

Ecological site F154XA015FL Mineral Depressional Wetlands

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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): 154X–South-Central Florida Ridge

MLRA 154 is entirely in Peninsular Florida, and contains 8,285 square miles. The landscape of MLRA 154 is characterized by a series of parallel, prominent sandy ridges of Pleistocene marine origin, including the Brooksville and Mount Dora Ridges. These North to South oriented parallel ridges are interspersed with more low lying physiographic provinces, including: upland hills, plains, valleys and gaps (Puri and Vernon 1964). The extreme western portion of the MLRA consists of thin belt of coastal lowlands and marshlands.

Many of the soils of MLRA 154 are Pleistocene or Holocene sands that are underlain with older, loamy Pliocene marine sediments (Cypresshead formation) or the clayey Miocene marine sediments (Hawthorne formation). A combination of marine depositional events and the dissolution of underlying limestone (karst geology) is responsible for surficial topography throughout Peninsular Florida.

Classification relationships

All portions of the geographical range of this site falls under the following ecological / land classifications including:

-Environmental Protection Agency's Level 3 and 4 Ecoregions of Florida: 75 Southern Coastal Plain; 75c Central Florida Ridges and Uplands (Griffith, G. E., Omernik, J. M., & Pierson, S. M., 2013)

-Florida Natural Area Inventory, 2010 Edition: Depression Swamp, Depression Marsh, Basin Swamp (FNAI, 2010)

Ecological site concept

The central concept of the Mineral Depressional Wetlands includes very deep and very poorly drained soils that formed from marine deposits. A few soils are moderately deep to limestone bedrock. These soils occur in isolated depressions or along the fringes of water bodies in flat landscapes (slopes < 1%). This site includes depressional map units of the Allanton, Anclote, Astor, Basinger, Boca, Delray, EauGallie, Felda, Fellowship, Floridana, Floridana Variant, Hicoria, Holopaw, Martel, Monteocha, Myakka, Placid, Pomona, Pompano, Riviera, Sellers, St. Johns, Surrency, Wabasso, and Wesconnett series. This site is mapped in depressions within most physiographic units of this MLRA 154, but is most extensive in the Central Valley, Gulf Coastal Lowlands, and Tsala Apopka Plain. The overall extent is approximately 130,000 acres.

Associated sites

F154XA013FL	Histic Alluvial Forests These are very poorly drained alluvial concepts that will occur in organic soils, and will differ in physiographic positions, affect the types of vegetation and management strategies
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F154XA014FL	Histic Wetland Depressions These are very poorly drained depressional concepts that will occur in organic soils, and will differ in physiographic positions, affect the types of vegetation and management strategies
F154XA016FL	Wet Mineral Alluvial Forest And Marshlands These sites are very poorly drained alluvial concepts that will occur on mineral soils, resulting in different types and amounts of vegetation as well as management strategies
R154XX017FL	Wet Saline Marshes And Swamps These are very poorly drained tidal soils that will exist in intertidal landscape positions

Similar sites

F154XA013FL	Histic Alluvial Forests These are very poorly drained floodplain concepts that will occur in organic soils, and will differ in physiographic positions, affect the types of vegetation and management strategies
F154XA014FL	Histic Wetland Depressions These are very poorly drained closed depression concepts that will occur in organic soils, and will differ in physiographic positions, affect the types of vegetation and management strategies
F154XA016FL	Wet Mineral Alluvial Forest And Marshlands These sites are very poorly drained alluvial concepts that will occur on mineral soils rather than organic soils, resulting in different types and amounts of vegetation as well as management strategies

Table 1. Dominant plant species

Tree	(1) <i>Taxodium ascendens</i>
Shrub	Not specified
Herbaceous	(1) <i>Panicum hemitomon</i>

Physiographic features

This site is located within the Floridian Section of the Coastal Plain Province of the Atlantic Plain. Elevation of this site ranges between 3 to 130 feet (1 to 40 meters). This ecological site occurs throughout the MLRA in closed, shallow depressions and along fringes of lakes or ponds in central and west-central Florida. Slopes are level and range from 0 to 1%. Typically, the soils formed in loamy or sandy marine deposits. A few soils formed in clayey marine deposits or are moderately deep to limestone bedrock.

Table 2. Representative physiographic features

Landforms	(1) Marine terrace > Depression
Runoff class	Negligible to low
Flooding duration	Not specified
Flooding frequency	None
Ponding duration	Long (7 to 30 days) to very long (more than 30 days)
Ponding frequency	Occasional to frequent
Elevation	1–40 m
Slope	0–1%
Ponding depth	0–97 cm
Water table depth	0–15 cm
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Not specified
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Flooding duration	Extremely brief (0.1 to 4 hours) to long (7 to 30 days)
Flooding frequency	None to frequent
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	None to frequent
Elevation	Not specified
Slope	Not specified
Ponding depth	Not specified
Water table depth	0–122 cm

Climatic features

The climate is characterized by humid subtropical with long hot summers and mild winters. In the winter months, Canadian air masses move across Peninsular Florida and produce cool, cloudy, rainy weather. Freezing temperatures are occasional in the northern MLRA areas, with typically less than 30 days of the year with temperatures dropping below freezing.

Precipitation in the northern MLRA is distributed fairly evenly throughout the year. Average annual precipitation ranges from 45 to 55 inches. Highest monthly precipitation falls from June through October, with June through August being the wettest period. Winter rainfall is associated with cold fronts.

Hurricanes and tropical storms affect much of the MLRA 154 region. Catastrophic hurricanes make landfall along the Atlantic coast of Peninsular Florida on the order of two to four times per century. Strong winds and heavy rainfall affect the interior peninsula; rainfall from hurricanes and tropical systems vary widely but can exceed 20 inches from one storm. Hurricanes are most likely to occur between June and November and are most common in August and September.

Table 4. Representative climatic features

Frost-free period (characteristic range)	246-365 days
Freeze-free period (characteristic range)	365 days
Precipitation total (characteristic range)	1,295-1,346 mm
Frost-free period (actual range)	215-365 days
Freeze-free period (actual range)	324-365 days
Precipitation total (actual range)	1,270-1,372 mm
Frost-free period (average)	317 days
Freeze-free period (average)	357 days
Precipitation total (average)	1,321 mm

