Ecological site PX138X00Y010
Sandy Flood Plain Marshes and Swamps

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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): 138X–North-Central Florida Ridge

The MLRA notes section provides a brief description of the entire MLRA. This description is intended to provide some context about the MLRA within which this ecological site is associated. A more complete description of the MLRA can be found in Ag Handbook 296 (USDA-NRCS, 2022). This MLRA is on a limestone upland that is mantled with sandy marine deposits and has an irregular, gently rolling topography. Because of the underlying karst topography, there are a moderate number of limestone sinkholes, some filled with water. Production of cash crops, hay, and pasture is the primary land use. This area comprises about 2,196 square miles (5,688 square kilometers) and is entirely within Florida. This area is underlain by sediments of the Quaternary Period (present to 2.58 million years ago) that overlie the Neogene (2.53 to 23.03 million years ago) and Paleogene (23.03 to 66 million years ago) formations of the Hawthorn Group (Green et al., 2006). The rocks are progressively older to the south. The Quaternary sediments are largely undifferentiated marine deposits consisting of fine to coarse sands that are poorly to moderately sorted with variable mixtures of clay and organic material. The formations of the Hawthorn Group are, from youngest to oldest, the Statesville Formation, Coosawhatchie Formation, Suwannee Limestone, and Ocala Limestone. The Statesville Formation consists of thinly interbedded, and commonly cross-bedded, dolostone and clay alternating with beds of sand. Phosphate grains are common to abundant. The Coosawhatchie Formation is made up of poorly to moderately sorted sandy clay or clayey sand with phosphate grains, limestone, and dolostone. The Suwannee Limestone is a cream colored to tan, crystalline, vuggy and muddy, fossiliferous, variably dolomitic carbonate. It has chert nodules in some areas. The Ocala Limestone was deposited in the Eocene (33.9 to 56 million years ago) and is the oldest rock formation exposed in Florida. It is a white to cream-colored, fossiliferous limestone and has chert nodules in some areas. This area borders MLRA 133A to the north, which has only slight differences in use and management due to the underlying karst topography. Its boundaries with MLRA 152A to the west and MLRA 153A to the east are distinguishable by an abrupt scarp on a lower, younger marine terrace. Its boundary with MLRA 154 is a gradual transition to slightly younger marine sediments to the south. Elevation of the MLRA ranges from 26 to 197 feet (8 to 60 meters). Local relief is generally 10 to 20 feet (3 to 6 meters) but can be as much as 35 feet (10 meters). The dominant soil orders are Ultisols, Entisols, and Alfisols. The soils in the area dominantly have a thermic temperature regime, a udic moisture regime, and siliceous mineralogy. This area supports open pine and oak vegetation. Major wildlife species include white-tailed deer, raccoon, skunk, opossum, rabbit, gray squirrel, fox squirrel, turkey, bobwhite quail, and mourning dove. The abundant rainfall and the Floridan aquifer are the principal sources of water in the area. The many lakes and ponds are used for recreation. Most of the river water is suitable for almost all uses. Shallow and deep wells in the Floridan aquifer provide water for public supply, domestic use, industry, mining, livestock, and irrigation. This aquifer is one of the most productive sources of ground water in the United States. Its water is hard but of good quality. Wells yield large quantities of the calciumbicarbonate type of water. The Floridan aquifer is a thick sequence of Tertiary limestone and dolomite. The Eocene Avon Park Formation and Ocala Limestone are the thickest and most productive units in the aquifer system. A significant portion of this MLRA along riparian areas remains wooded with some larger holdings used exclusively for forestry. Pulpwood and lumber are the principal forest products. Hay and pasture are of great extent throughout this MLRA. The cropland in the area is used mainly for corn, peanuts, tobacco, soybeans, vegetables, and melons. The major resource concerns are maintenance of organic matter and productivity of the soils, management of soil moisture, and management of animal waste. Conservation practices on cropland generally include crop rotations, cover crops, nutrient management, pest management, and irrigation water management. (USDA, NRCS, 2022)

Classification relationships

Most of this area is in the East Gulf Coastal Plain section of the Coastal Plain province of the Atlantic Plain. The southern one-quarter is in the Floridian section of the same province and division. (McNab et al., 2007; USDA, NRCS, 2022) MLRA 138 is relatively small and comprises the eastern half of EPA level IV ecoregion 65o, Tallahassee Hills and Valdosta Limesink, which is part of level III ecoregion 65, Southeastern Plains. (U.S. EPA, 2013) The reference community of this site corresponds approximately with the Floodplain Swamp community. (FNAI, 2010) The improved pasture community of the managed grassland state corresponds well with Forage Suitability Group G138XA145FL. The improved drained pasture community corresponds well with Forage Suitability Group G138XA141FL. (USDA, NRCS, 2013)

Ecological site concept

This site occurs on flood plains along major rivers and streams, and it experiences occasional to frequent flooding, or would in the absence of water control structures. Soils are poorly to very poorly drained. The land is flat with slopes mostly from 0 to 2 percent. Soils are mostly sandy, have a spodic horizon within 30 inches, an argillic horizon below 40 inches, or both. Some soils may have a mollic or umbric horizon. Some soils may lack a diagnostic horizon. This site often supports Flood Plain Swamp, Mixed Scrub-Shrub Wetland, Coniferous Plantation, and Improved Pasture communities.

Associated sites

PX138X00Y020	**Sandy Over Loamy Flood Plain Marshes and Swamps** A diverse array of flood plain and stream terrace soils and sites are associated together adjacent to a riverine system. These soils are in a similar landscape position but have different physical properties and productivity.
PX138X00Y030	**Loamy and Clayey Flood Plain Marshes and Swamps** A diverse array of flood plain and stream terrace soils and sites are associated together adjacent to a riverine system. These soils are in a similar landscape position but have different physical properties and productivity.
PX138X00Y040	**Sandhill or Scrub on Stream Terraces** A diverse array of flood plain and stream terrace soils and sites are associated together adjacent to a riverine system. These soils are in a different landscape position but have similar physical properties, such as texture, and different levels of productivity.
PX138X00Y050	**Sandy or Sandy Over Loamy Upland Pine on Stream Terraces** A diverse array of flood plain and stream terrace soils and sites are associated together adjacent to a riverine system.
PX138X00Y060	**Loamy and Clayey Bottomland Forests on Stream Terraces** A diverse array of flood plain and stream terrace soils and sites are associated together adjacent to a riverine system.

Similar sites

PX138X00Y020	**Sandy Over Loamy Flood Plain Marshes and Swamps** These sites support similar native vegetation communities, but production is somewhat different, especially regarding grazing forage production.
PX138X00Y030	**Loamy and Clayey Flood Plain Marshes and Swamps** These sites support similar native vegetation communities, but production is somewhat different, especially regarding grazing forage production.
PX138X00Y070	**Sandy Depression Basin and Dome Swamps** PX138X00Y070 will typically display different native vegetation than PX138X00Y010, but grazing forage production will be very similar.

Table 1. Dominant plant species

Tree	(1) *Taxodium distichum* (2) *Nyssa aquatica*
Shrub	Not specified
Herbaceous	Not specified

Legacy ID

F138XY010AL

Physiographic features

This site occurs on flood plains along major rivers and streams and experiences regular flooding, or would in the absence of water control structures. Dominant hydrology on this site is typically flooding. Slope is typically 0 to 2 percent.

Table 2. Representative physiographic features

Landforms	(1) Marine terrace > Flood plain (2) Marine terrace > Stream terrace
Runoff class	Very low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional
Ponding frequency	None
Elevation	20 – 60 m
Slope	0 %
Water table depth	20 – 50 cm
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Very low
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)

Flooding frequency	None to frequent
Ponding frequency	None
Elevation	10 – 60 m
Slope	0 %
Water table depth	0 – 50 cm

Climatic features

The maximum precipitation occurs in summer, and the minimum occurs in winter and late autumn. Rainfall occurs during high-intensity, convective thunderstorms in summer. The average annual temperature is 68 to 69 degrees F (20 to 21 degrees C).

An additional hazard of concern during late summer through early fall are tropical cyclones. While most impacts from hurricanes and tropical storms are confined along the coastal zone, heavy rainfall, severe flooding, and high winds can occur well into Florida when such systems pass through the area. To the extreme, the region is susceptible to the effects of a strong Bermuda High during the summer, which can cause devastating drought conditions for weeks and even months in some years.

(USDA, NRCS, 2022)

Table 4 Representative climatic features

Frost-free period (characteristic range)	220-230 days
Freeze-free period (characteristic range)	250-260 days
Precipitation total (characteristic range)	1,320-1,370 mm
Frost-free period (actual range)	210-230 days
Freeze-free period (actual range)	240-270 days
Precipitation total (actual range)	1,320-1,370 mm
Frost-free period (average)	220 days
Freeze-free period (average)	260 days
Precipitation total (average)	1,350 mm

- (1) JASPER [USC00084394], Jasper, FL
- (2) LIVE OAK [USC00085099], Live Oak, FL
- (3) MAYO [USC00085539], Live Oak, FL
- (4) LAKE CITY 2 E [USC00084731], Lake City, FL
- (5) HIGH SPRINGS [USC00083956], High Springs, FL
- (6) BELL 4NW [USC00080598], Old Town, FL

Influencing water features

The Suwannee River, which originates in the Okefenokee Swamp to the northeast and is spring-fed, flows through this MLRA. The Alapaha and Withlacoochee Rivers join the Suwannee River in the area. Another Suwannee River tributary, the Santa Fe River, crosses the southern part of the area. (USDA, NRCS, 2022)

Wetland description

Dominant hydrology on this site is flooding. This site is very poorly to poorly drained. It represents locations where the soils may or may not meet hydric field criteria, and the variation between the two may be exceptionally subtle. In situations where the soil is hydric, this site represents locations that are periodically flooded, but are not exposed to tidal influences. Any wetlands that occur within a channel are riverine in nature. All others on this site are palustrine in nature.

Soil features

Please note that the soils listed in this section of the description may not be all inclusive. There may be additional soils that fit the site's concepts. Additionally, the soils that provisionally form the concepts of this site may occur elsewhere, either within or outside of the MLRA and may or may not have the same geomorphic characteristics or support similar vegetation. Some soil map units and soil series included in this "provisional" ecological site were used as a "best fit" for a particular soil – landform catena during a specific era of soil mapping, regardless of the origin of parent material or the location of MLRA boundaries. Therefore, the listed soils may not be typical for MLRA 138 or a specific location, and the associated soil map units may warrant further investigation in a joint ecological site inventory – soil survey project. When utilizing this provisional description, the user is encouraged to verify that the area of interest meets the appropriate ecological site concepts by reviewing the soils, landform, vegetation, and physical location. If the site concepts do not match the attributes of the area of interest, please review the Similar or Associated Sites listed in the General Information section of this description to determine if another site may be a better fit for your area of interest.

This site is comprised of soils in the Leon, Osier, and Plummer series. These soils are poorly drained, sandy, and have a spodic horizon within 30 inches, an argillic horizon below 40 inches, or both. Some soils may have a mollic or umbric horizon. Some soils may lack a diagnostic horizon.

Table 5. Representative soil features

Parent material	(1) Marine deposits
Surface texture	(1) Fine sand (2) Sand
Drainage class	Poorly drained
Permeability class	Rapid
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified

Available water capacity (0-101.6cm)	3.05 – 7.87 cm
Soil reaction (1:1 water) (0-25.4cm)	3.5 – 5.5
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Table 6. Representative soil features (actual values)

Drainage class	Poorly drained
Permeability class	Moderately rapid to rapid
Soil depth	200 cm
Surface fragment cover <=3"	0 %
Surface fragment cover >3"	0 %
Available water capacity (0-101.6cm)	2.29 – 11.18 cm
Soil reaction (1:1 water) (0-25.4cm)	3.5 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	0 %

Ecological dynamics

The information presented in this ecological site description (ESD) and state-and-transition model (STM) were developed using archaeological and historical information, published and unpublished scientific reports, professional experience, consultation with technical experts, and NRCS inventories and studies. The information presented represents a complex set of plant community dynamics and environmental variables. Not all scenarios or plants are represented and included. Key indicator plants, animals, and ecological processes are described to help guide land management decisions and actions.

Historically, these sites have been drained frequently to support a variety of land uses including pasture. This drained state is included in this STM because this state exists widely today across the landscape. This site may or may not represent a wetland but drainage of wetlands today is significantly regulated. NRCS is required to consider impacts to wetlands according to Federal laws including, but not limited to, the Clean Water Act, the Wetland Conservation provisions of the Food Security Act of 1985, and State, Tribal, and local laws. It is the policy of NRCS to protect and promote wetland functions and values in all NRCS assistance (National Environmental Compliance Handbook (NECH) 610.36).

Flood plain swamp along channels may be regularly inundated by flowing aerobic water. However, backswamps are flooded with stagnant water for extensive periods of time, resulting in highly anaerobic conditions. The lack of available oxygen inhibits breakdown of leaf litter and leads to considerable peat accumulation. Anaerobic conditions may contribute to increased nutrient release from sediments through bacterial processes. During dry summer months when evapotranspiration rates increase, surface water may be entirely lacking. Floods redistribute detrital accumulations to other portions of the flood plain or into the main river channel. This rich organic debris is essential to the functional integrity of downriver ecosystems such as estuaries, providing a vital source of nutrients. Flood plain swamp may also act as a nutrient sink or transformer depending on local conditions, making these wetlands particularly valuable in disposal of partially treated wastewater. The topography of alluvial forest and flood plain swamp, particularly in larger alluvial river systems, is a result of a seasonal flooding pattern which builds levees and point bars, creates scour channels and depressions, and introduces flowing water into backswamps. Old channels and levees left behind by the changing meander of the river itself become part of the complex mosaic. The oxbows and backswamps created by meander processes are important breeding grounds for fish when high water connects them to the river. Flood plain swamp is usually too wet to support fire; however, large cypress trees are somewhat fire-resistant, and thus infrequent fires during very dry conditions may contribute to cypress dominance. Fires may greatly damage the understory. (FNAI, 2010)

Following this narrative, a “provisional” state and transition model is provided that includes the “perceived” reference state and several alternative (or altered) vegetation states that have been observed and/or projected for this ecological site. This model is based on limited inventories, literature, expert knowledge, and interpretations. Plant communities may differ from one location to the next depending on the severity of local land use activities and rates of deposition. Depending on objectives, the reference plant community may not necessarily be the management goal.

The environmental and biological characteristics of this site are complex and dynamic. As such, the following diagram suggests pathways that the vegetation on this site might take, given that the modal concepts of climate and soils are met within an area of interest. Specific locations with unique soils and disturbance histories may have alternate pathways that are not represented in the model. This information is intended to show the possibilities within a given set of circumstances and represents the initial steps toward developing a defensible description and model. The model and associated information are subject to change as knowledge increases and new information is garnered. This is an iterative process. Most importantly, local and/or state professional guidance should always be sought before pursuing a treatment scenario.

State and transition model

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 9. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 10. Community 1.4 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 11. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					

1	**Graminoids**			2354-14571	
	limpograss	HEAL5	*Hemarthria altissima*	8967-14571	–
	maidencane	PAHE2	*Panicum hemitomon*	5604-7510	–
	Japanese millet	ECES	*Echinochloa esculenta*	4483-6725	–
	blue maidencane	AMPU6	*Amphicarpum purshii*	2354-2802	–
Forb					
2	**Legumes**			2242-3363	
	shyleaf	AEAM	*Aeschynomene americana*	2242-3363	–

Table 12. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Graminoids**			3363-15692	
	Bermudagrass	CYDA	*Cynodon dactylon*	11208-15692	–
	limpograss	HEAL5	*Hemarthria altissima*	8967-14571	–
	pearl millet	PEGL2	*Pennisetum glaucum*	6725-13450	–
	bahiagrass	PANO2	*Paspalum notatum*	3363-6725	–
Forb					
2	**Legumes**			2242-3363	
	shyleaf	AEAM	*Aeschynomene americana*	2242-3363	–
	hairy indigo	INHI	*Indigofera hirsuta*	2242-3363	–

Table 13. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Inventory data references

Data collection and analysis of field data will be performed during the Verification Stage of ESD development. Production data for pasture communities taken from the USDA, NRCS Florida Field Office Technical Guide, forage suitability groups (USDA, NRCS, 2013).

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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	09/26/2026
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:

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:**