Issued June 1968

SOIL SURVEY

Cleveland County, Arkansas

Major fieldwork for this soil survey was done in the period 1960–63. Soil names and descriptions were approved in 1965. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1965. This survey was made cooperatively by the Soil Conservation Service and the Arkansas Agricultural Experiment Station; it is

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EXPLANATION

Series Year and Series Number

Series year and number were dropped from all soil surveys sent to the printer after December 31, 1965. Many surveys, however, were then at such advanced stage of printing that it was not feasible to remove series year and number. Consequently, the last issues bearing series year and number will be as follows:

Series 1957, No. 23, Las Vegas and Eldorado Valleys Area, Nev.

Series 1958, No. 34, Grand Traverse County, Mich.

Series 1960, No. 31, Elbert County, Colo. (Eastern Part)

Series 1961, No. 42, Camden County, N. J.

SOIL SURVEY OF CLEVELAND COUNTY, ARKANSAS

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

CLEVELAND COUNTY is in the southeastern part of Arkansas (fig. 1). It covers an area of 384,640 acres, or 601 square miles. Rison is the county seat.

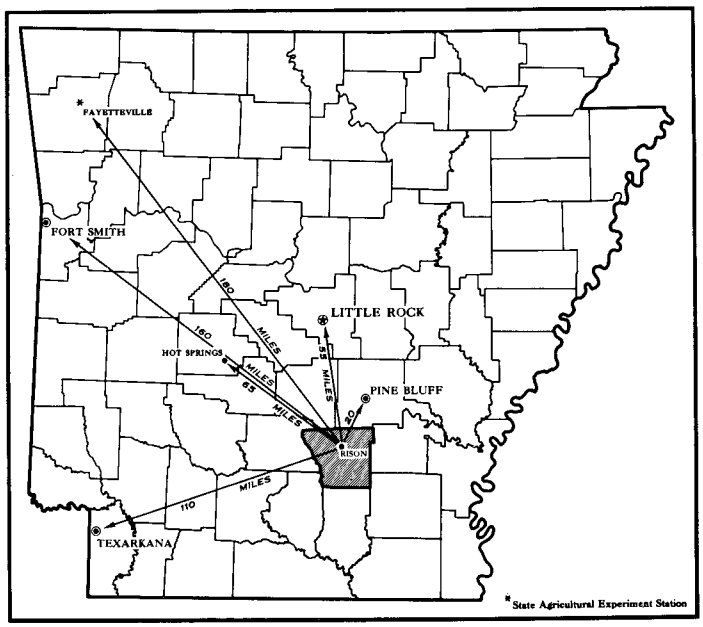

Figure 1.—Location of Cleveland County in Arkansas.

The greater part of this county is wooded, and the chief industries are centered around timber production. Most of the farmers work in the woods or in lumber mills and farm part time.

How This Soil Survey Was Made

about the soils. They dug or bored many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the underlying material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. To use this survey efficiently, it is necessary to know the kinds of groupings most used in local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, the major horizons of all the soils of one series are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Ruston and Susquehanna, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the natural, undisturbed landscape. Soils of one series can differ somewhat in the texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in the texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Susquehanna silty clay and Susquehanna very fine sandy loam are two soil types in the Susquehanna series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their

aries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this survey was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered

General Soil Map

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

A map showing soil associations is useful to people who want a general idea of the soils in a county, who

ally are on natural levees bordering the streams. They have a surface layer of dark-brown to strong-brown very fine sandy loam and a subsoil of strong-brown to yellowish-brown silty clay loam to fine sandy loam. Collins soils are moderately well drained. They are similar to Wehadkee soils in texture but have a dark-brown to brown surface layer and upper subsoil.

About 98 percent of this association is wooded. Small tracts of Ochlockonee and Collins soils that are not

tiss soils are moderately well drained and have a subsoil of yellowish-brown silt loam to sandy clay loam. Stough soils are somewhat poorly drained. They have a subsoil of light yellowish-brown silt loam to silty clay loam mottled with gray and brown. Both Prentiss and Stough soils have a compact layer, or fragipan, at a depth of 12 to 36 inches.

More than 95 percent of this association is wooded. Small areas of Cahaba and Prentiss soils are used for

drained. They have a medium-textured to fine-textured brown and yellow. The underlying material consists of

About 10 percent of the Boswell acreage in this county is used for cultivated crops and pasture. The rest is in pines and hardwoods. If the [illegible]

wildlife habitats. (Capability unit VIIe-1; woodland suitability group 12; wildlife suitability group 2)

brown and yellow. The underlying material consists of beds of unconsolidated sand, silt, and silty clay.

Caddo soils contain little organic matter. They have slow runoff, very slow permeability in the subsoil, and medium available water capacity. Tilth is poor. The response to lime and fertilizer is poor.

About 5 percent of the Caddo acreage in this county is used for pasture and small grain. The rest is in pine

23 to 44 inches, strong-brown, firm sandy clay loam.
44 to 56 inches +, yellowish-red, friable fine sandy loam mottled with brown.

The surface layer is as much as 18 inches thick in some places and in small areas contains quartz gravel and a few chert fragments. In a few small areas the subsoil is fine sandy loam, and in some it is yellowish brown. Rills and shallow gullies are common. Included

Falaya Series

The Falaya series consists of somewhat poorly drained, acid soils on flat, frequently flooded, active flood plains of streams. These soils formed in recent alluvium. They have a surface layer of dark-gray to brown silt loam and a subsoil of gray silt loam to silty clay loam mottled with brown and yellowish brown. Mottling begins at a depth of 8 to 16 inches.

Falaya soils are medium in organic-matter content. Runoff is slow, permeability is slow, and the available water capacity is high.

Most of the Falaya acreage in this county is in bottomland hardwoods and a few loblolly pines. A few acres are used for summer pasture.

Falaya silt loam (0 to 1 percent slopes) (Fa).—This is a somewhat poorly drained, medium acid to very strongly acid soil on bottom lands. The main layers of a typical profile are—

0 to 9 inches, dark yellowish-brown, friable silt loam.
9 to 15 inches, yellowish-brown, friable silt loam.
15 to 50 inches +, gray, sticky silt loam mottled with yellowish brown and brown.

The depth to the mottled layer ranges from 8 to 16 inches. In some places this horizon contains thin layers of silty clay loam. Included with this soil in mapping were a few small areas of Wehadkee and Collins soils.

The organic-matter content is medium. Permeability is moderate, internal drainage is slow, and the available water capacity is high. Floods are frequent.

Most of this soil is in native vegetation, which consists of bottom-land hardwoods and a few loblolly pines. A few acres are used for summer pasture. (Capability unit Vw–1; woodland suitability group 3; wildlife suitability group 1)

Falkner Series

The Falkner series consists of level and nearly level, somewhat poorly drained, medium acid and strongly acid soils on uplands. These soils occur at the northeastern

20 to 42 inches +, mottled red, gray, and yellowish-brown, plastic clay.

The surface layer is 6 to 12 inches thick, and the depth to the mottled horizon ranges from 14 to 30 inches. Included with this soil in mapping were small areas of Hatchie and Caddo soils.

The natural fertility of this Falkner soil is low to medium, and the organic-matter content is low to medium. Surface runoff is slow, permeability is slow in the subsoil, and the available water capacity is medium. Tilth is good.

Most of this soil is in native vegetation, which consists of hardwoods and a few pines. If it is properly fertilized, it is fairly well suited to late crops and to most pasture plants commonly grown in the county. (Capability unit IIIw–2; woodland suitability group 8; wildlife suitability group 2)

Falkner silt loam, 1 to 3 percent slopes, eroded (FkB2).—This is a somewhat poorly drained soil on uplands. It has a thin cover of loess. It is better drained than Falkner silt loam, 0 to 1 percent slopes. The surface layer is marked by a few rills and shallow gullies caused by concentrated runoff from areas upslope. Included with this soil in mapping were a few small spots of Hatchie and Caddo soils and of a Falkner soil on slopes of 3 to 8 percent.

Most of this Falkner soil is in cultivated crops and pasture. If this soil is properly fertilized and is protected from runoff, it is fairly well suited to most crops and pasture plants commonly grown in this county. (Capability unit IIIw–2; woodland suitability group 8; wildlife suitability group 2)

Gravel Pits

Gravel pits (Gp) are on the higher ridges in this county. They range from 1 to 20 acres in diameter and from 5 to 25 feet in depth. About 90 percent of the acreage is in Saffell soils; the rest is in Boswell, Nacogdoches, and Ruston soils.

This land type is not suitable for cultivation or pasture

Hatchie silt loam, 1 to 3 percent slopes (HaB).—This is a somewhat poorly drained soil on uplands. It has a thin cover of loess. The main layers of a typical profile are—

0 to 3 inches, dark grayish-brown silt loam.
3 to 7 inches, pale-brown, friable silt loam.
7 to 22 inches, pale-brown silt loam or light silty clay loam mottled with gray and brown; blocky structure.
22 to 42 inches, pale-brown silt loam or light silty clay loam mottled with gray and yellowish brown; very compact and brittle.
42 to 60 inches +, mottled gray and yellowish-brown silt loam; blocky structure.

The depth to the fragipan ranges from 18 to 30 inches. Included with this soil in mapping were a few small spots of Falkner and Caddo soils.

The natural fertility of this Hatchie soil is low. Runoff is medium, permeability is slow, and the available water capacity is medium. Tilth is poor to fair. The response to lime and fertilizer is poor to moderate.

