

REVISED FIELD GUIDE TO THE

YELLOW JACKET

INTERPRETIVE TRAIL

Written by:

James Inabinet

Illustrated by:

Margaret A. Inabinet

**A Project Of La Terre
Bioregional Center**

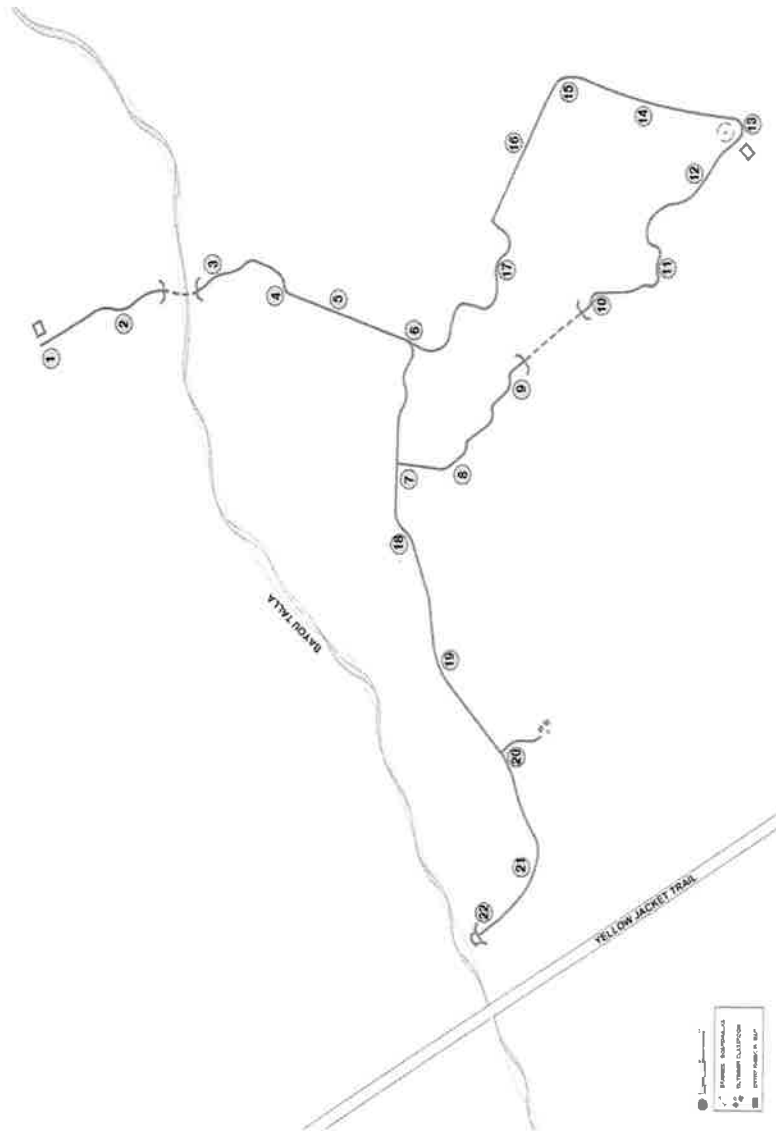
Copyright © 2021 James Inabinet

All rights reserved. No part of this work may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopying and recording, or by any information storage or retrieval system, without permission in writing from the publisher.

Printed in the United States of America

Publisher: La Terre Press
22591 Rue La Terre
Kiln, MS 39556
(228) 255-4019

Map View of the Yellow Jacket Interpretive Trail:



Introduction To La Terre Bioregional Center: Field Guides To Outdoor Education

After 30+ years of exhaustive study, researchers have discovered the obvious:

We have *now* learned that children learn better when they are engaged. Children learn better when they are active participants in the learning process; when they become vested in the process, possessing a feeling of ownership.

We have *now* learned that children learn better when we create hands-on, experiential opportunities within the teaching/learning milieu. Understanding has *moment* when it is directly experienced.

We have *now* also learned that children learn better when we create whole-learning, systems approaches to teaching instead of piecemeal, unconnected data. It is critical to temper the verbal with direct observation and experience.

Finally, we have *now* learned that children learn better when our goals as educators are to facilitate learning. To the extent that we create opportunities for children to learn, give them the tools to learn, and get out of the way so that they may learn, the more *learning* happens.

An Interpretive Center, even if minimally constructed, when accompanied with associated field materials, can facilitate the adoption of these techniques. Outdoor Education research seems to bear this out. Approximately fifty studies have been conducted in the past fifty years providing conclusive proof that outdoor education is effective in building skills in the cognitive, affective, and psychomotor domains. With the new Mississippi

assessments clearly suggestive as to the increased use of interdisciplinary approaches and critical thinking techniques; an Interpretive Center is an exciting way to initiate better ways to teach and learn and document the results.

Informal studies of south Mississippi teachers conducted by La Terre Bioregional Center indicated that teachers are wary of outdoor education for three reasons: the first of these is that there is simply no place to go. Travel is such a logistical nightmare that spending more than a day or so per year at an off-school site is difficult at best. The second reason is that teachers simply do not feel comfortable with their knowledge level about natural phenomena; they need more information about it. The third reason is that even if they had that information, they would have trouble connecting it with their classroom objectives. It's not that they are incapable of accomplishing this; it would simply take up too much of their precious time.

This Field Guide addresses these three concerns. In the first place, this book is designed to be used *at* the school, not at some distant location. Secondly, it provides necessary background information about specific aspects of the natural phenomena at the school. Third, it provides the curriculum connections by referring to specific core objectives for K through 5 for using this book in a natural area at the school. A map of the school is provided to complete the connection. It tells where on the campus to go.

This book and a natural area, even an Outdoor Science Laboratory, at a school will have *no* effect on outdoor education unless *you* the teacher *go* into nature to inculcate outdoor, experiential education into your daily lesson plans. Use It! Liberate your students and yourself from the four walls ... at least sometime.