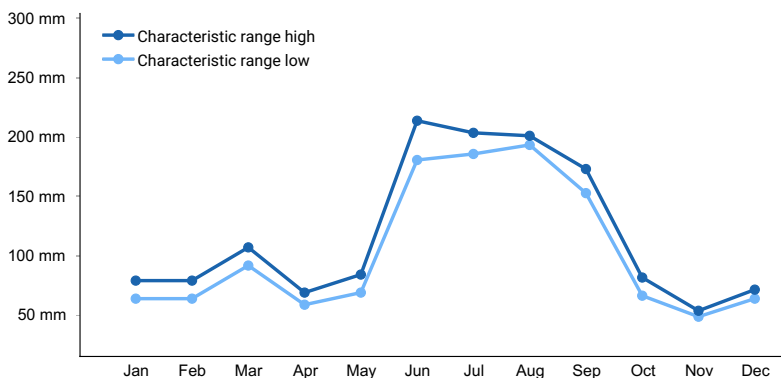


Figure 1. Monthly precipitation range

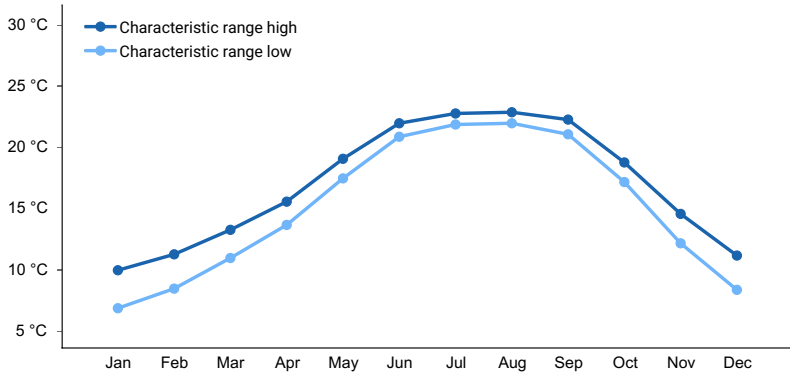


Figure 2. Monthly minimum temperature range

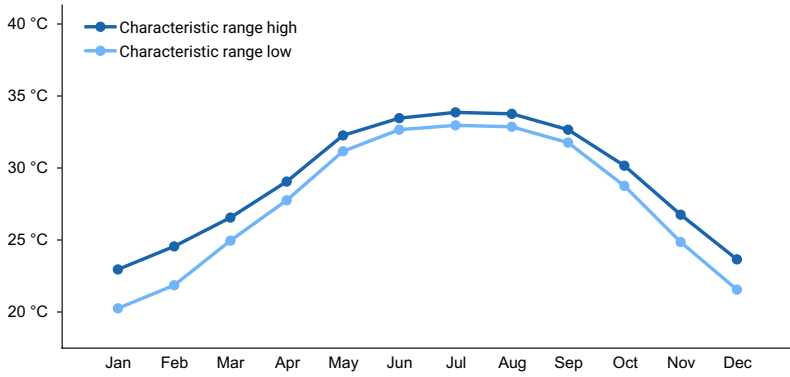


Figure 3. Monthly maximum temperature range

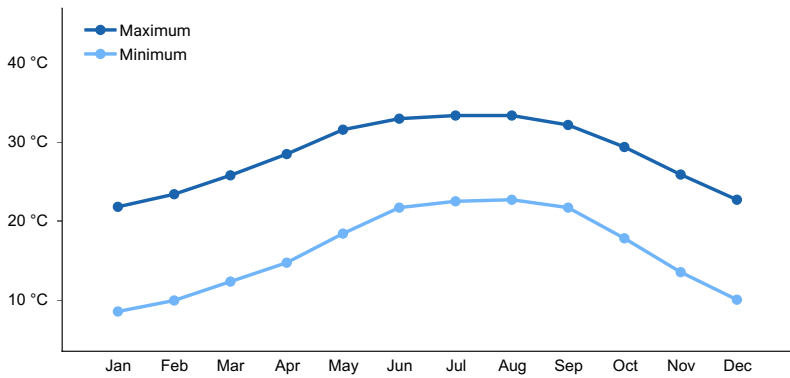


Figure 4. Monthly average minimum and maximum temperature

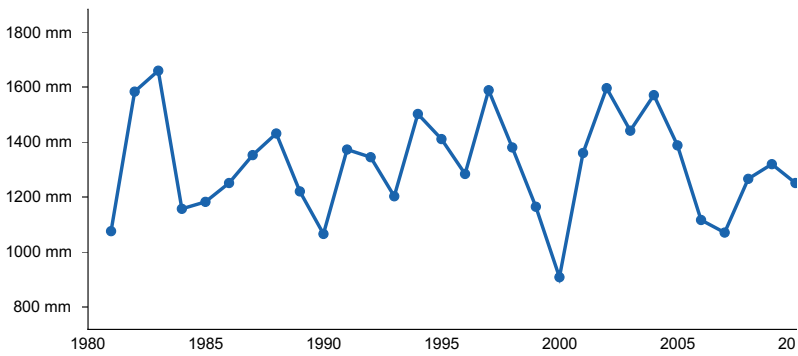


Figure 5. Annual precipitation pattern

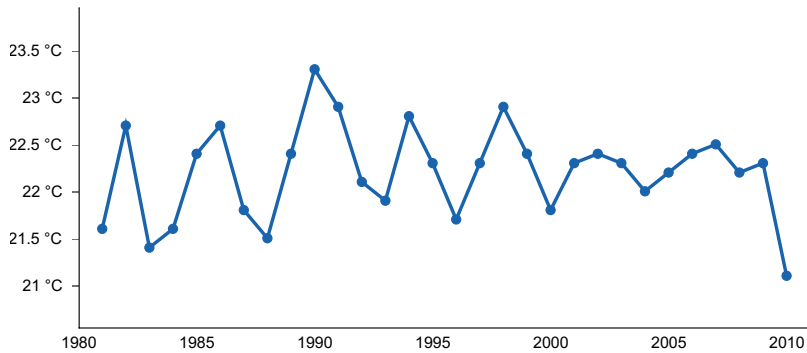


Figure 6. Annual average temperature pattern

Climate stations used

- (1) AVON PARK 2 W [USC00080369], Avon Park, FL
- (2) ORANGE SPRINGS 2SSW [USC00086618], Fort Mc Coy, FL
- (3) BARTOW [USC00080478], Bartow, FL
- (4) LAKE ALFRED EXP STN [USC00084707], Haines City, FL
- (5) LISBON [USC00085076], Leesburg, FL
- (6) BROOKSVILLE CHIN HILL [USC00081046], Brooksville, FL
- (7) CLERMONT 9 S [USC00081641], Clermont, FL
- (8) INVERNESS 3 SE [USC00084289], Inverness, FL
- (9) PLANT CITY [USC00087205], Plant City, FL
- (10) TARPON SPGS SEWAGE PL [USC00088824], Tarpon Springs, FL
- (11) GAINESVILLE 11 WNW [USC00083322], Gainesville, FL
- (12) MTN LAKE [USC00085973], Lake Wales, FL
- (13) SAINT LEO [USC00087851], San Antonio, FL
- (14) LAKELAND [USW00012883], Lakeland, FL