Most of this soil is in mixed hardwoods and a few scattered pines. If properly fertilized, it is fairly well suited to late row crops and to most pasture plants. (Capability unit IIw–1; woodland suitability group 6; wildlife suitability group 4)

Lafe Series

The Lafe series consists of somewhat poorly drained and poorly drained soils that are slightly acid or neutral in the surface layer and strongly alkaline in the subsoil. These soils, locally known as prairie soils, occur on terraces along the Saline River, near Kingsland. They are mostly level or depressional, but mounds from 50 to 100 feet in diameter and from 3 to 4 feet in height cover about 10 percent of the surface area. The surface layer is coarser textured on the mounds than between them.

The surface layer of these soils is grayish-brown to pale-brown silt loam to very fine sandy loam. The subsoil is silt loam to silty clay with lenses of silt and clay. It is dark brown to pale brown and is mottled with various shades of brown, yellow, and gray. Concretions of calcium carbonate are common throughout the profile in most places, and the content of sodium and magnesium is [illegible] subsoil is dominantly silty clay loam but contains some lenses of clay and silt. In color it ranges from dark brown to pale brown mottled with various shades of brown, yellow, and gray. Calcium carbonate concretions, ranging from few to many, occur throughout the profile in some places. About 10 percent of the surface is covered by mounds 50 to 100 feet in diameter and 3 to 4 feet high.

The organic-matter content of this soil is low, and natural fertility is low. Runoff is slow, and permeability is very slow.

This soil is in native vegetation, which consists of a sparse cover of three-awn grass and annual lespedeza. It is used only for early spring grazing. Stunted pines and post oaks grow on the mounds and around the edges of the soil areas. (Capability unit VIs–1; woodland suitability group 18; wildlife suitability group 5)

Nacogdoches Series

The Nacogdoches series consists of well-drained, medium acid and strongly acid soils on uplands. These soils have a surface layer of dark reddish-brown to red gravelly loam that contains fragments of ironstone and sandstone of various sizes and in various amounts. The upper part of the subsoil is clay loam that ranges from dark red to reddish brown and contains much gravel. The lower part is mottled red, gray, yellow, and brown clay; it contains much fine gravel or laminated layers of ironstone and sandstone. The underlying material consists of beds of unconsolidated sand, silt, clay, and gravel.

Nacogdoches soils are medium in organic-matter content and medium to high in natural fertility. They have moderate permeability and medium available water capacity.

Nacogdoches gravelly loam, 2 to 8 percent slopes, eroded (NaC2).—This is a well-drained, highly productive soil on uplands. The main layers of a typical profile are—

0 to 8 inches, dark-red, friable gravelly loam; sandstone and ironstone gravel as much as one-fourth inch in diameter.

Ochlockonee Series

The Ochlockonee series consists of well-drained, medium acid and strongly acid soils on bottom lands. These soils formed in recent alluvium. They are scattered throughout the better drained parts of the bottom lands, near the larger streams. The surface layer is dark-brown to strong-brown very fine sandy loam, and the subsoil is strong-brown to yellowish-brown silt loam to fine sandy loam. In some places the subsoil is mottled with gray below a depth of 30 to 50 inches.

Ochlockonee soils are medium in organic-matter content and high in natural fertility. Permeability is moderate, and the available water capacity is medium.

Most of the acreage of Ochlockonee soils in this county is in native vegetation, which consists of bottom-land hardwoods and a few scattered loblolly pines. Some areas are flooded occasionally.

Ochlockonee very fine sandy loam (0 to 1 percent slopes) (Oc).—This is a brown, well-drained soil on bottom lands. The main layers of a typical profile are—

0 to 10 inches, dark-brown, friable very fine sandy loam.
10 to 27 inches, strong-brown, friable silt loam.
27 to 42 inches, strong-brown, firm loam.
42 to 60 inches, strong-brown, firm loam mottled with gray.

Mottling begins at a depth of 30 to 50 inches. Included with this soil in mapping were small areas of Wehadkee and Collins soils and small areas that have a surface layer of silt loam or fine sandy loam.

The natural fertility of this Ochlockonee soil is high. Permeability is moderate, and the available water capacity is medium. Tilth is good. Some areas are flooded in winter and spring.

Most of this soil is in native vegetation, which consists of bottom-land hardwoods and a few scattered loblolly pines. All the common row crops and pasture plants can be grown. (Capability unit I–1; woodland suitability group 2; wildlife suitability group 1)

Ochlockonee-Wehadkee association (Ow).—This association occurs near the Saline River. It is about 65 percent Ochlockonee soils, 25 percent Wehadkee soils, and 10 percent Collins and Falaya soils. A few small areas have a sandy, yellowish-brown subsoil. Typical profiles of the soils are described under the respective series names.

The soils of this association are poorly drained to well drained. They are subject to frequent flooding. The topography is undulating. Slopes rarely exceed 3 percent.

This association has never been cleared. Most of the woodland stands consist of bottom-land hardwoods and scattered loblolly pines. (Ochlockonee soil, capability unit Vw–1; Wehadkee soil, capability unit VIw–1; both soils in woodland suitability group 2, and in wildlife suitability group 1)

Pheba Series

The Pheba series consists of somewhat poorly drained, medium acid to very strongly acid soils. The surface layer of these soils is dark-gray to brown very fine sandy loam. The subsoil is yellowish-brown silt loam to sandy clay loam mottled with various shades of gray and brown. A fragipan occurs in the lower part of the subsoil. The underlying material consists of beds of unconsolidated sand, silt, and silty clay.

Pheba soils are low in natural fertility. They have slow runoff, slow permeability, and medium available water capacity. Tilth is poor to fair. The response to lime and fertilizer is poor to moderate.

Pheba very fine sandy loam, 0 to 1 percent slopes (PeA).—This is a somewhat poorly drained, mottled soil that has a high water table. The main layers of a typical profile are—

0 to 6 inches, grayish-brown, friable very fine sandy loam mottled with yellowish brown.
6 to 18 inches, yellowish-brown, friable silt loam mottled with gray and brown.
18 to 32 inches, mottled gray, yellowish-brown, and brownish-yellow, compact silt loam.
32 to 50 inches +, mottled gray, brown, and yellowish-brown, firm silty clay loam.

The surface layer ranges from 6 to 10 inches in thickness and from dark gray to brown in color. The subsoil ranges from silt loam to sandy clay loam in texture. A fragipan of irregular thickness begins 18 to 36 inches below the surface. Included with this soil in mapping were a few spots of Caddo soils.

The organic-matter content is low, and natural fertility is low. Surface runoff is slow, permeability is slow, and the available water capacity is medium. Tilth is poor.

Most of this Pheba soil is in native vegetation, which consists of mixed pines and hardwoods. If properly drained and fertilized, this soil is fairly well suited to most row crops and pasture plants commonly grown in the county. (Capability unit IIIw–1; woodland suitability group 6; wildlife suitability group 4)

Pheba very fine sandy loam, 1 to 3 percent slopes (PeB).—This is a somewhat poorly drained, mottled soil that has a high water table. It is similar to Pheba very fine sandy loam, 0 to 1 percent slopes, but has somewhat faster surface runoff and is easier to drain. Included with this soil in mapping were small areas that have a silt loam surface layer.

Most of this Pheba soil is in native vegetation, which consists of mixed pines and hardwoods. If properly drained and fertilized, it is fairly well suited to row crops and pasture plants. (Capability unit IIIw–1; woodland suitability group 6; wildlife suitability group 4)

Prentiss Series

The Prentiss series consists of moderately well drained, medium acid and strongly acid soils. These soils occur on the better drained terraces near the larger streams. Their surface layer is dark grayish-brown to light yellowish-brown very fine sandy loam, and their subsoil is brownish-yellow to yellowish-brown silt loam to silty clay loam. A mottled fragipan begins 18 to 36 inches below the surface. The underlying material was washed from Ruston, Savannah, and Shubuta soils of the upland.

Prentiss soils are medium in natural fertility and medium in organic-matter content. They have medium runoff, slow to moderate permeability in the subsoil, and medium available water capacity. Tilth is good, except where the erosion hazard is severe.

About 20 percent of the Prentiss acreage in this county is cultivated or in pasture. The rest supports mixed pines and hardwoods.

Prentiss very fine sandy loam, 1 to 3 percent slopes (PrB).—This is a moderately well drained, productive soil on stream terraces. The main layers of a typical profile are—

0 to 10 inches, grayish-brown, friable very fine sandy loam.

About 20 percent of the Ruston acreage in this county is in cultivated crops and pasture. The rest supports mixed pines and hardwoods.

Ruston fine sandy loam, 3 to 8 percent slopes (RuC).—This is a well-drained, permeable soil on uplands. The main layers of a typical profile are—

0 to 8 inches, yellowish-brown, friable fine sandy loam.
8 to 13 inches, strong-brown, friable loam.

Shubuta fine sandy loam, 3 to 8 percent slopes, eroded (SmC2).—This is a moderately well drained, acid soil on uplands. It is similar to Shubuta fine sandy loam, 3 to 8 percent slopes, but surface runoff is faster and the

wildlife habitat. (Capability unit VIe–1; woodland suitability group 12; wildlife suitability group 2)

Susquehanna Series

The Susquehanna series consists of nearly level to steep, somewhat poorly drained, strongly acid to extremely acid soils. These soils occur as small areas at the higher elevations on uplands. They have a surface layer of dark-gray to grayish-brown very fine sandy loam or silty clay and a subsoil of mottled red, gray, and yellowish-brown clay. The underlying material consists of beds of unconsolidated acid clay or soft clay shale.

Susquehanna soils are low in natural fertility. They

common, and there are a few shallow gullies. The reddish clay subsoil is exposed in severely eroded spots. Included with this soil in mapping were a few small spots of Susquehanna silty clay and of Boswell soils.