..... **NOTES**

Table Of Contents

Introduction	3
Table of Contents	5
Introduction To Interpretive Trails	6
Field Guide to Yellow Jacket Interpretive Trail	7
Map View Of the Yellow Jacket Interpretive Trail ..	76

AN INTRODUCTION TO INTERPRETIVE TRAILS

..... NOTES

An Interpretive Trail is an Ecology Trail. As such, it is most concerned with emphasizing communities of plants and animals coexisting in equilibrium, an equilibrium that is influenced by gradual, natural change. Individual species and their identification are important, but not as important as the *community* as a whole.

In natural ecosystems it is CHANGE that is constant. Natural places do not stand still, but are dynamic and ever-changing. Ecology is the study of the interrelationships between the plants, animals, fungi, bacteria, etc. and their physical environment, the wind, the rain, the soil, etc. Within the context of natural change, it is these interrelationships that are CRITICAL! No organism stands alone; no organism exists outside of the context of its natural environment. Along the trail, the station signs identify specific organisms that constitute the *natural area*. But it is imperative to remember this COMMUNITY CONCEPT and observe the whole picture, trying not to lose the forest for the trees.

In an Interpretive Trail, there are a variety of communities and assemblages of plants and animals. Observe the forest litter and rotting vegetation on the ground to realize how the Earth works. The cycles and systems manifested within our forests are critical to the health of those ecosystems and the Earth as well. The nutrient cycle that returns nutrients to the soil is vital to the health of these natural areas; the water cycle that recycles the water all around us is critical to the plants we take for granted all around us. These systems have operated on the Earth for millennia and, though overlooked, form the basis for ALL life on the Earth - not just right here, right now. It

Plate.

Elderberry is growing here, on the other side of the tidal pool. It needs abundant light and is easily shaded out. It is an important food for mammals and birds. The early settlers used the berries for fabric dye, tea, and wine. For more information, refer to the Fruiting Patterns and Ecology Plate.

Blue Jay was observed here. Blue jays are noisy, rabble-rousing birds that are the bird *bully* of the local bird world. It has a predominate and easily-distinguishable blue and white color. For more information, refer to the Vertebrata Plate.

is also important to note that all energy on the Earth is of the SUN; plants are solar energy collectors and are therefore *the* energy source that supports all life on this planet.

These natural systems, relationships, and more can be witnessed all around if one stops, looks, and listens.

Field Guide To The Yellow Jacket Interpretive Trail:

1. Ecotone. At the trailhead, we are standing in mowed grass facing a forest. This is an *ecotone*, a break between ecosystems. Here it is an ecotone between a “mowed grass ecosystem” and a forest. Ecotones are important for many animal species especially small mammals that eat the herbs next to the forest in the succession area and retreat to the forest for protection from predators.

Note the stark contrast as we move into the forest ahead which has a much reduced herb layer due to both light intensity (less light strikes the ground) and ground litter (a leaf *mat* virtually mulches out most herbs that attempt to grow).

Human-Maintained Ecosystem. The mowed grass, *human-maintained* ecosystem, is kept so by incessant mowing. Dominated by the herb layer, these grass species and their associates thrive where there is abundant light. Grasses can tolerate the cutting-off of the top part of their leaves and so are adapted to living in an area of constant mowing. Also note that there is relatively little or no leaf litter on the ground; also a plus for grasses.

Upland Pine Ecosystems are characterized by abundant pines in the canopy, abundant bushes/shrubs/small trees in the understory such as yaupon, greenbrier, sweetleaf, and wax myrtle, and an herb layer dominated by small vines such as poison ivy, Virginia creeper, etc. For more information, refer to the Upland Pine Ecosystem Plate.

Herb Layer is minimal here due to the abundant leaves on the ground. The plants growing on the ground are *herbs*; most herbs grow with difficulty under a forest canopy

information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Note. At the end of the trail, at post 22, note the tidal bayou.

Tidal Bayou is observed at the end of the trail [Bayou Talla]. The bayou is estuarine, which indicates that it is connected to the Gulf of Mexico. This section of the bayou is notably affected by tides. The water in the bayou is brackish containing many species from both fresh waters and salt. Mulletts were observed below the bridge on the other side of the bayou.

Tidal Pool at the end of the trail holds water because of influx from the bayou itself but also because the bottom is lined with impervious clay which keeps the water from percolating down into the ground. Inside the pool is very soft mud/muck filled with composting leaves and detritus that has fallen in; such an anaerobic environment produces methane that is seen bubbling through the muck. For more information, refer to the Groundwater, Wetlands, and Springs Plate.

Blunt-Nosed Minnow was observed swimming here in the bayou. These minnows feed on tiny animal and plant matter that is eaten as they swim along. They can live in very little water and thrive here and in ditches all along the south.

Japanese Tallow is growing here, on the other side of the tidal pool. Tallow is an imported prolific pest that interferes with natural succession and with the growth of important food trees for birds and mammals. Tallow leaves turn brilliant red in fall. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta

species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Note. The low light conditions at the ground level and the heavy litter there making it nearly impossible for herbs to grow.

Titi is growing here, a few of them, in the understory of the forest. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey lovers.

Wax Myrtle is growing here in the understory, a common understory shrub in pine forests. Early settlers used the whitish berries for candle wax making the scented *bayberry* candles. For more information, refer to the Upland Pine Ecosystem Plate and the Anthophyta Plate.

Red Maple is growing here as juveniles in the subcanopy. Red maple is a common bottomland species in Mississippi. It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*-type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Sweet Bay Magnolia is growing here as juveniles in the subcanopy. Sweet Bay is a common bottomland species in the Magnolia family. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more

unless the ground is relatively free of decaying leaves and sunlight is ample. For more information, refer to the Nutrient Cycle Plate and the Humus/Erosion Plate.

Leaf Litter covers the ground here. Not all litter is bad! There is virtually *no herb layer* because of the heavy leaf litter on the ground. Again, herbs grow with difficulty unless the ground is relatively free of decaying leaves and sunlight is ample. For more information, refer to the Humus/Erosion Plate and the Soil Ecosystem Plate).

Loblolly Pine is growing here in the canopy. Loblolly is a common pine species throughout Mississippi, easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Wax Myrtle is growing here in the subcanopy. Note that the lower limbs are dying and in decay simply because there's not enough light to support it all. Wax myrtle is a common understory shrub in pine forests. Early settlers used the whitish berries for candle wax making the scented *bayberry* candles. For more information, refer to the Upland Pine Ecosystem Plate and the Anthophyta Plate.

