils formed in loamy and clayey calcareous sediments.

In a representative profile the surface layer is dark grayish-brown clay loam about 10 inches thick. Next in sequence downward is 12 inches of very dark grayish-brown clay loam, 18 inches of brown clay that

contains a few calcium carbonate concretions in the lower part, and 10 inches of pale-brown calcareous clay. The underlying material is light-gray calcareous clay loam.

These soils are well drained. Runoff is slow. Internal drainage is slow, and permeability is moderately slow. The available water capacity is high.

Blanket soils are used mostly for crops. They are well suited to most crops grown locally. Improved pastures have been established in some areas.

used as pasture. The hazard of water erosion is moderate. Capability unit IIe–1; Clay Loam range site; pasture group 7C.

Bolar Series

The Bolar series consists of moderately deep, gently sloping to sloping, calcareous loamy soils on uplands. These soils formed in interbedded limestone and calcareous marls.

The surface layer is dark grayish-brown clay loam about 12 inches thick. The next lower layer is brown clay loam about 6 inches thick. Below this is about 12 inches of pale-brown clay loam. The underlying material is indurated limestone.

Included with this soil in mapping are areas on slightly higher parts of the landscape that have slopes greater than 3 percent. Also included is a soil similar to the Bolar soil, but that contains between 15 and 35 percent coarse fragments throughout; a soil that is more than 40 inches deep over rock; Denton soils in small slightly depressed areas; areas of Purves clay and Aledo soils along upper slopes, and small inclusions of Blanket, Krum, and Venus soils.

sloping to sloping, noncalcareous loamy soils on uplands. These soils formed in material weathered from strongly cemented sandstone.

In a representative profile the surface layer is light-brown, slightly acid fine sandy loam about 10 inches thick. The next 22 inches is medium acid, yellowish-red clay. It is underlain by reddish-yellow strongly cemented sandstone.

These soils are well drained. Runoff is rapid. Permeability is moderately slow, and the available water capacity is medium.

Bonti soils are used mostly as range. Some areas are used for crops or are in pasture.

Representative profile of Bonti fine sandy loam, 1

Figure 7.—**Bonti and Truce soils, 1 to 8 percent slopes. Sandstone outcrop in foreground.**

subangular blocky structure; hard, firm; common very fine roots and pores; many very fine threads and films of calcium carbonate; calcareous, moderately alkaline; gradual, wavy boundary.

IIBb—55 to 60 inches, brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; massive; very hard, friable; many films, threads, and soft masses of calcium carbonate; calcareous, moderately alkaline.

The A horizon is dark grayish brown, grayish brown, brown, dark brown, or very dark grayish brown. It is 20 to 35 inches thick.

The B2 horizon is brown, grayish brown, or light brownish gray. It is fine sandy loam, loam, or clay loam.

The depth to the buried horizon is 24 to more than 60 inches.

Bo—Bosque loam, occasionally flooded. This nearly level soil is on bottom land that is occasionally flooded. Mapped areas are elongated and follow the contour of drainageways. Areas range from 5 to more than 200 acres in size, but average about 25 acres. Slopes are 0 to 1 percent.

[illegible] in a soil that is overburden. Inclusions make up less than 20 percent of any one mapped area.

The hazard of water erosion is slight, but soil areas are subject to flooding. They are flooded as often as one or more times in 4 to 10 years, mainly in May or September. Most areas are flooded for 24 hours or less.

Most of the acreage is for crops. Some areas are established to pasture. Capability unit IIw–1; Loamy Bottom Land range site; pasture group 2A.

Brackett Series

The Brackett series consists of shallow, gently sloping to steep, calcareous loamy soils on uplands. These soils formed in material weathered from interbedded limestone and calcareous clay loam.

In a representative profile the surface layer is light brownish-gray, calcareous clay loam about 4 inches thick. The next 10 inches is light-gray calcareous loam. The underlying material is weakly cemented limestone and calcareous pale yellow clay loam.

Representative profile of Brackett clay loam, in an area of Brackett and Maloterre soils, 3 to 12 percent slopes, 5.3 miles southwest of Springtown via Farm Road 51, then 0.7 mile west, then north and east 2 miles on county road, then west of road 75 feet from fence:

A1—0 to 4 inches, light brownish-gray (10YR 6/2) clay loam, brown (10YR 5/3) moist; moderate, fine, granular structure; hard, friable; many fine pores; few fossil shells and rock fragments; about 60 percent calcium carbonate equivalent; calcareous, moderately alkaline; clear, wavy boundary.

B2—4 to 14 inches, light-gray (10YR 7/2) loam, pale brown (10YR 6/3) moist; moderate, medium, subangular blocky structure; hard, friable; few pores; 60 percent calcium carbonate equivalent; common fine calcium carbonate concretions and limestone shell fragments; calcareous, moderately alkaline; abrupt,

seasonal seepage. Not assigned to a capability unit, range site, or pasture group.

BsE—Brackett and Maloterre soils, 3 to 12 percent slopes. This gently sloping to strongly sloping mapping unit is on upland ridges. Areas are longer than they are wide and follow the contour of hills and ridges (fig. 8). Areas range from 5 to 400 acres in size, but are mostly about 70 acres.

Average composition of this mapping unit is 50 percent Brackett soil, 22 percent Maloterre soil, and 28 percent soils of minor extent, but composition is variable. Brackett soils are dominant and make up 40 to 80 percent of mapped areas. They are along side slopes and usually have a slope of 5 to 12 percent. Maloterre soils, where present, make up 10 to 40 percent of the mapped areas. They are along the more nearly level

Figure 8.—**Thin stand of grasses on shallow Brackett and Maloterre soils, 3 to 12 percent slopes.**

Most of the acreage is used as range. This mapping unit is not suited to cultivation. The hazard of water erosion is moderate. Capability unit VIIs–1; Steep Adobe range site; not assigned to a pasture group.

Bunyan Series

The Bunyan series consists of deep, nearly level, noncalcareous loamy soils on bottom lands. These soils formed in stratified loamy alluvial sediments.

In a representative profile the surface layer is brown, neutral fine sandy loam about 10 inches thick. The un-

Ap—0 to 10 inches, brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; weak, fine, subangular blocky structure; slightly hard, friable; common roots and pores; neutral; abrupt, smooth boundary.

C1—10 to 30 inches, light-brown (7.5YR 6/4) sandy clay loam, brown (7.5YR 5/4) moist; single grained; hard, friable; few fine roots; thin strata of brown (7.5YR 4/2) fine sandy loam about 1 inch thick; slightly acid; abrupt, smooth boundary.

C2—30 to 60 inches, brown (7.5YR 5/4) sandy clay loam, brown moist; single grained; hard, friable; few roots; slightly acid.

The A horizon is pale brown, brown, light brownish

low the contours of drainageways. They range from 10 to more than 150 acres in size, but average about 25 acres. Slopes are 0 to 1 percent.

Included with this soil in mapping are Lincoln and Yahola soils in small, slightly higher areas along stream banks. Also included are small areas of Bosque and Frio soils.

The hazard of water erosion is slight, but soil areas are subject to occasional flooding. Areas are flooded as often as one or more times in 4 to 10 years, mainly in May or September. Most areas are flooded for 24 hours or less.

Bunyan soils are used mostly for crops. Pasture is established in some areas. Capability unit IIw–1; Loamy Bottom Land range site; pasture group 2A.

Chaney Series

The Chaney series consists of deep, gently sloping, noncalcareous sandy soils on uplands. These soils formed in sandy and clayey materials.

In a representative profile the surface layer is dark grayish-brown, slightly acid loamy fine sand about 4 inches thick. Below this, in sequence downward, is 12 inches of pale-brown, slightly acid loamy fine sand; 6

C—42 to 60 inches, light-gray (5Y 7/1) sandy clay, gray (5Y 6/1) moist; few, fine, faint mottles of red (2.5YR 5/8) and yellowish red (5YR 5/8); massive; neutral.

The A horizon is 6 to 20 inches thick. It is neutral to medium acid. The A1 horizon is very pale brown, dark grayish brown, grayish brown, pale brown, or brown. The A2 horizon is pale brown, very pale brown, or light gray. Content of siliceous pebbles ranges from none to about 20 percent.

The Bt horizon is dark red, red, light yellowish brown, reddish brown, light gray, brownish yellow, yellowish red, or reddish yellow and is clay or sandy clay. It has prominent grayish or brownish mottles. Some profiles have a mottled matrix of red, yellow, brown, and gray. Reaction is medium acid to neutral.

The C horizon is at a depth of 40 to more than 50 inches. It is gray, olive yellow, reddish gray, light gray, or olive and is shaly clay or sandy clay. In some areas it contains strata of sandstone or gravel.

ChC—Chaney loamy fine sand, 1 to 5 percent slopes. This gently sloping soil is on uplands. Mapped areas are irregular in shape. They range from about 20 to more than 100 acres in size, but average about 75 acres.

This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of

In a representative profile the surface layer is very dark grayish-brown calcareous clay about 16 inches thick. The next 19 inches is dark grayish-brown calcareous clay. It is underlain by indurated limestone bedrock.

These soils are well drained. Runoff is medium. Permeability is slow, and the available water capacity is medium.

Denton soils are used mostly for crops. Some areas are used as range, and some areas are used for im-

The next 31 inches is red, slightly acid sandy clay loam. Below this is 25 inches of yellowish-red, slightly acid sandy clay loam, and then about 10 inches of reddish-yellow, slightly acid sandy clay loam. The underlying material is white, neutral, weakly cemented sandstone and fine sandy loam.

These soils are well drained. Runoff is slow to rapid. Permeability is moderate, and the available water capacity is high.

Duffau soils are used mostly as pasture and range.

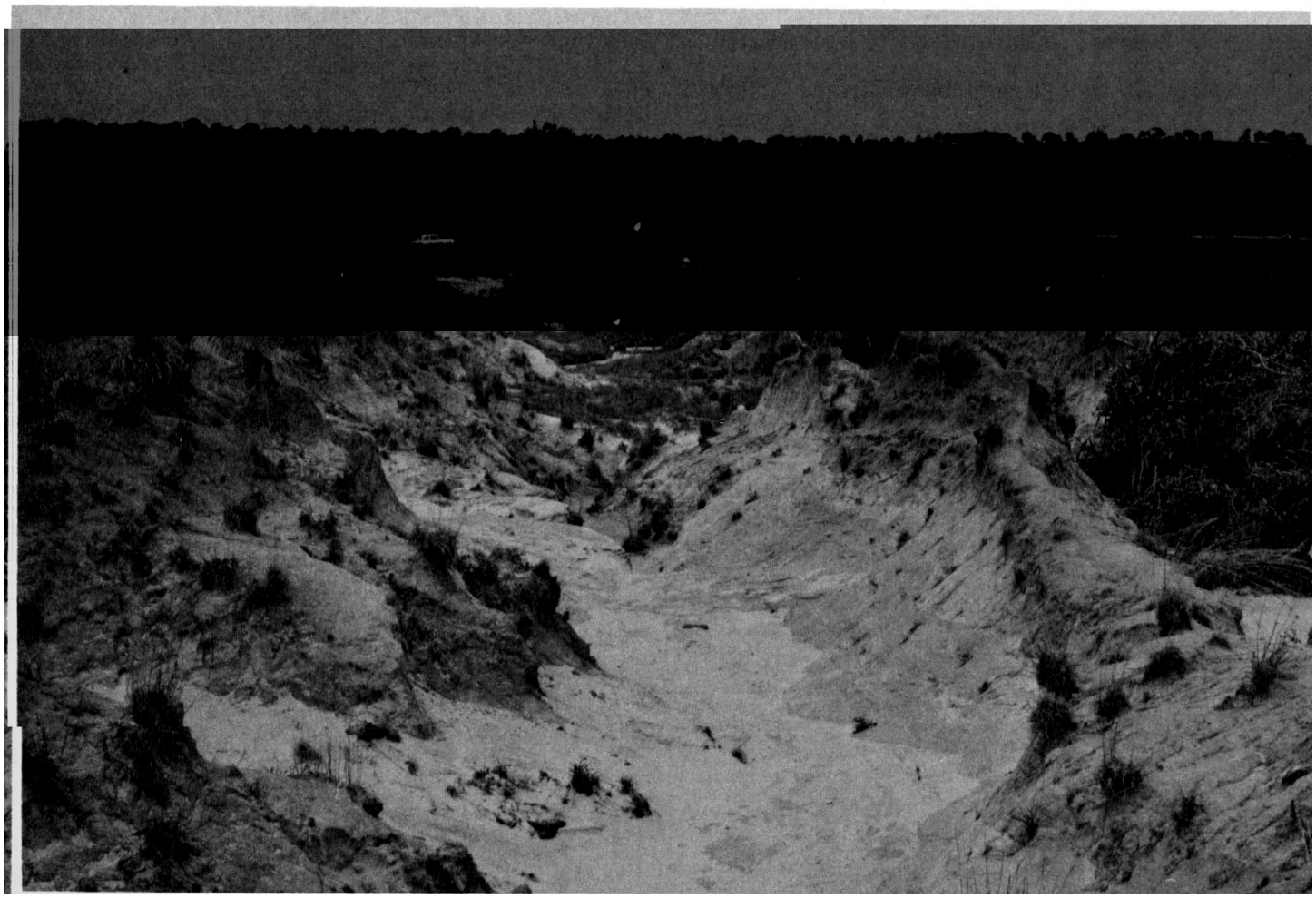


Figure 9.—**Severely gullied area of Duffau-Orthents complex, 3 to 8 percent slopes, severely eroded.**

soils, but their profiles are thinner. Gullies are 3 to 30 feet wide and 2 to 20 feet deep. Narrow bands of eroded soil separate the gullies.

Of minor extent are eroded and severely eroded Weatherford and Windthorst soils and, along lower slopes, small areas of Selden and May soils.

This mapping unit is suitable only for range. Pasture is difficult to establish because extensive shaping is needed. Runoff is medium. These areas are critical silt sources. The hazard of water erosion is severe. Capability unit VIIe–1; Sandy Loam range site; not assigned to a pasture group.

DhD—Duffau-Urban land complex, 3 to 8 percent slopes. This gently sloping to sloping mapping unit is on upland hillsides in the City of Weatherford. Mapped areas are rounded to irregular in shape.

This unit is about 50 percent Duffau soils, 40 percent Urban land, and 10 percent soils of minor extent. Duffau soils dominate, but are in patterns so intricately mixed with Urban land that it is not practical to separate them at the scale of mapping used.

In an undisturbed area of Duffau soil, the surface layer is light-brown loamy fine sand about 10 inches thick. The next 31 inches is red sandy clay loam. Below this is 25 inches of yellowish-red sandy clay loam, then about 10 inches of reddish-yellow sandy clay loam. The underlying material is white, weakly cemented sandstone.

Urban land is used for works and structures, such as buildings, streets, driveways, sidewalks, and patios. It is also used for parts of some shopping centers, service stations, small shops and businesses, and the accompanying parking areas.

Included with this unit in mapping are small areas of Lamar, May, Weatherford, and Windthorst soils.

Some areas have been cut and shaped for building sites and lot leveling. Cuts vary from a few inches to several feet, depending on slope and the size and type of building to be constructed. Because most cuts and fills were made in the original soil, the thickness of horizons in the existing profile may vary widely from the profile described as representative of the series. However, the basic characteristics of the soil remain much the same. In many places imported soil materials are used for leveling. Runoff is rapid.

The main soil characteristics that affect urban development are permeability, slope, and erodibility. Not assigned to a capability unit, range site, or pasture group.

DmC—Duffau and Weatherford soils, 1 to 5 per-

cent slopes. These gently sloping soils are on upland hillsides. Mapped areas are mid and lower slopes. Areas are elongated in shape and follow the contour of hillsides. They range from 10 to 150 acres in size, but most are about 35 acres (fig. 10).

The composition of this unit is variable, and the pattern in which soils occur is not uniform. Average composition of this mapping unit is 50 percent Duffau soils, 35 percent Weatherford soils, and 15 percent soils of minor extent. Duffau soils are dominant. They make up 40 to 60 percent of the mapped acreage. They are present in all areas, mostly along lower slopes. Weatherford soils make up 30 to 40 percent of the mapped acreage, and are mostly along upper slopes. Surface texture is variable. About 70 percent of the mapped areas have a surface layer of loamy fine sand, and about 30 percent of the areas have a surface layer of fine sandy loam.

The Duffau soil has the profile described as representative of the Duffau series.

The surface layer of Weatherford soils is light brown loamy fine sand about 10 inches thick. The next 5 inches is reddish-brown sandy clay loam. Below this is 15 inches of yellowish-red sandy clay loam, and then 16 inches of reddish-yellow sandy clay loam. The underlying material is white, weakly cemented packsand.

Of minor extent are small areas of Chaney, Heaton, Selden, and Windthorst soils. Chaney and Selden soils are along lower slopes and valleys. Heaton and Windthorst soils are along upper slopes and ridges. Also included with this unit in mapping are a few small areas of soils that have slopes of as much as 8 percent.

This mapping unit is used for pasture, crops, and orchards. Some areas are in range. Runoff is slow. The hazard of water erosion is slight, but the hazard of soil blowing is severe. Capability unit IIIe–4; Sandy range site; pasture group 9A.

DwC2—Duffau and Weatherford soils, 2 to 5 percent slopes, eroded. These gently sloping soils are on eroded upland hillsides. Mapped areas are mostly once-cultivated fields that were farmed for a time and then had much of the surface layer removed by water erosion. Areas are irregular in shape. They range from 10 to more than 100 acres in size, but average about 30 acres.

The composition of this unit is variable, and the pattern in which soils occur is not uniform. Average composition of this mapping unit is 50 percent Duffau soils, 35 percent Weatherford soils, and 15 percent

Figure 10.—**Orchard and cover crop of oats and winter peas on Duffau and Weatherford soils, 1 to 5 percent slopes.**

soils of minor extent. Duffau soils are dominant. They make up 37 to 60 percent of the mapped area. They are present in all areas, mostly along lower slopes. Weatherford soils make up 15 to 40 percent of the mapped areas, and are mostly on the more convex slopes.

The surface layer of Duffau soils is brown fine sandy loam about 6 inches thick. The next 12 inches is yellowish-red sandy clay loam. Below this is 42 inches of red sandy clay loam. The underlying material is reddish-yellow sandy clay loam.

The surface layer of Weatherford soils is brown fine

some uneroded areas, and a few large gullies along natural drains.

This mapping unit is used mostly as range. Some areas are in pasture or crops and a few are in orchards. The hazard of water erosion is severe. Runoff is medium. Capability unit IVe–1; Sandy Loam range site; pasture group 8C.

DyD3—Duffau and Weatherford soils, 2 to 8 percent slopes, severely eroded. These gently sloping to sloping, severely eroded soils are on upland hillsides. Over three-fourth of the original surface layer has been removed by water erosion, and small gullies and rills

mile west and southwest of the post office at Aledo, 1,050 feet north of road:

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; moderate, medium, subangular blocky structure; very hard, firm; common fine roots and pores; few fine concretions; common insect casts and burrows; calcareous, moderately alkaline; abrupt, smooth boundary.

A11—6 to 18 inches, very dark grayish-brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; moderate, medium, subangular blocky structure; very hard, firm; few fine roots; few fine concretions; calcareous, moderately alkaline; gradual, wavy boundary.

A12—18 to 46 inches, very dark grayish-brown (10YR 3/2) silty clay, very dark brown (10YR 2/2) moist; moderate, medium, subangular blocky structure; very hard, firm; few fine roots; few fine concretions and films of calcium carbonate; calcareous, moderately alkaline; clear, wavy boundary.

C—46 to 60 inches, grayish-brown (10YR 6/2) silty clay loam, grayish brown (10YR 5/2) moist; massive; very hard, firm; few concretions and common films and threads of calcium carbonate; calcareous, moderately alkaline.

The A horizon is dark grayish-brown, very dark grayish brown, brown, or grayish brown and is 22 to 58 inches thick.

The B horizon is present in some profiles and is lighter colored than in the A horizon.

The C horizon is grayish brown or gray, dark brown to

As a result of the severe flooding hazard, this soil is not suited to cultivation. Most areas are used as pasture or range (fig. 11). Capability unit Vw–1; Loamy Bottom Land range site; pasture group 1C.

Hardeman Series

The Hardeman series consists of deep, nearly level to strongly sloping, low lying, calcareous loamy soils on uplands. These soils formed in loamy sediments.

In a representative profile the surface layer is reddish-brown, calcareous very fine sandy loam about 10 inches thick. The next 40 inches is yellowish-red, calcareous very fine sandy loam. The underlying material is reddish-yellow calcareous fine sandy loam.

These soils are well drained. Runoff is slow to medium. Permeability is moderately rapid, and the available water capacity is medium.

Hardeman soils are used mostly for crops. Some areas are used as pasture and range.

Representative profile of Hardeman very fine sandy loam, 6 to 12 percent slopes, in a pasture, 0.65 mile east of the junction of a county road and Farm Road 1543 just south of the Brazos River bridge at Dennis, 250 feet north of road:

A1—0 to 10 inches, reddish-brown (5YR 4/4) very fine

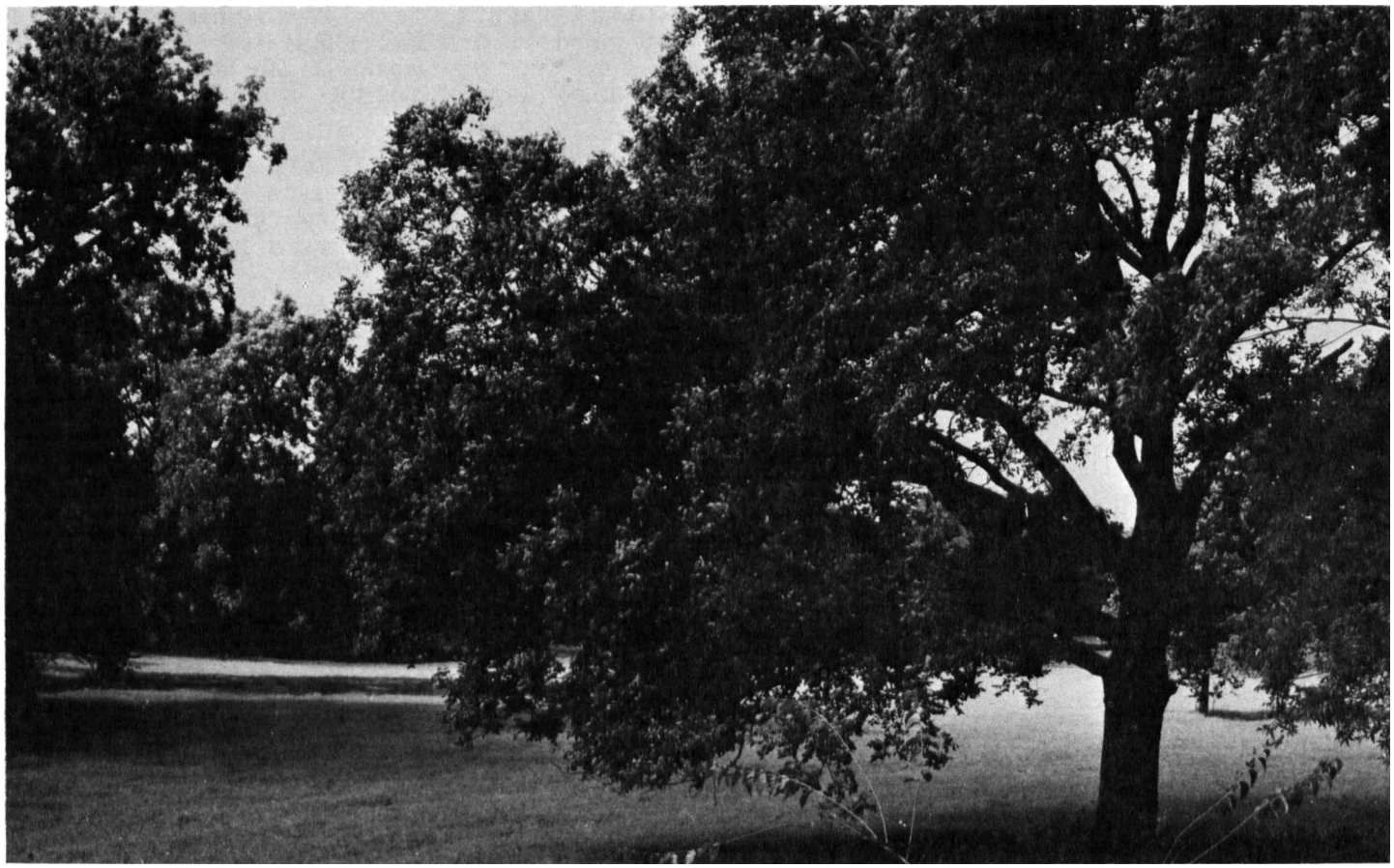


Figure 11.—**Coastal bermudagrass and pecan trees on Frio clay loam, frequently flooded.**

low lying upland terraces of the Brazos River. Mapped areas are long, narrow breaks paralleling the river. Most areas are about 30 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are areas where slopes are as much as 20 percent and some gullies that cross the mapped areas. Also included are Bastrop

very slow. Permeability is very slow, and the available water capacity is high.

Most of the Hassee soils are used as pasture. A few areas are cultivated.

Representative profile of Hassee fine sandy loam, 0 to 1 percent slopes, 8 miles west of Weatherford via U.S. Highway 80, to a county road 1 mile east of

B3tca—36 to 50 inches, light brownish-gray (10YR 6/2) clay, grayish brown (10YR 5/2) moist; moderate, medium subangular blocky structure; extremely

hard, firm; few small calcium carbonate concretions and soft masses; calcareous, moderately alkaline; clear, smooth boundary.

Cca—50 to 64 inches, light brownish-gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; very hard, firm; common yellowish-brown and olive-yellow mottles; few small calcium carbonate concretions and soft masses; calcareous, moderately alkaline.

Depth to calcium carbonate concretions or soft masses is 28 to 50 inches.

The A1 or Ap horizon is very dark grayish brown, grayish brown, or dark grayish brown and is 9 to 16 inches thick. The A2g horizon is light brownish gray, grayish brown, or light gray and is 1 to 6 inches thick. The A horizon is fine sandy loam or loam and is slightly acid or neutral.

The Bt horizon is dark grayish brown, very dark grayish brown, light brownish gray, or dark gray and is slightly acid to moderately alkaline. Mottles in shades of red, brown, or yellow are common in the lower part.

The C horizon is clay or clay loam.

HeA—Hassee fine sandy loam, 0 to 1 percent slopes. This nearly level soil is on slightly depressed uplands. Mapped areas are round in shape. They range from 5 to more than 30 acres in size, but most are about 20 acres.

Included with this soil in mapping are small areas of soils that have slopes of more than 1 percent; small areas of Blankett and Thurber soils; and areas of Bonti, Chaney, and Truce soils along slight ridges.

Water is ponded in many areas, and the surface layer is saturated in places during wet seasons. The hazard of water erosion is slight.

Most of the acreage is used as pasture. Some areas

Figure 19. Profile of Hassee fine sand, 1 to 5 percent slopes.

in the lower part, and most profiles have skeletans and clean sand grains in the lower part of the Bt horizon.

HfC—Heaton fine sand, 1 to 5 percent slopes. This gently sloping soil is on uplands. Mapped areas are irregular in shape. They range from 10 to more than 100 acres in size, but are mostly about 50 acres.

Included with this soil in mapping are small eroded areas and areas of a soil that is similar to Heaton soil but has a surface layer less than 20 inches thick. Also included are small areas of Bastrop, Duffau, Nimrod, Patilo, and Windthorst soils.

Most of the acreage is used for crops. Some areas are used as pasture. The hazard of water erosion is slight, and the hazard of soil blowing is severe. Capability unit IIIe–4; Sandy range site; pasture group 9A.

Hensley Series

The Hensley series consists of shallow, nearly level to gently sloping, noncalcareous loamy soils on uplands. These soils formed in material weathered from limestone bedrock.

In a representative profile the surface layer is reddish-brown, mildly alkaline clay loam about 6 inches thick. The next 8 inches is reddish-brown, mildly alkaline clay. It is underlain by indurated limestone bedrock.

These soils are well drained. Runoff is slow. Permeability is slow, and the available water capacity is low.

Hensley soils are used mostly for range. A few areas are used as pasture.

Representative profile of Hensley clay loam in an area of Hensley complex, 0 to 3 percent slopes, 16 miles southwest of Weatherford, via U.S. Highway 80 and Interstate 20, then 3.5 miles south and 0.05 mile west on county road, 50 feet north of road:

A1—0 to 6 inches, reddish-brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate, medium, subangular blocky structure; hard, friable; limestone fragments, mostly 6 to 12 inches along the long axis, cover 10 percent of surface; mildly alkaline; clear, wavy boundary.

B2t—6 to 14 inches, reddish-brown (2.5YR 4/4) clay, dark reddish brown (2.5YR 3/4) moist; moderate, medium, subangular blocky structure; very hard, firm; 10 percent limestone fragments; mildly alkaline; abrupt, wavy boundary.

R—14 to 15 inches, indurated limestone bedrock.

The content of coarse limestone fragments ranges from none to 30 percent.

The A horizon is reddish brown or brown, and it is slightly acid to mildly alkaline.

The Bt horizon is reddish brown, dark reddish brown, red, or dark red. It is clay loam or clay and is neutral to moderately alkaline. It is clay loam or clay and is neutral to moderately mixed to be separated at the scale of mapping used.

Included with this unit in mapping is a soil along slope breaks that is similar to Hensley soils but is calcareous and shallower. Also included are areas of Purves soils in slightly concave positions, areas of a soil that is similar to Hensley soil but less red, and small areas of rock outcrop.

Most of the acreage is used as range. The hazard of water erosion is moderate. Several large limestone quarries have been opened. Capability unit VIs–1; Redland range site; pasture group 13A.

Krum Series

The Krum series consists of deep, nearly level to gently sloping, calcareous clayey soils on uplands. These soils formed in thick beds of calcareous clayey sediments.

In a representative profile the surface layer is very dark grayish-brown and dark grayish-brown calcareous clay about 24 inches thick. Below this is 20 inches of grayish-brown calcareous clay, then grayish-brown calcareous clay with common calcium carbonate concretions.

These soils are well drained. Runoff is slow to medium. Permeability is moderately slow, and the available water capacity is high.

Most areas of these soils are used for crops. Improved pasture has been established in some areas and some are used as range.

Representative profile of Krum clay, 1 to 3 percent slopes, northeast of Weatherford. From the courthouse in Weatherford, 4 miles east on U.S. Highway 180, 7 miles north on Farm Road 1707, 50 feet east of field gate on east side of road:

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) clay, very dark brown (10YR 2/2) moist; weak, fine and medium, subangular blocky structure; hard, firm; common fine roots; few fine cemented calcium carbonate concretions; calcareous, moderately alkaline; abrupt, smooth boundary.

A11—6 to 12 inches, very dark grayish-brown (10YR 3/2) clay, very dark brown (10YR 2/2) moist; moderate, medium, subangular blocky structure; hard, firm; few fine cemented calcium carbonate concretions; calcareous, moderately alkaline; gradual, wavy boundary.

A12—12 to 24 inches, dark grayish-brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; moderate, fine and medium, subangular blocky structure; very hard, firm; few fine roots and pores; few fine calcium carbonate concretions; calcareous, moderately alkaline; gradual, wavy boundary.

B2—24 to 44 inches, grayish-brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate, medium, subangular blocky structure; very hard, firm; few roots; few fine calcium carbonate concretions;

The B horizon is brown, light brown, grayish brown, or

angular blocky and granular structure; hard, fri-

is slow. Permeability is rapid, and the available water capacity is low. Depth to the water table is 5 to 8 feet.

Lincoln soils are used mostly as pasture or range. Many areas are used for recreation.

Representative profile of Lincoln loamy fine sand, in an area of Lincoln soils, frequently flooded, in a wooded pasture, approximately 16 miles southwest of Weatherford. From the south end of the Brazos River bridge on Farm Road 1543 at Dennis, east on a county road 0.63 mile, 0.44 mile north of road:

A1—0 to 7 inches, pale-brown (10YR 6/3) loamy fine sand, brown (10YR 4/3) moist; weak, medium, subangular blocky structure; soft, very friable; common fine roots; thin strata of silt loam and fine sand; calcareous, moderately alkaline; gradual, wavy boundary.

C—7 to 60 inches, very pale brown (10YR 8/3) fine sand,

2.1 miles, 50 feet west of push gate:

A1—0 to 10 inches, reddish-brown (5YR 4/4) loam, dark reddish brown (5YR 3/4) moist; weak, subangular blocky structure; slightly hard when dry, friable when moist; many fine roots and pores; few fine quartz pebbles; neutral; clear, wavy boundary.

B2t—10 to 25 inches, reddish-brown (2.5YR 5/4) clay, reddish brown (2.5YR 4/4) moist; moderate, fine and medium, subangular blocky structure; very hard when dry, firm when moist; few fine roots and pores; common, distinct clay films; few fine iron and manganese concretions; slightly acid; abrupt, wavy boundary.

R—25 to 27 inches, indurated platy limestone.

The content of coarse fragments throughout the soil ranges from 0 to 10 percent.

The A horizon is reddish brown, brown, or dark brown. It is 5 to 12 inches thick and is slightly acid to mildly alkaline.

The A horizon is grayish brown, dark grayish brown, brown, pale brown, or very pale brown and is gravelly clay loam, clay loam, or gravelly clay. Content of limestone fragments, mostly of pebble size, ranges from 5 to 35 percent. Depth to the R horizon is 3 to 10 inches.

MaC—Maloterre soils, 2 to 5 percent slopes. These gently sloping soils are on uplands. Mapped areas follow the contour of ridgetops. They range from 5 to more than 100 acres in size, but average about 40 acres.

Included with this soil in mapping are areas of valleys. Mapped areas are elongated and follow the contour of higher lying hills. They range from 5 to 100 acres in size, but average about 15 acres.

