Ecological site PX133A00X005
Upland Longleaf Pine Woodland Dry

Accessed: 05/02/2024

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 133A–Southern Coastal Plain

This MLRA (shown in orange in the figure above) is in Alabama (26 percent), Mississippi (24 percent), Georgia (21 percent), Florida (8 percent), North Carolina (7 percent), Virginia (5 percent), South Carolina (4 percent), Tennessee (4 percent), and Louisiana (1 percent). It makes up about 106,485 square miles (275,930 square kilometers). It is the largest MLRA in the U.S. The city of Alexandria, Virginia, is at the northernmost tip of the area. The MLRA also includes Fredericksburg, Richmond, and Petersburg, Virginia; Rocky Mount, Goldsboro, Fayetteville, and Lumberton, North Carolina; Florence, Sumter, and Orangeburg, South Carolina; Albany and Tifton, Georgia; Tallahassee, Florida; Tuskegee, Eufaula, Selma, and Tuscaloosa, Alabama; Savannah, Tennessee; Corinth, Starkville, Grenada, Meridian, Hattiesburg, and McComb, Mississippi; and Bogalusa, Louisiana. Interstates 95, 64, 85, 40, 20, 20/59, 26, 16, 75, 10, 65, 59, and 55 cross this area from north to south. This area extends from Virginia to Louisiana and Mississippi, but it is almost entirely within three sections of the Coastal Plain Province of the Atlantic Plain. The northern part is in the Embayed Section, the middle part is in the Sea Island Section, and the southern part is in the East Gulf Coastal Plain Section. This MLRA is strongly dissected into nearly level and gently undulating valleys and gently sloping to steep uplands. Stream valleys generally are narrow in their upper reaches but become broad and have widely meandering stream channels as they approach the coast. Elevation ranges from 80 to 655 feet (25 to 200 meters), increasing gradually from the lower Coastal Plain northward. Local relief is mainly 10 to 20 feet (3 to 6 meters), but it is 80 to 165 feet (25 to 50 meters) in some of the more deeply dissected areas.

Classification relationships

ATTENTION: This ecological site meets the requirements for PROVISIONAL. A provisional ecological site is established after ecological site concepts are developed and an initial state-and-transition model is drafted. A provisional ecological site typically will include literature reviews, land use history information, legacy data, and must include some soils data, ocular estimates for canopy and/or species composition by weight, and some line-point intercept information. A provisional ecological site provides the conceptual framework of soil-site correlation for the development of the ESD. For more information about this ecological site, please contact your local NRCS office.

Ecological site concept

This system of upland Pinus palustris-dominated vegetation ranges from southern Virginia (beginning approximately at
the James River) to northeastern Florida (excluding longleaf pine of the Fall-Line Sandhills, accommodated by another ecological
system), where it was once perhaps the most extensive system in the Outer Coastal Plain within its range. Examples and associations
share the common feature of upland (non-wetland) moisture regimes and natural exposure to frequent fire. They occur on a variety of
well- to excessively drained soils, and on the higher parts of upland-wetland mosaics. The vegetation is naturally dominated by Pinus
palustris. Most associations have an understory of scrub oaks. The herb layer is generally well-developed and

dominated by grasses. Aristida stricta primarily dominates in the northern part of its range, and Aristida beyrichiana in the southern part. Frequent, low-intensity fire is the dominant natural ecological force. This system occurs on upland sites of the Middle to Outer Atlantic Coastal Plain, on landforms that include loamy to
sandy flats, relict beach system deposits, eolian sand deposits, Carolina bay rims, and occasional low rolling hills. Soils range from
mesic to xeric and from sandy to loamy or occasionally clayey. Most natural remnants are on coarse sands, but most examples
probably once occurred on loamy soils. Soils are largely acidic and infertile, and the coarsest sands are excessively drained and sterile. The unifying feature of this system is non-wetland sites that naturally supported frequent fire. As such, it once covered much of the landscape of the Coastal Plain. Variations in soil texture and drainage appear to be a primary driver of differences between
associations within the system, with biogeography also important. Descriptions of Ecological Systems for
Modeling of LANDFIRE Biophysical Settings
Ecological Systems
06 October 2007
Descriptions provided to TNC and LANDFIRE by NatureServe

Table 1. Dominant plant species

Tree	(1) *Pinus palustris* (2) *Quercus laevis*
Shrub	Not specified
Herbaceous	(1) *Aristida stricta*

Legacy ID

F133AY005NC

Physiographic features

This area extends from Virginia to Louisiana and Mississippi, but it is almost entirely within three sections of the Coastal Plain Province of the Atlantic Plain. The northern part is in the Embayed Section, the middle part is in the Sea Island Section, and the southern part is in the East Gulf Coastal Plain Section. This MLRA is strongly dissected into nearly level and gently undulating valleys and gently sloping to steep uplands. Stream valleys generally are narrow in their upper reaches but become broad and have widely meandering stream channels as they approach the coast. Elevation ranges from 80 to 655 feet (25 to 200 meters), increasing gradually from the lower Coastal Plain northward. Local relief is mainly 10 to 20 feet (3 to 6 meters), but it is 80 to 165 feet (25 to 50 meters) in some of the more deeply dissected areas.

Table 2. Representative physiographic features

Landforms	(1) Swamp

Climatic features

The average annual precipitation in this area ranges from 41 to 53 inches (1,041 to 1,346 millimeters). Maxiumum precipitation occurs in midsummer, and the minimum occurs in autumn. High-intensity, convective thunderstorms account for summer rainfall. If snow occurs at all, it is in small amounts.

The average annual temperature ranges from 59 to 65 degrees F (15 to 18 degrees C).

Climate data is based on Normal PRISM data for the period 1981-2010.

Table 3. Representative climatic features

Frost-free period (average)	205 days
Freeze-free period (average)	232 days

Precipitation total (average)	50 in

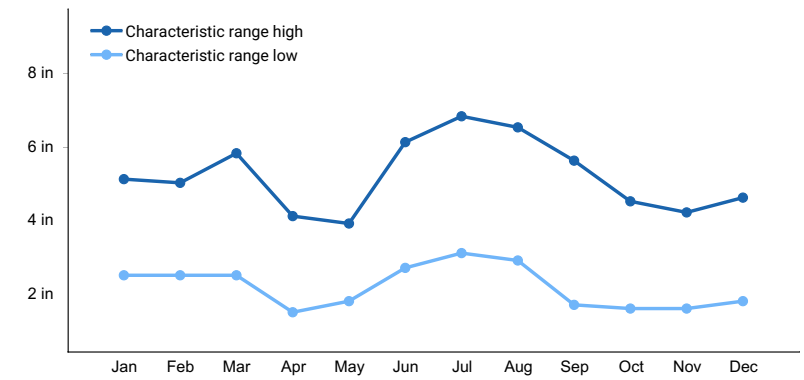

Figure 1. Monthly precipitation range

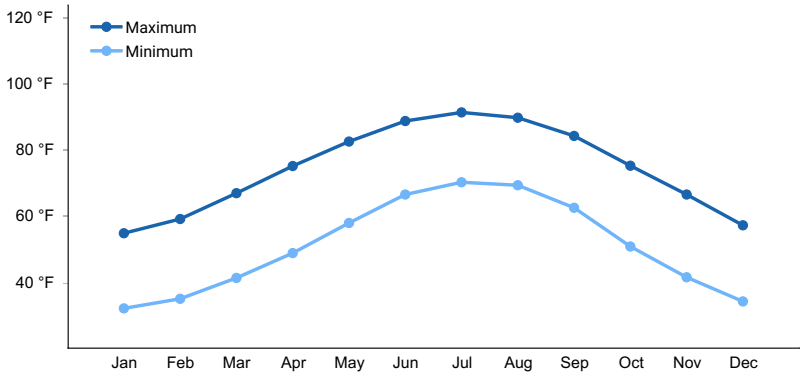

Figure 2. Monthly average minimum and maximum temperature

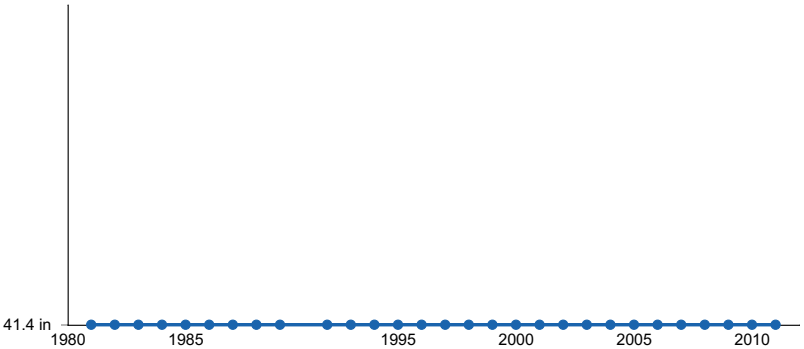

Figure 3. Annual precipitation pattern

Climate stations used

- (1) BYRON EXP STN [USC00091448], Byron, GA
- (2) SANDHILL RSCH ELGIN [USC00387666], Elgin, SC
- (3) AUGUSTA BUSH FLD AP [USW00003820], Augusta, GA
- (4) COLUMBIA [USW00013883], West Columbia, SC
- (5) AIKEN 5SE [USC00380074], Aiken, SC
- (6) CAMDEN 3 W [USC00381310], Camden, SC
- (7) CHERAW [USC00381588], Cheraw, SC
- (8) HAMLET [USC00313784], Hamlet, NC
- (9) JACKSON SPRINGS 5 WNW [USC00314464], Jackson Springs, NC
- (10) PELION 4 NW [USC00386775], Pelion, SC
- (11) MACON MIDDLE GA RGNL AP [USW00003813], Macon, GA
- (12) POPE AFB [USW00013714], Fort Bragg, NC

Influencing water features

This ecological site is seasonally flooded.

Soil features

Parent Material: unconsolidated sandy and loamy marine deposits
Landscape: Coastal Plain
Landform: Ridges and hillslopes
Hillslope Profile Position: Summit, shoulder, and backslope
Geomorphic Component: Side slope and interfluve
Slopes: 0 to 15 percent but range to 45 percent
Elevation: 30 to 152 meters (98 to 500 feet)
Mean annual air temperature: 16 to 18 degrees C (62 to 66 degrees F)
Mean annual precipitation: 1219 to 1422 millimeters (48 to 64 inches)
Frost free duration: 190 to 310 days

GEOGRAPHICALLY ASSOCIATED SOILS:
These are the Ailey, Alaga, Blanton, Bonneau, Bonifay, Fuquay, Lakeland, Lucy, and Orangeburg, series.
Ailey soils are well drained or somewhat excessively drained on similar positions and have sandy surface and subsurface layers 51 to 102 centimeters (20 to 40 inches) in thickness. The subsoil is dense with some brittleness and cementation and are in an Arenic subgroup.
Alaga soils are excessively drained on similar to lower positions, and are Quartzipsamments.
Blanton soils are somewhat excessively drained to moderately well drained on lower positions and are in a Grossarenic subgroup.
Bonneau soils are well drained on lower, stream terrace positions, are in an Arenic subgroup and have an argillic horizon at depths of 56 to 188 centimeters (22 to 74 inches).
Bonifay soils are well drained soils and are on slightly lower positions, have more than 5 percent plinthite in the argillic horizons and are in the Grossarenic Plinthic subgroup.
Fuquay soils are well drained on lower positions and are in an Arenic subgroup.
Lakeland soils are excessively drained on similar to higher positions and are Quartzipsamments.
Lucy soils are well drained on similar positions and are in an Arenic subgroup.
Orangeburg soils are well drained on similar to lower positions, have a control section of fine-loamy, and are in the Typic subgroup.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY:
Drainage class: Somewhat excessively drained
Saturated Hydraulic Conductivity (Ksat): moderately high in the Bt horizon and high in the A and E horizons
Permeability: moderate in the Bt horizon and rapid in the A and E horizons
Flooding frequency and Duration: None
Ponding frequency and Duration: None

USE AND VEGETATION:
Most areas of Troup soils are in forests of pine and mixed hardwoods. Cleared areas are used for pastureland and for growing peanuts, watermelons, and vegetables.

DISTRIBUTION AND EXTENT:
Major Land Resource Area (MLRA's): The series occurs primarily in the Southern Coastal Plain (MLRA 133A). It also occurs to a lesser extent in the Carolina and Georgia Sand Hills (MLRA 137), North Central Florida Ridge (MLRA 138), Eastern Gulf Coast Flatwoods (MLRA 152A), and the Atlantic Coast Flatwoods (MLRA 153A).
Extent: large extent
Troup, Lakeland, Wagram,Blanton

Table 4. Representative soil features

Surface texture	(1) Mucky loam
Drainage class	Very poorly drained

Permeability class	Moderate
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	15 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	3.5–5
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The ecological dynamics of the Cypress –Gum Swamp is influenced by the amount and duration of flooding and forest disturbances such as from logging and regeneration or succession following logging. Damming by beavers or by humans can lead to the establishment of ponds called Coastal Plain Semipermanent Impoundments. These ponds support aquatic vegetation, but when dams fail, the site is available for ruderal marsh plants, generally wetland graminoids. These sites can further succeed to Blackwater Bottomland Hardwoods or Cypress -- Gum Swamp, depending on the amount and duration of flooding of the site.

State and transition model

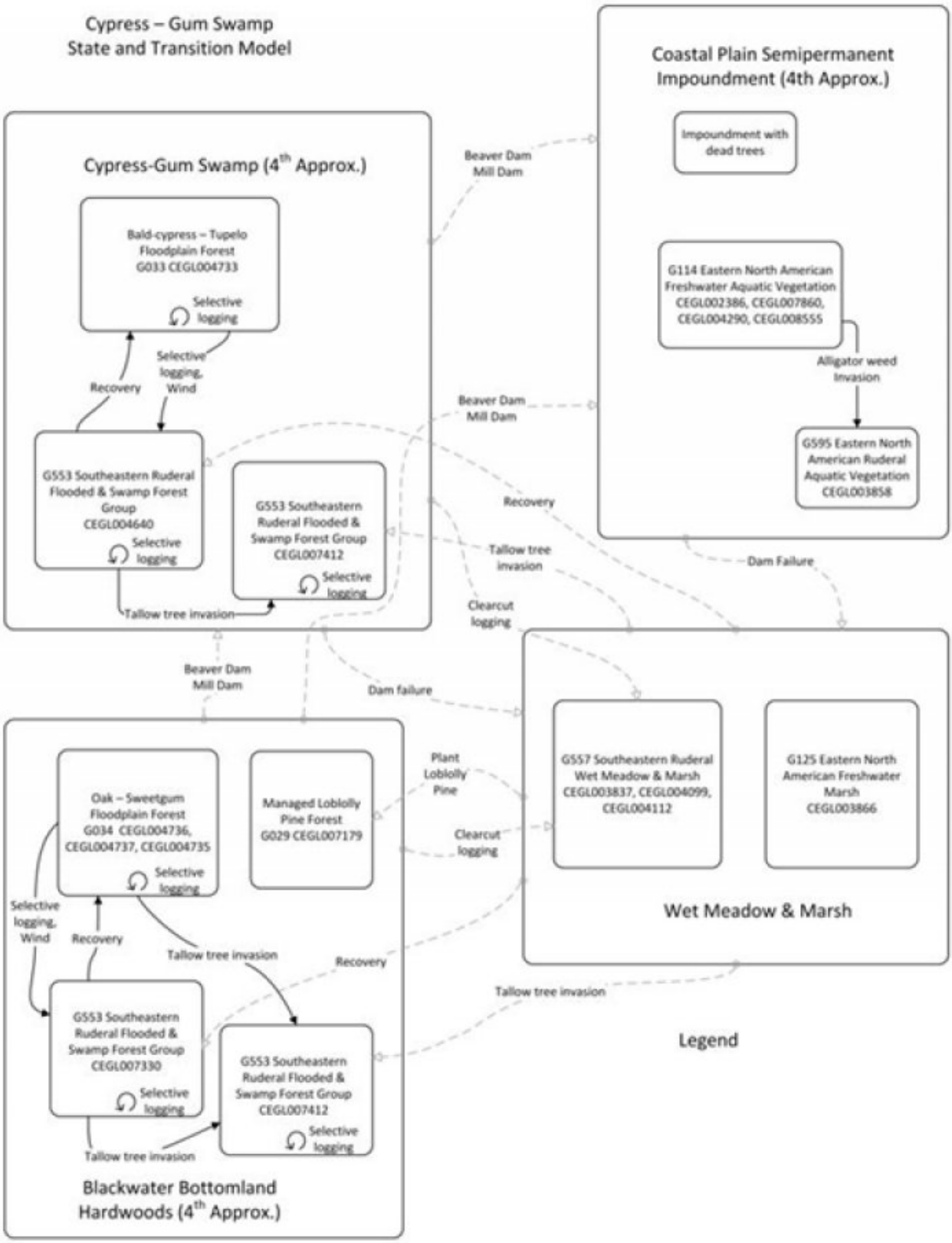

Figure 5. State and transition model.

The transitions in the Cypress – Gum Swamp state transition model are listed below in alphabetical order. These can be either transitions between states, transitions within a particular state, or they can be factors which serve to maintain a site in a particular condition. If the factor maintains a site in a particular condition, it is indicated with a looped arrow in the state transition model diagram. Transitions within a state are indicated with solid line arrows and transitions between states are indicated with dashed line arrows. Because of the variety of natural disturbances and land management methods used in the Cypress – Gum Swamp site, there are many transitions and paths between states as well as within the four states of the Cypress – Gum Swamp site. Not all the possible transitions are indicated in the state and transition diagram.

Beaver Dam: Beavers will construct dams on streams and impound water behind the dams. The dam can be maintained by beavers. The Coastal Plain Semipermanent Impoundment state is frequently associated with beaver dams. Also sites that have been Blackwater Bottomland Hardwoods can transition to Cypress – Gum Swamp as a result of increased flooding from beaver activity. Since beaver fur was one of the first natural products exported from eastern North America to England and Europe, the role of beavers was dramatically reduced several centuries ago. Today beaver populations have rebounded and beaver dams are more common than they have been in recent centuries.

Clearcut Logging: This includes the clearcut logging of any trees which may be on the Cypress - Gum site. Methods such as seed tree cut which result in a naturally reseeded stand are included here.

Dam Failure: Either beaver dams or mill dams will breach, allowing the water level behind the dam to go down. This is part of the natural dynamics of floodplains which have beaver and beaver dams. Since beaver fur was one of the first natural products exported from eastern North America to England and Europe, the role of beavers was dramatically reduced several centuries ago. Settlers put in mill dams in areas that had adequate stream flow and gradient, agricultural production and some transportation that made the site favorable. Because the North Carolina Sandhills area was not a good area for agriculture, fewer mill dams were put in than in the more heavily settled and farmed Piedmont. Most historic mill dams have failed or breached. If a site had been Blackwater Bottomland Hardwoods before dam construction, dam failure will allow it to recover and return to that state, from either the Cypress – Gum Swamp or Coastal Plain Semipermanent Impoundment states. However, the first transition after dam failure is to the Wet Meadow & Marsh state.

Mill Dam: Settlers put in mill dams in areas that had adequate stream flow and gradient, agricultural production and some transportation that made the site favorable. Because the North Carolina Sandhills area was not a good area for agriculture, fewer mill dams were put in than in the more heavily settled and farmed Piedmont. Most historic mill dams have failed or breached. The Coastal Plain Semipermanent Impoundment state was historically associated with mill dams. Also sites that have been Blackwater Bottomland Hardwoods can transition to Cypress – Gum Swamp as a result of increased flooding from mill dams.

Plant Loblolly Pine: This can include mechanical planting, hand planting as well as some methods which allow the natural reseeding from remnant mature loblolly pine (*Pinus taeda*) trees.

Recovery: Recovery refers to the long process of natural forest succession which takes place over years or decades. In floodplains, native trees naturally regenerate in canopy gaps, or larger canopy openings created by high winds. If there are large Oaks (*Quercus* spp.), these can reseed with acorns, also the stumps can resprout after logging. Bald Cypress (*Taxodium distichum*) seedlings do best when there is exposed soil during a time of dry down in the swamp. Since this can be a rare event, disturbed stands more readily regenerate Tupelo (*Nyssa aquatica* or *Nyssa biflora*) seedlings.

Selective Logging: This includes logging of both hardwoods, cypress (*Taxodium distichum, Taxodium ascendens*) and loblolly pine (*Pinus taeda*). This can be a beneficial ecological restoration technique, which promotes natural regeneration of desired trees, provided that mature seed trees remain after the logging.

Tallow tree invasion: Tallow tree (*Triadica sebifera*) is not known from the North Carolina Sandhills as of 2011. It is an invasive tree which can dominate floodplain sites, preventing many uses of those lands. It is also difficult and expensive to control. The transition is included for future reference, in case Tallow tree becomes established in the North Carolina Sandhills. Tallow tree (*Triadica sebifera*) has become locally common from Colleton County, SC southward through the tidewater area of GA, and promises to become a serious weed tree (Weakley 2011) as it has further south.

Wind: High winds can knock down or break trees over small to large areas. The winds that cause forest disturbance could be from tornados or hurricanes. Since the North Carolina Sandhills are inland, the frequency of hurricane force winds is lower than what would occur in coastal areas.

Figure 6. State and transition model legend.

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

_____

2. **Presence of water flow patterns:**

_____

3. **Number and height of erosional pedestals or terracettes:**

_____

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

_____

5. **Number of gullies and erosion associated with gullies:**

_____

6. **Extent of wind scoured, blowouts and/or depositional areas:**

_____

7. **Amount of litter movement (describe size and distance expected to travel):**

_____

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

_____

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

_____

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

_____

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

_____

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