Gallberry is growing here at the trailhead and down the trail. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Game Trail crosses the trail 50 feet from the trailhead. Animals, like humans, are creatures of habit. Small [and large] animals in a thicket area such as this will take the same path repeatedly in their forays through the thicket

until an actual trail is observable.

Titi is growing here. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey lovers.

Red Maple is growing here. Red maple is a common bottomland species in Mississippi; the specimen here is a juvenile of the species. It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*-type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Slash Pine is growing here. Slash is a common pine species in south Mississippi. It is easily distinguished from others by *medium-long* needles, two to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Note. Gallberry is growing in profusion as we move down the trail.

2. Ecotone. Note the shift in ecosystem as we move downhill, out of the pine dominated canopy with abundant bushes into a hardwood dominated canopy with fewer bushes. As we move deeper into the branch and the soil becomes richer, and moister favoring hardwood development. Note as well how much easier it is to see through the forest into the drainage branch.

Note. Herb layer plants are mostly absent because of low light conditions and heavy mulch.

Bottomland Hardwood Ecosystem. This ecosystem is dominated by hardwoods. As a general rule, hardwoods

trail beneath the pines. Black gums are a common bottomland species that is an important food source for birds, especially migratory birds. Note the black spots in the leaves in the fall as they turn red and yellow. The heartwood is susceptible to rot and many are hollow becoming the homes for squirrels, raccoons, and bees. Settlers used a piece of hollow blackgum to make a beehive. For more information, see the Fruiting Patterns and Ecology Plate, the Anthophyta Plate, and the Fall Colors Plate.

Titi is growing here in the understory of the forest. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey lovers.

Blackjack oak is growing here. Blackjack oak can often be found in xeric areas as it competes for water well. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

22. Note. As we move towards post 22, the trail moves us increasingly downslope and into moister soils.

Loblolly Pine is growing here, big ones dominating the canopy. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Yaupon is growing here. Yaupon is a common *holly*

Bluestem Grass is growing here along the edge of the trail. Grasses have round, usually hollow stems that are jointed with leaves attached at the joint. The leaves are in twos and grow opposite one another all the way down the stem. Bluestem is a tufted, perennial grass that once extremely common throughout the state. It is in the *andropogon* tribe of grasses that are the most common vascular plants in the world.

Fall Asters were growing here along the edge of the trail in the fall of 2020. A member of the aster family, fall aster has tiny flower heads (about ½ inch in diameter) with white [or violet] ray flowers and yellow disc flowers that are common in the fall. Such flowers are *composite* featuring many flowers making up the central flower core. Each flower is actually many allowing a single bee visit to pollinate many flowers instead of one. The leaves are tiny as well. For more information, refer to the Flower Parts Plate.

Helianthus was growing here along the edge of the trail in the fall of 2020. Helianthus is a wild sunflower; its flowers are yellow, *composite* flowers. For more information, refer to the Flower Parts Plate.

Comfort Root was growing here along the edge of the trail in 2020. Comfort root is an hibiscus with large, white to cream flowers bearing red centers that flower all summer. The leaves have the habit of sticking to clothing and a casual walk through such a thicket results in many of these leaves having to be picked off.

Note. As we move down trail and down slope, more abundant and diverse plants begin to appear.

Black Gum is growing here, a couple of them just off the

compete better for water than pines *when water is abundant*; they also compete better when the soil is richer. Nutrients leached from upland soils are transported here by soil water and made available to these trees. For more information, refer to the Bottomland Hardwoods Plate and the Community Concept in the Bottomland Hardwoods Plate.

Yellow Pitcher Plants are growing here; look for them. Pitcher plants are carnivorous plants that commonly live in infertile areas, supplementing their nutrient intake from the soil with nutrients derived from dissolved insects that become trapped in their hooded, hollow leaf.

Moss/Bryophyte are growing abundantly on the ground and on tree trunks. It is the magnificent green *carpet-like* plant. Mosses, like ferns, are a non-seed bearing plant that reproduces by spores. Moss must have standing water to reproduce. Along with ferns, bryophytes became much of the world's supply of coal. For more information, refer to the Bryophyte Plate.

Cinnamon Ferns are growing here. Ferns are a non-seed bearing plant that reproduces by spores. Ferns, or Pterophytes, are a primitive plant that became much of the world's supply of coal 400+ million years ago. Cinnamon fern is the most common fern species in Mississippi. For more information, refer to the Pterophyta Plate.

Titi is growing here. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey, prized by honey lovers.

Red Maple [is abundant here]. It is a common bottomland species in Mississippi; the specimen here is a juvenile of

the species. It features a three-pointed leaf that turns brilliant red in the fall. Seeds are *samara*-type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Sweet Bay Magnolia is a common bottomland species in the Magnolia family. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Black Gum with a buttressed bole is observed here. Black gums are a common bottomland species that is an important food source for birds, especially migratory birds. Note the black spots in the leaves in the fall as they turn red and yellow. The heartwood is susceptible to rot and many are hollow becoming the homes for squirrels, raccoons, and bees. Settlers used a piece of hollow blackgum to make a beehive. For more information, see the Fruiting Patterns and Ecology Plate, the Anthophyta Plate, and the Fall Colors Plate.

Buttressed Bole. The swollen bases of these trees are called *buttressed boles* [bole means trunk]. Swollen trunks have the dual purpose of lowering the center of gravity of wetland trees (to be less prone to blowing over) and for exchanging gases when inundated with water [trees roots have to breathe too].

Liverwort is growing here. Liverwort are bryophytes like mosses, non-vascular plants that must live near water. Liverworts have been around, relatively unchanged, for many millions of years. They are not common. For more information, refer to the Bryophyte Plate.

in the spring. For more information, refer to the Anthophyta Plate.

Water Oak is growing here, back and behind everything. Water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Nine-Banded Armadillo signs can be observed here, i.e., the small holes dug into the sandy soil. Armadillos are mammals with a leathery “armor shell.” Armadillos dig for their food [ground insects, grubs, and worms] with their long, sharp claws which they also use to dig out their nests.

