

Ecological site F154XA014FL Histic Wetland Depressions

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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 Histic Wetland Depressions is very deep, very poorly drained soils frequently ponded that forms in organic material that may be underlain with a mineral substratum. These soils are in closed depressions or along the fringes of water bodies, on slopes less than 1%. This site includes map units of the Brighton, Dorovan, Everglades, Gator, Hontoon, Lauderhill, Ledwith, Ocoee, Okeechobee, Okeelanta, Oklawaha, Pamlico, Samsula, Terra Ceia, and Tomoka series. This site is mapped in landform depressions of the Gulf Coastal Lowlands, Central Valley, St. Johns River Offset, Tsala Apopka Plain, and Western Valley physiographic units. The overall extent is approximately 94,000 acres.

Associated sites

R154XX017FL	Wet Saline Marshes And Swamps These are very poorly drained tidal soils that will exist in intertidal landscape positions
F154XA013FL	Histic Alluvial Forests 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

F154XA015FL	Mineral Depressional Wetlands These are very poorly drained depressional concepts that will occur in mineral soils rather than 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

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
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
F154XA015FL	Mineral Depressional Wetlands These are very poorly drained depressional concepts that will occur in mineral soils rather than organic soils, and will differ in physiographic positions, affect the types of vegetation and management strategies

Table 1. Dominant plant species

Tree	(1) <i>Taxodium ascendens</i> (2) <i>Nyssa biflora</i>
Shrub	(1) <i>Ilex cassine</i> (2) <i>Persea palustris</i>
Herbaceous	(1) <i>Woodwardia virginica</i> (2) <i>Panicum hemitomom</i>

Physiographic features

The entire area for this site is located within the Floridian Section of the Coastal Plain Province of the Atlantic Plain. Elevations of this site varies between sea level and 164 feet (0 to 50 meters). The concept is distributed throughout the MLRA on deep, closed depressions and along fringes of lakes or ponds. Slopes are level (0 to 1%). Typically, soils are organic material >16 inches thick, underlain by sandy, loamy, or clayey marine deposits.

Table 2. Representative physiographic features

Landforms	(1) Marine terrace > Depression
Runoff class	Negligible to low
Flooding frequency	None
Ponding duration	Long (7 to 30 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	0–164 ft
Slope	0–1%
Water table depth	0–6 in
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Not specified
Flooding frequency	Not specified
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	None to frequent

Elevation	Not specified
Slope	0–2%
Water table depth	0–24 in

Climatic features

The climate varies considerably across the latitudinal gradient of MLRA 154. The north to south orientation of MLRA 154 spans three USDA plant hardiness zones in the Florida Peninsula (USDA-ARS).

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. Below freezing temperatures are occasional in the northern area of the MLRA but very rare in the southern. Overall, there are typically fewer than 30 days of the year with below freezing temperatures in MLRA 154.

Similarly, average temperatures vary considerably from north to south over the range of the site. Average seasonal low temperature in the northern areas is 12.7°C in January, and prolonged freezing temperatures are common in the winter months. In contrast, southern areas have more uniformity of seasonal temperatures and winter freezes are rare.

Precipitation in MLRA 154 is distributed fairly evenly throughout the year. Average annual precipitation ranges from 45 to 55 inches (114 to 140 cm). The highest monthly precipitation occurs from June through October, with June through August being the wettest period. However, the northern areas receive substantially more precipitation during the winter months compared to the southern. Winter rainfall is associated with seasonal cold fronts, which tend to disintegrate before reaching the southern reaches of MLRA 154.

Hurricanes and tropical storms affect much of MLRA 154. 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 (MLRA 154); rainfall from hurricanes and tropical systems vary widely but can exceed 20 inches (51 cm) from one event. 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)	229-365 days
Freeze-free period (characteristic range)	365 days
Precipitation total (characteristic range)	51-53 in
Frost-free period (actual range)	213-365 days
Freeze-free period (actual range)	314-365 days
Precipitation total (actual range)	50-54 in
Frost-free period (average)	309 days
Freeze-free period (average)	356 days
Precipitation total (average)	52 in

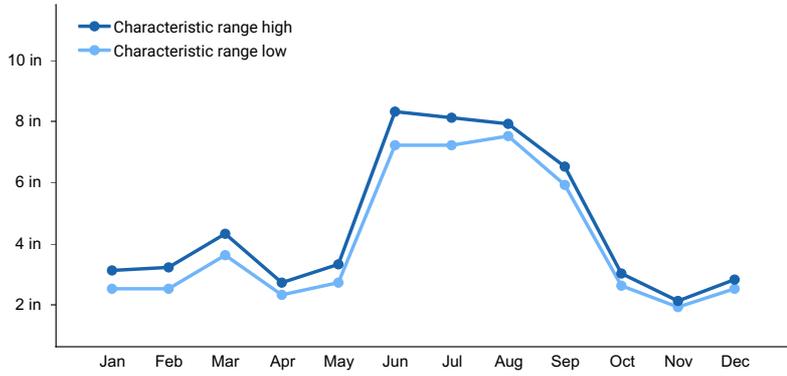


Figure 1. Monthly precipitation range

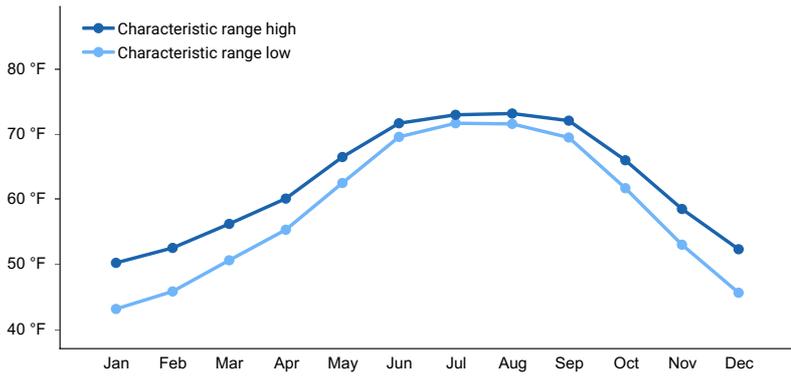


Figure 2. Monthly minimum temperature range

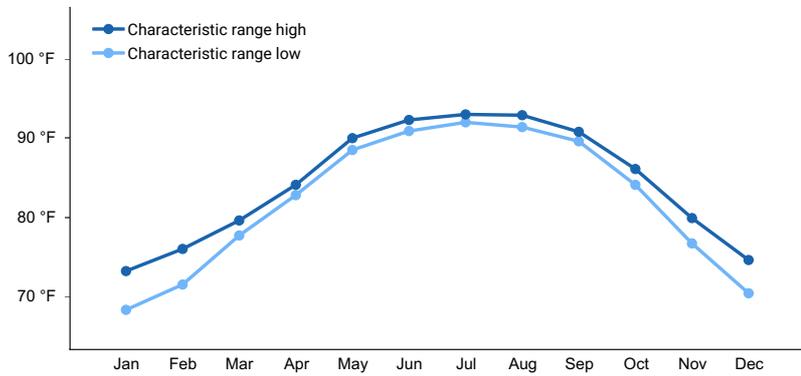


Figure 3. Monthly maximum temperature range

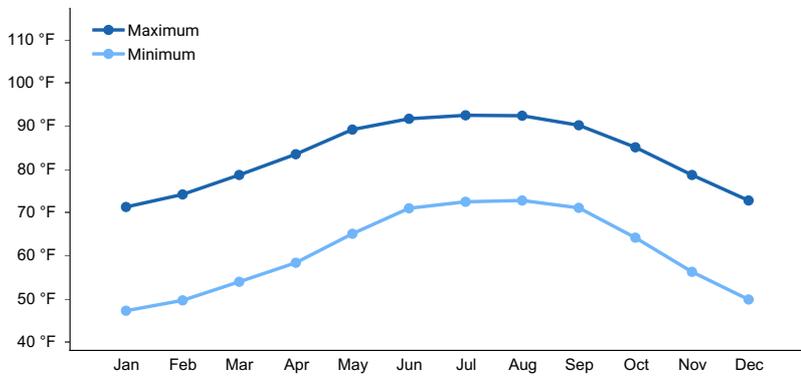


Figure 4. Monthly average minimum and maximum temperature

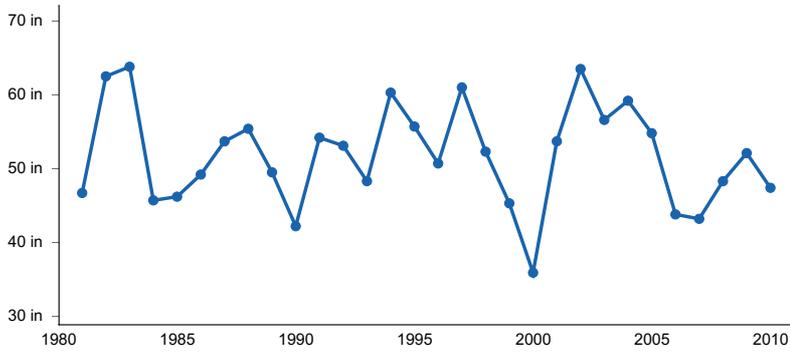


Figure 5. Annual precipitation pattern

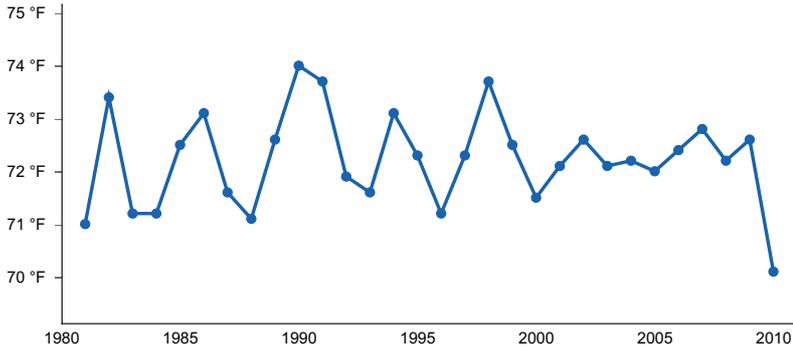


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BROOKSVILLE CHIN HILL [USC00081046], Brooksville, FL
- (2) MTN LAKE [USC00085973], Lake Wales, FL