Included with this soil in mapping are small areas of May soils that have less than one percent slope and a few small rills and eroded places. Also included are areas of gently sloping Duffau, Weatherford, and Windthorst soils along upper slopes of ridges, small areas of Bunyan and Yahola soils near natural drains, and

light brownish gray. It is clay loam or sandy clay loam and is strongly acid to medium acid.

In places there is an underlying C horizon that is reddish-yellow to light-gray clay, sandy clay, sandy loam, or sand.

NdC—Nimrod fine sand, 1 to 5 percent slopes. This gently sloping soil is on uplands. Mapped areas are irregular to somewhat round in shape. They range from 10 to 300 acres in size, but average about 45 acres. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Heaton and Patilo soils on ridges; small areas of Duffau, Weatherford, and Windthorst soils along narrow ridges and more sloping areas; and small areas of Chaney and Selden soils. Also included are some areas of a soil that is similar to Nimrod soils but has a more clayey subsoil.

Most of the acreage is used for pasture. Some areas are used for crops and range. The hazard of water erosion is slight, but the hazard of soil blowing is severe. Capability unit IIIe–4; Sandy range site; pasture group 9A.

NdD—Nimrod fine sand, 5 to 8 percent slopes. This sloping soil is on uplands. Mapped areas are mostly round and encompass entire small hills and ridges. These areas range from 10 to 50 acres in size, but average about 20 acres.

The surface layer is grayish brown, slightly acid fine sand about 6 inches thick. The next 24 inches is light gray, slightly acid fine sand. Below this is 15 inches of red, strongly acid sandy clay loam mottled with light [illegible]

shoe Bend Road for 4.2 miles, east of road 350 feet from fence:

Ap—0 to 6 inches, brown (7.5YR 5/4) silt loam, brown (7.5YR 4/4) moist; weak, subangular blocky structure; slightly hard, friable; common fine roots and pores; calcareous, moderately alkaline; abrupt, smooth boundary.

C—6 to 60 inches, reddish-yellow (5YR 6/6) silt loam, yellowish red (5YR 5/6) moist; massive; slightly hard, friable; few fine roots and pores; few thin bedding planes that have textures of silty clay loam and silty clay; calcareous, moderately alkaline.

The A horizon is 6 to 16 inches thick. It is yellowish red, reddish brown, light brown, or brown.

The underlying C horizon is reddish yellow, yellowish red, reddish brown, or brown. It is silt loam, silty clay loam, or loam and is moderately alkaline and calcareous.

Nr—Norwood silt loam. This nearly level soil is on bottom lands along the Brazos River. Mapped areas are weakly concave, broad or elongated flood plains. They range from 10 to 130 acres in size, but average about 55 acres. Slopes are 0 to 1 percent.

Included with this soil in mapping are small areas of Ships soils in depressions, small areas of Yomont and Lincoln soils, and small areas of Bastrop and Hardeman soils along slightly higher positions.

This soil is used mostly for crops. Some areas are used as improved pasture. The hazard of water erosion is slight. The soil is flooded about once in 10 to 15 years. Some areas are being developed for recreation. Capability unit I–1; Loamy Bottom Land range site; pasture group 2A.

Owens soils are used mostly as range. They are not suited to cultivated crops.

Representative profile of Owens clay in an area of Owens-Truce complex, 5 to 30 percent slopes, in a pasture, 2 miles south of Farm Road 1543 river bridge at Dennis, then 5.4 miles west on county road to pas-

percent is Truce soils, and 6 percent is included soils. Owens soils dominate the complex and have the stronger, convex slopes. Truce soils are along less sloping foot slopes and near upper slope breaks. Owens and Truce soils are both in every mapped area. They occur in patterns so intricately mixed that they can

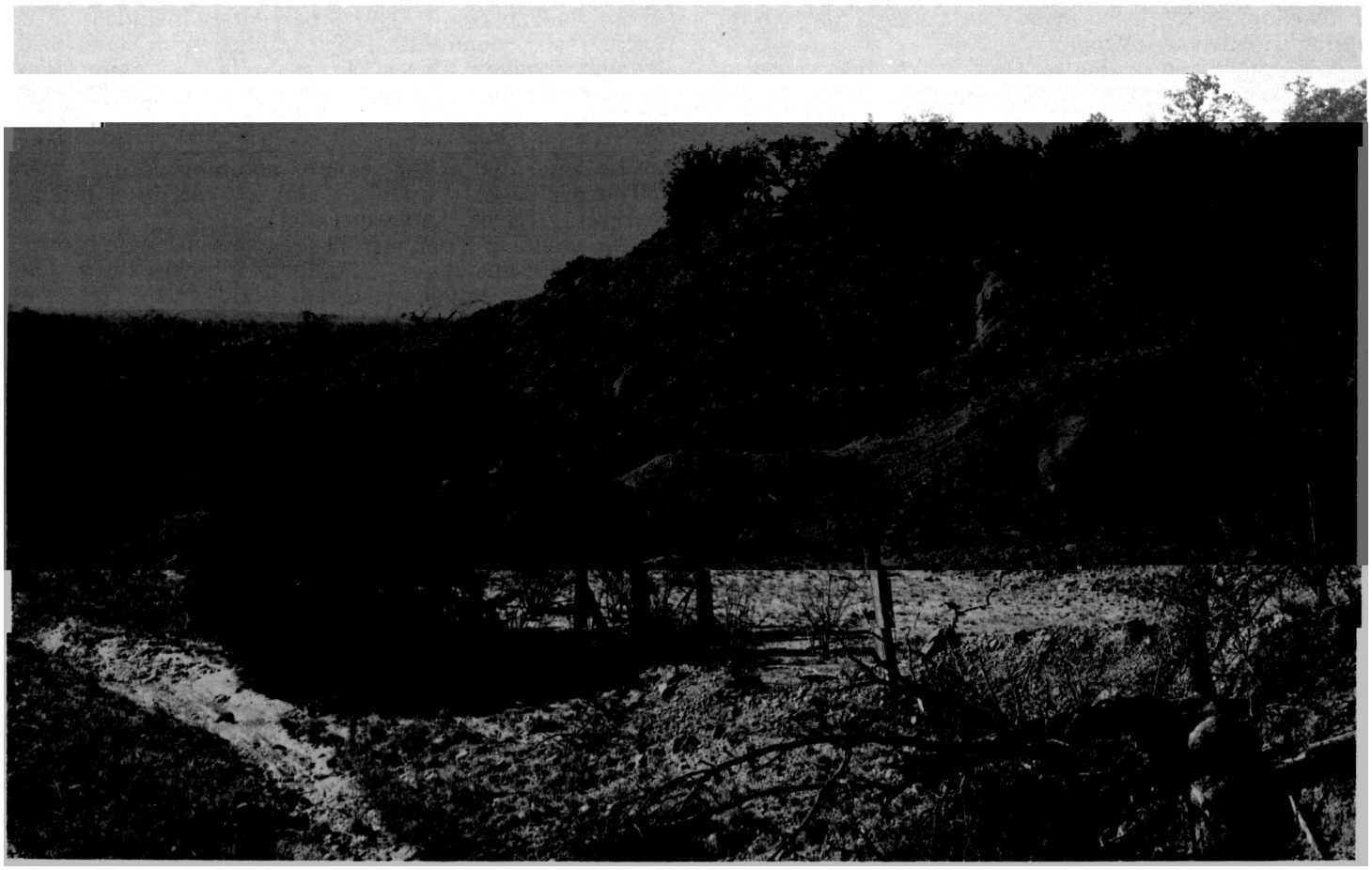


Figure 13.—**Landscape of Owens-Truce complex, 5 to 30 percent slopes.**

brownish gray (10YR 6/2) and light yellowish brown (2.5Y 6/4); weak, coarse, blocky structure; hard, firm; common, prominent clay films; medium acid.

The A horizon is 40 to 70 inches thick. The A1 horizon is very pale brown, grayish brown, pale brown, brown, or light brown. The A2 horizon is light yellowish brown, light brown, very pale brown, light gray, or white. It is fine sand or loamy fine sand and is neutral to medium acid.

The Bt horizon is dominantly yellowish red or red and has prominent mottles in shades of light yellowish brown

mapped areas. Patilo soils are along lower slopes and are dominant in larger areas. The other soils are mostly along undulating ridges in patterns so intricately mixed that they cannot be separated from the Patilo soils. A few areas of Patilo soils that have slopes of as much as 10 percent are also included.

This mapping unit is used mainly as range and pasture. A few small areas are used for crops. A perched water table is at a depth of 3 to 7 feet in some areas

Representative profile of Purves clay, 1 to 3 percent slopes, in native range, 5.5 miles north of the courthouse in Weatherford via Farm Road 51, then west on a county road for 0.3 mile, then north 0.3 mile, 100 feet west of road:

extent. The soils and urban areas are so intricately mixed that it is not practical to separate them at the scale of mapping used.

In undisturbed areas the Purves soil has a surface layer of dark grayish-brown clay about 10 inches

horizons combined are 40 to more than 60 inches thick. The A1 horizon is brown or grayish brown. The AC horizon is yellowish brown, brown, or grayish brown.

The C horizon is brown, yellowish brown, and grayish brown and is clay, shaly clay or shale.

ReB—Reap clay, 1 to 3 percent slopes. This gently sloping soil is on upland plains. Mapped areas are somewhat round to irregular in shape, and they are along lower slopes of clayey hills. They range from 10 to 100 acres in size, but average about 20 acres.

Included with this soil in mapping are small areas of Chaney, Owens, Thurber, and Truce soils. Chaney soils are along upper slopes of narrow ridges. Owens and Truce soils are along breaks. Thurber soils are in weak depressions on lower slopes. Also included is a soil that is similar to Reap soil but has a redder color.

Most of the acreage is used as range. A few areas are used for crops. The hazard of water erosion is moderate. Capability unit IIIe–3; Clay Flat range site; pasture group 7A.

Selden Series

The Selden series consists of deep, gently sloping, noncalcareous sandy soils on uplands. These soils formed in loamy materials.

In a representative profile the surface layer is grayish-brown loamy fine sand about 4 inches thick. The next 14 inches is pale-brown loamy fine sand. Below this is 10 inches of brownish-yellow sandy clay loam that has grayish mottles. Below this, to a depth of 65 inches [illegible]

is brownish yellow, yellow, yellowish red, or reddish yellow. Mottles are in shades of red, yellow, or gray.

Depth to the C horizon is more than 60 inches.

SdC—Selden loamy fine sand, 1 to 5 percent slopes. This gently sloping soil is on upland plains. Areas are irregular to oval shaped. They range from 5 to 100 acres in size, but average about 35 acres. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Duffau and Windthorst soils on ridges; small areas of Chaney, Nimrod, and Patilo soils along lower positions; a few small eroded areas; isolated small gullies; and a few areas that have a slope of as much as 8 percent.

Most of the acreage was once used for crops. Much is now used as pasture. The hazard of water erosion is slight, and the hazard of soil blowing is severe. Capability unit IIIe–4; Sandy range site; pasture group 9A.

SdC2—Selden loamy fine sand, 1 to 5 percent slopes, eroded. This gently sloping eroded soil is on uplands. Mapped areas are irregular in shape, and often follow the contour of slope and old field boundaries. Soil blowing and water erosion have removed much of the surface layer, and only 4 to 10 inches remain in most areas. Some areas have small gullies and rills 1 to 4 feet deep and 5 to 20 feet wide, mostly crossable with farm machinery. Areas range from 10 to 80 acres in size, but average about 30 acres.

The surface layer is pale-brown loamy fine sand about 8 inches thick. The next 17 inches is yellowish-red and gray sandy clay loam. Some of the lower layer has been mixed with the surface layer in most

thorst soils. Chaney and Nimrod soils are in less sloping concave areas; Duffau, Weatherford, and Windthorst soils are along ridges and breaks.

Many areas were disturbed for building construction. Cuts and fills were made for site leveling. Cuts

weakly concave bottom land along the Brazos River. Mapped areas are irregular in shape. They range from 10 to 500 acres in size, but average about 40 acres.

Included with this soil in mapping are areas of Yomont, Norwood, and Hardeman soils. Also included

Depth to films, threads, or soft masses of calcium carbonate is 15 to 28 inches.

The A horizon is dark grayish brown, very dark grayish brown, dark brown, or brown, and it is slightly acid to mildly alkaline.

The Bt horizon is grayish brown, light olive brown, brown, dark grayish brown, or very dark grayish brown. It is clay, sandy clay, or clay loam and has a clay content of 35 to 55 percent. It is neutral to moderately alkaline.

Depth to the C or Cca horizon is 30 to 60 inches. These horizons are very pale brown, pale brown, or olive gray and are clay loam, clay, or shale.

ThB—Thurber clay loam, 1 to 3 percent slopes. This gently sloping soil is in weakly concave valleys. Mapped areas are irregular to round in shape. They range from 5 to 50 acres in size, but average about 20 acres.

Included with this soil in mapping are small areas of Bonti, Chaney, and Truce soils along narrow ridges; small areas of Blanket and Hassee soils in slightly higher positions; and areas of Thurber soil with slopes of less than one percent in slight depressions. Also included are areas of a soil that is similar to Thurber soil but has a sandy loam, silt loam, and loam surface layer.

Most of the acreage was once used for crops, but pasture and range are now established in many areas. The hazard of water erosion is moderate. Capability unit IIIe–3; Claypan range site; pasture group 7H.

Truce Series

The Truce series consists of deep, gently sloping to steep, noncalcareous loamy soils on uplands. These soils formed in loamy to clayey materials weathered from shales and sandstone.

In a representative profile the surface layer is brown, slightly acid fine sandy loam about 8 inches thick. The next 16 inches is reddish brown, slightly acid clay. Below this is 24 inches of brown mildly alkaline clay. The underlying material is pale-olive moderately alkaline shaly clay.

These soils are well drained. Runoff is rapid. Permeability is slow, and the available water capacity is horizons are brown, pale brown, yellowish brown, or dark grayish brown. The A2 horizon, where present, is 1 or 2 units of value lighter than the A1 horizon. The A horizon is slightly acid to neutral. Some profiles contain up to 20 percent sandstone fragments.

The B21t horizon is reddish brown, yellowish red, or dark reddish brown. The B22t horizon is brown, strong brown, yellowish brown, reddish yellow, reddish brown, or light olive brown. The B horizon is slightly acid to moderately alkaline and is clay, clay loam, or sandy clay.

Depth to the C horizon is 40 to 60 inches. This horizon is clayey shale, shaly clay, or shale and is pale olive, olive, gray, olive yellow, or light olive brown. Strata of sandstone as well as sandstone fragments are common in some profiles.

TrB—Truce fine sandy loam, 1 to 3 percent slopes. This gently sloping soil is on upland foot slopes. Mapped areas follow the contour of hills. They range from 5 to more than 100 acres in size, but average about 35 acres. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Bonti, Chaney, Hassee, and Thurber soils. Bonti soil occupies the higher ridges. Chaney soils are along undulating ridges. The less sloping Hassee and Thurber soils are on slightly depressed lower slopes. Also included, in the southwest part of the county near Dennis, is a soil that is similar to Truce soil but is redder and more permeable.

Most of the acreage was cultivated at one time but is now in pasture and range. The hazard of water erosion is moderate. Capability unit IIe–2; Tight Sandy Loam range site; pasture group 8A.

TrC—Truce fine sandy loam, 3 to 5 percent slopes. This gently sloping soil is on upland foot slopes. Mapped areas are irregular in shape and follow the contour of associated hills. They range from 5 to 40 acres in size, but average about 20 acres.

The surface layer is brown fine sandy loam about 8 inches thick. The next 12 inches is reddish-brown clay. Below this is about 22 inches of brown clay. The underlying material is pale-olive shaly clay.

inches of yellowish-brown clay. The underlying material is gray shaly clay.

Included with this soil in mapping are small areas of Bonti, Chaney, Hassee, and Owens soils. Bonti soils are along narrow ridges. Chaney soils are along lower slopes in weak depressions. Owens soils occupy small hillsides. Also included were areas of uneroded Truce soils, some stony areas, and some areas of a soil that is similar to Truce soil but is redder and is more permeable.

Most of the acreage was once cultivated but is now used as range or is idle. The hazard of water erosion is severe. Capability unit IIIe–9; Tight Sandy Loam range site; pasture group 8A.

TrD2—Truce fine sandy loam, 5 to 8 percent slopes, eroded. This sloping eroded soil is on upland hills. More than 50 percent of the surface layer has been removed through erosion and a few areas have small gullies. Mapped areas range from 10 to more than 100 acres in size, but average about 50 acres.

The surface layer is pale-brown, slightly acid fine sandy loam about 4 inches thick. Next, in sequence downward, is 16 inches of reddish brown neutral clay, 15 inches of brown mildly alkaline clay, and 10 inches of light olive brown moderately alkaline clay. The

percent slopes, 4.5 miles southwest of Weatherford. From the junction of U.S. Highways 180 and 80 in Weatherford, southwest 4.5 miles on U.S. Highway 80, 100 feet north of fence along Interstate Highway 20 access road:

Ap—0 to 9 inches, brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate, medium, sub-

of Aledo, Bolar, Krum, Lamar, and Purves soils. Aledo, Bolar, and Purves soils are along upper slopes and ridges. Krum soils are along lower slopes. Lamar soils are along small knobs and hillsides. Also included are a few eroded areas of Venus soils.

Most of the acreage is used as range. Some areas are used for crops and pasture. The hazard of water

Weatherford Series

The Weatherford series consists of deep, gently sloping to sloping, noncalcareous sandy to loamy soils on uplands. These soils formed in interbedded loamy materials and weakly cemented sandstone.

In a representative profile the surface layer is brown, slightly acid fine sandy loam about 4 inches thick. The next 6 inches is light brown, slightly acid fine sandy loam. Below this is 35 inches of yellowish-red and reddish-yellow, slightly acid sandy clay loam. The underlying material is pink, slightly acid, weakly cemented sandstone (fig. 15).

These soils are well drained. Runoff is medium. Permeability is moderate, and the available water capacity is high.

Weatherford soils are used mostly as range and pasture. Some areas are in orchards and [illegible]

A1—0 to 4 inches, brown (7.5YR 5/2) fine sandy loam, dark brown (7.5YR 4/2) moist; weak, medium, granular structure; slightly hard, very friable; many fine roots and pores; slightly acid; clear, smooth boundary.

A2—4 to 10 inches, light-brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak, fine, subangular blocky structure; slightly hard, very friable; common fine roots and pores; slightly acid; clear, wavy boundary.

B21t—10 to 28 inches, yellowish-red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate, medium, subangular blocky structure; very hard, friable; common fine roots and pores; patchy clay films on surfaces of peds; slightly acid; gradual, wavy boundary.

B22t—28 to 45 inches, reddish-yellow (5YR 6/8) sandy clay loam, yellowish red (5YR 5/8) moist; weak, coarse, subangular blocky structure; very hard, friable; few patchy clay films on surfaces of peds; slightly acid; clear, wavy boundary.

A2—4 to 10 inches, light yellowish-brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable; slightly acid; abrupt, smooth boundary.

B21t—10 to 18 inches, red (2.5YR 4/6) sandy clay, red (2.5YR 4/6) moist; strong, fine and medium, blocky structure; extremely hard, very firm; nearly continuous clay films on faces of most peds; medium acid; gradual, smooth boundary.

B22t—18 to 38 inches, yellowish-red (5YR 5/6) sandy clay, yellowish red (5YR 4/6) moist; many, medium, faint, strong-brown (7.5YR 5/6) mottles, many, distinct, brownish-yellow (10YR 6/6) mottles; moderate, coarse, blocky structure; extremely hard, very firm; common, discontinuous clay films on faces of peds; medium acid; gradual, wavy boundary.

B3t—38 to 50 inches, coarsely and prominently mottled red (2.5YR 4/8), yellowish-brown (10YR 5/8), and pale-brown (10YR 6/3) sandy clay loam; thin lenses and pockets of sandy loam; weak, coarse, blocky structure; extremely hard, very firm; slightly acid; gradual, wavy boundary.

C—50 to 60 inches, light-gray (10YR 7/2) clay; prominent, coarse mottles of red (2.5YR 5/6) and yellow (2.5Y 5/6); massive; slightly acid.

The A horizon is 6 to 19 inches thick. It is fine sandy loam to loamy fine sand and is slightly acid to neutral. The A1 horizon is light brownish gray, grayish brown, light yellowish brown, pale brown, or brown. The A2 horizon is light gray, light brownish gray, pale brown, light yellowish brown, or very pale brown.

The B2t horizon is red, reddish brown, or yellowish red. It is sandy clay or clay and is slightly acid to medium acid. Base saturation in some part of the Bt horizon is over 75 percent. The lower part of the B2t horizon is mottled in

downward, is 4 inches of pale-brown loamy fine sand, 18 inches of light-brown fine sandy loam, and 6 inches of light-brown sandy clay loam. Below this is light-brown fine sandy loam.

These soils are well drained. Runoff is slow. Permeability is moderately rapid, and the available water capacity is medium.

Yahola soils are used mostly as pasture. A few areas are range.

Representative profile of Yahola fine sandy loam, in an area of Yahola and Bunyan soils, frequently flooded, 2 miles north of intersection of U.S. Highway 180 and Farm Road 51 in Weatherford, then 1 mile east on county road, 250 feet south of bridge over Willow Creek:

A1—0 to 8 inches, brown (7.5YR 5/2) fine sandy loam, dark brown (7.5YR 4/2) moist; weak, subangular blocky structure; slightly hard, friable; calcareous, moderately alkaline; abrupt, smooth boundary.

C1—8 to 12 inches, pale-brown (10YR 6/3) loamy fine sand,

of Bosque, Frio, and Lincoln soils. Bosque and Frio soils are in the lower, slightly concave areas along the outer edges of mapped areas. Lincoln soils are along stream banks. Also included are small areas of a soil that is similar to Bunyan soil but is calcareous and a soil on creek banks that has a slope of as much as 20 percent.

Most of the acreage is used as pasture and range. Because of flood hazards, these soils are not used for crops. Capability unit Vw–3; Loamy Bottom Land range site; pasture group 2A.

Yomont Series

The Yomont series consists of deep, nearly level, calcareous loamy soils on bottom lands. These soils formed in calcareous stratified loamy alluvium.

In a representative profile the surface layer is yellowish-red, calcareous very fine sandy loam about 8 inches thick. The next 37 inches is reddish-yellow,

The hazard of water erosion is slight, and the hazard of soil blowing is moderate. Capability unit IIe-4; Loamy Bottom Land range site; pasture group 2A.

Ym—Yomont very fine sandy loam, frequently flooded. This nearly level soil is on bottom lands. Slopes

nated by Roman numerals I to VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict

graph; and the Arabic numeral specifically identifies the capability unit within each subclass.

On the following pages the capability units in Parker County are described and suggestions for the

soil has a surface layer of fine sandy loam and lower layers of sandy clay loam. The available water capacity is high. The hazard of water erosion is slight. The hazard of soil blowing is slight.

or loam. The available water capacity is high. The

mulch tillage also helps to conserve moisture.

helps in maintaining soil tilth. Varying the plow depth helps to eliminate compaction. Terraces and contour farming are needed to help control water erosion. Grassed waterways and diversions are needed in places to control runoff.

trol soil blowing. Terraces and grassed waterways are needed in places to control runoff.

Maintaining and improving soil tilth, soil structure, and organic-matter content are the main management objectives. Use of a cropping system that includes high-residue crops helps improve tilth, structure, and organic-matter content. Varying the plow depth helps eliminate compaction. Grassed waterways and diversions are needed in places to control runoff from higher lying areas.

CAPABILITY UNIT IIIe-1

[redacted]

needed to help control erosion. Grassed waterways and diversions are needed in places to control runoff.

CAPABILITY UNIT IIIe-4

This capability unit consists of deep, moderately permeable to slowly permeable, gently sloping soils on uplands. The surface layer is loamy fine sand or fine sand, and the lower layers are sandy clay loam, sandy clay, or clay. The available water capacity is low to high. The hazard of water erosion is slight, and the [redacted]

Peanuts and truck crops are the main crops. Some acreage is in oats and forage sorghum.

Maintaining and improving soil tilth, conserving moisture and controlling soil blowing are the main management objectives. Use of a cropping system that includes high-residue crops and close spaced soil-improving crops helps to improve tilth, conserve moisture, and control soil blowing. Stripcropping and use of cover crops also help to control soil blowing.

CAPABILITY UNIT IIIe-8

The only soil in this capability unit is Lindy loam, 1 to 3 percent slopes, a moderately deep, slowly permeable, gently sloping soil on uplands. The surface layer is loam. The lower layers are clay and rest on [illegible]

serve moisture, and control soil blowing. Stripcropping and use of fertilizers and crop residue also help control soil blowing.

CAPABILITY UNIT IIIw-1

The only soil in this capability unit is Hassee fine sandy loam, 0 to 1 percent slopes, a deep, very slowly permeable, nearly level soil on uplands. The surface layer is fine sandy loam, and the lower layers are loam, clay loam, or clay. The available water capacity is high. The hazard of water erosion is slight. This soil is hard and crusty when dry. Some areas receive extra water.

Forage sorghum and small grains are the main crops. Some acreage is in peanuts.

Maintaining and improving soil tilth and conserving

clay loam. The available water capacity is low. The hazard of water erosion is moderate. The hazard of soil blowing is severe.

Forage sorghums, small grains, and peanuts are the main crops. Some areas are in truck crops.

Maintaining and improving soil tilth, conserving moisture, and controlling soil blowing and water erosion are the main management objectives. Use of a cropping system that includes high-residue crops and close spaced soil-improving crops helps improve tilth, conserve moisture, and control soil blowing. Strip-

hazard of water erosion is slight. The hazard of soil blowing is slight to moderate. These soils are subject to frequent flooding.

The hazard of flooding makes the soils of this unit unsuitable for cultivation. Most areas are used as pasture or range. Some areas are used for recreation.

CAPABILITY UNIT VIe-1

This capability unit consists of deep, moderately permeable and moderately slowly permeable, gently

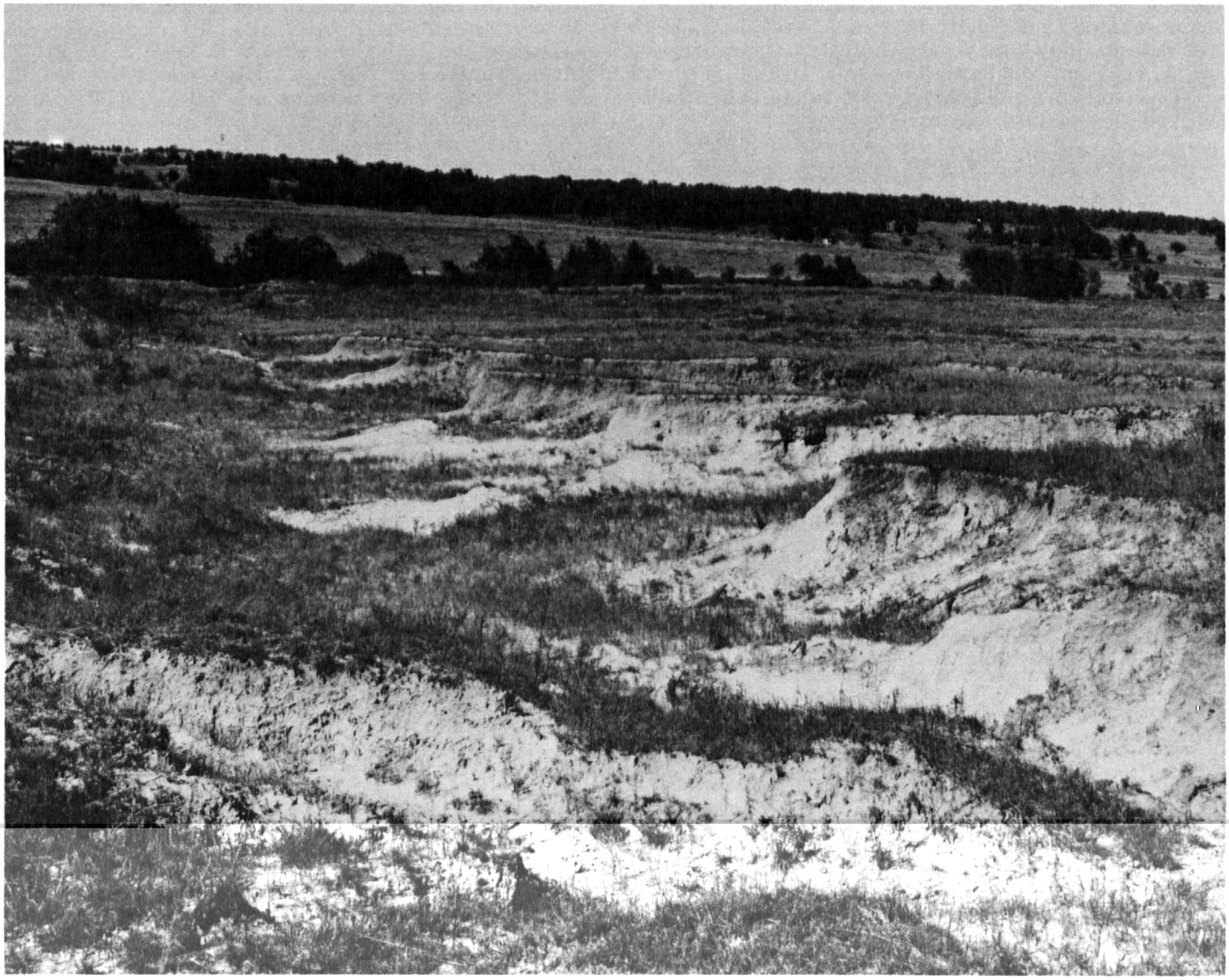


Figure 18.—**Natural vegetation on Windthorst soils, 1 to 8 percent slopes, severely eroded.**

CAPABILITY UNIT VIs-2

The only soils in this capability unit are Bonti and [redacted] water capacity is low to high. The hazard of water erosion is severe.

[redacted]

soils on uplands. The surface layer is clay, fine sandy loam, or stony fine sandy loam, and the lower layers are clay or shaly clay. The available water capacity is low to medium. The hazard of water erosion is severe.

These soils are suitable only for range and wildlife.

Predicted Yields

Table 2 lists predicted yields of the principal crops grown in the county. The predictions are based on estimates made by farmers, soil scientists, and others who have knowledge of yields in the county and on information taken from research data. The predicted yields are average yields per acre that can be expected by good commercial farmers at the level of management which tends to produce the highest economic returns.

The yields are given for arable dryland soils. Not included in this table are soils that are used only for range or recreation.

Crops other than those shown in table 2 are grown in the county, but their predicted yields are not included because their acreage is small or reliable data on yields are not available.

The predicted yields can be expected if the following management practices are used:

1. Rainfall is effectively used and conserved.
2. Surface and/or subsurface drainage systems are installed.
3. Crop residue is managed to maintain soil tilth.
4. Minimum but timely tillage is used.
5. Insect, disease, and weed control measures are consistently used.
6. Fertilizer is applied according to soil tests and crop needs.
7. Adapted crop varieties are used at recommended seeding rates.

TABLE 2.—*Predicted average yields per acre of principal crops*—Continued

Soil	Oats	Peanuts	Forage sorghums	Tame pasture
	Bu	*Lb*	*AUM*[1]	*AUM*[1]
Venus clay loam, 3 to 5 percent slopes	45	---	6.5	6.0
Venus clay loam, 5 to 8 percent slopes	40	---	5.5	5.5
Windthorst loamy fine sand, 1 to 5 percent slopes	30	1,200	5.0	6.0
Windthorst fine sandy loam, 1 to 3 percent slopes	40	1,200	5.0	5.5
Windthorst fine sandy loam, 3 to 5 percent slopes	35	850	4.5	5.0
Windthorst fine sandy loam 1 to 5 percent slopes, eroded	30	800	4.0	4.5
Windthorst fine sandy loam, 5 to 8 percent slopes	25	800	4.0	4.5
Yahola and Bunyan soils, frequently flooded	---	---	---	7.0
Yomont very fine sandy loam	40	---	6.5	7.0
Yomont very fine sandy loam, frequently flooded	---	---	---	7.0

[1] Animal-unit-month, the number of months in a year that an acre will provide grazing for one animal unit (one cow, steer, or horse or seven sheep or goats) without injury to the pasture.

Pasture and Hayland

Well managed pasture and hayland are essential to the maintenance of a balanced forage program in the county.

wide system. Not all of the groups in the statewide system are represented in Parker County; therefore, the numbers are not consecutive.

The pasture group of any soil can be found by referring to the "Guide to Mapping Units" at the back

Figure 19.—**Coastal bermudagrass on Bunyan fine sandy loam, occasionally flooded.**

PASTURE GROUP 3A

This group consists only of Lincoln soils, frequently flooded. These are deep, sandy, nearly level to gently sloping soils on bottom land. Permeability is rapid, and the available water capacity is low. Areas are frequently flooded.

Seedings are difficult to establish because of the cutting action of blowing sand. Fertilizer needs to be added for sustained forage production, and applications should be split and applied at planned intervals throughout the growing season.

These soils are best suited to warm-season forage. Seedbeds are difficult to establish because the soil becomes puddled if it is grazed when wet. Fertilizer needs to be added for sustained forage production.

This soil is well suited to cool- and warm-season forage. The production potential is high for improved bermudagrass, johnsongrass, kleingrass, King Ranch bluestem, and hardinggrass.

PASTURE GROUP 7C

This group consists of deep to moderately deep, clayey to loamy, nearly level to gently sloping soils on uplands. Permeability is moderate to slow, and the

loamy, sloping soils on uplands. Permeability is moderate, and the available water capacity is medium to high.

Fertilizer needs to be added for sustained forage production. Steep slopes make improved pastures difficult to establish.

These soils are well suited to cool- and warm-season forage. Slope and good drainage, however, make them better suited to cool-season plants. The production potential is medium for improved bermudagrass, johnsongrass, kleingrass, and King Ranch bluestem. It is high for hardinggrass.