Live Oak is growing here, a relatively small one. Leaves of the live oak are evergreen, hence the name. The shape of the leaves are a distinctive oblong to elliptic, two to five inches in length. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. All oaks are important food for birds, squirrels, and deer. For more information, refer to the Anthophyta Plate, the Oak ID Plate, and the Acorns/Mast Plate.

Saw Palmetto is growing here in abundance, smaller ones all along the herb layer. Palmetto varies in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

relationship with fungi. Fungi are essentially masses of thread-like mycelia that are literally everywhere in the soil. These threads attach themselves to root hairs of the pines. Through this link, a mycorrhizae, the fungus brings water and nutrients to the pine in exchange for sugars.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Gallberry is growing here. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Wild Blueberry is growing here. Spring berries are an important food for mammals and birds. The edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of what you are eating though; holly berries may make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Sweetleaf is growing here in the subcanopy. Sweetleaf, often called *horse sugar* is a common shrub in both bottomland and upland forests in Mississippi. Evergreen leaves are leathery and oblong and have a *sweet taste* that is distinctive. A fungal infection often causes this species to produce large, fleshy-green gall-like growths on the buds

Foliose and Crustose Lichen can be observed growing on the black gum and red bay. Lichens are not one species, but two. An algae and a fungus are living in a symbiotic relationship known as *mutualism*. For more information, refer to the Lichen/Symbiosis Plate.

Wolf Spider was observed here running along the leaf litter. Wolf spiders do not weave webs, but are *hunters* preferring to stalk the leaves on the ground for prey.

3. Note. We are moving fully into the drainage branch/ephemeral stream now and can actually see the central channel, often punctuated by persistent standing pools of water.

Drainage Branch/Ephemeral Stream crosses the trail here showing sand and silt deposition, sand and silt that was eroded from the surrounding upland area. This drainage branch (actually Bayou Talla) flows only when there is abundant rainfall. Any species living in this environment must be adapted to flooding on a regular basis. Animal tracks, especially of raccoon and opossum are common on stream beds like this.

Ephemeral Pool. Note the pools in the drainage branch. These persist if the rainfall is abundant and disappear with any kind of dry spell or drought when the water table recedes. These pools are an important source of breeding ground for amphibians and drinking water for larger animals.

Amphibians use pools such as this to lay their eggs. Many types of frogs will come to an area such as this and lay eggs when water levels are high. Similarly, salamanders will also lay their eggs in the water. Amphibians are also there

to eat the invertebrate larvae that are swimming in the pool such as mayflies, dobsonflies, and caddisflies.

Leopard Frog was observed here in 2020. Leopard frogs are a common insectivorous amphibian in Mississippi that must live near water. For the leopard frog, to dry out is to die.

Crawfish was also observed here in early 2021. Crawfish are truly omnivorous crustaceans that will eat anything they can find. They will often shred parts of leaf packs and logs to get the detritus and any molds or insects that may be living there.

Black Gum is observed here with a *buttressed bole*. Black gums are a common bottomland species that is an important food source for birds, especially migratory birds. Note the black spots in the leaves in the fall as they turn red and yellow. The heartwood is susceptible to rot and many are hollow becoming the homes for squirrels, raccoons, and bees. Settlers used a piece of hollow blackgum to make a beehive. For more information, see the Fruiting Patterns and Ecology Plate, the Anthophyta Plate, and the Fall Colors Plate.

Buttressed Bole. The swollen bases of the trees in this area called *buttressed boles*; buttressed boles have the dual purpose of lowering the center of gravity of wetland trees (so they are less prone to blowing over) and for exchanging gases when inundated with water.

Moss/Bryophyte are growing here on the trunks of trees, an indicator of abundant moisture. It is the magnificent green *carpet-like* plant growing in association with algae. Mosses are a non-seed bearing plant that reproduces by spores. They *must* have standing water to reproduce. For

Erosion. Note the size of the ravine behind the classroom seats, *gully erosion*. Raging waters in the ephemeral stream have a lot of power to erode exposed soils.

Saw Palmetto is growing here. Palmetto varies in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

21. Note. As we move towards post 21, the trail takes us downslope. Though the soil is still xeric [note the washed out sand along the sides and in the trail], as we move downslope we move into a moister regime which instigates a shift in ecosystem characteristics. Look for it ...

Xeric Soils. In dry soils [xeric means dry], even pines with the aid of mycorrhizae grow slowly if at all. This site is dry because of abundant sand. Rainwater percolates downward below the reach of roots very rapidly. This is a super sandy loam that is mostly sand.

Loblolly Pine is growing here in the canopy. Note that as we move downslope, the pines are becoming larger and more robust. Note how these pines, near the ephemeral stream, are larger than we've seen in the xeric soils. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Mycorrhizae. At least part of the reason that pines out-compete hardwoods in sandy loams, is through their

Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. All oaks are important food for birds, squirrels, and deer. For more information, refer to the Anthophyta Plate, the Oak ID Plate, and the Acorns/Mast Plate.

Note. The bird nest in the live oak, possibly a cardinal?

Spiny Orb Weaver spider and his web was observed here in 2020. The spider is an *orb weaver*. The web has a central hole where the spider awaits his prey; often the web has a heavy, centrally-located zig-zag design that is supposed to strengthen the web.

Southern Red Oak is growing here. Southern Red Oak is a common upland and bottomland *red* oak species. The acorns are important as mast for deer and birds. Settlers used this tree for shade and the wood for furniture and tools. Refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Note. Deep ravine with ephemeral pools that effectively drain the land on both sides of this strip of forested land.

Ephemeral Stream. Note that this drainage branch flows only when there is abundant rainfall. The sandy and muddy bottom consists of materials washed here from the eroded upland soils. Any species living in this environment must be adapted to flooding on a regular basis. Animal tracks, especially of raccoon, opossum, and armadillo are common on stream beds like this.

Sand Deposition is apparent here; sand eroded from the upland soils is carried by surface waters until a flat area is reached that slows the water down causing it to drop its load of materials, in this case sand.

more information, refer to the Bryophyte Plate.