Most of this Susquehanna soil has been cultivated but has since reverted to woodland through natural reseeding or has been planted with pine seedlings. It is fairly well suited to pasture plants if it is properly fertilized and protected from further erosion, but it is better used for woodland and wildlife habitat. (Capability unit VIe–1;

is fairly well suited to small grain and pasture. It is not suited to row crops. (Capability unit IVs–1; woodland suitability group 9; wildlife suitability group 5)

commonly grown in the county. (Capability unit IIe–1; woodland suitability group 8; wildlife suitability group 2)

Tippah silt loam, 3 to 8 percent slopes, eroded (TaC2).—This is a moderately well drained soil on uplands.

The largest areas of these soils occur along Moro Creek and the Saline River. About 98 percent of the acreage is in native vegetation, which consists of hardwoods and a few scattered loblolly pines. Some areas are used for summer pasture.

Wehadkee silt loam (0 to 1 percent slopes) (Wa).—This is a deep, poorly drained soil on bottom lands. The main layers of a typical profile are—

The soils of this association are frequently flooded and are poorly drained or somewhat poorly drained. The Caddo soil is not flooded so frequently as the Wehadkee soil, nor is it flooded so deeply nor for so long a time.

This association has never been cleared. It has a heavy growth of timber and underbrush. The Wehadkee soil supports hardwoods and a few scattered loblolly pines. The Caddo soil supports mixed pines and hard-

cluded with this soil in mapping were a few small areas of Phebe soils.

with outlets and vegetated waterways, and, in a few

The capability units in Cleveland County are discussed

Cotton, corn, peas, tomatoes, vegetables, vetch, and Austrian Winter peas are well suited to these soils. Suit-

surface layer of fine sandy loam to gravelly loam and

Among the suitable cultivated crops are cotton, corn, tomatoes, small grain, and cowpeas. Suitable pasture

These soils are easy to cultivate. They contain a medium amount of organic matter and are medium acid

These soils are low in natural fertility and are difficult to cultivate. They are strongly acid to extremely

These soils are not suited to cultivation. They are more suitable for pasture, woodland, or wildlife habitat.

TABLE 2.—*Estimated average acre yields of major crops*

[Yields in columns A are to be expected, over a period of years, under common management, and those in columns B under improved management. Absence of figure indicates that the soil generally is unsuitable for the crop. Gravel pits is not listed]

Mapping unit	Corn		Cotton		Oats		Tomatoes		Lespedeza		Permanent pasture [1]	
	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb. of lint*	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Animal-unit-months* [2]	*Animal-unit-months* [2]
Amagon silt loam, heavy substratum, 0 to 3 percent slopes									0.5	1.0	2.5	4.5
Amagon silt loam, heavy substratum, 3 to 8 percent slopes									.5	1.0	2.5	4.5
Angie silt loam, 0 to 1 percent slopes					20	40			.8	1.5	3.0	5.0
Angie silt loam, 1 to 3 percent slopes					20	40			.7	1.2	3.0	5.0
Boswell loam, 1 to 3 percent slopes, eroded	15	25	200	300	20	40			.5	1.2	3.0	5.0
Boswell loam, 3 to 8 percent slopes, eroded					15	35			.4	1.0	2.5	4.0
Boswell loam, 8 to 20 percent slopes, eroded											2.0	3.0
Bowie fine sandy loam, 1 to 3 percent slopes	30	60	300	500	30	50	100	300	.8	1.2	4.0	6.5
Bowie fine sandy loam, 3 to 8 percent slopes	25	55	300	500	30	50	100	300	.8	1.2	4.0	6.5
Caddo silt loam, 0 to 1 percent slopes			200	300	20	35			1.0	1.5	4.0	6.0
Caddo silt loam, 1 to 3 percent slopes			200	300	20	35			1.0	1.5	4.0	6.0
Cahaba fine sandy loam, 3 to 8 percent slopes, eroded	20	50	275	450	20	40	75	250	.8	1.2	4.0	6.5
Collins silt loam	40	65	400	675	40	60			1.3	2.3	6.5	9.0
Falaya silt loam									1.0	1.8	3.5	5.5
Falkner silt loam, 0 to 1 percent slopes			250	400	25	45			1.0	1.6	4.0	6.0
Falkner silt loam, 1 to 3 percent slopes, eroded	20	40	240	465	25	45			.7	1.3	3.5	5.5
Hatchie silt loam, 1 to 3 percent slopes			240	400	25	40			1.0	1.5	4.0	6.0
Lafe silt loam											1.0	1.5
Nacogdoches gravelly loam, 2 to 8 percent slopes, eroded	20	40	280	400	20	40	80	275	.7	1.3	4.0	6.0
Ochlockonee very fine sandy loam	40	65	400	650	40	60			1.3	2.3	6.0	9.0
Ochlockonee-Wehadkee association									1.0	1.5	5.0	8.0
Pheba very fine sandy loam, 0 to 1 percent slopes	18	30	215	375	20	40			1.0	1.5	3.0	6.0
Pheba very fine sandy loam, 1 to 3 percent slopes	20	40	240	390	25	45			1.0	1.5	3.0	6.0
Prentiss very fine sandy loam, 1 to 3 percent slopes	25	45	300	500	30	50	100	300	.8	1.8	4.0	6.5
Prentiss very fine sandy loam, 3 to 8 percent slopes	25	45	290	490	25	45	100	300	.9	1.8	4.0	6.0
Ruston fine sandy loam, 3 to 8 percent slopes	25	50	300	525	25	50	100	300	.8	1.6	4.5	7.0
Ruston fine sandy loam, 3 to 8 percent slopes, eroded	20	45	260	410	20	45	75	250	.7	1.5	4.0	6.5
Saffell gravelly fine sandy loam, 3 to 8 percent slopes	16	35	260	400	20	38	60	225	.6	1.0	3.0	4.5
Saffell gravelly fine sandy loam, 8 to 25 percent slopes											2.5	3.0
Savannah very fine sandy loam, 1 to 3 percent slopes	25	50	300	500	30	50	100	300	.8	1.8	4.0	6.5
Savannah very fine sandy loam, 3 to 8 percent slopes	25	45	300	440	25	45	100	300	.6	1.3	3.5	6.0
Savannah very fine sandy loam, 8 to 12 percent slopes, eroded									.3	.8	3.0	4.5
Shubuta fine sandy loam, 3 to 8 percent slopes	20	40	250	400	20	40	75	150	.7	1.5	4.5	6.0
Shubuta fine sandy loam, 3 to 8 percent slopes, eroded	18	35	200	350	18	35	60	100	.5	1.0	4.0	5.5
Shubuta fine sandy loam, 8 to 12 percent slopes											3.5	5.0

Use of the Soils for Woodland [2]

Forest once covered all of Cleveland County except a small prairie just southeast of Saline. The principal commercial trees were loblolly pine, shortleaf pine, oak, sweetgum, and hickory on the uplands and oak, sweetgum, tupelo-gum, loblolly pine, cypress, ash, sycamore, and pecan on the bottom lands.

Forest cover types

The forests in Cleveland County are classified in the following forest cover types (*7*): [3] (1) loblolly pine-

example, loblolly pine is a major species on the better drained soils. The areas occupied by the three types in this county generally coincide with the soil associations shown on the colored general soil map at the back of this survey.

The *loblolly pine-shortleaf pine* type predominates on the Savannah-Ruston-Saffell, the Tippah-Pheba-Boswell, and the Nacogdoches-Shubuta-Susquehanna soil associations. Associated types also represented in these areas are the shortleaf pine, the shortleaf pine-oak, the loblolly pine, the swamp chestnut oak-cherrybark oak,

Wehadkee-Falaya soil associations. Also represented in these areas are the swamp chestnut oak-cherrybark oak and the sugarberry (hackberry)-American elm-green ash forest types.

Management of woodland

The interpretations in this section will help owners and operators of woodland to establish, manage, and harvest tree crops. The basic step in making these interpretations is the rating of each soil according to characteristics that affect the production of trees. Such characteristics are the depth of the soil; arrangement of the layers in the profile; texture, drainage, color, reaction, and consistence of each layer; content of humus and minerals; degree of erosion; and slope. All of these characteristics are discussed in the sections "Descriptions of the Soils," and "Genesis, Morphology, and Classification of the Soils."

Management of woodland can be planned more effectively if soils are grouped according to those characteristics that affect the growth of trees and the management of stands. The soils of Cleveland County have been placed in 18 woodland suitability groups. Each group consists of soils that are about the same in suitability for wood crops, potential productivity, and management requirements.

Table 3 lists the 18 woodland groups and the map symbols that represent the soils in each group. The table shows, for each group, the severity of the soil-related limitations, estimates of productivity for specified trees, and a list of trees preferred for management in existing stands and for planting. These ratings are explained in the following paragraphs. The woodland groups are discussed further on in the text.

Erosion hazard refers to potential sheet and gully erosion. The hazard for each woodland group is rated as *slight*, *moderate*, or *severe* and is based on the slope, the erodibility, and the depth of the soils.

Equipment limitation depends on characteristics and topographic features that restrict the use of conventional

factors in woodland management

Potential productivity			Management problems		
Species	Estimated site class [1]	Average yearly growth [2]	Erosion hazard	Equipment limitation	Seedling mortality
		Bd. ft./acre, Doyle rule			
Loblolly pine	95 to 104	430 to 540	Slight	Slight	Slight.
Shortleaf pine	85 to 94	385 to525			
Cherrybark oak	110 to 119	(3)			
Sweetgum	100 to 109	430 to 550			
Cottonwood	95 to 104	415 to 565			
Loblolly pine	95 to 104	430 to 540	Slight	Moderate	Slight.
Shortleaf pine	85 to 94	385 to 525			
Cherrybark oak	110 to 119	(3)			
Sweetgum	100 to 109	430 to 550			
Cottonwood	95 to 104	415 to 565			
Loblolly pine	90 to 99	365 to 480	Slight	Moderate	Slight.