PASTURE GROUP 7H

This group consists only of Thurber clay loam, 1 to 3 percent slopes. It is a deep, loamy, gently sloping soil on uplands. Permeability is very slow, and the available water capacity is high.

Soil compaction is a problem if this soil is grazed when wet. Seedbeds are difficult to prepare because the texture is clayey. Grass is difficult to establish because of surface crusting. Fertilizer needs to be added for sustained forage production.

This soil is well suited to cool- and warm-season forage. The production potential is high for improved bermudagrass, johnsongrass, kleingrass, and hardinggrass. It is medium for King Ranch bluestem.

PASTURE GROUP 8A

This group consists of deep to moderately deep, loamy, nearly level to sloping soils on uplands. Permeability is moderately slow [illegible]

hazards to establishing grasses. Fertilizer needs to be added for sustained forage production.

These soils are well suited to cool- and warm-season forage. The production potential is high for improved bermudagrass, johnsongrass, kleingrass, hardinggrass, and weeping lovegrass.

PASTURE GROUP 9A

This group consists of deep, sandy, gently sloping to sloping soils on uplands. Permeability is moderate to slow, and the available water capacity is low to high.

Seedling grasses are difficult to establish because of the cutting action of blowing sand and the difficulty of obtaining a firm seedbed. Fertilizer needs to be added for sustained forage production, and applications should be split and applied at planned intervals throughout the growing season.

These soils are best suited to warm-season forage. The production potential is high for improved bermudagrass and weeping lovegrass (fig. 20).

PASTURE GROUP 9B

This group consists only of Patilo complex, 1 to 5 percent slopes. These are deep, sandy, gently sloping soils on uplands. Permeability is moderately slow, and the available water capacity is low.

Seedling grasses are difficult to establish because of the cutting action of blowing sand and the difficulty of obtaining a firm seedbed. Fertilizer needs to be added for sustained forage production, and applications should be split and applied at planned intervals throughout the growing season.

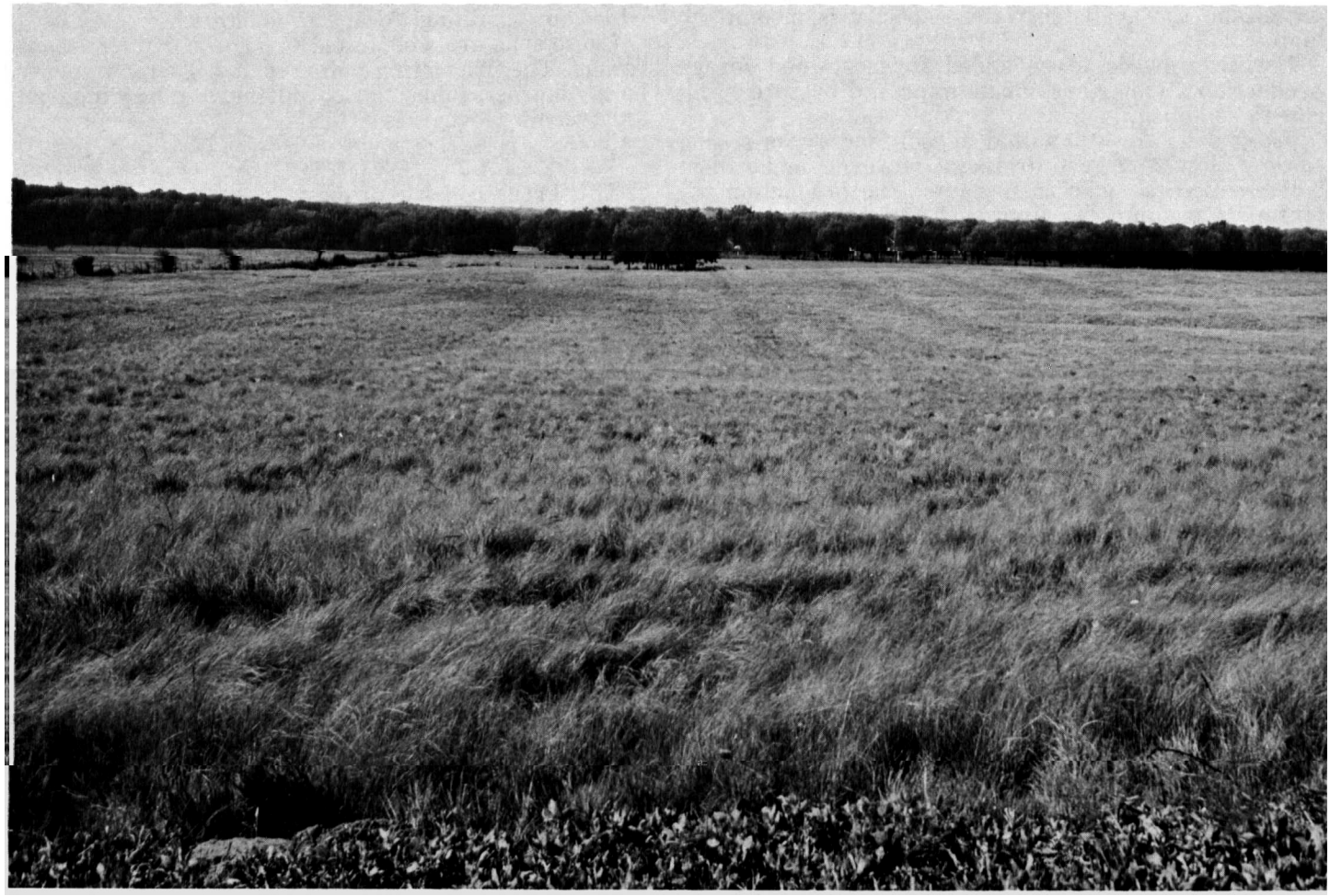


Figure 20.—Weeping lovegrass pasture on Selden loamy fine sand, 1 to 5 percent slopes.

increasers after the climax vegetation has been reduced by grazing. Many are annual weeds, some are shrubs that have some grazing value, but others have little value for grazing.

Four range condition classes are used to indicate the degree of departure from the potential, or climax, vegetation caused by grazing or other uses. The classes show the present condition of the native vegetation on a range site in relation to the native vegetation that could grow there.

A range is in excellent condition if 76 to 100 percent of the vegetation is of the same kind as that in the climax stand. It is in good condition if the percentage is 51 to 75; in fair condition if the percentage is 26 to 50; and in poor condition if the percentage is 25 or less.

Range condition is judged according to standards that apply to the particular range site. It expresses the present kind and amount of vegetation in relation to the climax plant community for that site.

Potential forage production depends on the range site. Current forage production depends on the range condition and the moisture available to plants during their growing season.

The main objective of good range management is to keep range in excellent or good condition. If this is done, water is conserved, yields are improved, and the soils are protected. The problem, however, is recognizing important changes in the kind of cover on a range site. Changes take place gradually and can be misinterpreted or overlooked. Growth encouraged by heavy rainfall may indicate that the range is in good condition, when actually the cover is weedy and the long-term trend is toward lower production. On the other hand, range that has been closely grazed for short periods under the supervision of a careful manager, may have a degraded appearance that temporarily conceals its quality and ability to recover.

to 4,000 pounds of air-dry herbage per acre annually, depending on rainfall. About 90 percent is forage for cattle, sheep, or goats.

If the site is grazed too heavily, vine-mesquite, white tridens, Canada wildrye, and meadow dropseed decrease. Continued overgrazing results in an invasion of hairy tridens, Texas grama, lotebush, tasajillo, and upright prairie coneflower. Mesquite invades readily. In years of above-normal rainfall broomweed grows in fall, winter, and spring.

CLAY LOAM RANGE SITE

The slowly permeable to moderately permeable, nearly level to sloping, deep to moderately deep soils of this site are on uplands. These soils have a surface layer of clay or clay loam and lower layers of clay, silty clay loam, or clay loam. The available water capacity is medium to high. The hazard of water erosion is slight to

The climax plant community is an open prairie of tall grass interspersed with some mid grasses. Woody species such as elm, pecan, and hackberry are along the small streams. The approximate species composition, by weight, is 20 percent little bluestem; 15 percent indiangrass; 10 percent big bluestem; 10 percent side-oats grama; 5 percent silver bluestem; 5 percent meadow dropseed; 5 percent Texas wintergrass; 5 percent Texas bluegrass; 5 percent Canada wildrye; 5 percent elm, pecan, hackberry, live oak, and other woody species; and 15 percent Engelmann daisy, bundleflowers, prairieflowers, maximilian sunflower, dotted gayfeather, compass plant, and other desirable forbs.

If the site is in excellent condition, it produces 3,000 to 6,500 pounds of air-dry herbage per acre annually, depending on rainfall. About 95 percent is forage for cattle, sheep, or goats.

If the site is grazed too heavily, indiangrass and big

mann daisy, greenthread, catclay sensitivebrier, maximilian sunflower, western ragweed, and other forbs.

If the site is in excellent condition, it produces 2,500 to 3,500 pounds of air-dry herbage per acre annually, depending on rainfall. About 95 percent is used as forage for cattle, sheep, or goats.

If the site is grazed too heavily, silver bluestem, [illegible] percent live oak, post oak, and a few other woody species; and 5 percent forbs, such as maximilian sunflower, bush sunflower, Engelmann daisy, dotted gayfeather, sagewort, bundleflowers, western ragweed, and heath aster.

This site produces approximately 6,000 pounds of air-dry herbage per acre annually if growing conditions are favorable and 2,000 pounds or less [illegible]

bluestem; 25 percent side-oats grama, meadow dropseed, Canada wildrye, vine-mesquite, and tall dropseed; 10 percent pecan, elm, and live oak; and 5 percent Engelmann daisy, trailing wild bean, maximilian sunflower, heath aster, and Baldwin ironweed.

This site produces approximately 3,500 to 7,000 pounds of air-dry herbage per acre annually, depending on rainfall. Approximately 90 percent is forage for cattle, sheep, or goats.

If the site is grazed too heavily, big bluestem and indiangrass decrease. Little bluestem, side-oats grama, and tall dropseed at first increase and then decrease as other mid grasses increase. Continued overgrazing results in a dominant cover of buffalograss, meadow

post oak and blackjack oak; 5 percent Texas ash, greenbrier, cedar elm, skunkbush sumac, elbowbush, and bumelia; and 5 percent Engelmann daisy, western ragweed, bundleflower, and prairie-clover.

If the site is in excellent condition, it produces 2,000 to 3,500 pounds of air-dry herbage per acre annually, depending on rainfall. About 80 percent is forage for cattle, sheep, or goats.

If the site is grazed too heavily, big bluestem, indiangrass, and sand lovegrass decrease. Little bluestem and mid grasses at first increase, but then decrease under continued overgrazing; oak, skunkbush, greenbrier, three-awn, red lovegrass, sand dropseed, ragweed, and silverleaf nightshade dominate the site, and

bumelia, poison oak, pricklyash, and hackberry; and 5 percent trailing wild bean, lespedeza, erect dayflower, and dalea.

If the site is in excellent condition, it produces 2,500 to 4,500 pounds of air-dry herbage per acre annually, depending on rainfall. About 80 percent is forage for

5 percent Texas wintergrass; 5 percent hairy dropseed; 5 percent silver bluestem; 5 percent live oak, elm, elbowbush, and bumelia; and 5 percent dotted gayfeather, Engelmann daisy, western ragweed, and prairie-clover.

If the site is in excellent condition, it produces 2,000 to 3,000 pounds of air-dry herbage per acre in a well

alfalfa, bigtop dalea, white milkwort, prairie-clover, and dotted gayfeather.

If the site is in excellent condition, it produces 1,000 to 3,000 pounds of air-dry herbage per acre annually, depending on rainfall. About 85 percent is forage for cattle, sheep, or goats.

If the site is too heavily grazed, big and little bluestem, indiangrass, and side-oats grama decrease. When the site is in poor condition, Texas grama, perennial three-awn, queensdelight, hairy tridens, and red grama are dominant. Juniper and Texas oak readily increase and form a canopy of as much as 40 to 60

If the site is too heavily grazed, tall grasses decrease. When the site is in poor condition, side-oats grama decreases and perennial three-awn, red grama, hairy tridens, buffalograss, broomweed, and graygold aster are dominant.

Wildlife [4]

Soils directly influence the kind and amount of vegetation and the amount of water available, and in this way indirectly influence the kinds of wildlife that can live in an area. Soil properties that affect the

soil useful to crops, (2) surface texture, (3) available

TABLE 3.—*Suitability of soils for wildlife habitat elements and kinds of wildlife*

Soil series and	Elements of wildlife habitat						Kind of wildlife		
	Grain	Domestic grasses	Wild herba-	Shrubs	Wetland plants	Shallow water developm	Openland	Range-	Wetland

TABLE 3.—*Suitability of soils for wildlife habitat elements and kinds of wildlife*—Continued

Soil series and map symbols	Elements of wildlife habitat						Kind of wildlife		
	Grain and seed crops	Domestic grasses and legumes	Wild herbaceous plants	Shrubs	Wetland plants	Shallow water developments	Openland	Rangeland	Wetland
Patilo: PaC	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
Purves: PcB, PcC, PuC	Fair	Good	Poor	Fair	Poor	Very poor.	Fair	Poor	Very poor.
Reap: ReB	Fair	Good	Poor	Good	Poor	Very poor.	Fair	Fair	Very poor.
Selden: SdC, SdC2, SuC	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ships: Sw	Fair	Fair	Fair	Good	Poor	Poor	Fair	Fair	Poor.
Thurber: ThB	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
Truce:									
TrB	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TrC, TrC2	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TrD2	Poor	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
TuF	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Venus:									
VeB	Good	Good	Good	Fair	Poor	Very poor.	Good	Fair	Very poor.
VeC, VeD, VuD	Fair	Good	Good	Fair	Poor	Very poor.	Good	Fair	Very poor.
Weatherford:									
Weatherford part of DmC, DwC2 and DwD2	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Weatherford part of unit DyD3	Poor	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Windthorst:									
WnC, WoC, WoD, WuD	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WoB	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WoC2, WvD3	Poor	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Yahola: Yb	Poor	Fair	Fair	Fair	Very poor.		Fair	Fair	Very poor.
Yomont:									
Ym	Very poor.	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Yo	Good	Good	Good	Fair	Very poor.	Very poor.	Good	Fair	Very poor.

typical examples. Typical range plants are bluestem, grama, perennial forbs, and legumes.

Shrubs produce wildlife food in the form of fruits, nuts, buds, catkins, or browse. Such plants commonly grow in their natural environment, but they may be planted and developed through wildlife management programs. Typical species are oak, dogwood, and silverberry.

Wetland plants are annual and perennial herbaceous plants that grow wild on moist and wet sites. They furnish food and cover mostly for wetland wildlife. Typical examples are smartweed, wild millet, spike-

excavations for controlling water, generally not more than 5 feet deep, to create habitat for waterfowl. Some are designed to be drained, planted, and then flooded; others are permanent impoundments that grow submersed aquatics.

Kinds of Wildlife.—Table 3 rates soils according to their suitability as habitat for the three kinds of wildlife in the county—openland, rangeland, and wetland wildlife. These ratings are related to ratings made for the elements of habitat. For example, soils rated very poor for shallow water developments are rated very poor for wetland wildlife.

and foxes are typical examples of openland wildlife.

Rangeland wildlife are birds and mammals that normally live in rangeland areas of grass, low-growing trees, and shrubs. Meadow lark, quail, wild turkeys, coyote, deer, and raccoons are typical examples of

Paths and trails are used for local and cross-country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not

[An asterisk in the first column indicates that at least one mapping unit is made up of two or more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow the instructions in

TABLE 4.—*Degree and kind of limitation affecting recreational development*—Continued

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Maloterre: MaC	Moderate: small stones; too clayey.	Moderate: small stones; too clayey.	Severe: depth to rock.	Moderate: small stones; too clayey.
May: MfB	Slight	Slight	Moderate: slope	Slight.
Nimrod: NdC, NdD	Severe: dusty; too sandy.	Severe: dusty; too sandy.	Severe: dusty; too sandy.	Severe: too sandy.
Norwood: Nr	Severe: floods	Moderate: floods	Moderate: floods	Slight.
Orthents: Mapped only with Duffau series. Too variable to rate.				
*Owens: OcE, OtG For Truce part of OtG, see Truce series.	Severe: percs slowly; slope; too clayey.	Severe: slope; too clayey.	Severe: percs slowly; slope; too clayey.	Severe: too clayey.
Patilo: PaC	Severe: too sandy	Severe: too sandy	Severe: too sandy	Severe: too sandy.
*Purves: PcB, PcC, PuC Urban land part of PuC is too variable to rate.	Severe: too clayey	Severe: too clayey	Severe: depth to rock; too clayey.	Severe: too clayey.
Reap: ReB	Severe: percs slowly; too clayey.	Severe: too clayey	Severe: percs slowly; too clayey.	Severe: too clayey.
*Selden: SdC, SdC2, SuC Urban land part of SuC is too variable to rate.	Moderate: too sandy	Moderate: too sandy	Severe: dusty	Moderate: too sandy.
Ships: Sw	Severe: percs slowly; too clayey.	Severe: too clayey	Severe: percs slowly; too clayey.	Severe: too clayey.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 5 and 6, and it also can be used to make other useful maps.