Algae is growing profusely on the swollen trunks here in association with moss. Algae are not plants, but protists. They are usually associated with water environments. Growing on the trunks is an indication that it is wet enough in the shade of this great canopy for these specific algae to survive *out of water*.

Sweet Bay Magnolia, a common bottomland species in the Magnolia family, is growing here in the canopy. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Red Maple shares the canopy with sweet bay magnolia, but there are not many of them. Red maple is a common bottomland species in Mississippi; the specimen here is a juvenile of the species. It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*- type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Titi is growing here. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey lovers.

Foliose and Crustose Lichen can be observed growing on the trunks of titi. Lichens are not one species, but two. An algae and a fungus are living in a symbiotic relationship known as *mutualism*. For more information, refer to the Lichen/Symbiosis Plate.

Sphagnum Moss is growing along the ground here. Sphagnum is a bryophyte like the other mosses in the forests here but is distinguished by its long fronds. Sphagnum moss has the ability to hold water making it useful in gardening. Like ferns, bryophytes are non-seed bearing plants that reproduce by spores; also, like ferns, bryophytes became much of the world's supply of coal. They *must* have standing water to reproduce. For more information, refer to the Bryophyte Plate.

Liverwort is growing here. Liverwort are bryophytes like mosses, non-vascular plants that must live near water. Liverworts have been around, relatively unchanged, for many millions of years. They are not common. For more information, refer to the Bryophyte Plate.

Tapped Tree. A slash pine was tapped here for *turpentine* and other naval stores in the distant past. It is a common pine species in south Mississippi. It is easily distinguished from others by *medium-long* needles, two to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Poison Ivy is visible on ground; note how they are growing up from the ground like a rigidly-stalked plant. This is the way poison ivy *searches* for a plant to support it. Poison ivy is a harmful species; it is distinguishable from similar species by three leaflets and a *hairy-looking stem*. Heed the old warning: "leaflets three . . . let it be!" Poison ivy, if handled, will cause a rash. Poison ivy grows along the ground in much the same way as it climbs; small rootlets are attached to the vine or *stolon* attaching it to the ground in several places where small limbs grow upward. For more information, refer to the Poison Ivy Plate and the Vine Adaptation Plate.

still dominate the canopy while yaupon and gallberry still dominate the subcanopy partly because of their waxy leaves. Sweetleaf is part of the subcanopy too.

Gallberry is growing here. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Loblolly Pine is growing here. Note how these pines, near the ephemeral stream, are larger than we've seen in the xeric soils. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Water Oak is growing here; water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Witch Hazel is growing here near the classroom. Witch hazel is a common understory shrub or small tree in bottomlands and moist uplands. Witch hazel is preferred wood the settlers used for *water divining*. An astringent made from the inner bark was used by settlers (and is still available) for its analgesic properties.

Live Oak is growing here. Leaves of the live oak are evergreen, hence the name. The shape of the leaves are a distinctive oblong to elliptic, two to five inches in length.

a common upland and bottomland *red* oak species. The acorns are important as mast for deer and birds. Settlers used this tree for shade and the wood for furniture and tools. Refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Eastern Red Cedar is growing here in the xeric soil, down the trail a bit, towards post 20. Cedars are a non-flowering tree that has a soft, aromatic wood highly resistant to insects and rot; it is commonly used to make cedar chests. Settlers used juvenile cedar trees for long-lasting fence posts. For more information, refer to the Coniferophyta Plate.

Fall Aster was observed here in the fall of 2020. A member of the aster family, fall aster has tiny flower heads (about ½ inch in diameter) with white [or violet] ray flowers and yellow disc flowers that are common in the fall. Such flowers are *composite* featuring many flowers making up the central flower core. Each flower is actually many allowing a single bee visit to pollinate many flowers instead of one. The leaves are tiny as well. For more information, refer to the Flower Parts Plate.

Cloudless Sulfur was observed here in early 2021 flitting around. A yellow butterfly, cloudless sulfur is one of the few insects that can be observed during all parts of the year, even winter.

Note the heavy mulch on the ground off the trail. Note too the relative absence of herbs. The combination of mulch, lack of moisture, and low light conditions make it nearly impossible for herbs to grow back in there.

20. Note. Here we find that the xeric conditions of the last 100 feet or so remain largely unchanged. Diminutive pines

Note. There are a lot of mosses growing on the ground and a lot of bare ground. Because of the low light conditions, grasses and herbs have a hard time growing here even if the ground becomes bare.

4. Ecotone. As we move towards post 4, note the rapid movement up-slope and the change in ecosystem. The ecosystem shifts from the dominant hardwoods to dominant pines in the canopy. As we move towards post 4, we also encounter a small area of carnivorous plants to the left of the trail, including pitcher plants and butterworts.

Yellow Pitcher Plants are growing here; look for them. Pitcher plants are carnivorous plants that commonly live in infertile areas, supplementing their nutrient intake from the soil with nutrients derived from dissolved insects that become trapped in their hooded, hollow leaf.

Butterwort is growing here. Butterwort is a carnivorous plant that uses sticky leaves to trap and digest insects in order to supplement nutrient intake in poor soil.

Hardheads are growing here. Also called pipewort or hat pins, hardheads are a monocot growing in wetland areas and bogs. Flower stalks are naked and tall crowned with a white, dense round head ... the flower.

Upland Pine Ecosystems are characterized by abundant pines in the canopy, abundant bushes/shrubs/small trees in the understory such as yaupon, and wax myrtle, and an herb layer dominated by small vines such as poison ivy, Virginia creeper, etc. Simply put, pines cannot compete with hardwoods when water is abundant, but are vigorous when it is scarce. For more information, refer to the Upland Pine Ecosystem Plate and the Community Concept in the Upland Pine Ecosystem Plate.

Sandy Loam soil type is associated with upland sites in Mississippi. Sandy loam contains sand and varying amounts of silt and clay. Water and nutrients readily move through this ecosystem and down to the ephemeral stream below. Sites like these are considered *upland pine sites* because of the plant assemblages that tend to grow there. Upland Pine Ecosystems thrive in such sandy loam out-competing hardwoods for available water. For more information, refer to the Soil Ecosystem Plate.