Influencing water features

This site occurs as isolated depressions (Terrene Wetlands) surrounded by upland soils, fringes along natural water bodies (Lentic Fringe Wetland), or a complex of depression-low gradient terrain that forms a drainage network through subtle, interconnected topographic lows. Typically, these depressions are a result of dissolution of underlying karstic limestone and are functionally important for aquifer recharge.

Water enters the depressions either through runoff from adjacent better drained environments, or from lateral recharge from surrounding soils. Water outflows occur from evaporation, evapotranspiration, overland flow to an interconnected depression, or to aquifer recharge. Hydrology within these depressions is typically, either the apparent ground water table, or in the case of less permeable underlying materials (Aquitard), a perched water table.

Soil features

Hydrological regimes of frequent seasonal ponding is the unifying environmental feature of this site. Accordingly, this site occurs in depressional landforms of a wide range of soil taxa (Aquolls, Aquods, Aquents, Aqualfs, Aquults, and Aquepts). This includes depressional phases of the follow soil series: Allanton, Anclote, Astor, Basinger, Boca, Delray, EauGallie, Felda, Fellowship, Floridana, Floridana Variant, Hicoria, Holopaw, Iberia, Martel, Monteochoa, Myakka, Paisley, Placid, Plummer, Pomona, Pompano, Riviera, Sellers, St. Johns, Surrency, Wabasso and Wesconnett. These soils are very deep, very poorly drained, sandy, clayey, or loamy soils formed from marine sediments. The dominant representative slope for the correlated soil components is dominantly 0 to 1% but a few map units' range to 2%. Clay content ranges from 2 to 60%. Soil mineralogy is dominantly siliceous.

Soil Profile Images.



Figure 7. soil profiles

Table 5. Representative soil features

Parent material	(1) Marine deposits
Surface texture	(1) Fine sand (2) Sand (3) Loamy sand (4) Clay (5) Mucky (6) Fine sandy loam (7) Sandy clay loam
Drainage class	Very poorly drained
Permeability class	Very slow to very rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	4.06–20.83 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–1 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	1
Soil reaction (1:1 water) (0-101.6cm)	4.6–7
Subsurface fragment volume <=3" (0-101.6cm)	0–10%
Subsurface fragment volume >3" (0-101.6cm)	1%

Table 6. Representative soil features (actual values)

Drainage class	Very poorly drained to poorly drained
Permeability class	Not specified
Soil depth	Not specified
Surface fragment cover <=3"	Not specified

Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	Not specified
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–4
Soil reaction (1:1 water) (0-101.6cm)	3.5–8.4
Subsurface fragment volume <=3" (0-101.6cm)	Not specified
Subsurface fragment volume >3" (0-101.6cm)	0–1%

Ecological dynamics

The Mineral Depressional Wetlands site occurs in isolated depressions in a larger landscape of pyrogenic vegetation (usually Mesic Flatwoods or Upland Sandhill). These depressional wetlands are often relatively small (< 1 acre) and isolated, but also includes larger wetlands associated with lake edges and irregular depression (such as sloughs). Depressional wetlands are typically circular with concentric zones of vegetation extending outward from the center. In this manner, these depressional wetlands are distinguishable from Basin Marshes and Basin Swamps (FNAI 2010).

The origin of depressional wetlands is variable. Some are formed as solution depressions in underlying limestone in poorly drained soils. Accumulations of organic material forms muck layers in the soil surface. Poorly drained conditions, coupled with moisture retaining mucks, contributes to the near perennial wet environment.

