14600

Southern Coastal Plain Nonriverine Cypress Dome

BpS Model/Description Version: Aug. 2020

Vegetation Type

Woody Wetland

Map Zones

55, 56, 99

Geographic Range

There is some discrepancy in the distribution of Southern Coastal Plain Nonriverine Cypress Domes. NatureServe (2006) indicates that this system occurs primarily in FL and adjacent areas of southern GA, but also occurs rarely in AL, MS and LA. NatureServe (2004) lists several alliances within this ecological system including: Pond-Cypress/Myrtle Dahoon Depression Forest, Pond-Cypress/(Swamp Blackgum)/Swamp Doghobble-Shining Fetterbush-Wax-Myrtle Depression Forest, and Pond-Cypress/Myrtle Dahoon/(Peatland Sedge, Pinebarren Sedge) Stringer Forest that extend from the coastal plain of southern NC to eastern LA. Robertson et al. (1998) indicates that cypress domes are distributed throughout FL and along the Atlantic Coastal Plain in shallow depressions within the pine flatwoods ecosystems. Mitch and Gosselink (2000) indicate that cypress domes are numerous in the upland pine flatwoods of FL and southern GA.

Despite the discrepancy in the distribution of this ecological system, the majority of representatives occur in FL and adjacent southern GA.

Biophysical Site Description

Cypress domes typically occur as small patch communities imbedded within a larger matrix of pine flatwoods (Abrahamson and Harnett 1990). These patches are roughly circular in shape and typically range in size from 1-10ha (Mitch and Gosselink 2000). In profile, these systems display a characteristic domed shape, with the largest trees in the center of the dome and tree becoming progressively shorter towards the perimeter. Not all domes display this characteristic.

Domes typically occupy poorly drained to permanently wet depressions in areas of low relief (NatureServe 2006, Wilhite and Toliver 1990). Domes are isolated wetland systems and are not associated with floodplains. Water is primarily derived from rainfall and drainage from adjacent uplands. Water levels may fluctuate greatly during the year, but typically cypress domes are inundated up to a meter or more (in the center of the dome) during the summer rainy season, and dry for several months during the winter and spring (Monk and Brown 1965, Brown 1981, Crownover et al. 1995).

Soils are typically acidic sands and/or clays (Monk and Brown 1965) underlain by an impermeable clay layer or hardpan that inhibits the downward movement of water (Ewel 1990, Monk and Brown 1965, Brown 1981, Mitch and Gosselink 2000). Organic deposits accumulate over the clay or sand layers, and are generally deepest in the center of the dome (Monk and Brown 1965).

Vegetation Description

Cypress domes are typically dominated by pond cypress (*Taxodium ascendens*) with occasional black gum (*Nyssa sylvatica*). Other minor associates include swamp bay (*Persea palustris*), dahoon holly (*Ilex cassine*), slash pine (*Pinus elliottii*), sweet bay (*Magnolia virginica*), sweet gum (*Liquidambar styraciflua*), and red maple (*Acer rubrum*). The canopy is generally dense, with larger trees towards the center of the dome on deeper organic soils.

Shrubs and ground cover vegetation may be dense to relatively sparse, depending on light availability (Mitsch and Gosselink 2000). Shrubs include shiny lyonia (*Lyonia lucida*), wax myrtle (*Morella cerifera*), Virginia willow (*Itea virginica*), buttonbush (*Cephalanthus occidentalis*) and others. Ground cover vegetation can include ferns, various wetland herbs and grasses, and sphagnum moss. Species include Virginia chain fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnamomea*), swamp fern (*Blechnum serrulatum*), pickerelweed (*Pontederia cordata*), red root (*Lachnanthes caroliniana*), lizards tail (*Saururus cernuus*), and others.

BpS Dominant and Indicator Species

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

Fire is one of the primary disturbances that affect cypress domes. Without periodic fires, hardwood invasion and peat accumulation would convert the dome to a different wetland community type (Florida Natural Areas Inventory 1990). Marois and Ewel (1983) found that protection from fire in north Florida results in an increase in dominance of slash pine, bays, and black gum in cypress swamps. Ewel and Mitsch (1978) found that fire in a cypress dome in northern FL had a cleansing effect on the dome, selectively killing pines and hardwoods but relatively few pond cypress.

The fire frequency of cypress domes is not concisely documented. Ewel (1990) stated cypress domes may burn several times each century in north FL. The Florida Natural Areas Inventory (FNAI) (1990) states the normal fire cycle might be as short as 3-5yrs along the outer edge and as long as 100-150yrs towards the center. Personal observations indicate that the edges of cypress domes and cypress stringers burn frequently, often nearly as frequent as the surrounding pine flatwoods. However, the interior portions burn infrequently and only during extended drought periods.

Fires typically are light surface fires that do not kill the cypress or burn deep into the organic soil. During drought conditions fires can burn into the organic soils and kill the trees. One personal observation of a fire during drought conditions in a cypress dome at Tosohatchee State Reserve, Orlando, FL, resulted in the consumption of deep peat accumulations in the center of the dome and subsequent mortality of the trees. Consumption of the peat lowered the surface of the ground and created a hole in the donut effect which later re-vegetated with aquatic emergent and grass species.

Hydrology is another dominant force influencing cypress domes. Cypress domes are typically inundated for 200-300 days per year, but may dry out for several months during the winter and early spring (FNAI 1990). Drought conditions increase fire susceptibility and extended drought periods may influence species composition. Robertson et. al. (1998) found that shallow water in cypress domes (usually resulting from drainage) provides conditions more favorable for successful competition by evergreen hardwoods and pines.

Cypress domes occur in hurricane prone areas of the southeast US. Several sources in the literature indicated that cypress trees appear more resistant to storm related mortality than many other species. K. Ewel, through a personal communication cited in Mitsch and Gosslink (2000), relayed an observation from SC following Hurricane Hugo that cypress trees remained standing while pines and hardwoods did not. Ogden (1992) reported that following Hurricane Andrew, hardwoods in Everglades National Park were downed while cypress remained standing for the most part. Guntenspergen and Vairin (1996) in their documentation of the effects of Hurricane Andrew on LA reported that cypress-tupelo swamps remained almost unaffected by storm damage while hardwood forests lost almost one-third of their trees. Personal observations in cypress domes at The Nature Conservancy’s Disney Wilderness Preserve in Kissimmee, FL following three storm events in 2004 indicated that while some limbs and a few trees blew down, overall damage to the systems was minimal.

Fire Frequency

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

Cypress domes are typically small patch communities, ranging in size from 1-10ha, within a much larger pine flatwoods matrix. A single fire event within the pine flatwoods matrix frequently will affect several cypress domes.

Adjacency or Identification Concerns

Southern Coastal Plain Nonriverine Cypress Dome may also be referred to as dome swamps, cypress heads or cypress ponds. They are similar in species composition and ecological characteristics to Southern Coastal Plain Nonriverine Basin Swamp, but are smaller in size and typically do not include bald cypress or a significant hardwood component. Cypress domes occur as small patch communities within upland pine systems. Adjacent communities may include any of the pine flatwoods or pine savanna ecological systems. Cypress domes are frequently surrounded by a transition zone or ecotone of freshwater marsh or wet prairie that occurs between it and the upland pine systems.

Cypress domes occur frequently in FL and adjacent portions of southern GA. While there are many intact representatives remaining, many have been impacted by fire exclusion, artificial drainage and logging. Fire exclusion and drainage frequently result in increasing numbers of hardwoods, shrubs and pines, and the eventual decline of the cypress. Logging rapidly removes the cypress, which may not return depending on the availability of seed sources, and the system is converted into a forested hardwood system. During conversion of land for agricultural purposes, cypress domes are frequently left in place because they are not suitable for pasture or crop land. In these circumstances they appear as small treed islands within a pasture or row crop field. In urban landscapes, cypress domes have also been impacted by impounding, which increases the hydroperiod and stresses the trees. While cypress will persist in this condition, reproduction is reduced or eliminated and they decline in vigor. This condition may also result in a shift in understory and ground cover species to those more tolerant of permanently flooded conditions.

Issues or Problems

The range of this system is somewhat in question and depends on how it is defined. Most authors agree that the majority of representatives occur in FL and adjacent portions of southern GA.

The fire frequency of this system as well as many other wetland types has not been well documented or specifically defined. Probabilities used in this model were based on literature estimates and personal observations. However, most literature indicate a general (several times per century) estimate and personal observations are limited by time scale. More research and documentation is needed.

Native Uncharacteristic Conditions

Comments

Succession Classes

**Mapping Rules**

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

**Description**

Class A 11 Early Development 1 - All Structures

DBH

Indicator Species

Description

The early post replacement class includes seedling and sapling size pond cypress that have resprouted post disturbance (usually fire). This class generally occurs in a band around the outer perimeter of the cypress dome. The width of this band may vary depending on suitable conditions for cypress seed germination and fire. Under suitable conditions and in the absence of a killing fire, this band of seedling or sapling size cypress may expand outward into the adjacent wet prairie or marsh community. Following a severe fire, trees around the outer perimeter will be killed. Cypress in the remaining protected portions of the dome provide seeds to re-colonize the area.

Trees in this class are typically less than two meters tall. Understory vegetation may include a mix of those found in the interior of the cypress dome and those found in the adjacent wet prairie, marsh or pine flatwoods/savanna systems. In higher fire environments, grasses and sedges tend to predominate.

This portion of the cypress dome may be affected by fire almost as frequently as the surrounding pine flatwoods/savannah systems. Hurricanes have a minimal impact on this age class, and drought conditions may reduce the percent cover by cypress and allow encroachment of more mesic species from the surrounding pine communities.

*Maximum Tree Size Class*  
Sapling >4.5ft; <5" DBH

Class B 1 Mid Development 1 - Closed

Indicator Species

Description

Class represents the mid-development closed condition. In cypress domes, closed refers to the structure and physiognomy of the understory vegetation and the level of encroachment of hardwoods into the canopy. This class is characterized by cypress trees with a significant component of hardwood trees, pines, mid-story trees and shrubs that have established in the absence of fire. This class typically contains an abundance of larger woody shrubs such as wax myrtle and fetterbush and understory trees such as red maple and dahoon holly that have established in the absence of fire. Ground cover vegetation may include an abundance of ferns, lizards tail, redroot and other species.

A single surface fire would not significantly affect the composition and structure of this class. Repeated surface fires can remove the hardwood component and return the class to an open condition. Replacement fires during extended drought periods, would result in consumption of the accumulated peat and mortality of the trees. This would return the system to the early post replacement class.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Class C 24 Mid Development 1 - Open

Indicator Species

Description

Class represents the mid-development open condition. In cypress domes, open refers to the structure and physiognomy of the understory vegetation and the level of encroachment of hardwoods into the canopy. Class is characterized by a canopy composed almost exclusively of pond cypress. Shrubs and mid-canopy species such as red maple and dahoon holly occur occasionally, but do not represent a significant component of the system. Ground cover vegetation may be sparse to locally abundant, depending on light availability, and may include ferns, lizards tail, red root, panic grasses, beakrushes and other sedges. In some systems, sphagnum mosses are the predominant ground cover.

The outer edges may receive a surface fire often. Fire frequency generally declines towards the center of the dome and surface fires may only reach the interior portions more rarely. Replacement fires occur are rare. This event occurs during extended drought periods, and results in consumption of the organic material and mortality of many of the trees, returning the class to an early post replacement condition.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Class D 57 Late Development 1 - Open

Indicator Species

Description

Class represents the late development open condition. In cypress domes, open refers to the structure and physiognomy of the understory vegetation and the level of encroachment of hardwoods into the canopy. This class occurs in the central portion of the dome on deeper organic soils. Class is characterized by a canopy composed almost exclusively of pond cypress. Hardwoods may occur. Shrubs and mid-canopy species such as wax myrtle, red maple, and dahoon holly occur occasionally, but do not represent a significant component of the system. Ground cover vegetation may be sparse to locally abundant, depending on light availability, and may include ferns, lizards tail, red root, panic grasses, beakrushes and other sedges. In some systems, sphagnum mosses are the predominant ground cover.

Surface fires may reach the interior portions of the dome occasionally. Replacement fires occur as well. Replacement fires occur during extended drought periods, and result in consumption of the organic material and mortality of many of the trees, returning the class to an early post replacement condition. In some circumstances this can appear to create a hole and the donut effect where the outer bands of trees remain intact and the center portion returns to the early post-replacement class.

*Maximum Tree Size Class*  
Large 21-33" DBH

Class E 7 Late Development 1 - Closed

Indicator Species

Description

Class represents the late development closed condition. In cypress domes, closed refers to the structure and physiognomy of the understory vegetation and the level of encroachment of hardwoods into the canopy. This class occurs in the central portion of the dome on deeper organic soils. Class is characterized by a mixed canopy of pond cypress and hardwoods including blackgum, sweet bay, loblolly bay, swamp bay and others. Mid-canopy trees, shrubs ground cover vegetation may be sparse to locally abundant, depending on light availability. Species include dahoon holly, red maple, wax myrtle, ferns, lizards tail, red root, panic grasses, beakrushes and other sedges. In some representatives, sphagnum mosses are the predominant ground cover.

A single surface fire would not significantly affect the composition and structure of this class. Repeated surface fires can remove the hardwood component and return the class to an open condition. Replacement fires, occurring during extended drought periods, would result in consumption of the accumulated peat and mortality of the trees. This would return the system to the early post replacement class if a seed source is available. In some circumstances this can appear to create a hole and a donut effect where the outer bands of trees remain intact and the center portion returns to the early post-replacement class. Severe fires may also initiate a transition to a different type of system such as marsh or shrub dominated swamp.

*Maximum Tree Size Class*  
Large 21-33" DBH

Model Parameters

Deterministic Transitions

Probabilistic Transitions

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