Mycorrhizae. At least part of the reason that pines out-compete hardwoods in sandy loams, is through their relationship with fungi. Fungi are essentially masses of thread-like mycelia that are literally everywhere in the soil. These threads attach themselves to root hairs of the pines. Through this link, a mycorrhizae, the fungus brings water and nutrients to the pine in exchange for sugars.

Loblolly Pine is growing here in abundance as the prime constituent of the canopy. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Water Oak is growing here as part of the canopy. Water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Mistletoe can be observed in the water oak. Mistletoe is a parasite whose roots invade the cambium layer of the tree to take the food that passes there. It may eventually *kill* the

what you are eating though; holly berries may make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Sweetleaf is growing here. Sweetleaf, often called *horse sugar* is a common shrub in both bottomland and upland forests in Mississippi. Evergreen leaves are leathery and oblong and have a *sweet taste* that is distinctive. A fungal infection often causes this species to produce large, fleshy-green gall-like growths on the buds in the spring. For more information, refer to the Anthophyta Plate.

Water Oak is growing here, back and behind everything. Water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Goldenrod is growing where it can get enough light. Goldenrod has yellow fall flowers and is very prolific taking over an un-maintained field nearly completely in just a couple of years. Most allergies are caused by the associated ragweed. For more information, refer to the Gall Plate and the Goldenrod Plate.

Wild Persimmon is growing here, a juvenile. Persimmon is a common bottomland tree in Mississippi that yields a small orange fruit (actually a many-seeded berry) that is food for birds and mammals. Settlers used the bark to make an astringent and the fruit to make wine. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Southern Red Oak is growing here. Southern Red Oak is

the aid of mycorrhizae grow slowly if at all. This site is dry because of abundant sand. Rainwater percolates downward below the reach of roots very rapidly. This is a super sandy loam that is mostly sand.

Loblolly Pine is growing in here. Note, when compared to other pines along the interpretive trail, these pines are unusually small. This is due to the xeric soils it's growing in. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Mycorrhizae. At least part of the reason that pines out-compete hardwoods in sandy loams, is through their relationship with fungi. Fungi are essentially masses of thread-like mycelia that are literally everywhere in the soil. These threads attach themselves to root hairs of the pines. Through this link, a mycorrhizae, the fungus brings water and nutrients to the pine in exchange for sugars.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Wild Blueberry is growing here. Spring berries are an important food for mammals and birds. The edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of

host tree. In winter it is the only green in the upper branches. For more information, refer to the Mistletoe Plate.

Live Oak is growing here. Leaves of the live oak are evergreen. The shape of the leaves are a distinctive oblong to elliptic, two to five inches in length. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. All oaks are important food for birds, squirrels, and deer. For more information, refer to the Anthophyta Plate, the Oak ID Plate, and the Acorns/Mast Plate.

Southern Red Oak is growing here. Southern Red Oak is a common upland and bottomland *red* oak species. The acorns are important as mast for deer and birds. Settlers used this tree for shade and the wood for furniture and tools. Refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Slash Pine is growing here. Slash is a common pine species in south Mississippi. It is easily distinguished from others by *medium-long* needles, two to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Sweetleaf is growing here as part of the subcanopy, along with titi and juvenile trees. Sweetleaf, often called *horse sugar* is a common shrub in both bottomland and upland forests in Mississippi. Evergreen leaves are leathery and oblong and have a *sweet taste* that is distinctive. A fungal infection often causes this species to produce large, fleshy-green gall-like growths on the buds in the spring. For more information, refer to the Anthophyta Plate.

Titi is growing here as part of the subcanopy, along with

sweetleaf and juvenile trees. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey lovers.

Note. Here there is even more litter on ground and, subsequently, not many herbs.

Gallberry is growing here. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Saw Palmetto is growing here in abundance. Palmetto varies in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

Spiny Orb Weaver spider and her web was observed here—look for them! The spider is an *orb weaver*. The web has a central hole where the spider awaits his prey; often the web has a heavy, centrally-located zig-zag design that is supposed to strengthen the web.

Pollution/Discarded Steel Chair is laying on the ground here. Such a discarded item *could be* recycled, but often isn't. Tons of easily recycled steel lies rusting away in landfills.

Note. Still going up-slope. We are approaching the field now.

leafy stem arises to support purple flowers.

Longleaf Pine is growing here down the trail to the right, by itself. It looks like a big tuft of grass. Longleaf pine has the longest leaves of all the pines (8 to 18" long) and the largest cones. Needles are three to a sheath like loblolly, but the leaves are much longer. Longleaf pine is resistant to fire and was the primary tree species of pine savannahs where fire is common. This longleaf is in the "grass stage." Note the pine needles tufted around the terminal bud. This tuft is to protect the terminal bud from a fire. Longleaf pine is so adapted to fire that many stay in the grass stage until a fire warms the plant; rapid upward growth follows to move the terminal bud high above the next fire.

19. Note. At post 19 we note the thicket of palms. All around we find the xeric conditions largely unchanged. Diminutive pines still dominate the canopy while yaupon and gallberry still dominate the subcanopy partly because of their waxy leaves. Sweetleaf is part of the subcanopy too.

Saw Palmetto is growing here in a thicket. Palmetto varies in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

Thicket Habitat. Thickets such as this palm thicket are important habitat for small mammals that *must* have a place to hide from predators. Such thickets are the home for voles, mice, and rabbits.

Xeric Soils. In dry soils [xeric means dry], even pines with

make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Gallberry is growing here along with yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Wild Blueberry is growing here. Spring berries are an important food for mammals and birds. The edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of what you are eating though; holly berries may make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Nine-Banded Armadillo signs can be observed here, i.e., the small holes dug into the sandy soil. Armadillos are mammals with a leathery “armor shell.” Armadillos dig for their food [ground insects, grubs, and worms] with their long, sharp claws which they also use to dig out their nests.

Note. At post 18 and beyond we find the xeric conditions largely unchanged. Diminutive pines still dominate the canopy while yaupon and gallberry still dominate the subcanopy partly because of their waxy leaves. Sweetleaf is part of the subcanopy too.

Deer’s Tongue is growing along the side of the trail. Deer’s tongue is an herb that features a basal rosette of leaves that grows all summer until late summer when a

Yaupon is growing here, near the edge of the forest. It is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Wild Blueberry is growing here in abundance near the edge. Spring berries are an important food for mammals and birds. The edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of what you are eating though; holly berries may make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Note. The change in ecosystem as we leave the forest for the field.

Deer Track was observed here, at the edge of the field, in early 2021. It’s not unusual for deer tracks to be found at the edge of a forest. Deer are wary creatures. They move out into the field to graze, ever-ready to dart into the safety of the forest if they feel themselves endangered.

5. Ecotone: old field and upland pine. Note the stark boundary between the old field facing post 5 [behind you] and the forest behind post 5.

Upland Pine Ecosystems are characterized by abundant pines in the canopy, abundant bushes/shrubs/small trees in the understory such as dogwood, yaupon, and wax myrtle, and an herb layer dominated by small vines such as poison ivy, Virginia creeper, etc. For more information, refer to

the Upland Pine Ecosystem Plate and the Community Concept in the Upland Pine Ecosystem Plate.

Sandy Loam soil type is associated with upland sites in Mississippi. Sandy loam contains sand and varying amounts of silt and clay. Water and nutrients readily move through this ecosystem and down to the ephemeral stream below. Sites like these are considered *upland pine sites* because of the plant assemblages that tend to grow there. Upland Pine Ecosystems thrive in such sandy loam out-competing hardwoods for available water. For more information, refer to the Soil Ecosystem Plate.

Loblolly Pine is growing here, making up the canopy. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Yaupon is growing here under the pines. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Wax Myrtle is a common understory shrub in pine forests. Early settlers used the whitish berries for candle wax making the scented *bayberry* candles. For more information, refer to the Upland Pine Ecosystem Plate and the Anthophyta Plate.

Wild Blueberry is growing here under the pines. Spring berries are an important food for mammals and birds. The

Coniferophyta Plate.

Mycorrhizae. At least part of the reason that pines out-compete hardwoods in sandy loams, is through their relationship with fungi. Fungi are essentially masses of thread-like mycelia that are literally everywhere in the soil. These threads attach themselves to root hairs of the pines. Through this link, a mycorrhizae, the fungus brings water and nutrients to the pine in exchange for sugars.

Bluestem Grass is growing here. Grasses have round, usually hollow stems that are jointed with leaves attached at the joint. The leaves are in twos and grow opposite one another all the way down the stem. Bluestem is a tufted, perennial grass that once extremely common throughout the state. It is in the *andropogon* tribe of grasses that are the most common vascular plants in the world.

Yucca is growing here. Yucca is a perennial monocot, leaves originating from a central core. Leaves are lanceolate terminated with sharp spines giving it the name *Spanish Bayonet*. In late spring a stalk rises out of the leaf bunch laden with white flowers.

Sweetleaf is growing here as part of the subcanopy in this xeric soil. Sweetleaf, often called *horse sugar* is a common shrub in both bottomland and upland forests in Mississippi. Evergreen leaves are leathery and oblong and have a *sweet taste* that is distinctive. A fungal infection often causes this species to produce large, fleshy-green gall-like growths on the buds in the spring. For more information, refer to the Anthophyta Plate.

Yaupon is growing here in the understory. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to

Smilax vine is growing here. Smilax is the genus of all greenbriers, but most people call the large varieties just smilax. It is a tough, woody vine with large spines that will cut and tear at clothing and skin. The bright green terminal bud of growing smilax is edible and steams to taste just like asparagus.

Southern Magnolia is growing here, just before the trail moves out onto the edge of the old field. Southern Magnolia is both the state tree and flower. Magnolia seeds are encased in a cone and are important food for birds, especially migratory birds. Curiously, magnolia trees are pollinated by beetles. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

18. Note. As we approach post 18, the xeric nature of the soil dictate the character of the ecosystem along the trail. Note that the pine canopy is diminutive and the understory is composed mainly of yaupon and gallberry [bushes with waxy leaves that retain water] and yucca, a *desert plant*. Other plants along the trail here can live in dry soils.

Xeric Soils. In dry soils [xeric means dry], even pines with the aid of mycorrhizae grow slowly if at all. This site is dry because of abundant sand. Rainwater percolates downward below the reach of roots very rapidly. This is a super sandy loam that is mostly sand.

Loblolly Pine is growing in here. Note, when compared to other pines along the interpretive trail, these pines are unusually small. This is due to the xeric soils it's growing in. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the

edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of what you are eating though; holly berries may make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Japanese Tallow is growing here under the pines. Tallow is an imported prolific pest that interferes with natural succession and with the growth of important food trees for birds and mammals. Tallow leaves turn brilliant red in fall. It has become an important bee food. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Red Maple is growing here, a common bottomland species in Mississippi; the specimen here is a juvenile of the species. It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*-type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Sweet Bay Magnolia is a common bottomland species in the Magnolia family. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Gallberry is growing here. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Note again, that the forest is behind the reference post and the field is in front of it. Now we turn our focus to the field.

Old Field Ecosystem. When management ends, mowed fields become old fields. Old fields do not remain fields for long, but undergo plant succession on the way to becoming forest.

Plant Succession refers to the change in plant communities through time. Succession begins in an old field when management ends. Annual grasses are invaded by perennials like goldenrod, ragweed, asters, etc. Next, bushes and trees are introduced. Over time, the old field becomes a forest.

Grass Species are growing here in the presence of abundant sunlight. Grasses are herbaceous plants growing close to the ground and requiring abundant light. They will grow wherever and whenever their seeds are exposed to sunlight, the seeds lying dormant in the soil for years before being exposed to light and sprouting. For more information, refer to the Humus/Erosion Plate, the Light Tolerance Plate, and the Soil Ecosystem Plate.

Bluestem Grass is growing here. Grasses have round, usually hollow stems that are jointed with leaves attached at the joint. The leaves are in twos and grow opposite one another all the way down the stem. Bluestem is a tufted, perennial grass that once extremely common throughout the state. It is in the *andropogon* tribe of grasses that are the most common vascular plants in the world.

Cogon Grass is growing in the field. Cogon is an invasive Asian grass that was introduced into the entire southeast. Cogon is vigorous and prolific here. As cogon move in, it

lovers.

Foliose and Crustose Lichen can be observed growing on the trunks of titi. Lichens are not one species, but two. An algae and a fungus are living in a symbiotic relationship known as *mutualism*. For more information, refer to the Lichen/Symbiosis Plate.

Funnel Web Weaving Spiders were observed here on the base of the fallen tree. Funnel web weavers begin their webs with horizontal sheet webs of nonadhesive silk. A funnel of woven silk extends off to one side of this web to conceal the spider. A barrier web is then constructed over the top of the sheet and funnel. When an insect flies into the barrier web, it invariably falls to the sheet below where the very speedy spider runs out; captures it; and drags it into the funnel to eat.

Yaupon is growing here in the understory. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Gallberry is growing here. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Note. The absence of herbs along this stretch of trail, due to the low light conditions and the abundance of leaf litter on the ground.

a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*-type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Sweet Bay Magnolia, a common bottomland species in the Magnolia family, is growing here in the subcanopy. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Wax Myrtle is growing here in the understory, a common understory shrub in pine forests. Early settlers used the whitish berries for candle wax making the scented *bayberry* candles. For more information, refer to the Upland Pine Ecosystem Plate and the Anthophyta Plate.

Moss/Bryophyte is growing on the trunk of bushes here, an indicator of abundant moisture. It is the magnificent green *carpet-like* plant growing in association with algae. Mosses are a non-seed bearing plant that reproduces by spores. They *must* have standing water to reproduce. For more information, refer to the Bryophyte Plate.

Algae is growing profusely on the trunk of bushes here in association with moss. Algae are not plants, but protists. They are usually associated with water environments. Growing on the trunks is an indication that it is wet enough in the shade of this great canopy for these specific algae to survive *out of water*.

Titi is growing here in the understory of the forest. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey

takes over, choking out native grasses that cannot compete.

Turkey Vultures, were observed circling over the field in 2020. Vultures are birds of prey that feed on carrion [dead animals]. Turkey vultures use their sense of smell to find carrion.

Helianthus was observed growing here in the fall of 2020. Helianthus is a wild sunflower; its flowers are yellow, *composite* flowers. For more information, refer to the Flower Parts Plate.

Comfort Root is growing here, readily visible and abundant in late summer. An hibiscus with large, white to cream flowers bearing red centers, comfort root makes flowers all summer. Common to all coastal Mississippi counties, it commonly grows in thickets. The leaves have the habit of sticking to clothing, especially socks and jeans.

Boneset is growing here. It is an aster with small, white flowers in clusters. The plant can get quite large (to five feet or more) and grows abundantly in wet meadows and pond edges. The leaves are distinctive in that the leaves are opposite, each set at right angles to the set above and below. Boneset is in the aster family; its flowers are composite with ray and disc flowers. For more information, refer to the Flower Parts Plate.

A **Gulf Fritillary** butterfly was observed here in the fall of 2020. A common fall butterfly in coastal Mississippi, the gulf fritillary is an important pollinator. Passion flower is its host plant.

6. Upland Pine Forest. Now we are actually moving into the pine forest. The canopy is made up mostly of pines, while the subcanopy is mostly made up of water oaks and live oaks [that may one day take over the canopy]. Below that are bushes, well-stratified: yaupon, wax myrtle, juvenile black gum, red maple, sweetleaf, water oak, dwarf sumac, and gallberry. Grasses and various asters are growing along the ground where they can get enough light and are not mulched out.

Loblolly Pine is growing here. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and

Plate.

Greenbrier is growing here all over some of the titi. Greenbrier is a very persistent evergreen vine. It exhibits the *whorled* method of climbing; a modified leaf wraps around the object being climbed. Thorny stems control herbivore grazing. For more information see the Vine Adaptation Plate.

Japanese Climbing Fern is growing here on titi and on a pine too. It is the only climbing fern found in Mississippi. Japanese Climbing Fern is an imported fern that has been completely naturalized into southern forests. Single leaves extend from the underground rhizome with leaflets branching off the petiole; they may reach lengths of three meters making them the longest leaves of any plant in North America. For more information, refer to the Pterophyta Plate.

Saint John's Wort is growing at the edge of the forest [note that the word "wort" means "plant" in Old English, especially as it refers to herbs]. St. John's Wort is a common herb along ditches, ponds, and old fields. It's summer, yellow flowers are distinctive. Native Americans used the herb for medicinal purposes and has recently been proven to be an effective remedy for depression.

Loblolly Pine is growing in the canopy, towering above everything else. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Red Maple is growing here in the subcanopy. Red maple is a common bottomland species in Mississippi. It features

information, refer to the Flower Parts Plate.

Yellow rhexia is growing here in the old field. Rhexia is an herb with fall, yellow flowers. It is widely distributed all over the coast but not far inland. It is easily identified by the four petals. For more information, refer to the Flower Parts Plate.

Fall Aster was observed here in the fall of 2020. A member of the aster family, fall aster has tiny flower heads (about ½ inch in diameter) with white [or violet] ray flowers and yellow disc flowers that are common in the fall. Such flowers are *composite* featuring many flowers making up the central flower core. Each flower is actually many allowing a single bee visit to pollinate many flowers instead of one. The leaves are tiny as well. For more information, refer to the Flower Parts Plate.

Comfort Root is growing here. Comfort root is an hibiscus with large, white to cream flowers bearing red centers that flower all summer. The leaves have the habit of sticking to clothing and a casual walk through such a thicket results in many of these leaves having to be picked off.

Post 17. Note. Moving downslope into the drainage branch. Note that cogon only grows up to the edge of the forest. It is very sensitive to light and stops spreading as soon as there is less light.

Blackberry is growing along the ground here at the edge of the forest-field ecotone. Blackberries are an important food for mammals; thickets of blackberries create an ideal habitat for small mammals such as rabbits, mice, voles, and the reptiles that hunt them. Thorns on the stems is a mechanism to control herbivore grazing. For more information, refer to the Fruiting Patterns and Ecology

its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Water Oak is growing here; water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Oak Galls were observed on the leaves of a water oak here; look for them. Leaf galls on oaks resemble small round muscadine berries attached to the leaf. