14740

Gulf and Atlantic Coastal Plain Small Stream Riparian Systems

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
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Vegetation Type

Woody Wetland

Map Zones

32, 37, 44, 45, 98

Model Splits or Lumps

This BpS is lumped with: 1462

Geographic Range

The geographic distribution of this BpS includes second and third order forested streams from southeast TX into central LA north into central AR. Species composition and arrangement will likely vary from south to north and east to west.

Biophysical Site Description

The West Gulf Coastal Plain Small Stream Riparian Systems includes both mesic stream bottoms and wet-mesic stream bottoms. Characteristically they form deep, well-developed stream channels and narrow flood plains in the upper reaches. In the lower areas they form broader flood plains. Floods irregularly inundate the lower areas. These sites serve as the transition from the mesic uplands to the seasonally flooded river floodplains. The inclusion of BpS 1462 (West Gulf Coastal Plain Seepage Swamp and Baygall) represents the presence of baygalls embedded within this landscape. Baygalls form at the interface between uplands and streams where soil layers force water to the surface. The wetland characteristics of baygalls limit the growth of overstory trees, resulting in shrubby thickets. Baygalls disappear quickly or gradually into more typical riparian areas with distinct incised stream channels. Beaver dams frequently cause open wetland inclusions of a few to many acres in size, sometimes with considerable open water.

Vegetation Description

White oak (*Quercus alba*), sweet gum (*Liquidambar sytraciflua*), loblolly pine (*Pinus taeda*), water oak (*Q. nigra*), American beech (*Fagus grandifolia*) and southern magnolia (*Magnolia grandiflora*), and in the wettest areas such as long term beaver ponds and small-scale *Taxodium distichum* (cypress)-*Nyssa biflora* (swamp black gum) swamps, Cypress (*Taxodium distichum*) dominate the overstory vegetation of this BpS. Numerous other species present vary widely in dominance from place to place, including laurel oak (*Q. laurifolia*), willow oak (*Q. phellos*), black willow (*Salix nigra*), red maple (*Acer rubrum*), eastern hophornbeam (*Ostrya virginiana*), American hornbeam (*Carpinus caroliniana*), American holly (*Ilex opaca*) and rarely a local subdominant of bigleaf magnolia (*M. macrophylla*). The fire maintained canebreaks occur infrequently in this BpS under current conditions.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| QUAL | *Quercus alba* | White oak |
| LIST2 | *Liquidambar styraciflua* | Sweetgum |
| PITA | *Pinus taeda* | Loblolly pine |
| QUNI | *Quercus nigra* | Water oak |
| FAGR | *Fagus grandifolia* | American beech |
| MAGR4 | *Magnolia grandiflora* | Southern magnolia |
| TADI2 | *Taxodium distichum* | Bald cypress |

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

Disturbance Description

Flooding is not severe and frequent enough to play a major role in structural composition in this system. Likewise, fire is probably not a large factor in maintaining these systems. It probably occurred with similar frequency to adjacent uplands on the upper reaches, but was very low intensity and minor. Blowdown and insects impact small areas across the landscape, but only infrequently occur.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 428 | 8 |  |  |
| Moderate (Mixed) | 129 | 26 |  |  |
| Low (Surface) | 49 | 66 |  |  |
| All Fires | 33 | 100 |  |  |

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

The scale of disturbance is primarily small and gap-phase disturbance occurring from natural tree death, small wind events and fire encroachment from uplands. Widespread events will occur in hurricane prone areas in coastal southeast TX/coastal LA into the Pineywoods. In AR, icestorms could cause a widespread event. Although rare, wildfires can occur in this BpS.

Adjacency or Identification Concerns

This BpS occurs between the West Gulf Coastal Plain Mesic Hardwood Forest (BpS 1323) and West Gulf Coastal Plain Pine-Hardwood Forest (BpS 1371) on the upper reaches and the Gulf and Atlantic Coastal Plain Floodplain Systems (BpS 1473) on the lower reaches.

Issues or Problems

In one case, local fire staff described a site on the Kisatchie National Forest as one that would "never burn, or only burn under extreme conditions". Nevertheless, the site burned under low intensity used in prescribed burning later that season.

Native Uncharacteristic Conditions

Comments

For MZ37 the description for this model combined some initial modeling by Laing and Mangham (mostly from experiences in east Texas) to Hyatt's experience on the Kisatchie National Forest in LA and his widespread field experience in AR.

Succession Classes

**Mapping Rules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Upper Layer Lifeform** | **Height (m)** | **Canopy Cover (%)** | | | | | | | | | |
| **0-10** | **11-20** | **21-30** | **31-40** | **41 - 50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-100** |
| Herb | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Herb | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 1.0-3.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | >3.0 | A | A | A | A | A | A | A | A | A | A |
| Tree | 0-5 | A | A | A | A | A | A | A | A | A | A |
| Tree | 5-10 | A | A | A | A | A | A | A | A | A | A |
| Tree | 10-25 | B | B | B | B | B | B | B | B | B | B |
| Tree | 25-50 | C | C | C | C | C | C | C | C | C | C |
| Tree | >50 | C | C | C | C | C | C | C | C | C | C |

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 14 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PITA | Pinus taeda | Loblolly pine | Upper |
| LIST2 | Liquidambar styraciflua | Sweetgum | Upper |
| ACRU | Acer rubrum | Red maple | Upper |
| Carex | <NOT FOUND IN NRCS> | <NOT FOUND IN NRCS> | Lower |

Description

Surface fires occur infrequently. Mixed and replacement fires are rare. Blowdown from storms, insect damage, flooding, and other events leave the area in a variety of conditions. Class could vary from bare ground created when a flooded beaver pond drains to a tangle of down timber created by blowdown or timber harvest. The structure forms as these open areas begin to regenerate to forest. For the first few years a tangle of wetland and streamside vegetation dominates the area. *Carex* species, other sedges, and wetland forbs such as *Rhexia* invade forming an initial mat of dense herbs. As trees begin to penetrate this mass, a varied mix of Loblolly Pine, Sweet Gum, Red Maple and other species grow. Species vary widely by soil and hydrology. The fast growing vegetation may be reset to age zero when beavers return and flood small areas.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Class B 19 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PITA | Pinus taeda | Loblolly pine | Upper |
| LIST2 | Liquidambar styraciflua | Sweetgum | Upper |
| ACRU | Acer rubrum | Red maple | Upper |

Description

Surface fires and mixed fires maintain the class. Species vary so widely in the mid stage of this BpS difficulty exists in describing the overstory. Often loblolly pine has captured the sunlight shading out other species, but other shade tolerant species may dominate, such as red maple. The class is best defined by tree height and diameter. Hydrology varies widely, from somewhat dry lower slopes adjoining streams which are infrequently flooded, to baygalls which are perennially wet, to sites along larger streams with swampy backwater channels, bayous and braided stream form.

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

Class C 67 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PITA | Pinus taeda | Loblolly pine | Upper |
| MAGR4 | Magnolia grandiflora | Southern magnolia | Upper |
| FAGR | Fagus grandifolia | American beech | Upper |
| TADI2 | Taxodium distichum | Bald cypress | Upper |

Description

Mature stands of this BpS vary widely in species composition. Drier sites may have white oak, loblolly pine, black oak (*Quercus velutina*), etc. These dry sites occur in the full gradient of streams, from smaller to larger channels in this area. In this setting either soils or topography may contribute to the dryness of the site. For example, a deeply channeled large stream in an area with some slope in the floodplain might both be infrequently flooded and still support white oak as the flooding is brief. As the moisture gradient trends wetter, sweet gum, loblolly pine and red maple become more dominant. At the wetter end, where backwater sloughs and bayous wind through the floodplain, a more typical wetland overstory forms with loblolly pine, American beech, southern magnolia, and in the wettest areas such as long term beaver ponds, cypress. Numerous other species present vary widely in dominance from place to place, including laurel oak, willow oak, black willow, red maple, eastern hophornbeam, American hornbeam, American holly, and rarely a local subdominant of bigleaf magnolia. The fire maintained canebreaks occur infrequently in this BpS under current conditions.

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

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 15 |
| Mid1:CLS | 16 | Late1:CLS | 40 |
| Late1:CLS | 41 | Late1:CLS | 999 |

Probabilistic Transitions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disturbance Type** | **Disturbance occurs In** | **Moves vegetation to** | **Disturbance Probability** | **Return Interval (yrs)** | **Reset Age to New Class Start Age After Disturbance?** | **Years Since Last Disturbance** |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Mixed Fire | Early1:ALL | Early1:ALL | 0.004 | 250 | No | 0 |
| Optional 1 | Early1:ALL | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.025 | 40 | No | 0 |
| Wind or Weather or Stress | Mid1:CLS | Early1:ALL | 0.0025 | 400 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Optional 1 | Mid1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.017 | 59 | No | 0 |
| Mixed Fire | Mid1:CLS | Mid1:CLS | 0.02 | 50 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Mixed Fire | Late1:CLS | Late1:CLS | 0.005 | 200 | No | 0 |
| Optional 1 | Late1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.02 | 50 | No | 0 |

Optional Disturbances

Optional 1: Flooding (beaver ponds)

References

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