This information, however, does not eliminate need for further investigations at sites selected for specific

index numbers in parentheses, is shown in table 7; the estimated classification, without group index numbers, is given in table 5 for all soils mapped in the survey area.

USDA texture is determined by the relative proportions of sand, silt, and clay in soil material that is

TABLE 5.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil that other series that appear in the first column. The

Soil series and map symbols	Hydrologic soil group	Depth to bedrock	Depth from surface	USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHTO	
		Inches	*Inches*				*Percent*
Aledo: ALE	C	8–20	0–4	Clay loam	CL, GC	A–6, A–4	5–20
			4–16	Very gravelly clay loam	GC or SC	A–2–6, A–2–4	5–30
			16	Fractured indurated limestone.			
Bastrop: BaA, BaB, BaC2	B	>60	0–12	Fine sandy loam	SM, ML, SM–SC or CL–ML	A–4	---
			12–75	Sandy clay loam	SC or CL	A–6	---
Blanket: BbB	C	>60	0–22	Clay loam	CL	A–6	---
			22–50	Clay	CL or CH	A–7–6	---
			50–62	Clay loam	CL	A–6, A–7–6	---
Bolar: BcB, BcC, BcD	C	20–40	0–30	Clay loam	CL	A–6, A–7–6	0–15
			30	Indurated limestone bedrock.			
*Bonti: BfB, BfC, BfC2	C	20–40	0–10	Fine sandy loam	ML, SM, SM–SC, SC, CL–ML, CL	A–4	0–2
			10–32	Clay	CL	A–6, A–7–6	0–2
			32–34	Strongly cemented sandstone.			
BnD (For Truce part of BnD, see TuF in Truce series.)	C	20–40	0–10	Stony fine sandy loam	SM, SC, CL, SM–SC, CL–ML, ML	A–4, A–2–4	8–25
			10–35	Clay	CL	A–6, A–7–6	0–20
			35–36	Strongly cemented sandstone.			
Bosque: Bo	B	>60	0–25	Loam	CL, CL–ML	A–4, A–6	---
			25–55	Clay loam	CL	A–6, A–4	---
			55–60	Sandy clay loam	CL	A–6, A–7–6	---
*Brackett: BrE, BsE, BsG (For Maloterre part of BsE and BsG, see Maloterre series. No estimates for Urban land part of BrE.)	C	10–20	0–4	Clay loam	SC or CL	A–6	0–20
			4–14	Loam	SC or CL	A–6	0–20
			14–30	Interbedded weakly and strongly cemented limestone and pale-yellow clay loam.			
Bunyan: Bu	B	>60	0–10	Fine sandy loam	SC, CL	A–4, A–6	---
			10–60	Sandy clay loam	CL, SC	A–4, A–6	---
Chaney: ChC, ChC2	C	>60	0–16	Loamy fine sand	SM or SP–SM	A–2–4	0–5
			16–60	Sandy clay	CL or CH	A–7–6	0–5
Denton: DeB	D	22–40	0–35	Clay	CH	A–7–6	0–10
			35–36	Indurated limestone bedrock.			

significant to engineering

may have different properties and limitations. For this reason it is necessary to follow carefully the instructions for referring to symbol > means more than; < means less than]

Percentage less than 3 inches in diameter passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 0.074 mm)							Uncoated steel	Concrete
				Percent		*Inches per hour*	*Inches per inch of soil*	*pH*			
65–95	60–90	55–90	40–70	30–40	10–20	0.6–2.0	0.07–0.18	7.9–8.4	Moderate	Moderate	Low.
35–55	30–50	25–50	15–35	30–40	10–20	0.6–2.0	0.05–0.12	7.9–8.4	Low	Moderate	Low.
98–100	98–100	90–100	45–55	18–25	2–7	2.0–6.0	0.14–0.17	5.6–7.3	Low	Low	Low.
98–100	98–100	90–100	40–60	26–35	11–22	0.6–2.0	0.15–0.19	6.1–7.3	Low	Moderate	Low.
98–100	95–100	90–100	70–80	28–40	12–25	0.6–2.0	0.15–0.20	6.6–7.8	Moderate	High	Low.
95–100	95–100	85–95	75–85	41–55	20–35	0.2–0.6	0.12–0.18	6.6–8.4	Moderate.		
85–100	80–100	70–90	51–80	30–45	20–30	0.6–2.0	0.12–0.18	7.4–8.4	Moderate.		
75–95	75–95	70–90	51–70	30–42	15–25	0.6–2.0	0.11–0.20	7.9–8.4	Moderate	High	Low.
90–100	90–100	70–100	36–65	18–30	2–10	0.6–2.0	0.11–0.15	5.6–7.3	Low	Low	Moderate.
80–100	80–100	80–100	51–70	30–45	18–25	0.2–0.60	0.15–0.20	5.1–6.0	Moderate	High	Moderate.
75–90	75–90	55–90	30–55	18–35	2–10	0.6–2.0	0.08–0.12	5.6–7.3	Low	Low	Moderate.
80–100	80–100	80–100	51–70	30–45	18–25	0.2–0.60	0.15–0.20	5.1–6.0	Moderate	High	Moderate.
100	95–100	80–100	60–80	24–40	7–22	0.6–2.0	0.15–0.17	7.9–8.4	Low	High	Low.
100	95–100	95–100	60–80	30–40	10–25	0.6–2.0	0.15–0.18	7.9–8.4	Low	High	Low.
98–100	95–100	80–100	60–80	26–45	11–25	0.6–2.0	0.11–0.18	7.9–8.4	Low	High	Moderate.
80–100	80–100	55–75	45–85	30–40	11–20	0.2–0.6	0.1–0.15	7.9–8.4	Low	High	Low.
80–100	80–100	55–75	45–85	30–40	11–20	0.2–0.6	0.1–0.15	7.9–8.4	Low	High	Low.
100	95–100	70–90	40–65	25–35	8–16	2.0–6.0	0.11–0.15	6.1–7.3	Low	Low	Low.
100	95–100	80–90	40–75	25–40	10–25	0.6–2.0	0.15–0.19	5.6–8.4	Low	Moderate	Low.
90–100	90–100	60–95	10–30	<25	[1]NP–3	2.0–6.0	0.05–0.10	5.6–7.3	Very low	Low	Low.
90–100	90–100	90–100	51–85	42–60	25–42	0.06–0.2	0.15–0.18	5.6–7.3	Moderate	High	Moderate.
80–100	80–100	80–100	75–95	51–70	30–45	0.06–0.2	0.15–0.20	7.9–8.4	High	High	Low.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Hydrologic soil group	Depth to bedrock	Depth from surface	USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHTO	
		Inches	*Inches*				*Percent*
*Duffau:							
DhD, DmC	B	>60	0–9	Loamy fine sand	SM	A–4, A–2–4	---
For Weatherford part of DmC, see Weatherford series. No estimates for Urban land part of DhD.			9–75	Sandy clay loam	SC or CL	A–6	---
			75–95	Weakly cemented sandstone and fine sandy loam.	SM, SC, SM–SC, CL, ML, CL–ML	A–4, A–6	---
DgD3, DwC2, DwD2, DyD3	B	>60	0–6	Fine sandy loam	SM, ML or SM–SC, CL–ML	A–4, A–2–4	---
No estimates for Orthents part of DgD3. For Weatherford part of DwC2, DwD2, DyD3, see Weatherford series.			6–60	Sandy clay loam	SC or CL	A–6	---
Frio: Fc, Ff	B	>60	0–18	Clay loam	CL	A–6, A–7–6	---
			18–60	Silty clay, silty clay loam	CL	A–6, A–7–6	---
Hardeman: HaB, HaE	B	>60	0–60	Very fine sandy loam, fine sandy loam.	ML, CL–ML	A–4	---
Hassee: HeA	D	>60	0–15	Fine sandy loam, loam	CL	A–4, A–6	---
			15–64	Clay, clay loam	CH, CL	A–7–6	---
Heaton: HfC	A	>60	0–30	Fine sand	SM	A–2–4	0–3
			30–90	Sandy clay loam	SC	A–2–4, A–2–6, A–4, A–6	---
Hensley: HnB	D	10–20	0–6	Clay loam	CL, SC	A–6	0–25
			6–14	Clay	CL or CH	A–6, A–7–6	0–10
			14–15	Indurated limestone bedrock.			
Krum: KcA, KcB	C	>60	0–60	Clay	CH	A–7–6	---
Lamar: LaC, LaD	B	>60	0–60	Clay loam, silty clay loam	CL, CL–ML	A–6, A–4	---
Lincoln: Lf	A	>60	0–7	Loamy fine sand	SM, SM–SP, SM–SC	A–2–4, A–3, A–4	---
			7–60	Fine sand	SM, SM–SP, SP	A–2–4, A–3	---
Lindy: LnB	C	20–40	0–10	Loam	CL	A–4, A–6	0–5
			10–25	Clay	CL or CH	A–6, A–7–6	0–5
			25–30	Indurated platy limestone.			
Maloterre: MaC	D	3–10	0–7	Gravelly clay loam	CL	A–6	5–10
			7–10	Indurated limestone containing many fossil shells.			
May: MfB	B	>60	0–12	Fine sandy loam	ML, CL–ML, SM SM–SC	A–4	---
			12–40	Sandy clay loam	SC or CL	A–6	---
			40–60	Clay loam	CL	A–6 or A–4	---
Nimrod: NdC, NdD	C	>60	0–28	Fine sand	SM or SP–SM	A–2–4	---
			28–45	Sandy clay loam	SC	A–6, A–2–6	---
			45–65	Sandy clay	SC or CL	A–6, A–2–6	---

significant to engineering—Continued

Percentage less than 3 inches in diameter passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 0.074 mm)							Uncoated steel	Concrete
				Percent		*Inches per hour*	*Inches per inch of soil*	*pH*			
95–100	95–100	80–98	15–40	<21	NP–3	2.0–6.0	0.07–0.11	6.1–7.8	Very low	Moderate	Low.
95–100	95–100	85–100	40–60	30–40	15–24	0.6–2.0	0.15–0.19	6.1–7.8	Low	Moderate	Low.
95–100	95–100	80–100	40–65	20–35	2–18	2.0–6.0	0.07–0.11	6.1–7.8	Low	Low	Low.
98–100	95–100	75–90	30–60	<25	NP–7	2.0–6.0	0.11–0.15	6.1–7.8	Low	Moderate	Low.
95–100	95–100	85–100	40–60	30–40	15–24	0.6–2.0	0.15–0.19	6.1–7.8	Low	Moderate	Low.
95–100	95–100	75–100	70–95	35–49	20–30	0.2–0.6	0.15–0.20	7.9–8.4	Moderate	High	Low.
95–100	90–100	75–100	70–90	35–49	20–30	0.2–0.6	0.15–0.20	7.9–8.4	Moderate	High	Low.
100	98–100	98–100	51–75	<30	NP–7	2.0–6.0	0.10–0.15	7.4–8.4	Very low	Low	Low.
99–100	99–100	80–95	51–75	20–35	8–16	0.6–2.0	0.11–0.20	6.1–7.3	Low	High	Low.
99–100	99–100	90–100	75–85	45–55	30–40	<0.06	0.12–0.20	6.1–8.4	High	High	Low.
95–100	95–100	75–90	15–30	<25	NP–3	2.0–6.0	0.05–0.09	6.1–7.3	Very low	Low	Low.
98–100	95–100	75–90	25–45	20–35	8–15	0.6–2.0	0.14–0.16	6.1–7.3	Low	Moderate	Low.
65–95	60–95	55–95	36–80	20–40	11–20	0.2–0.6	0.10–0.18	6.1–7.8	Low	High	Low.
80–100	75–100	70–100	60–95	38–55	18–30	0.06–0.2	0.08–0.20	6.6–8.4	Moderate	High	Low.
95–100	95–100	95–100	85–95	51–65	25–45	0.2–0.6	0.15–0.20	7.9–8.4	High	High	Low.
95–100	95–100	85–100	60–80	20–40	5–18	0.6–2.0	0.12–0.15	7.9–8.4	Moderate	Moderate	Low.
98–100	98–100	98–100	8–45	<25	NP–5	6.0–20.0	0.05–0.10	7.9–8.4	Low	Low	Low.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Hydrologic soil group	Depth to bedrock	Depth from surface	USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHTO	
		Inches	*Inches*				*Percent*
Norwood: Nr	B	>60	0–6	Silt loam	CL, CL–ML	A–6, A–4	---
			6–60	Silt loam	CL	A–6, A–7–6	---
Orthents. Mapped only with Duffau series. Too variable to rate.							
*Owens: OcE, OtG. For Truce part of OtG, see TrB in Truce series.	D	15–20	0–18	Clay	CL or CH	A–7–6	0–20
			18–40	Shaly clay	CL or CH	A–6, A–7–6	0–5
Patilo: PaC	C	>60	0–48	Fine sand	SM	A–2–4	---
			48–70	Sandy clay loam	SC	A–6 or A–2–6	---
Purves: PcB, PcC, PuC. No estimates for Urban land part of PcC.	D	12–20	0–15	Clay	CH	A–7–6	0–20
			15–16	Limestone bedrock.			
Reap: ReB	D	>60	0–55	Clay	CH	A–7–6	---
			55–64	Shaly clay.			
Selden: SdC, SdC2, SuC. No estimates for Urban land part of SuC.	C	>60	0–18	Loamy fine sand	SM, SM–SC, SP–SM	A–2–4	---
			18–65	Sandy clay loam	SC	A–2–6, A–6	---
Ships: Sw	D	>60	0–52	Silty clay, clay	CH	A–7–6	---
			52–60	Very fine sandy loam	CL–ML, CL, SM–SC, SM, SC ML	A–4	---
Thurber: ThB	D	>60	0–8	Clay loam	CL	A–4, A–6	---
			8–37	Clay	CL or CH	A–7–6	---
			37–64	Clay loam	CL	A–6, A–7–6	---
Truce:							
TrB, TrC, TrC2, TrD2	C	>60	0–8	Fine sandy loam	SM–SC, SC, CL, CL–ML	A–4	0–10
			8–48	Clay	CL	A–4, A–6	---
			48–60	Shaly clay.			
TuF	C	>60	0–10	Stony fine sandy loam	GM–GC, SC, CL–ML, CL, GC,	A–4	5–20

significant to engineering—Continued

Percentage less than 3 inches in diameter passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 0.074 mm)							Uncoated steel	Concrete
				Percent		*Inches per hour*	*Inches per inch of soil*	*pH*			
100	100	95–100	70–90	20–35	7–15	0.60–2.0	0.17–0.21	7.9–8.4	Low	High	Low.
100	100	90–100	85–95	20–45	11–25	0.60–2.0	0.15–0.20	7.9–8.4	Low	High	Low.
90–100	80–100	70–100	70–95	45–60	22–30	<0.06	0.13–0.17	7.9–8.4	High	High	Low.
95–100	85–100	80–90	55–80	40–55	25–35	<0.06	0.03–0.08	7.9–8.4	High	High	Low.
100	95–100	90–100	8–20	<25	NP–3	6.0–20.0	0.05–0.08	5.6–7.3	Very low	Low	Low.
90–100	90–100	90–100	25–45	20–35	11–20	0.2–0.6	0.14–0.18	5.1–6.5	Low	Low	Moderate.
75–100	75–100	70–95	70–90	51–65	30–40	0.2–0.6	0.12–0.18	7.9–8.4	High	High	Low.
98–100	98–100	95–100	75–90	51–70	35–45	<0.06	0.15–0.17	7.9–8.4	Very high	High	Low.
98–100	98–100	90–100	10–20	20–25	2–6	2.0–6.0	0.05–0.09	6.1–7.3	Low	Low	Moderate.
95–100	95–100	90–100	25–49	25–40	15–25	0.2–0.6	0.14–0.17	5.6–6.5	Low	High	Moderate.
100	100	100	85–99	51–65	35–45	<0.06	0.14–0.19	7.9–8.4	Very high	Very high	Low.
95–100	90–100	85–95	40–65	<30	NP–10	2.0–6.0	0.10–0.20	7.9–8.4	Low	Very high	Low.
95–100	95–100	90–100	60–90	25–35	8–20	0.2–0.6	0.15–0.20	6.1–7.8	Moderate	High	Low.
95–100	95–100	90–100	70–95	41–60	25–40	<0.06	0.12–0.18	6.6–8.4	High	High	Low.
95–100	85–100	75–100	51–85	35–49	20–35	<0.06	0.12–0.18	7.9–8.4	High	High	Low.
75–100	75–100	70–100	40–75	18–30	5–10	0.6–2.0	0.11–0.15	6.1–7.3	Low	Low	Low.
80–100	80–100	80–100	51–80	30–45	20–30	0.06–0.2	0.12–0.18	6.1–8.4	Moderate	High	Low.
70–90	70–85	65–85	36–60	18–30	5–10	0.6–2.0	0.08–0.12	6.1–7.3	Low	Low	Low.
80–100	80–100	80–100	51–80	30–45	20–30	0.06–0.2	0.12–0.18	6.1–8.4	Moderate	High	Low.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Hydrologic soil group	Depth to bedrock	Depth from surface	USDA texture	Classification		Coarse fraction greater than 3 inches
					Unified	AASHTO	
		Inches	*Inches*				*Percent*
Weatherford:							
Mapped only with Duffau soils.	B	>60	0–10	Fine sandy loam	SM, ML, CL–ML, SM–SC	A–4	---
Weatherford part of DwC2, DwD2, DyD3.			10–45	Sandy clay loam	SC or CL	A–6	---
			45–65	Weakly cemented packsand			
Weatherford part of DmC.	B	>60	0–10	Loamy fine sand	SM	A–2–4	---
			10–46	Sandy clay loam	SC or CL	A–6	---
			46–65	Weakly cemented packsand			
Windthorst:							
WoB, WoC, WoC2, WoD, WuD, WvD3.	C	>60	0–10	Fine sandy loam	CL–ML, SM–SC, SM, ML	A–4	---
No estimates for Urban land part of WuD.			10–60	Clay, sandy clay; sandy clay loam.	CL or CH	A–6 or A–7–6	---
WnC	C	>60	0–15	Loamy fine sand	SM or SM–SC	A–2–4	---
			15–60	Clay	CL or CH	A–6 or A–7–6	---
*Yahola: Yb	B	>60	0–60	Fine sandy loam; loamy fine sand; sandy clay loam.	SM, SM–SC	A–4, A–2–4	---
For Bunyan part of Yb, see Bunyan series.							
Yomont: Yo, Ym	B	>60	0–80	Very fine sandy loam	ML, CL–ML	A–4	---

[1] NP is nonplastic.

TABLE 6.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil ring to other series that appear in the first column. Some terms in this table

Soil series and map symbols	Degree and kind of limitations for—				
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfill
Aledo: ALE	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Bastrop: BaA, BaB, BaC2	Moderate: percs slowly.	Moderate: seepage.	Slight	Slight	Slight
Blanket: BbB	Severe: percs slowly.	Slight	Severe: too clayey.	Moderate: shrink swell.	Severe: too clayey.
Bolar:					
BcB, BcC	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock; low strength, shrink swell.	Moderate: depth to rock.
BcD	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock; shrink swell.	Moderate: depth to rock.
*Bonti:					
BfB, BfC, BfC2	Severe: depth to rock; percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock; shrink swell.	Severe: depth to rock.
BnD	Severe: depth to rock; percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock; shrink swell.	Severe: depth to rock.
For Truce part of BnD, see TuF in Truce series.					
Bosque: Bo	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods
*Brackett:					

significant to engineering—Continued

Percentage less than 3 inches in diameter passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion	
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 0.074 mm)							Uncoated steel	Concrete
				Percent		*Inches per hour*	*Inches per inch of soil*	*pH*			
98–100	95–100	75–90	45–55	<25	NP–7	2.0–6.0	0.11–0.15	6.1–7.3	Low	Moderate	Low.
98–100	95–100	90–100	40–60	30–40	15–24	0.6–2.0	0.15–0.19	5.6–6.5	Low	Moderate	Low.
95–100	95–100	75–98	15–30	<21	NP–3	2.0–6.0	0.07–0.11	6.1–7.3	Very low	Moderate	Low.
98–100	95–100	90–100	40–60	30–40	15–24	0.6–2.0	0.15–0.19	5.6–6.5	Low	Moderate	Low.
98–100	95–100	95–100	36–75	<28	NP–7	0.6–2.0	0.12–0.17	6.1–7.3	Low	High	Low.
99–100	99–100	88–100	51–85	35–55	20–35	0.2–0.6	0.15–0.20	5.6–8.4	High	High	Low.
95–100	95–100	90–95	15–30	<21	NP–4	2.0–6.0	0.07–0.11	6.1–7.3	Very low	High	Low.
99–100	99–100	88–100	51–85	35–55	20–35	0.2–0.6	0.15–0.20	5.6–8.4	High	High	Low.
---	100	85–98	20–49	<26	NP–6	2.0–6.0	0.10–0.15	7.9–8.4	Low	Low	Low.
100	98–100	95–100	55–85	<30	NP–5	2.0–6.0	0.16–0.20	7.9–8.4	Very low	Moderate	Low.

interpretations of soils

that may have different properties and limitations. For this reason it is necessary to follow carefully the instructions for refer-
are explained in the glossary, where they are identified by an asterisk]

Degree and kind of limitations for—Continued			Suitability as source of—		Soil features affecting terraces and diversions
Local roads and streets	Pond reservoir areas	Embankments	Road fill	Topsoil	
Severe: depth to rock.	Severe: depth to rock.	Severe: thin layer.	Poor: thin layer	Poor: small stones; thin layer.	Depth to rock.
Moderate: low strength.	Moderate: seepage.	Moderate: piping.	Fair: low strength.	Fair: thin layer	Favorable.
Severe: low strength.	Moderate: seepage.	Moderate: compressible; piping.	Poor: low strength.	Fair: too clayey	Favorable.
Severe: low strength.	Severe: depth to rock; seepage.	Moderate: thin layer.	Poor: low strength; thin layer.	Fair: excess lime	Favorable.

TABLE 6.—*Engineering*

Soil series and map symbols	Degree and kind of limitations for—				
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfill
BrE, BsE	Severe: depth	Severe: depth	Moderate: depth	Moderate: depth	Severe: depth

interpretations of soils—Continued

Degree and kind of limitations for—Continued			Suitability as source of—		Soil features affecting terraces and diversions
Local roads and streets	Pond reservoir areas	Embankments	Road fill	Topsoil	
Moderate: depth to rock.	Severe: seepage.	Moderate: thin layer.	Poor: thin layer	Poor: excess lime	Depth to rock; rooting depth.
Severe: slope	Severe: seepage.	Moderate: thin layer.	Poor: thin layer	Poor: excess lime	Depth to rock; rooting depth.
Severe: floods	Moderate: seepage.	Moderate: piping.	Fair: low strength.	Fair: thin layer	Not needed.
Severe: low strength.	Slight	Moderate: erodes easily, piping.	Poor: low strength.	Poor: too sandy	Erodes easily; piping.
Severe: low strength; shrink swell.	Severe: depth to rock.	Moderate: compressible; shrink swell.	Poor: low strength; shrink swell.	Poor: too clayey	Favorable.
Moderate: low strength.	Moderate: seepage.	Moderate: piping.	Fair: low strength.	Fair: thin layer	Erodes easily.
Moderate: low strength.	Moderate: seepage.	Moderate: piping.	Fair: low strength.	Poor: too sandy	Too sandy.

TABLE 6.—*Engineering*

Soil series and map symbols	Degree and kind of limitations for—				
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfill
plex with Duffau series. Too variable to rate.					
*Owens: OcE, OtG. For Truce part of OtG, see TrC in Truce series.	Severe: percs slowly; slope.	Severe: slope	Severe: slope; too clayey.	Severe: shrink swell; slope.	Severe: slope; too clayey.
Patilo: PaC	Severe: percs slowly.	Severe: seepage.	Severe: cut-banks cave.	Slight	Moderate: too sandy; wet.
Purves: PcB, PcC, PuC. No interpretations for	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock; shrink	Severe: depth to rock.

interpretations of soils—Continued

Degree and kind of limitations for—Continued			Suitability as source of—		Soil features affecting terraces and diversions
Local roads and streets	Pond reservoir areas	Embankments	Road fill	Topsoil	
Severe: shrink swell; slope.	Slight	Moderate: compressible.	Poor: shrink swell.	Poor: too clayey	Rooting depth; slope.
Slight	Severe: seepage.	Moderate: piping; seepage.	Good	Poor: too sandy	Erodes easily; piping.
Severe: depth to rock; shrink swell.	Severe: depth to rock.	Severe: thin layer.	Poor: depth to rock; shrink swell.	Poor: too clayey	Depth to rock.
Severe: low strength; shrink swell.	Slight	Moderate: shrink swell; unstable fill.	Poor: low strength; shrink swell.	Poor: too clayey	Percs slowly.
Slight	Moderate: seepage.	Moderate: piping.	Good	Poor: too sandy	Too sandy.
Severe: shrink swell.	Slight	Moderate: shrink swell; unstable fill.	Poor: shrink swell.	Poor: too clayey	Not needed.
Severe: low strength; shrink swell.	Slight	Moderate: compressible.	Poor: low strength; shrink swell.	Poor: thin layer	Percs slowly.
Severe: low strength.	Slight	Moderate: low strength.	Poor: low strength.	Fair: thin layer	Favorable.
Severe: low strength.	Slight	Moderate: low strength.	Poor: low strength.	Fair: thin layer	Slope.
Severe: low strength; slope.	Slight	Severe: large stones.	Poor: low strength.	Poor: large stones.	Large stones; slope.
Moderate: low strength.	Severe: seepage.	Moderate: piping.	Fair: low strength.	Fair: too clayey	Favorable.
Moderate: low strength.	Severe: seepage.	Moderate: piping.	Fair: low strength.	Fair: too clayey	Slope.
Moderate: low strength.	Moderate: seepage.	Moderate: piping.	Fair: low strength.	Poor: too sandy	Too sandy.
Moderate: low strength.	Moderate: seepage.	Moderate: piping.	Fair: low strength.	Fair: thin layer	Erodes easily.
Moderate: low strength.	Moderate: slope.	Moderate: piping.	Fair: low strength.	Fair: thin layer	Erodes easily.
Severe: shrink swell.	Moderate: seepage.	Moderate: compressible.	Poor: shrink swell.	Poor: too sandy	Too sandy.
Severe: shrink swell.	Moderate: seepage.	Moderate: compressible.	Poor: shrink swell.	Fair: thin layer	Erodes easily.
Severe: floods	Severe: seepage.	Moderate: piping.	Fair: low strength.	Good	Not needed.

TABLE 6.—*Engineering*

Soil series and map symbols	Degree and kind of limitations for—				
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfill
For Bunyan part of Yb, see Bunyan series.					
Yomont:					
Ym	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods
Yo	Severe: floods	Severe: floods; seepage.	Severe: floods	Severe: floods	Severe: floods

TABLE 7.—

[Tests performed by Texas Highway Department, Materials

Soil name and location	Parent material	Report No.	Depth	Shrinkage		
				Limit	Linear	Ratio
			Inches	*Percent*	*Percent*	
Aledo clay loam, in an area of Aledo association, undulating:						
4 miles southeast of Weatherford, from the junction of Farm Road 51 and State Highway 171 south of Weatherford, go 0.65 mile southeast on State Highway 171, 0.3 mile east on county road; 500 feet south of road to a native range pasture. (Modal)	Limestone bedrock.	71–338–R	0–4	22	7.1	1.65
		71–339–R	4–16	21	7.4	1.69
Bastrop fine sandy loam, 0 to 1 percent slopes:						
about 12 miles southwest of Weatherford; from	Old alluvial loamy or	70–356–R	0–8	16	2.0	1.81
		70–357–R	17–28	17	5.1	1.85

interpretations of soils—Continued

Degree and kind of limitations for—Continued			Suitability as source of—		Soil features affecting terraces and diversions
Local roads and streets	Pond reservoir areas	Embankments	Road fill	Topsoil	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 7.—*Soil test*

Soil name and location	Parent material	Report No.	Depth	Shrinkage		
				Limit	Linear	Ratio
			Inches	*Percent*	*Percent*	
Nimrod fine sand, 1 to 5 percent slopes: from junction of Farm Road 920 and Farm Road 3107 at Poolville, go west 0.5 mile, south and west on county road 2.5 miles; 50 feet south of road. (Modal)	Basal sands and sandy clay loams.	71–346–R	8–28	17	0	1.80
		71–347–R	28–45	15	5.3	1.86
Norwood silt loam: 13 miles south of Weatherford; from courthouse in Weatherford go south on State Highway 171, south on Farm Road 1884 for 9 miles, south and west on Horseshoe Bend Road 4.2 miles; east of road 350 feet from fence. (Modal)	Calcareous loamy alluvium.	71–353–R	0–6	20	3.5	1.71
		71–354–R	6–60	19	7.2	1.80
Thurber clay loam, 1 to 3 percent slopes: approximately 15 miles southwest of Weatherford; from Brock go west on county road 3 miles; 150 feet south of road to field. (Modal)	Calcareous clay and clay loam.	70–368–R	0–8	15	5.7	1.86
		70–369–R	8–18	12	15.0	1.99
		70–370–R	37–50	13	11.9	1.98
Truce fine sandy loam, 1 to 3 percent slopes: from railroad crossing on Farm Road 113 in Millsap go south 2.2 miles, west and south on county road 1.2 miles; west of road 100 feet from fence. (Modal)	Shaly clay.	71–348–R	0–8	16	3.3	1.84
		71–349–R	8–24	14	12.1	1.93
		71–350–R	48–60	20	13.7	1.84
Venus clay loam, 3 to 5 percent slopes: 4.5 miles southwest of Weatherford; from junction of U.S. Highway 180 and 80 in Weatherford, go southwest 4.5 miles on U.S. Highway 80; 100 feet north of fence along Interstate-20 access road.	Limy earths.	70–361–R	0–9	14	8.2	1.89
		70–362–R	16–50	16	8.5	1.85
		70–363–R	50–62	16	8.7	1.86

data—Continued

Mechanical analysis [1]											Liquid limit	Plasticity index	Classification [2]	
Percentage passing sieve									Percentage smaller than—					
1¼ inch	⅞ inch	⅝ inch	⅜ inch	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	0.05 mm	0.005 mm	0.002 mm			AASHTO	Unified
											Percent			
---	---	---	---	---	100	97	18	12	4	3	19	3	A-2-4(0)	SM
---	---	---	---	---	100	99	40	34	24	22	25	12	A-6(2)	SC
---	---	---	---	---	100	99	87	71	15	11	26	7	A-4(8)	CL-ML
---	---	---	---	---	---	100	94	85	28	22	32	15	A-6(10)	CL
---	---	---	---	100	99	97	71	60	20	15	26	10	A-4(7)	CL
---	---	---	100	99	99	96	77	70	40	36	44	27	A-7-6(16)	CL
---	---	---	100	99	95	87	71	65	45	30	36	22	A-6(12)	CL
---	---	---	---	---	100	99	54	44	18	15	22	6	A-4(4)	CL-ML
100	99	99	99	98	97	96	71	65	45	39	38	21	A-6(11)	CL
---	---	---	100	99	98	95	92	91	62	44	50	29	A-7-6(18)	CL or CH
---	---	---	---	---	100	99	77	65	21	18	30	13	A-6(9)	CL
---	---	---	---	---	100	98	77	63	28	25	33	17	A-6(11)	CL
---	---	---	100	99	96	92	73	60	27	23	33	18	A-6(11)	CL
---	---	---	---	---	---	100	72	55	13	8	27	6	A-4(7)	CL-ML
---	---	---	---	---	---	100	85	70	39	36	43	25	A-7-6(15)	CL
---	---	---	---	---	---	100	83	56	8	6	26	4	A-4(8)	CL-ML
---	---	---	---	---	---	100	74	43	5	4	26	4	A-4(8)	CL-ML

coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

[2] Unified and AASHTO classification made by Soil Conservation Service personnel.

[3] 100 percent passed the 2-inch sieve and 94 percent the 1¾-inch sieve.

soil, expressed in pH values. The pH value and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content, that is, the extent to which the soil

weakens uncoated steel or concrete. Rate of corrosion of uncoated steel is related to soil properties, such as drainage, texture, total acidity, and electrical conductivity of the soil material. Risk of corrosion for concrete is influenced mainly by the content of sodium or magnesium sulfate, but also by soil texture and

Engineering interpretations

The interpretations in table 6 are based on the engineering properties of soils shown in table 5, on test data for soils in this survey area and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Parker County. In table 6, ratings are used to summarize limitation or suitability of the soils for all listed purposes other than for terraces and diversions. For these particular uses, table 6 lists these soil features not to be overlooked in planning, installation, and maintenance.

Soil limitations are indicated by the ratings slight, moderate, and severe. *Slight* means soil properties generally favorable for the rated use, or in other words, limitations that are minor and easily overcome. *Moderate* means that some soil properties are unfavorable but can be overcome or modified by special planning and design. *Severe* means soil properties so unfavorable and so difficult to correct or overcome as to require major soil reclamation, special designs, or intensive maintenance.

Soil suitability is rated by the terms *good, fair,* and *poor,* which have, respectively, meanings approximately parallel to the terms slight, moderate, and severe.

Following are explanations of some of the columns in table 6.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material from a depth of 18 inches to 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of [illegible] freedom from flooding or a high water table.

Dwellings without basements, as rated in table 6, are not more than three stories high and are supported by foundation footings placed in undisturbed soil. The features that affect the rating of a soil for dwellings are those that relate to capacity to support load and resist settlement under load, and those that relate to ease of excavation. Soil properties that affect capacity to support load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, slope, depth to bedrock, and content of stones and rocks.

Sanitary landfill is a method of disposing of refuse in dug trenches. The waste is spread in thin layers, compacted, and covered with soil throughout the disposal period. Landfill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill are ease of excavation, hazard of polluting ground water, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, and are friable and easy to excavate. Unless otherwise stated the ratings in table 6 apply only to a depth of about 6 feet, and therefore limitation ratings of *slight* or *moderate* may not be valid if trenches are to be much deeper than that. For some soils, reliable predictions can be made to a depth of 10 or 15 feet, but regardless of that, every site should be investigated before it is selected.

Local roads and streets, as rated in table 6, have an all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible

provided with adequate drainage and (2) the relative ease of excavating the material at borrow areas.

The soils were not rated as a source of sand and gravel because most of the soils of Parker County are unsuitable sources. Only Heaton fine sand, 1 to 5 percent slopes, Lincoln soils, frequently flooded, and Patilo complex, 1 to 5 percent slopes, are fair sources of sand; and the Nimrod soils are poor sources of sand.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil material, as in preparing a seedbed; by natural fertility of the material, or the response of plants when fertilizer is applied; and by absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics

classification is described [8] and each soil series represented in the county is placed in major categories of the system.

Soil is a natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living organisms acting on earthy parent material, as conditioned by relief over periods of time. Areas of a particular soil range from a few yards to several hundred acres in size.

Factors of Soil Formation

Soil is formed by the action of soil-forming processes on materials deposited or accumulated by geologic

The older stratigraphic units are exposed near the western limits of the county. Younger bedrock units are exposed in sequence in a generally eastward direction.

Pennsylvanian age rocks in the county are mainly interbedded limestone, sandstone, and shale of the Strawn Group. These strata are exposed along the western margin of the county. Hensley and Lindy soils were derived from limestone. Bonti soil is an example of soil formed in material weathered from sandstone. Owens and Truce soils formed in material weathered from shale.

Cretaceous rocks consist mainly of interbedded sandstone, limestone, marl, and clay of the Trinity, Fredericksburg, and Washita Groups. Formations of these groups are to the east of the Pennsylvanian age rocks and underlie most of the county. Duffau, Weatherford, and Windthorst soils are examples of soils derived from sandstone and clay. Aledo, Bolar, and Denton soils were derived from limestone and marl.

The Hassee and Thurber soils are examples of soils weathered from terrace deposits of Pleistocene age. These soils are in small areas in the western part of the county.

Alluvium is of Recent age and consists of gravel, sand, silt, and clay deposited along the Brazos River and many of the smaller stream valleys in the county. Bunyan, Lincoln, and Yahola soils are typical soils formed in alluvium.

Relief

Relief, or topography, affects soil formation by its influence on drainage, erosion, plant cover, and soil temperature. The soils of Parker County are nearly level to steep.

On the steeper slopes where runoff is rapid the soil material is likely to be removed by erosion almost as fast as horizons develop. Owens soils, for example, formed in more sloping areas than Thurber soils. Because of erosion, they are thinner and their profile is not so well developed.

Bastrop and May soils formed in nearly level to gently sloping areas. Much of the rain that falls does not run off these soils, but is absorbed. The rainfall

Formation of Horizons

The formation of soil horizons is the result of several processes. Among these are (1) accumulation of organic matter, (2) leaching of carbonates and bases, (3) reduction and transfer of iron, and (4) translocation of silicate clay minerals. In most soils more than one of these processes has been active in the development of soil horizons.

The soils of Parker County range from low to high in organic-matter content. The accumulation of organic matter in the upper part of the soil profile is important in the formation of the A1 horizon. Accumulation of organic matter causes dark surface horizons. Surface horizons that are dark colored, have at least 1 percent organic matter, and are at least 10 inches thick are called mollic epipedons. Denton and Venus soils have dark surface layers resulting from accumulation of organic matter.

Leaching of carbonates has occurred in many of the soils of Parker County. The leaching of carbonates and bases in soils generally precedes translocation of silicate clay minerals. Much leaching has occurred in Hassee and Thurber soils. Krum and Venus soils have surface horizons high in carbonates.

Reduction and transfer of iron, a process called gleying, is evident in the poorly drained soils of Parker County. Gray in the subsurface horizon shows reduction and loss of iron. Hassee soils have gray lower layers that indicate reduction and loss of iron. Yellowish-brown, strong-brown, and reddish-brown mottles and concretions in some horizons indicate segregation of iron. Chaney, Selden, and Nimrod soils have yellowish-brown, strong-brown, or reddish-brown mottles or concretions.

The translocation of clay minerals has also contributed to horizon development in many soils of Parker County. The B horizon generally has accumulations of clay (clay films) in pores and on the surfaces of peds. These soils were probably leached of carbonates and bases before the translocation of silicate clays

TABLE 8.—*Soils series classified by higher categories*

Series	Family	Subgroup	Order
Aledo	Loamy-skeletal, carbonatic, thermic	Lithic Haplustolls	Mollisols.
Bastrop	Fine-loamy, mixed, thermic	Udic Paleustalfs	Alfisols.
Blanket	Fine, mixed, thermic	Pachic Argiustolls	Mollisols.
Bolar	Fine-loamy, carbonatic, thermic	Typic Calciustolls	Mollisols.
Bonti	Fine, mixed, thermic	Ultic Paleustalfs	Alfisols.
Bosque	Fine-loamy, mixed, thermic	Cumulic Haplustolls	Mollisols.
Brackett	Loamy, carbonatic, thermic, shallow	Typic Ustochrepts	Inceptisols.
Bunyan	Fine-loamy, mixed nonacid thermic	Typic Udifluvents	Entisols.
Chaney	Fine, mixed, thermic	Aquic Paleustalfs	Alfisols.
Denton	Fine, montmorillonitic, thermic	Vertic Calciustolls	Mollisols.
Duffau	Fine-loamy, siliceous. thermic	Udic Paleustalfs	Alfisols.
Frio	Fine, mixed thermic	Cumulic Haplustolls	Mollisols.
Hardeman	Coarse-loamy, mixed, thermic	Typic Ustochrepts	Inceptisols.
Hassee	Fine, montmorillonitic, thermic	Mollic Albaqualfs	Alfisols.
Heaton	Loamy, siliceous, thermic	Arenic Paleustalfs	Alfisols.
Hensley	Clayey, mixed thermic	Lithic Rhodustalfs	Alfisols.
Krum	Fine, montmorillonitic, thermic	Vertic Haplustolls	Mollisols.
Lamar	Fine-silty, mixed, thermic	Typic Ustochrepts	Inceptisols.
Lincoln	Sandy, mixed, thermic	Typic Ustifluvents	Entisols.
Lindy	Fine, mixed, thermic	Udic Haplustalfs	Alfisols.
Maloterre	Loamy, carbonatic, thermic	Lithic Ustorthents	Entisols.
May	Fine-loamy, mixed, thermic	Udic Haplustalfs	Alfisols.
Nimrod	Loamy, siliceous, thermic	Aquic Arenic Paleustalfs	Alfisols.
Norwood	Fine-silty, mixed (calcareous), thermic	Typic Udifluvents	Entisols.
Owens	Clayey, mixed, thermic, shallow	Typic Ustochrepts	Inceptisols.
Patilo	Loamy, siliceous, thermic	Grossarenic Paleustalfs	Alfisols.
Purves	Clayey, montmorillonitic, thermic	Lithic Calciustolls	Mollisols.
Reap	Fine, montmorillonitic, thermic	Entic Chromusterts	Vertisols.
Selden	Fine-loamy, siliceous, thermic	Aquic Paleustalfs	Alfisols.
Ships	Very fine, mixed, thermic	Udertic Haplustolls	Mollisols.
Thurber	Fine, montmorillonitic, thermic	Typic Haplustalfs	Alfisols.
Truce	Fine, mixed, thermic	Udic Paleustalfs	Alfisols.
Venus	Fine-loamy, mixed, thermic	Typic Calciustolls	Mollisols.
Weatherford	Fine-loamy, siliceous, thermic	Ultic Haplustalfs	Alfisols.
Windthorst	Fine, mixed, thermic	Udic Paleustalfs	Alfisols.
Yahola	Coarse-loamy, mixed (calcareous), thermic	Typic Ustifluvents	Entisols.
Yomont	Coarse-silty, mixed (calcareous), thermic	Typic Ustifluvents	Entisols.

used in detailed soil surveys, allows us to organize and [illegible] which occur in many different climates. Each order is

(*Aqu,* meaning water or wet, and *ent,* from Entisol).

GREAT GROUP. Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The

names for texture, mineralogy, and so on, that are used as family differentiae. An example is the coarse-loamy, siliceous, acid, thermic family of Typic Hapla-

is less than an inch. Rare, exceptionally heavy snows, such as 15 inches that fell in January 1948, distort the data. The arithmetic mean gives a poor estimate of expected snowfall. Snow usually melts as it falls, only [illegible] outdoor activities.

winter and 80 percent in summer. The mean annual lake evaporation is about 60 inches.

At Weatherford the mean length of the warm season (freeze-free period) is 225 days. The mean dates of the last occurrence of 32° F. or lower temperatures

Soil Use Patterns and Trends

The soils of Parker County are used chiefly for farming. Some areas, however, are used for urban development and some are Federal land. Farmlands are used mainly for crops, pasture, and range. In recent years the percentage of land used for crops and range has been decreasing and improved grasses have been established. This trend is partly a result of the changing ownership pattern. Urban residents are buying small acreages and establishing improved pastures. The trend is expected to continue.

More and more acreage will be used for urban development as rural areas become more densely populated.

creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A mapping unit consisting of different kinds of soils that occur in such small individual areas or in such an intricate pattern that they cannot be shown separately on a publishable soil map.

***Compressible.** Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

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

Loose. Noncoherent when

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

***Excess lime.** Excess carbonates. Excessive carbonates, or lime, restrict the growth of some plants.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Genesis, soil. The manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that are responsible for the development of the solum,

more across. Large stones adversely affect the specified use.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state. In engineering, a high liquid indicates that the soil has a high content of clay and a low capacity for supporting loads.

***Low strength.** Inadequate strength for supporting loads.

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 their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill normally is a few inches in depth and width and is not large enough to be an obstacle to farm machinery.

***Rooting depth.** Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

***Seepage.** The rapid movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. If two sequa are present in a single soil profile, it is said to have a bisequum.

line generally overlies material that weathered in place, and it is ordinarily overlain by sediment of variable thickness.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of 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 together without any regular cleavage, as in many claypans and hardpans).

Substratum. Technically, the part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

GUIDE TO MAPPING UNITS

Map symbol	Mapping unit	Page	Capability unit Symbol	Capability unit Page	Range site Name	Range site Page	Pasture group
ALE	Aledo association, undulating	10	VIs-1	48	Shallow	58	(1/)
BaA	Bastrop fine sandy loam, 0 to 1 percent slopes	10	I-2	44	Sandy Loam	58	8C
BaB	Bastrop fine sandy loam, 1 to 3 percent slopes	10	IIe-3	45	Sandy Loam	58	8C
BaC2	Bastrop fine sandy loam, 2 to 5 percent slopes, eroded	11	IIIe-1	46	Sandy Loam	58	8C
BbB	Blanket clay loam, 1 to 3 percent slopes	12	IIe-1	44	Clay Loam	55	7C
BcB	Bolar clay loam, 1 to 3 percent slopes	12	IIe-1	44	Clay Loam	55	7C
BcC	Bolar clay loam, 3 to 5 percent slopes	13	IIIe-5	46	Clay Loam	55	7C
BcD	Bolar clay loam, 5 to 8 percent slopes	13	IVe-2	47	Clay Loam	55	7D
BfB	Bonti fine sandy loam, 1 to 3 percent slopes	13	IIe-2	45	Sandy Loam	58	8A
BfC	Bonti fine sandy loam, 3 to 5 percent slopes	14	IIIe-2	46	Sandy Loam	58	8A
BfC2	Bonti fine sandy loam, 1 to 5 percent slopes, eroded	14	IIIe-2	46	Sandy Loam	58	8A
BnD	Bonti and Truce soils, 1 to 8 percent slopes	14	VIs-2	49	----------	--	8A
	Bonti	--	-------	--	Sandy Loam	58	--
	Truce	--	-------	--	Tight Sandy Loam	59	--
Bo	Bosque loam, occasionally flooded	15	IIw-1	45	Loamy Bottom Land	56	2A
BrE	Brackett-Urban land complex, 3 to 12 percent slopes	16	(2/)	--	(3/)	--	(1/)
BsE	Brackett and Maloterre soils, 3 to 12 percent slopes	16	VIs-1	48	Steep Adobe	58	(1/)
BsG	Brackett and Maloterre soils, 12 to 30 percent slopes	16	VIIs-1	49	Steep Adobe	58	(1/)
Bu	Bunyan fine sandy loam, occasionally flooded	17	IIw-1	45	Loamy Bottom Land	56	2A
ChC	Chaney loamy fine sand, 1 to 5 percent slopes	18	IIIe-4	46	Sandy	57	9A
ChC2	Chaney loamy fine sand, 3 to 5 percent slopes, eroded	18	IIIe-10	47	Sandy	57	9A
DeB	Denton clay, 1 to 3 percent slopes	19	IIe-1	44	Clay Loam	55	7C
DgD3	Duffau-Orthents complex, 3 to 8 percent slopes, severely eroded	19	VIIe-1	49	Sandy Loam	58	(1/)
DhD	Duffau-Urban land complex, 3 to 8 percent slopes	20	(2/)	--	(3/)	--	(1/)
DmC	Duffau and Weatherford soils, 1 to 5 percent slopes	20	IIIe-4	46	Sandy	57	9A
DwC2	Duffau and Weatherford soils, 2 to 5 percent slopes, eroded	21	IIIe-1	46	Sandy Loam	58	8C
DwD2	Duffau and Weatherford soils, 5 to 8 percent slopes, eroded	22	IVe-1	47	Sandy Loam	58	8C
DyD3	Duffau and Weatherford soils, 2 to 8 percent slopes, severely eroded	22	VIe-1	48	Sandy Loam	58	(1/)
Fc	Frio clay loam, occasionally flooded	23	IIw-2	45	Loamy Bottom Land	56	1C
Ff	Frio clay loam, frequently flooded	23	Vw-1	48	Loamy Bottom Land	56	1C
HaB	Hardeman very fine sandy loam, 0 to 2 percent slopes	23	IIe-4	45	Sandy Loam	58	8C
HaE	Hardeman very fine sandy loam, 6 to 12 percent slopes	23	VIe-2	48	Sandy Loam	58	(1/)
HeA	Hassee fine sandy loam, 0 to 1 percent slopes	25	IIIw-1	47	Claypan	55	8A
HfC	Heaton fine sand, 1 to 5 percent slopes	26	IIIe-4	46	Sandy	57	9A
HnB	Hensley complex, 0 to 3 percent slopes	26	VIs-1	48	Redland	57	13A
KcA	Krum clay, 0 to 1 percent slopes	27	IIs-1	45	Clay Loam	55	7C
KcB	Krum clay, 1 to 3 percent slopes	27	IIe-1	44	Clay Loam	55	7C
LaC	Lamar clay loam, 3 to 5 percent slopes	27	IIIe-5	46	Clay Loam	55	7C
LaD	Lamar clay loam, 5 to 8 percent slopes	27	IVe-2	47	Clay Loam	55	7D
Lf	Lincoln soils, frequently flooded	28	Vw-2	48	Sandy Bottom Land	57	3A
LnB	Lindy loam, 1 to 3 percent slopes	28	IIIe-8	47	Deep Redland	56	7C
MaC	Maloterre soils, 2 to 5 percent slopes	29	VIIs-1	49	Very Shallow	59	13A
MfB	May fine sandy loam, 1 to 3 percent slopes	29	IIe-3	45	Sandy Loam	58	8C
NdC	Nimrod fine sand, 1 to 5 percent slopes	30	IIIe-4	46	Sandy	57	9A

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit		Range site		Pasture group
			Symbol	Page	Name	Page	
NdD	Nimrod fine sand, 5 to 8 percent slopes	30	IVe-3	47	Sandy	57	9A
Nr	Norwood silt loam	30	I-1	44	Loamy Bottom Land	56	2A
OcE	Owens clay, 3 to 12 percent slopes	31	VIe-3	48	Shallow Clay	58	(1/)
OtG	Owens-Truce complex, 5 to 30 percent slopes	31	VIIs-2	49	Shallow Clay	58	(1/)
PaC	Patilo complex, 1 to 5 percent slopes	32	IIIe-7	46	Deep Sand	56	9B
PcB	Purves clay, 1 to 3 percent slopes	33	IIIe-6	46	Shallow	58	13A
PcC	Purves clay, 3 to 5 percent slopes	33	IVe-4	48	Shallow	58	13A
PuC	Purves-Urban land complex, 1 to 5 percent slopes	33	(2/)	--	(3/)	--	(1/)
ReB	Reap clay, 1 to 3 percent slopes	34	IIIe-3	46	Clay Flat	55	7A
SdC	Selden loamy fine sand, 1 to 5 percent slopes	34	IIIe-4	46	Sandy	57	9A
SdC2	Selden loamy fine sand, 1 to 5 percent slopes, eroded	34	IIIe-10	47	Sandy	57	9A
SuC	Selden-Urban land complex, 1 to 5 percent slopes	34	(2/)	--	(3/)	--	(1/)
Sw	Shins silty clay	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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