

13390

West Gulf Coastal Plain Chenier and Upper Texas Coastal Fringe Forest and Woodland

BpS Model/Description Version: Aug. 2020

Updated: 4/24/2018

Modelers		Reviewers	
Chris Wells	chris_wells@usgs.gov		

Vegetation Type

Forest and Woodland

Map Zones

36, 37, 98

Geographic Range

This system includes a range of woody vegetation present along the northern Gulf of Mexico, from Louisiana to the upper Texas coast, including shell ridges along the coast and bay margins, coastal salt domes, stranded ancient barrier ridges (Ingleside barrier strandplain) and "chenier" (French for oak) ridges of the chenier plain.

Biophysical Site Description

The vegetation is dependent on fresh water from rain, since the surrounding marsh varies from fresh to oligohaline to brackish and even the open Gulf waters. The slight to modest elevation of the cheniers (from a few centimeters to 3m in height) and soil porosity (mostly coarse sand and shell) facilitates absorption of rainwater into the cheniers. No natural ponds are on the cheniers, though recent surface mining has resulted in numerous deep ponds that may be somewhat freshwater to quite brackish. The cheniers are critically important stopover sites for neotropical trans-Gulf migratory birds, mostly federally protected songbirds. The cheniers present vegetation and arthropod food sources for the birds on both legs of the trans-Gulf migration.

It is heterogeneous in physiognomy, including forests, woodlands and shrublands. The chenier plain is characterized by a prograding coastline replenished by sediments carried to the Gulf initially by the Mississippi and subsequently the Atchafalaya and other rivers. It is void of barrier islands and shoreline, sediments are reworked by waves into beach ridges, sometimes with a substantial shell component. This process has been continuing since the last glacial retreat, and as the coast line progrades, older beach ridges are left as interior ridges surrounded by marsh. These interior beach ridges are referred to as "cheniers" because they were historically dominated by live oak (*Quercus virginiana*). Ridges parallel the coast and are usually three meters above mean sea level. Today, very few remain vegetated by a live oak-dominated forest because many have been cleared for agriculture. Though not confined to coastal areas, salt domes are a distinctive feature along the Gulf Coast of upper Texas and Louisiana where they often form a drastic contrast to the low-lying Coastal Plain sediments surrounding them. Formed by the rise of salt masses which push up overlying strata, salt domes may rise 30m above the surrounding landscape. The natural vegetation of cheniers and salt domes are oak-dominated

woodlands and forests. The Ingleside barrier strandplain is a Pleistocene barrier ridge that outcrops discontinuously along the Texas coast. A note on terminology from Barrow et al. (2006). "The word derives from the French 'chene', meaning oak and in that language 'cheniere' is literally an oak grove. It is applied loosely to any grove of trees, predominantly oak in character. Scientifically, the term "chenier" is applied to certain land formations, whose origin and character are quite distinctive, and unlike most land formations in general." The description and model presented here are primarily based on the cheniers of Louisiana.

Vegetation Description

Pre-Columbian vegetation was usually a closed canopy dominated by live oak (*Q. virginiana*) and sugarberry (*Celtis laevigata*) with a general dominance of *Celtis* on the cheniers nearest the coast and *Q. virginiana* on the inland cheniers. Subcanopy species include Hercules' club (*Zanthoxylum clava-herculis*), green hawthorn (*Crataegus viridis*), and sweet acacia (*Acacia farnesiana*).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
QUVI	<i>Quercus virginiana</i>	Live oak
CELA	<i>Celtis laevigata</i>	Sugarberry
ZACL	<i>Zanthoxylum clava-herculis</i>	Hercules' club
CRVI2	<i>Crataegus viridis</i>	Green hawthorn
ACFA	<i>Acacia farnesiana</i>	Sweet acacia
MOCE2	<i>Morella cerifera</i>	Wax myrtle

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

Disturbance Description

Fires in the adjacent marsh, whether of anthropogenic or lightning origin, probably swept into the cheniers and were carried by the coarse groundcover and leaf litter. It is unlikely that flame heights reached into the canopy. These fuels were probably insufficient to kill the thick-barked, mature *Q. virginiana* found in the canopy but probably damaged or killed *C. laevigata* and other thin-barked dominant or codominant species. Subcanopy, shrub, and herbaceous species, as well as seedlings of the canopy species were probably severely impacted by fire when there was enough fuel to sustain a ground fire. The rhizomatous *C. viridis* and lignotuberous greenbriar (*Smilax* spp.), yaupon (*Ilex vomitoria*), and wax myrtle (*Morella cerifera*) probably survived the surface fires, although the aerial portions may have been killed. Severe hurricanes impact the cheniers. The winds defoliate the vegetation, snap limbs, and may uproot trees. The storm surges carry debris into the cheniers, which may mechanically impact the vegetation as well as deposit salt on the vegetation surfaces and into the soil, essentially poisoning the species that are not resistant to salinity. Loss of vegetation due to fire or tropic weather systems may directly impact the food resources required by trans-Gulf migratory birds.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	87	21		
Moderate (Mixed)				
Low (Surface)	23	79		
All Fires	18	100		

[illegible]

Shrub	>3.0	B	B	B	B	B	B	B	B	B	B
Tree	0-5	B	B	B	B	B	B	B	B	B	B
Tree	5-10	B	B	B	C	C	C	C	C	C	C
Tree	10-25	B	B	B	C	C	C	C	C	C	C
Tree	25-50	B	B	B	C	C	C	C	C	C	C
Tree	>50	B	B	B	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 15 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCHIZ4	Schizachyrium	Little bluestem	Middle
CYDA	Cynodon dactylon	Bermudagrass	Lower
LYBE	Lycium berlandieri	Berlandier's wolfberry	Upper
PANO2	Paspalum notatum	Bahiagrass	None

Description

This class consists of the chenier devoid of forest vegetation. Grasses will dominate the early successional/regenerative chenier, maybe due to extreme fire or hurricane conditions. In either case, all canopy, subcanopy, and shrubs species may be killed. Regeneration may depend entirely on the seedbank or transport from off-site if a storm surge of sufficient magnitude, duration and salinity impacts the chenier. Lesser impacts from lower-intensity storms or from fires may allow regeneration from subsurface germinative sources (seeds, tubers, rhizomes, etc.). Little bluestem grass (*Schizachyrium scoparium*), bermuda grass (*Cynodon dactylon*), and wolfberry (*Lycium berlandieri*) are common pioneer species. In modern times, the forest has been removed for cattle grazing, for lawns around homes and businesses, and along transportation and utilities rights-of-way.

Maximum Tree Size Class

None

Class B 1 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUVI	Quercus virginiana	Live oak	Upper
CELA	Celtis laevigata	Sugarberry	Upper
CRVI2	Crataegus viridis	Green hawthorn	Mid-Upper
MOCE2	Morella cerifera	Wax myrtle	Middle

This class consists of regenerating forest and of low-lying areas immediately adjacent to the marsh where frequent flooding or saline conditions limit woody growth. Grazing may retard tree growth and canopy development.

None

Indicator Species

This class consists of mature forest with a closed canopy and a low-density subcanopy and shrub layer. Herbaceous layer varies from sparse to luxuriant. Grazing may inhibit shrub and herbaceous layers (though not included in the model).

Very Large >33"DBH

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
Alternative Succession	Early1:ALL	Mid1:CLS	1	1	Yes	15
Replacement Fire	Early1:ALL	Early1:ALL	0.05	20	Yes	0
Native Grazing	Early1:ALL	Early1:ALL	0.05	20	No	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Mid1:OPN	Early1:ALL	0.007	143	Yes	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.05	20	No	0

Alternative Succession	Mid1:CLS	Mid1:OPN	1	1	Yes	15
Wind or Weather or Stress	Mid1:CLS	Early1:ALL	0.007	143	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.02	50	Yes	0
Surface Fire	Mid1:CLS	Mid1:CLS	0.03	33	No	0

References

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

NatureServe. 2006. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 18 July 2006.