- (3) SAINT LEO [USC00087851], San Antonio, FL
- (4) LAKELAND [USW00012883], Lakeland, FL
- (5) BARTOW [USC00080478], Bartow, FL
- (6) LAKE ALFRED EXP STN [USC00084707], Haines City, FL
- (7) LISBON [USC00085076], Leesburg, FL
- (8) WINTER HAVEN [USC00089707], Winter Haven, FL
- (9) CLERMONT 9 S [USC00081641], Clermont, FL
- (10) GAINESVILLE 11 WNW [USC00083322], Gainesville, FL
- (11) INVERNESS 3 SE [USC00084289], Inverness, FL
- (12) ORANGE SPRINGS 2SSW [USC00086618], Fort Mc Coy, FL

Influencing water features

The modal concept for this site is low lying, wetlands in closed depressions that are surrounded by drier environments. This site is situated on soils that are ponded for long or very long periods and have a high water table (dominantly near or above the surface). Many depressions are closed, isolated depressions (Terrene Wetlands) surrounded by upland soils, or as fringes along natural water bodies (Lentic Fringe Wetland).

Given the localized nature of this site and the significant hydrologic differences of surrounding communities, this site can have an abrupt ecotone which dramatically shifts species composition from depression swamps and marshes to drier sites within short distances. Species of this plant community are edaphically adapted to withstand long or very long inundation.

Hydrogeomorphically, this site receives water from runoff or by seepage from surrounding higher lying positions. These landscape units discharge water slowly through aquifer recharge, or in some cases through drainageways that connect adjacent depressions. Low slope gradient, concave or linear landform positions, and closed topography results in negligible runoff. The combination of fertile organic material, high or very high available water, and frequent ponding with long or very long duration are the keys to this site's plant community.

Soil features

Soils are either Typic Haplosaprists (Dorovan, Hontoon), Hemic Haplosaprists (Okeechobee), Typic Haplohemists (Brighton, Everglades), Lithic Haplosaprists (Lauderhill), or Terric Haplosaprists (Gator, Ocoee, Okeelanta, Oklawaha, Pamlico, Samsula, Shenks, Tomoka). These soils formed in herbaceous or woody plant materials more than 16 inches thick that are in various stages of decomposition. The Terric subgroup soils are underlain with clayey, loamy, or sandy mineral material. Minor taxa with a thin organic surface layer are included in this group (Ledwith-Typic Albaqualfs).

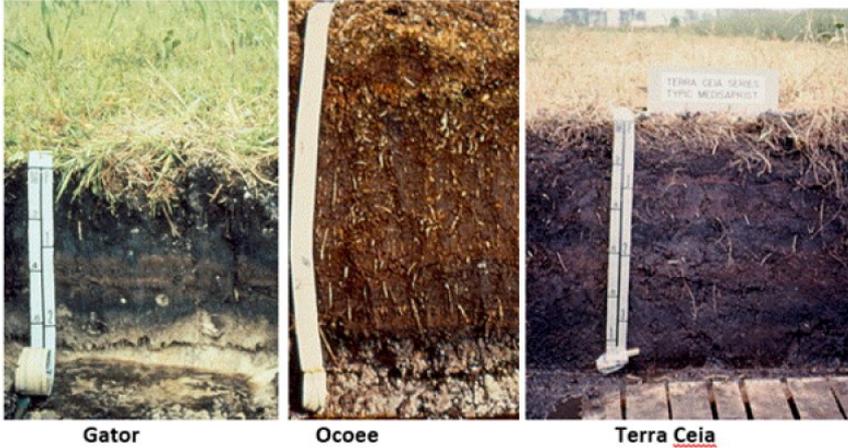


Figure 7. typical soil profiles

Table 5. Representative soil features

Parent material	(1) Herbaceous organic material (2) Woody organic material (3) Marine deposits
Surface texture	(1) Mucky
Drainage class	Very poorly drained
Permeability class	Moderate to moderately rapid
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	7.3–17 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0–1 mmhos/cm
Sodium adsorption ratio (0-40in)	1
Soil reaction (1:1 water) (0-40in)	4.3–7.3
Subsurface fragment volume <=3" (0-40in)	0%
Subsurface fragment volume >3" (0-40in)	0%

Table 6. Representative soil features (actual values)

Drainage class	Not specified
Permeability class	Very slow to very rapid
Soil depth	Not specified
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-40in)	Not specified
Calcium carbonate equivalent (0-40in)	Not specified
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–4
Soil reaction (1:1 water) (0-40in)	3.5–8.4
Subsurface fragment volume <=3" (0-40in)	Not specified
Subsurface fragment volume >3" (0-40in)	Not specified

Ecological dynamics

The Histic Wetland Depression concept 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) but can be considerably larger. Furthermore, depressional wetlands of this site 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 swamps.

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. Very poorly drained, coupled with moisture retaining mucks, contributes to the wet soil 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 flooding pattern 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.

Although these two wetland communities differ structurally and compositionally, common features unifying this site include very deep and very poorly drained organic soils that flood frequently. Flooding timing and duration is seasonally influenced and is tied to local precipitation and runoff from surrounding areas.