TABLE 3.—*Woodland suitability groups and*

Group and soil symbols	Preferred species	
	In existing stands	For planting
Group 8 (AmB, AmC, AnA, AnB, BoB2, BoC2, FkA, FkB2, SmC, SmC2, SnC2, TaA, TaB2, TaC2).	Loblolly pine, shortleaf pine, Southern red oak, sweetgum, cherrybark oak, Shumard oak.	Loblolly pine, shortleaf pine.
Group 9 (SvA, SvB2, SvC2, SuA, SuB).	Loblolly pine, shortleaf pine, Southern red oak, sweetgum, cherrybark oak, Shumard oak.	Loblolly pine, shortleaf pine.
Group 10 (SvE)	Loblolly pine, shortleaf pine, Southern red oak, sweetgum, cherrybark oak, Shumard oak.	Loblolly pine, shortleaf pine.
Group 11 (SmD)	Loblolly pine, shortleaf pine, Southern red oak, sweetgum, cherrybark oak, Shumard oak.	Loblolly pine, shortleaf pine.
Group 12 (BoE2, SnE, TaE)	Loblolly pine, shortleaf pine, Southern red oak, sweet-	Loblolly pine, shortleaf pine.

factors in woodland management—Continued

Potential productivity			Management problems		
Species	Estimated site class [1]	Average yearly growth [2]	Erosion hazard	Equipment limitation	Seedling mortality
		Bd. ft./acre, Doyle rule			
Loblolly pine	75 to 84	215 to 305	Slight	Slight	Slight.
Shortleaf pine	65 to 74	170 to 250			
Southern red oak	70 to 79	120 to 185			
Sweetgum	80 to 89	215 to 305			
Loblolly pine	75 to 84	215 to 305	Moderate	Moderate	Moderate.
Shortleaf pine	65 to 74	170 to 250			
Southern red oak	70 to 79	120 to 185			
Sweetgum	80 to 89	215 to 305			
Loblolly pine	75 to 84	215 to 305	Severe	Severe	Moderate.
Shortleaf pine	65 to 74	170 to 250			
Southern red oak	70 to 79	120 to 185			
Sweetgum	80 to 89	215 to 305			
Loblolly pine	75 to 84	215 to 305	Moderate	Slight	Slight.
Shortleaf pine	65 to 74	170 to 250			
Southern red oak	70 to 79	120 to 185			
Sweetgum	80 to 89	215 to 305			
Loblolly pine	75 to 84	215 to 305	Severe	Moderate	Slight.
Shortleaf pine	65 to 74	170 to 250			
Southern red oak	70 to 79	120 to 185			
Sweetgum	80 to 89	215 to 305			
Loblolly pine	75 to 84	215 to 305	Slight	Slight	Slight.
Shortleaf pine	65 to 74	170 to 250			
Loblolly pine	75 to 94	215 to 305	Slight	Moderate	Moderate.
Shortleaf pine	70 to 79	210 to 305			
Loblolly pine	65 to 74	125 to 205	Slight	Slight	Slight.
Shortleaf pine	65 to 74	170 to 250			
Loblolly pine	65 to 74	125 to 205	Moderate	Moderate	Moderate.
Shortleaf pine	65 to 74	170 to 250			

TABLE 4.—*Potential yields of forage in woodland*

Woodland suitability group	Yields, in pounds of dry matter per acre, under—				
	No canopy	Open canopy	Sparse canopy	Medium	Dense

rushes. Most of these plants are somewhat tolerant of shade and will persist if the canopy closes.

major forage plants are big bluestem, little bluestem, indiangrass, beaked panicum, low panicums, purpletop, longleaf uniola, and several kinds of legumes and forbs. Beaked panicum, low panicums, and longleaf uniola persist in small quantities, along with the woody plants, after the canopy closes.

WOODLAND SUITABILITY GROUP 10

This group consists of somewhat poorly drained, very slowly permeable soils. The surface layer is very fine sandy loam, and the subsoil is clay.

These soils are moderately high in productivity for wood crops and are suitable for pines and hardwoods. Pines generally are preferred for planting. The soil-

WOODLAND SUITABILITY GROUP 13

This group consists of well drained and moderately well drained, moderately permeable soils. The surface layer is fine sandy loam or very fine sandy loam, and the subsoil is sandy loam to sandy clay loam.

These soils are moderately high in productivity for wood crops and are better suited to pines than to other trees. The soil-related management problems are slight.

Among the woody plants in the understory vegetation are French mulberry, wild grape, muscadine, waxmyrtle, bush huckleberry, dogwood, redbud, dewberry, peppervine, and yellow jasmine. The major forage plants are big bluestem, little bluestem, plumegrass, switchgrass,

soil-related management problems are moderate and are stocking ponds are bluegill, redear, bass, and channel

TABLE 5.—*Suitability of plants as food for wildlife*

[The figure 1 indicates that the plant is *choice* (attractive and nutritious) for the given kind of wildlife; the figure 2, *fair* (eaten when choice foods are not available); the figure 3, *unimportant* (eaten only in small amounts)]

Plant	Part of plant eaten	Bob-white	Deer	Dove	Duck	Rabbit	Squirrel	Turkey	Nongame birds [1]		
									Fruit eaters	Grain and seed eaters	Nut and acorn eaters
Bahiagrass	Forage	3	1	3	3	3	3	3	3	3	3
	Seed	3	2	2	3	3	3	1	3	2	3
Baldcypress	Seed	3	3	3	3	3	1	3	3	3	3
Beech	Nut	1	2	1	1	3	1	1	3	3	1
Blackberry	Fruit	1	3	3	3	3	2	1	1	3	3
Blackgum	Fruit	2	3	3	3	3	1	2	2	3	2
Blueberry	Fruit	2	1	3	3	3	3	1	1	3	3
Browntop millet	Seed	1	3	1	1	3	3	1	3	1	3
Cherry, black	Fruit	1	3	3	3	3	1	2	1	3	2
Chinkapin	Nut	3	2	3	3	3	1	3	3	3	1

TABLE 6.—*Suitability of plants to soils, by wildlife suitability*

Low dikes can be constructed in most areas of these

group are scattered throughout the county and make up about 3 percent of the total acreage.

Most of the soils in this group are wooded. They provide adequate cover for wildlife but a limited choice of food. Many drainageways are suitable sites for ponds. Small areas near the Saline River have only a sparse cover of three-awn and annual lespedeza and a scattering of small pines, post oaks, and haws. These areas are of little value for wildlife.

Engineering Uses of the Soils [5]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for storing water, erosion control structures, drainage systems, and sewage disposal systems. The soil properties most important to the engineer are available water capacity, permeability, shear strength, consolidation characteristics, texture, plasticity, shrink-swell potential, and reaction. Topography and the depth to unconsolidated material are also important.

The information in this survey can be used to—

1. Make soil and land use studies that will aid in selecting and developing industrial, municipal, business, residential, and recreational sites.
2. Make preliminary estimates of soil properties for use in the planning of agricultural drainage systems, farm ponds, earthen dams, irrigation systems, terraces, waterways, and diversion terraces.
3. Make preliminary evaluations of soil conditions that will aid in selecting locations for highways and airports and in planning detailed investigations of selected locations.
4. Locate probable sources of gravel and sand suitable for use as structural material.
5. Correlate performance of engineering structures with types of soil and thus develop information that will be useful in designing and maintaining

map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some terms used by soil scientists may be unfamiliar to engineers, and other terms may have a special meaning in soil science. These terms are defined in the Glossary at the end of the survey.

Engineering classification systems

Two systems for classifying soils are in general use among engineers. Both are used in this survey. They are explained in the following paragraphs and in the PCA Soil Primer (*5*).

Most highway engineers classify soils according to the system approved by the American Association of State Highway Officials (AASHO) (*1*). This system of classification is based on the grain-size gradation, the liquid limit, the plasticity index, and the field performance of soils in highways. Soil materials are classified in seven principal groups. The groups range from A–1, which consists of gravelly soils of high bearing capacity (the best soils for subgrade), to A–7, which consists of clay soils having low strength when wet (the poorest soils for subgrade). Within each group, the relative engineering value of the soil material is indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest. The group index is shown in parentheses following the soil group symbol, for example A–6(9).

Some engineers prefer to use the Unified soil classification system established by the Corps of Engineers, U.S. Army (*18*). In this system the soils are identified according to texture and plasticity and are grouped according to their performance as engineering construction materials. Soils are identified as coarse grained (eight classes), fine grained (six classes), and highly organic.

Engineering test data

To help evaluate the soils for engineering purposes, samples from seven profiles representing five of the

soils are nonplastic, that is, they do not become plastic at any moisture content.

Table 7 also gives moisture-density data for the tested soils. If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material will increase until the optimum moisture content is reached. After that, the density decreases as the moisture content increases. The highest dry density obtained in the compaction test is termed *maximum dry density*, and the corresponding moisture content is the *optimum moisture*. Moisture-density data are important in earthwork, for, as a rule, soil is most stable if it is compacted to about the maximum dry density at approximately the optimum moisture content.

Engineering properties and interpretations

Table 8 shows estimates of some of the physical properties of soils that affect engineering work. The data

doches, Ruston, and Saffell soils have gravelly strata. These strata are possible sources of material for the subbase and base courses of pavements and for surfacing county roads. Because these strata normally contain clay, however, they are not suitable for use in concrete structures or for the surface course of a flexible pavement.

The ratings given for suitability for winter grading were made on the basis of soil drainage and the workability of the soil material when it is wet.

The Hatchie, Pheba, Prentiss, Stough, and Savannah soils have a compact layer, or fragipan, in the profile. This layer impedes drainage and causes a perched water table to form. The effect of the fragipan should be considered before a roadway is built across these soils. The Amagon, Angie, Boswell, Falkner, Lafe, Susquehanna, and Tippah soils have a very plastic subsoil, which also impedes drainage.

If the erosion hazard is moderate to severe, cultivated

TABLE 7.—*Engineering*

[Tests performed by the Arkansas State Highway Department in cooperation with U.S. Department of Commerce, Bureau

Soil name and location	Parent material	Arkansas report No. S–62–Ark–13–	Depth	Horizon
			In.	
Nacogdoches gravelly loam: SE¼NE¼ sec. 21, T. 10 S., R. 11 W. (Modal)	Sand, silt, clay, and gravelly material of forested Coastal Plain.	7–3	8 to 14	B21t
		7–5	25 to 41	B23t
		7–6	41 to 72	IIC
Saffell gravelly fine sandy loam: NE¼NE¼ sec. 27, T. 9 S., R. 11 W. (Modal)	Sand, silt, clay, and gravelly material of forested Coastal Plain.	4–3	7 to 36	B2t
		4–4	36 to 65	C
Shubuta fine sandy loam: SW¼SW¼ sec. 22, T. 11 S., R. 10 W.	Sand, silt, and clay of forested Coastal	[illegible]	[illegible]	[illegible]

test data

of Public Roads, according to standard procedures of the American Association of State Highway Officials (AASHO)]

Moisture-density	Mechanical analysis [2]			Classification

TABLE 8.—*Estimated physical*

Classification

properties of soils

Percentage passing sieve—			Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					
			Inches per hour	*Inches per inch of soil depth*	*pH*		
100	95 to 100	75 to 90	0. 2 to 0. 8	0. 21	4. 0 to 5. 5	High	Moderate.
100	95 to 100	80 to 100	<0. 05	. 16	4. 0 to 5. 5	Low	High.
95 to 100	90 to 100	85 to 95	0. 2 to 2. 5	. 21	4. 5 to 5. 5	Moderate to high	Moderate to low.
95 to 100	90 to 100	80 to 90	<0. 05	. 16	4. 0 to 5. 0	Moderate to high	High.
95 to 100	85 to 95	60 to 70	0. 2 to 5. 0	. 16	4. 5 to 5. 5	High	Low.
95 to 100	90 to 100	75 to 85	<0. 05	. 16	4. 5 to 5. 0	Low	High.
95 to 100	90 to 100	75 to 90	<0. 05	. 16	4. 5 to 5. 0	Moderate	High.
100	90 to 100	15 to 30	2. 5 to 5. 0	. 14	4. 5 to 5. 5	High	Low.
100	95 to 100	35 to 60	2. 5 to 5. 0	. 14	4. 5 to 5. 5	High	Low.
100	90 to 100	70 to 80	0. 2 to 0. 8	. 21	4. 0 to 4. 5	High	Low.
100	90 to 100	75 to 85	0. 2 to 0. 8	. 21	5. 0 to 5. 5	Moderate to high	Moderate.
100	95 to 100	45 to 65	2. 5 to 5. 0	. 14	5. 0 to 6. 0	Moderate to high	Low.
100	95 to 100	45 to 70	0. 8 to 2. 5	. 20	4. 5 to 5. 5	Moderate	Moderate.
100	100	25 to 35	2. 5 to 5. 0	. 14	4. 5 to 5. 5	High	Low.
100	95 to 100	50 to 65	0. 2 to 0. 8	. 21	4. 5 to 5. 5	Low to moderate	Low.
100	95 to 100	60 to 70	0. 05 to 0. 2	. 21	4. 5 to 5. 5	Moderate to high	Low.
100	95 to 100	60 to 80	0. 2 to 0. 8	. 21	4. 5 to 5. 5	High	Low.
100	95 to 100	50 to 70	0. 2 to 0. 8	. 21	4. 5 to 5. 5	High	Low.
100	90 to 100	65 to 80	0. 2 to 2. 5	. 21	4. 5 to 5. 5	High	Low.
100	90 to 100	75 to 85	0. 2 to 0. 8	. 20	4. 5 to 5. 5	Low	Moderate.
100	90 to 100	75 to 90	0. 05 to 0. 2	. 16	4. 5 to 5. 5	Low	High.
100	90 to 100	70 to 80	0. 2 to 0. 8	. 21	4. 5 to 5. 5	High	Low.
100	90 to 100	70 to 80	0. 2 to 0. 8	. 21	4. 5 to 5. 5	High	Low.
100	90 to 100	70 to 80	0. 05 to 0. 2	. 21	4. 5 to 5. 5	Low to moderate	Low.
100	95 to 100	70 to 80	0. 05 to 0. 2	. 21	4. 5 to 5. 5	Moderate to high	Low.
100	95 to 100	65 to 85	0. 8 to 2. 5	. 21	4. 5 to 6. 0	High	Low.
100	95 to 100	80 to 90	0. 05 to 0. 2	. 21	6. 0 to 8. 0	High	Moderate.
100	95 to 100	70 to 90	0. 05 to 0. 2	. 16	8. 0 to 9. 0	Moderate to low	Moderate.
75 to 95	70 to 80	40 to 60	2. 0 to 5. 0	. 08	5. 0 to 6. 0	High	Low.
75 to 95	80 to 90	60 to 75	0. 8 to 2. 0	. 16	5. 0 to 6. 0	Moderate	Moderate.
75 to 100	85 to 95	60 to 70	0. 05 to 0. 2	. 16	4. 5 to 5. 5	Low	High.
100	95 to 100	45 to 60	0. 8 to 2. 5	. 16	4. 5 to 5. 5	High	Low.
100	95 to 100	75 to 90	0. 2 to 0. 8	. 16	4. 5 to 5. 5	Moderate	Low.
100	95 to 100	60 to 80	0. 2 to 0. 8	. 16	4. 5 to 5. 5	Moderate	Low.
100	95 to 100	55 to 75	0. 2 to 0. 8	. 16	4. 5 to 5. 5	High	Low.

TABLE 8.—*Estimated physical*

Soil series and map symbols	Depth from surface	Classification		
		USDA texture	Unified	AASHO
	Inches			
Savannah (ShB, ShC, ShD2).	1 to 6	Very fine sandy loam or fine sandy loam.	ML	A-4
	6 to 22	Loam	CL	A-4 or A-6
	22 to 50	Loam	CL	A-4 or A-6

properties of soils—Continued

Percentage passing sieve—			Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					
			Inches per hour	*Inches per inch of soil depth*	*pH*		
95 to 100	90 to 100	50 to 70	0. 8 to 2. 5	0. 20	5. 5 to 6. 5	High	Low.
95 to 100	90 to 100	60 to 80	0. 8 to 2. 5	. 16	4. 5 to 5. 5	Moderate	Low.
95 to 100	90 to 100	60 to 80	0. 05 to 0. 2	. 16	4. 5 to 5. 5	Low	Low.
95 to 100	90 to 100	25 to 50	2. 5 to 5. 0	. 14	5. 0 to 6. 0	High	Low.
100	95 to 100	45 to 70	0. 5 to 0. 2	. 16	5. 0 to 6. 0	Low	Moderate to high.
100	95 to 100	50 to 70	0. 5 to 0. 2	. 16	4. 5 to 5. 5	Low to moderate	Moderate to high.
100	95 to 100	60 to 80	0. 8 to 2. 5	. 21	4. 0 to 5. 0	High	Low.
100	95 to 100	70 to 90	0. 05 to 0. 2	. 21	4. 5 to 5. 5	High	Low.
100	95 to 100	70 to 90	0. 05 to 0. 2	. 21	4. 5 to 5. 5	Moderate to low	Low.
100	95 to 100	75 to 95	0. 05 to 0. 2	. 21	4. 5 to 5. 5	High	Low.
98 to 100	90 to 100	55 to 75	0. 8 to 2. 5	. 20	4. 5 to 5. 5	High	Low.
98 to 100	95 to 100	80 to 90	<0. 05	. 16	4. 0 to 5. 0	Moderate to high	High.
98 to 100	95 to 100	80 to 95	<0. 05	. 16	4. 0 to 5. 0	Moderate to high	High.
95 to 100	90 to 100	80 to 90	0. 05 to 0. 2	. 16	4. 5 to 5. 5	Moderate to high	Moderate to high.
100	90 to 100	85 to 100	<0. 05	. 20	4. 5 to 5. 5	Moderate	High.
100	95 to 100	90 to 100	<0. 05	. 16	4. 5 to 5. 5	Moderate to low	High.
95 to 100	90 to 100	60 to 80	0. 8 to 2. 5	. 21	4. 5 to 6. 0	High	Low.
95 to 100	90 to 100	65 to 90	0. 2 to 0. 8	. 21	4. 0 to 5. 0	Moderate to low	Moderate.
95 to 100	90 to 100	70 to 95	<0. 05	. 16	4. 0 to 5. 0	Moderate to low	High.
100	95 to 100	65 to 75	0. 2 to 0. 8	. 21	4. 5 to 5. 0	High	Low.
100	98 to 100	65 to 75	0. 2 to 0. 8	. 21	4. 5 to 5. 5	Moderate	Low.
100	95 to 100	65 to 75	0. 05 to 0. 2	. 16	5. 0 to 6. 0	Moderate	Moderate.
100	95 to 100	50 to 64	0. 2 to 0. 8	. 16	4. 0 to 5. 5	High	Low.