Two types of State 1 vegetation occur in the depressional wetlands: Depression Marshes and Dome Swamp Forests (FNAI 2010). The former is an herbaceous dominated wetland, generally < 2 acres in size. The former is dominated by pond cypress (*Taxodium ascendens*) and/or black gum (*Nyssa biflora*) and is variable in size. The edaphic features differentiating these two natural communities are not known. Natural disturbances may influence distributions of these natural communities, in that the combination of frequent and variable inundation, and historically frequent fire may have maintained herbaceous depression marshes in the Florida Peninsula. Conversely, a more seasonal hydrology patterns in North Florida depressional wetlands may favor cypress dome forests. In general, herbaceous depression marshes are more common in the southern reaches of MLRA 154.

This site may include other herbaceous wetland vegetation, such as wet prairies and perhaps basin marsh (FNAI 2010). Further observation is needed to clarify ecological breadth of this concept.

Next to seasonal flooding, fire regimes are the most important ecological process which influence this site, particularly herbaceous dominated wetlands. There is little data on natural fire frequency in depression marshes, however it is thought that these wetlands burned with frequency similar to that of the surrounding landscape (in pre-European settlement times). In general, depressional wetlands in the broad expanses of peninsular flatwoods likely burned frequently, particularly during the dry season. Cessation of fire may allow increases in shrubby vegetation at the expense of herbaceous strata. However, succession to woody dominated communities is also dependent on ponding regimes, and the interplay between fire and hydrology (which is not well understood).

Common environmental features unifying this site include very deep and poorly drained mineral soils and frequent ponding. The timing, depth and duration of ponding is seasonally influenced, and is tied to local precipitation and runoff from surrounding areas.

State and transition model

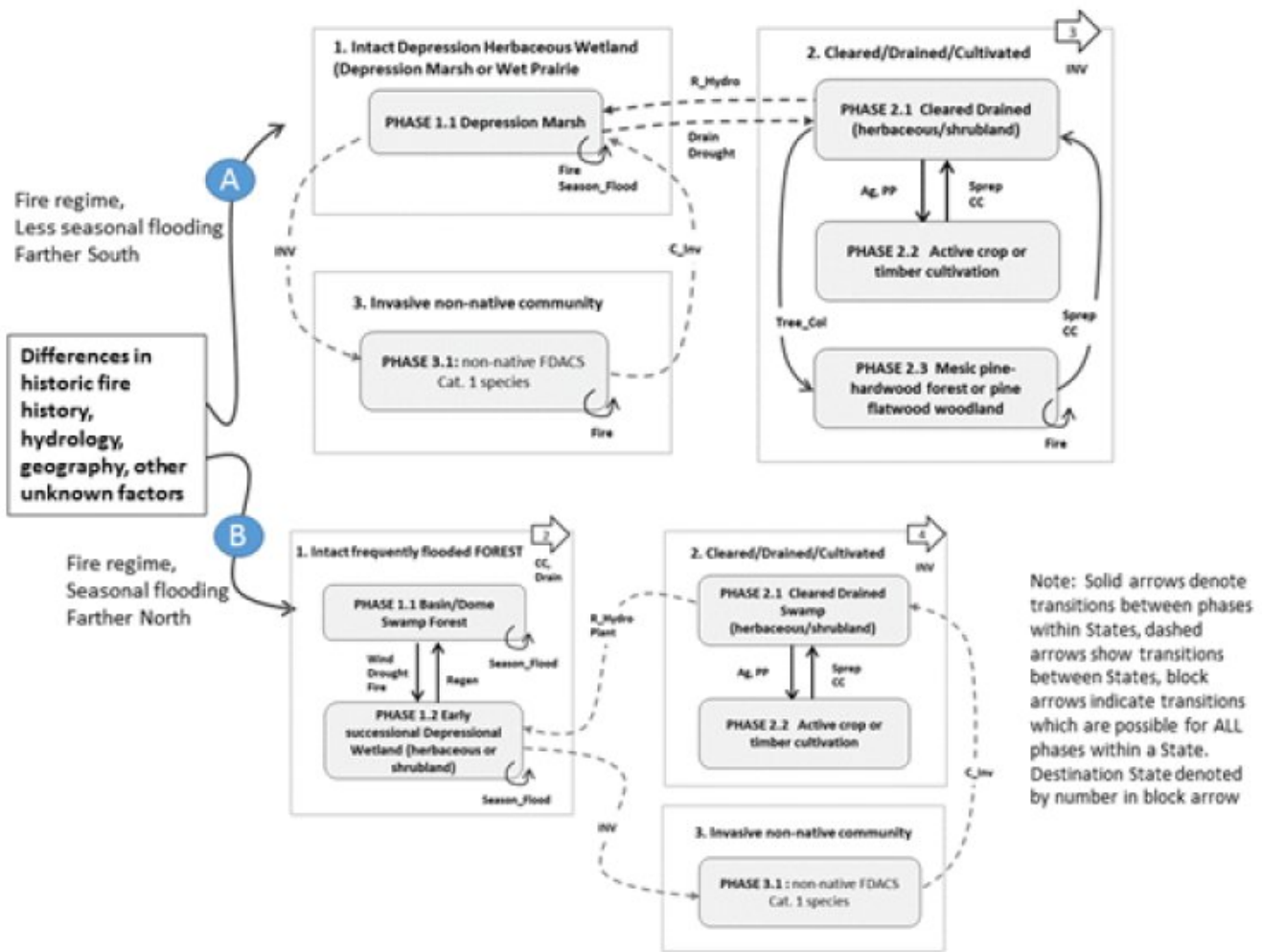


Figure 8. State and Transition Model

Legend for STMA

CC	Clearcut
Sprep	Site prep (mechanical and chemical)
INV	Invasion of noxious non-native plant species
C_Inv	Mechanical/chemical control of invasive plant species
Drain	Permanent drainage via mechanical methods
Season_Flood	Natural seasonal flooding regime
Drought	Extreme drought invoking tree mortality
Fire	Extreme intense fire (with drought) resulting in tree mortality
R_Hydro	Restoration natural hydrologic regimes
Ag	Various agricultural practices for crop cultivation
PP	Artificial planting of pines for commercial timber production
Tree_Col	Natural colonization of mesic woody species of drier site conditions

Legend for STM B

CC	Clearcut
Sprep	Site prep (mechanical and chemical)
INV	Invasion of noxious non-native plant species
C_Inv	Mechanical/chemical control of invasive plant species
Drain	Permanent drainage via mechanical methods
Season_Flood	Natural seasonal flooding regime
Drought	Extreme drought invoking tree mortality
Fire	Extreme intense fire (with drought) resulting in tree mortality
R_Hydro	Restoration natural hydrologic regimes
Plant	Artificial planting of native hardwood species
Regen	Natural Regeneration of native hardwoods
Ag	Various agricultural practices for crop cultivation
PP	Artificial planting of pines for commercial timber production

Figure 9. STM legend

State 1 Depression Marsh OR Dome Swamp

STATE 1A – Depression Marsh Herbaceous Wetland This wetland is dominated by herbaceous vegetation with some low growing shrubs in shallow rounded depressions embedded in flat poorly drained landscapes (although depression marshes do occur in sandhill landscapes in North Central Florida). Vegetation often appears to form “bands” which are coincident with length and duration of flooding. The center of larger depression marshes usually remain inundated year-round, and supports wetland and aquatic plants such as maidencane (*Panicum hemitomon*), pickerelweed (*Pontederia cordata*), bulltongue arrowhead (*Sagittaria lancifolia*), or sawgrass (*Cladium jamaicense*). Drier habitats of the outer zones support many species of beaksedges (*Rhynchospora* spp.), various grasses and low shrubs (several in the genus *Hypericum*). STATE 1B – Dome Swamp This is a forested depressional wetland. The most common canopy tree is pond cypress (*T. ascendens*), although in some cases black gum dominates (*N. biflora*). Because of the organic accumulations from greater biomass, coupled with less frequent fire, soils are mucks or peats. Herbaceous understory is variable, and also varies within the wetland according to hydro-period. Ferns are common ground cover. Fire is a natural disturbance important for the maintenance of dome swamps and depression marshes. Fire frequency may be influential in differentiating the composition and distribution of the two community types.

State 2 Cleared/Drained/Cultivated

This state describes conditions related to land use conversion for community production. Drastic changes in hydrologic regime result from draining and clearing. Cleared and drain land may be cultivated for various crops or made into improved pasture.

State 3

Invasive non-native community

State 4 describes a condition where one or several noxious non-native species has invaded and dominated the site.

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Contributors

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Approval

Charles Stemmans, 2/21/2024

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	05/06/2024
Approved by	Charles Stemmans
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:

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

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

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

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:**

17. **Perennial plant reproductive capability:**