State and transition model

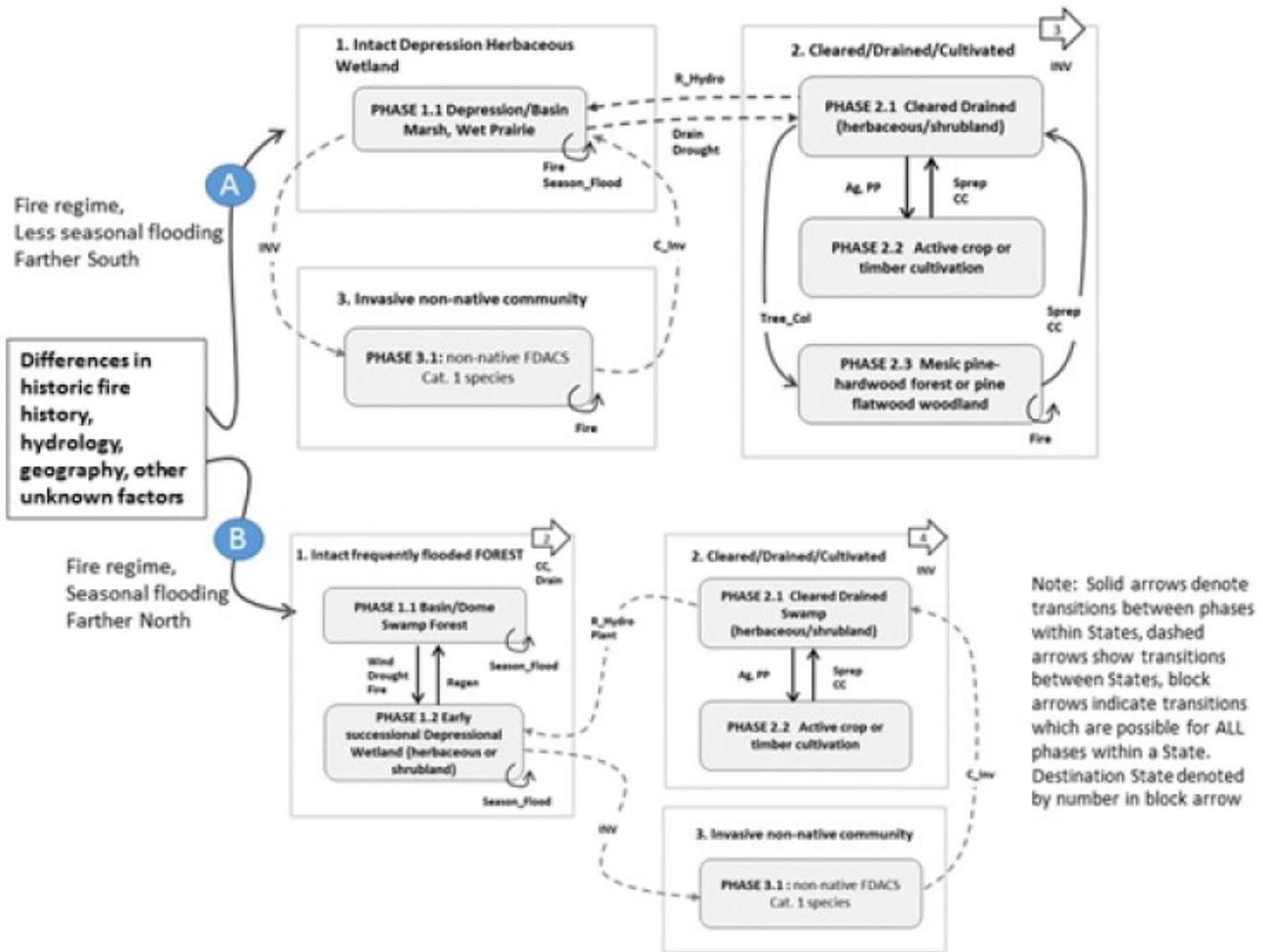


Figure 8. Histic Depression Wetland

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 site 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	04/18/2024
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:**
-