TABLE 9.—*Engineering*

interpretations

Tendency to slough or slide	Soil features affecting use of the soil for—						
	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Building foundations	Sewage disposal
	Kind	Hazard					

TABLE 9.—*Engineering*

Soil series and map symbols	Suitability of soil material for—		Suitability as source of—		Suitability for winter grading	Desirable location of grade line	Erosion hazard	Hydrologic soil group
	Road subgrade	Road fill	Topsoil	Sand and gravel				
Hatchie (HaB)	Poor	Poor	Poor	Poor	Poor because of somewhat poor drainage.	4 feet above seasonal high water table.	Slight	C
Lafe (La)	Poor	Poor	Poor	Poor	Poor because of somewhat poor or poor drainage.	4 feet above seasonal high water table.	Severe	D
Nacogdoches (NaC2)	Good	Good	Surface layer fair; other layers poor.	Fair	Good because of good drainage.	Anywhere	Moderate	C
Ochlockonee (Oc, Ow) (For Wehadkee part of Ow, see Wehadkee series).	Good	Good	Good	Poor	Fair because of occasional floods.	4 feet above high water mark.	Slight	B
Pheba (PeA, PeB)	Poor	Poor	Poor	Poor	Poor because of somewhat poor drainage.	4 feet above seasonal high water table.	Slight	C
Prentiss (PrB, PrC)	Good	Good	Surface layer good; other layers fair.	Poor	Good because of moderately good drainage.	4 feet above seasonal high water table.	Moderate	C
Ruston (RuC, RuC2)	Good	Good	Good	Medium locally; good in substratum.	Good because of good drainage.	Anywhere	Moderate	B
Saffell (SaC, SaE)	Good	Good	Poor	Good	Good because of good drainage.	Anywhere	Moderate to very severe.	B
Savannah (ShB, ShC, ShD2).	Good	Good	Surface layer good; other layers fair.	Poor	Good because of moderately good drainage.	4 feet above seasonal high water table.	Moderate to severe.	C

interpretations—Continued

Tendency to slough or slide	Soil features affecting use of the soil for—						
	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Building foundations	Sewage disposal
	Kind	Hazard					
Moderate	Impounded	Erodibility; fragipan in subsoil.	Seasonal high water table.	Cost high compared to benefits.	Not needed, because of flat topography.	High water table.	High water table; moderate to slow percolation rate.
High	None	Erodibility	Slow permeability; flat topography.	Cost high compared to benefits.	Not needed, because of flat topography.	Plastic clay subsoil; loose sand in substrata.	Slow percolation rate.
Moderate	Impounded	None	Not needed, because of good natural drainage.	Favorable available water capacity; favorable infiltration rate.	Erodibility	Stable; high content of gravel.	Moderate percolation rate.
Low	Excavated	None	Not needed, because of good natural drainage.	Favorable available water capacity; favorable infiltration rate.	Not needed, because of flat topography.	High water table.	Occasional floods.
Moderate	Impounded	Erodibility; fragipan in subsoil.	Seasonal high water table.	Cost high compared to benefits.	Not needed, because of flat topography.	High water table.	High water table; moderate to slow percolation rate.
Moderate	Impounded	Erodibility; fragipan in	Not needed, because of	Favorable available water	Erodibility	Stable, moderately well	Moderate percolation

TABLE 9.—*Engineering*

Soil series and map symbols	Suitability of soil material for—		Suitability as source of—		Suitability for winter grading	Desirable location of grade line	Erosion hazard	Hydrologic soil group
	Road subgrade	Road fill	Topsoil	Sand and gravel				
Shubuta (SmC, SmC2, SmD, SnC2, SnE).	Fair	Fair	Fair	Poor	Good because of moderately good drainage.	4 feet above seasonal high water table.	Moderate to very severe.	C
Stough (StB, StC)	Poor	Poor	Poor	Poor	Poor because of somewhat poor drainage.	4 feet above seasonal high water table.	Slight to moderate.	C
Susquehanna (SuA, SuB, SvA, SvB2, SvC2, SvE).	Poor	Poor	Poor	Poor	Poor because of somewhat poor drainage.	Anywhere if drainage is adequate.	Slight to very severe.	D
Tippah (TaA, TaB2	Poor	Poor	Poor	Poor	Good because	Anywhere if	Slight to	D

interpretations—Continued

Tendency to slough or slide	Soil features affecting use of the soil for—						
	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Building foundations	Sewage disposal
	Kind	Hazard					
High	Impounded	None	Not needed because of sloping topography.	Somewhat favorable available water capacity; favorable infiltration rate.	Erodibility	Deep to clay in substratum.	Moderate percolation rate.
Moderate	Impounded	Erodibility; fragipan in subsoil.	Seasonal high water table.	Cost high compared to benefits.	Not needed, because of flat topography.	High water table.	High water table; moderate to slow percolation rate.
High	Impounded	Erodibility	Generally not needed, because of slope; permeability.	Cost high compared to benefits.	Erodibility because of plastic clay subsoil.	Plastic clay with high shrink-swell potential.	Slow percolation rate.
High	Impounded	Slow permeability; high erodibility.	Generally not needed because of sloping topography.	Cost high compared to benefits.	Erodibility	Clay subsoil with high shrink-swell potential.	Slow percolation rate.
Moderate	Excavated	None	Seasonal high water table; flat topography; slow permeability.	Cost high compared to benefits.	Not needed, because of flat topography.	High water table; frequent floods.	High water table; frequent floods.
Moderate	Excavated	None	Seasonal high water table; slow permeability.	Cost high compared to benefits.	Not needed because of flat or nearly level topography.	High water table.	High water table; slow percolation rate.

Formation of Soils

in several properties because Susquehanna soils formed from clayey parent material and Ruston soils formed

TABLE 10.—*Mineralogy of*

[Dashed lines mean

Soil	Sample No. S-62-Ark-13-	Horizon	Depth from surface	Fine silt (5–2 microns)		Coarse clay (2–0.2 microns)	
				Percentage of sample	Mineralogy	Percentage of sample	Mineralogy
			Inches				
Nacogdoches gravelly loam.	7–3	B21t	8 to 14	0. 33	95 percent quartz, 2 percent illite, 2 percent kaolinite, 1 percent vermiculite.	18. 80	65 percent kaolinite, 15 percent vermiculite, 10 percent illite, 9 percent montmorillonite, less than 1 percent quartz, less than 1 percent chlorite.
	7–5	B23t	25 to 41	1. 27	85 percent quartz, 10 percent kaolinite, 4 percent illite, 1 percent vermiculite.	29. 74	85 percent kaolinite, 9 percent montmorillonite, 5 percent illite, less than 1 percent quartz, less than 1 percent vermiculite.
	7–6	IIC	41 to 72	2. 27	85 percent quartz, 10 percent illite, 4 percent kaolinite, 1 percent vermiculite.	26. 11	90 percent kaolinite, 5 percent montmorillonite, 4 percent illite, 1 percent quartz.
Saffell gravelly fine sandy loam.	4–3	B2t	7 to 36	2. 23	90 percent quartz, 5 percent illite, 2 percent kaolinite, 2 percent potash feldspars, 1 percent vermiculite.	3. 00	----------
	4–4	C	36 to 65	. 66	95 percent quartz, 4 percent illite, less than 1 percent potash feldspars, less than 1 percent plagioclase feldspars.	3. 19	90 percent kaolinite, 5 percent vermiculite, 4 percent illite, less than 1 percent quartz, less than 1 percent montmorillonite.
Shubuta fine sandy loam.	5–2	A2	2 to 7	1. 25	95 percent quartz, 2 percent potash feldspars, 1 percent vermiculite, less than 1 percent kaolinite, less than 1 percent illite, less than 1 percent plagioclase feldspars.	2. 31	65 percent kaolinite, 15 percent vermiculite, 10 percent quartz, 5 percent illite, 5 percent montmorillonite.
	5–4	B22t	14 to 25	. 98	95 percent quartz, 3 percent kaolinite, 1 percent illite, less than 1 percent potash feldspars, less than 1 percent plagioclase feldspars.	16. 47	65 percent kaolinite, 25 percent montmorillonite, 7 percent quartz, 3 percent illite.
	5–5	B3	25 to 60	1. 46	80 percent quartz, 15 percent illite, 5 percent kaolinite.	18. 65	48 percent montmorillonite, 40 percent kaolinite, 11 percent illite, 1 percent quartz.
Susquehanna silty clay.	6–2	B21t	3 to 10	6. 19	90 percent quartz, 5 percent illite, 4 per-	17. 96	65 percent kaolinite, 20 percent montmoril-

selected soils

absence of data]

Medium clay (0.2–0.08 micron)		Fine clay (less than 0.08 micron)		Total percentage of clay [1]	Calculated cation-exchange capacity of total clay	Percentage of free iron as Fe_2O_3
Percentage of sample	Mineralogy	Percentage of sample	Mineralogy			
					Meq./100 gm. soil	

TABLE 10.—*Mineralogy of*

Soil	Sample No. S-62-Ark-13-	Horizon	Depth from surface	Fine silt (5–2 microns)		Coarse clay (2–0.2 microns)	
				Percentage of sample	Mineralogy	Percentage of sample	Mineralogy
			Inches				
Susquehanna silty clay—Con.	6-3	B22t	10 to 20	5. 99	85 percent quartz, 10 percent illite, 4 percent kaolinite, less than 1 percent potash feldspars, less than 1 percent plagioclase feldspars.	17. 99	70 percent kaolinite, 20 percent montmorillonite, 7 percent illite, 3 percent quartz.
	6-4	B23	20 to 72	5. 42	90 percent quartz, 5 percent illite, 4 percent kaolinite, less than 1 percent potash feldspars, less than 1 percent plagioclase feldspars.	26. 29	80 percent kaolinite, 10 percent montmorillonite, 9 percent illite, 1 percent quartz.
Tippah silt loam	3-4	B21t	10 to 17	3. 16	90 percent quartz, 5 percent illite, 3 percent kaolinite, 1 percent vermiculite, less than 1 percent potash feldspars, less than 1 percent plagioclase feldspars.	12. 48	42 percent kaolinite, 15 percent quartz, 15 percent vermiculite, 13 percent illite, 10 percent montmorillonite, 5 percent interstratified chlorite and montmorillonite.
	3-7	IIB24t	32 to 62	3. 13	85 percent quartz, 8 percent illite, 5 percent kaolinite, 1 percent plagioclase feldspars less than 1 percent potash feldspars.	17. 93	65 percent montmorillonite, 30 percent kaolinite, 4 percent illite, 1 percent quartz.

[1] The sum of the individual clay fractions includes losses due to handling and to removal of free iron, salts, and some amorphous materials. These losses are offset, in part, by gains due to dispersion and attrition of the coarser particles and aggregates.
[2] Trace.

Climate

The climate in Cleveland County is one of warm summers, mild winters, and ample, well-distributed precipitation. The climate is uniform throughout the county, and consequently it does not account for significant differences among the soils.

Most of the soils on uplands and terraces are strongly weathered and strongly leached. Moderately high summer temperatures favor the activity of micro-organisms from about April 1 to November 1, and ample rainfall results in intense leaching of soluble and colloidal material from about the middle of November to the middle of June. Subzero temperatures are rare, and the soils are frozen for only short periods and to a depth of only a few inches; consequently, freezing and thawing have had little effect on weathering and soil formation.

Living organisms

Vegetation has had more influence than animal life on soil formation in this county. Pine and hardwood trees covered most of the soils on uplands and terraces. The most common species were loblolly pine, shortleaf pine, red oak, white oak, post oak, willow oak, water oak, hickory, sweetgum, blackgum, and ash. The bottom lands were covered with Nuttall oak, willow oak, swamp chestnut oak, cherrybark oak, hackberry, American elm, and green ash. The difference in native vegetation seems to be associated mainly with differences in drainage or in the frequency and duration of floods.

Parent material

Most of the soils in Cleveland County formed in sediments deposited in the Gulf of Mexico when the gulf extended northward to about the foot of the Ouachita Mountains. These sediments consisted mostly of noncalcareous sand, silt, and clay, and included some gravelly material. Hatchie, Falkner, and Tippah soils have a thin mantle of loess on the gulf sediments. The mantle ranges from less than 1 foot to more than 10 feet in thickness. The geological formations that are presently at the surface, with the exception of the loess, date from Tertiary, Pleistocene, and Recent times (*19*). Data about the sources of loess are not available, but it is assumed that the primary sources were the flood plains of the Mississippi River and the Arkansas River (*17*). Deposition probably occurred during and after the advances of the Wisconsin glaciers, the last of which moved into the Upper Mississippi River Valley about 11,000 years ago.

On the flood plains of the Saline River, Moro Creek, and their tributaries, the parent material consisted of

selected soils—Continued

Medium clay (0.2–0.08 micron)		Fine clay (less than 0.08 micron)		Total percentage of clay [1]	Calculated cation-exchange capacity of total clay	Percentage of free iron as Fe_2O_3
Percentage of sample	Mineralogy	Percentage of sample	Mineralogy			
					Meq./100 gm. soil	
6. 05	73 percent montmorillonite, 22 percent amorphous materials, 5 percent illite.	4. 58	80 percent montmorillonite, 20 percent amorphous materials.	28. 6	52	2. 3
16. 92	88 percent montmorillonite, 7 percent amorphous materials, 5 percent illite.	4. 88	90 percent montmorillonite, 10 percent amorphous materials.	48. 1	49	3. 5
5. 97	78 percent amorphous materials, 20 percent montmorillonite, 2 percent vermiculite.	(2)	62 percent amorphous materials, 38 percent montmorillonite.	18. 5	69	2. 2
16. 08	85 percent montmorillonite, 14 percent amorphous materials, 1 percent kaolinite.	6. 01	81 percent montmorillonite, 19 percent amorphous materials.	40. 0	77	1. 3

recent alluvium derived from the adjacent uplands and terraces.

Topography

Cleveland County occupies a smooth plain that slopes gently toward the southeast. Moro Creek, which forms

quired for a soil to form in humid, warm regions that have luxuriant vegetation than in dry or cold regions that have scanty vegetation. Less time is required for a soil to form from coarse-textured parent material than from fine-textured material, other factors being equal. Generally, older soils show a greater degree of differen-

ted in 1938 (*10*) and revised later (*8*). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965.[8] The current system is under continual study. Therefore readers interested in developments of the system should search for the latest literature available (*6*).

The current system of classification defines classes in terms of observable or measurable properties of soils. It

In table 11 the soils of Cleveland County are classified according to the current system and the 1938 system. Following are brief descriptions of each of the six categories in the current system.

ORDER.—Ten soil orders are recognized in the current system: Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histo-

sented in Cleveland County by Collins and Ochlockonee soils.

Inceptisols occur mostly on young, but not recent, land surfaces. Their name is derived from the Latin word *inceptum*, for beginning. This order is represented by

are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

SERIES.—The series has the narrowest range of characteristics of the categories in the classification system. It is explained in the section "How This Soil Survey Was

Representative Soil Profiles

In the following pages each soil series in Cleveland County is discussed briefly, and a profile of a soil representative of the series is described. The colors given are for moist soils.

Amagon Series

The Amagon series consists of nearly level and gently sloping, poorly drained, medium acid to very strongly acid soils on uplands. The underlying material is made up of beds of unconsolidated sand, silt, and clay.

Amagon soils are associated with Susquehanna and Pheba soils. Their subsoil is coarser textured than that of Susquehanna soils and is gray instead of gray and red. Amagon soils have a finer textured subsoil than Pheba soils, which have a fragipan.

Profile of Amagon silt loam, heavy substratum, 0 to 3 percent slopes (AmB), in a moist wooded area in the NE¼SE¼ sec. 3, T. 9 S., R. 13 W.:

O2—¼ inch to 0, partly decomposed plant remains.

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; abundant roots; common, fine, hard, dark-colored concretions; strongly acid; clear, smooth boundary.

A2—2 to 8 inches, gray (10YR 6/1) silt loam with few, fine, faint mottles of yellowish brown (10YR 5/4); moderate, medium, subangular blocky structure; friable; plentiful roots; few fine pores; few, fine, hard, dark-colored concretions; strongly acid; gradual, smooth boundary.

B11g—8 to 15 inches, gray (10YR 6/1) silt loam with [illegible]

Angie soils are associated mainly with Caddo and Prentiss soils. They are less gray than Caddo soils and have a finer textured subsoil. Angie soils are less brown and less well drained than Prentiss soils, have a finer textured subsoil, and lack the fragipan that is characteristic of those soils.

Profile of Angie silt loam, 0 to 1 percent slopes (AnA), in a moist wooded area in the SE¼SW¼ sec. 15, T. 11 S., R. 10 W.:

O1—¼ inch to 0, partly decomposed plant remains.

A1—0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, medium, subangular blocky structure; firm; plentiful roots; few, small, hard, dark-colored concretions; strongly acid; clear, smooth boundary.

B2t—4 to 18 inches, mottled strong-brown (7.5YR 5/8), gray (10YR 6/1), and yellowish-brown (10YR 5/6) silty clay loam; mottles are fine and medium; moderate, fine and medium, angular blocky structure; plastic; common clay films; plentiful fine roots; few, fine, hard, dark-colored concretions; a little chert gravel; very strongly acid; gradual, wavy boundary.

B3—18 to 30 inches, mottled red (2.5YR 4/8), gray (10YR 6/1), and yellowish-brown (10YR 5/8) silty clay loam; moderate, fine and medium, angular blocky structure; very plastic; a little chert gravel; very strongly acid; gradual, smooth boundary.

C—30 to 45 inches +, gray (10YR 6/1) silty clay or clay with common, fine and medium, distinct mottles of yellowish brown (10YR 5/8) and red (2.5YR 4/8); moderate, medium, angular blocky structure; very plastic; a little fine chert gravel; very strongly acid.

The A horizon ranges from dark gray to grayish brown in color. The B horizon is variegated red, gray, and brown silty clay loam, silty clay [illegible]

fine sandy loam in texture. The B21t horizon ranges from red to yellowish red in color and from 6 to 18 inches in thickness. In some places the B22t horizon is domi-

throughout, whereas Savannah soils are free of mottles in the upper part.

Profile of Caddo silt loam, 0 to 1 percent slopes (CaA), in a moist wooded area in the NW¼ NW¼ sec. 24, T. 8 S.,

and red (2.5YR 4/6); moderate, medium, angular blocky structure; firm when moist, slightly plastic when wet; patchy, thin clay films; few fine roots; few fine pores; very strongly acid; gradual, wavy boundary.

C—44 to 56 inches +, yellowish-red (5YR 4/6) fine sandy loam with splotches and streaks of yellowish brown (10YR 5/6); moderate, medium and coarse, angular blocky structure; friable; few fine roots; few fine pores; very strongly acid.

The A horizon ranges from dark grayish brown to yellowish brown in color and from 6 to 15 inches in thickness. The B21t horizon ranges from yellowish red to strong brown in color and is clay loam or sandy clay loam in texture. The B22t horizon is yellowish-red to strong-brown clay loam or sandy clay loam with a few fine mottles of various shades of yellow, brown, and gray. The color of the C horizon is about the same as that of the B22t horizon, but the texture generally is coarser, and the mottles are coarser.

Collins Series

The Collins series consists of moderately well drained, medium acid to very strongly acid soils on the flood plains of the larger streams. These soils formed in recent alluvium.

Collins soils are associated with Ochlockonee, Wehadkee, and Falaya soils. Collins soils are not so well drained as Ochlockonee soils but are better drained than Falaya and Wehadkee soils. Mottling occurs at a greater depth in Collins soils than in Falaya and Wehadkee soils.

Profile of Collins silt loam (Co), in a moist wooded area in the NE¼SW¼ sec. 24, T. 11 S., R. 10 W.:

grayer nearer the surface than Collins and Ochlockonee soils.

Profile of Falaya silt loam (Fa), in a moist wooded area in the NW¼SE¼ sec. 8, T. 11 S., R. 10 W.:

O1—½ to ¼ inch, leaves and twigs.

O2—¼ inch to 0, partly decomposed plant remains.

A1—0 to 9 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, subangular blocky structure; friable; abundant roots; few, fine, hard, dark-colored concretions; very strongly acid; clear, smooth boundary.

B1—9 to 15 inches, yellowish-brown (10YR 5/4) silt loam with common, fine, faint mottles of gray (10YR 6/1) and brown (10YR 5/3); weak, medium, angular blocky structure; friable; plentiful roots; many fine pores; few, fine, hard, dark-colored concretions; very strongly acid; clear, wavy boundary.

B2g—15 to 56 inches +, gray (10YR 6/1) silt loam with many, fine and medium, distinct mottles of yellowish brown (10YR 5/8) and brown (10YR 5/3); moderate, medium, subangular blocky structure; firm when moist, slightly sticky when wet; few fine roots; many, soft, dark-colored concretions up to 1 inch in diameter; few fine fragments of chert; very strongly acid.

The A horizon ranges from dark yellowish brown to grayish brown in color. The B1 horizon is yellowish brown to pale brown. The depth to the B2g horizon ranges from 8 to 16 inches. In many places the lower part of this layer is thinly stratified with silty clay loam.

Falkner Series

The Falkner series consists of level and nearly level, somewhat poorly drained, medium acid and strongly acid soils on uplands. These soils formed in a mantle of loess

The A horizon ranges from dark grayish brown to yellowish brown in color and from 6 to 12 inches in thickness. The B1 horizon ranges from brown to yellowish brown in color and from silt loam to light silty clay loam in texture. The B2t horizon ranges from yellowish brown to brown and is mottled with various shades of

Lafe Series

The Lafe series consists of somewhat poorly drained and poorly drained soils that are slightly acid or neutral in the surface layer and strongly alkaline in the B and C horizons, which have a high content of sodium and mag-

many fine to medium roots; a little ironstone and sandstone gravel; medium acid; clear, smooth boundary.

A3—3 to 8 inches, dark-red (2.5YR 3/6) gravelly loam; mod-

loam, or silt loam, contains thin strata of silty clay loam in some places. The color ranges from strong brown to yellowish brown. Splotches or mottles of gray and yel-

horizon is light yellowish brown to pale brown heavy sandy loam to sandy clay loam. The B′xtg horizon is loam, silt loam, or light sandy clay loam. The depth to the fragipan ranges from 18 to 36 inches.

Prentiss Series

The Prentiss series consists of moderately well drained, medium acid and strongly acid soils on stream terraces. The underlying material is made up of sediments washed from Ruston, Savannah, Shubuta, and other soils on up-

Ruston soils are associated with Bowie, Saffell, Savannah, and Shubuta soils. Ruston soils are better drained than Savannah soils, which have a fragipan. They are less permeable than Saffell soils, which contain large amounts of gravel. Ruston soils are not so fine textured in the subsoil as Shubuta and Bowie soils.

Profile of Ruston fine sandy loam, 3 to 8 percent slopes, eroded (RuC2), in a moist pasture in the SE¼NW¼ sec. 24, T. 11 S., R. 9 W.:

Ap 0 to 7 inches, yellowish brown (10YR 5/4), fine sandy

The gravel content of the A horizon ranges up to 60 percent, by volume. The B2t horizon ranges from reddish brown to red in color and from gravelly sandy loam to sandy clay loam in texture. More than 50 percent, by volume, is gravel. The texture of the C horizon ranges from sandy loam to sandy clay loam; there are a few thin layers of clay. The gravel content normally is more than 50 percent, by volume.

Savannah Series

Shubuta Series

The Shubuta series consists of gently sloping to moderately steep, moderately well drained, medium acid and strongly acid soils on uplands. The underlying material is made up of thinly stratified beds of unconsolidated sandy, silty, and clayey Coastal Plain deposits.

Shubuta soils are associated mainly with Boswell, Tippah, and Susquehanna soils. Shubuta soils are better drained, are more friable, and have a coarser textured subsoil than Susquehanna soils. They have a redder sub-

O1—½ to ¼ inch, leaves and small twigs.
O2—¼ inch to 0, partly decomposed plant remains.
A1—0 to 4 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; very friable; plentiful roots; few, fine, hard, dark-colored concretions; strongly acid; clear, smooth boundary.
A2—4 to 7 inches, pale brown (10YR 6/3) silt loam with few

The A horizon is very fine sandy loam or silty clay. It ranges from dark gray to grayish brown in color and from 4 to 8 inches in thickness. The texture of the B horizon is clay or silty clay.

Wehadkee Series

The Wehadkee series consists of poorly drained, slowly permeable, acid soils. These soils formed in recent alluvium on flat, frequently flooded, active flood plains.

Wehadkee soils are associated with Ochlockonee, Collins, and Falaya soils. They are more poorly drained and grayer in color than any of these associated soils, and they have a finer textured surface layer than Ochlockonee soils.

Profile of Wehadkee silt loam (Wa), in a moist wooded area:

O1—½ inch to 0, partly decomposed plant remains.

A1—0 to 6 inches, light brownish-gray (10YR 6/2) silt loam with few, fine, faint mottles of gray (10YR 5/1); weak, medium, subangular blocky structure; friable; abundant roots; few, fine, hard, dark-colored concretions; very strongly acid; clear, smooth boundary.

B21g—6 to 24 inches, gray (10YR 6/1) silt loam with many

C—40 to 54 inches +, mottled gray (10YR 6/1) and yellowish-brown (10YR 5/8) alternate layers of sand, silt, and clay; very strongly acid.

The A horizon ranges from 6 to 12 inches in thickness. The color of the A1 horizon is dark grayish brown to light brownish gray; that of the A2 horizon is light brownish gray or pale brown, with mottles of brownish yellow and yellowish brown. The texture of the B2g horizon is sandy loam, silt loam, or loam. The color is gray or light gray mottled with various shades of brown and yellow. The B3g horizon ranges from fine sandy loam to loam in texture and from light gray to gray in color.

Additional Facts About the County

the gentle slopes. The flood plains occur as wide, poorly drained bottom lands along sluggish streams. The best

temperature of 32° F. can occur as late as March 19 and as early as November 10. The earliest that a temperature

4 percent of the time. Since 1931, such droughts have occurred during the growing season only in 1936, 1943, and 1954.

The evaporation rate is high during summer; it ranges up to one-third of an inch per day. The average annual rate is almost 60 inches, which is slightly in excess of the average total precipitation (see table 12). Thus, in spite of the fairly substantial annual rainfall, a large amount of soil moisture is lost during rain-free periods in the hot summer months.

Agriculture

The 1959 Census of Agriculture compares farm data in Cleveland County for the years 1954 and 1959. The census figures show that the total land in farms in these years decreased from 169,503 acres to 93,704 acres, and the number of farms from 1,231 to 773. The average

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(11) ———
1959. GUIDE FOR EVALUATING SWEETGUM SITES. U.S. For. Serv. Occasional Paper 176, 8 pp., illus.
(12) ———

Firm.—When moist, soil crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, soil is readily deformed by moderate pressure but can be pressed into a lump; forms a wire when rolled between thumb and forefinger.

Sticky.—When wet, soil adheres to other material; tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, soil moderately resists pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, soil breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Crop rotation. A systematic changing of crops grown on the same

Permeability, soil. The quality that enables a soil to transmit water and air. Terms used to describe permeability are *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Phase. A subdivision of a soil type, series, or other unit in the soil classification system, made because of differences that affect the management of soils but not their classification. A soil type, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects management.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor

Slope classes. The slope classes used in this report are:

	Woodland suitability group		Wildlife suitability group	
	Number	Page	Number	Page
	13	30	3	33
	13	30	3	33
	8	29	2	33
	8	29	2	33
	11	30	2	33
	8	29	2	33
	12	30	2	33
	7	29	4	33
	7	29	4	33
	9	29	5	33
	9	29	5	33
	9	29	5	33
	9	29	5	33
	9	29	5	33
	10	30	5	33
	8	29	2	33
	8	29	2	33
	8	29	2	33
	17	31	2	33
	12	30	2	33
	4	28	1	32
	4	28	1	32
	--	--	--	--
	4	28	1	32
	4	28	1	32
	--	--	--	--
	4	28	1	32
	4	28	1	32
	6	29	4	33
	6	29	4	33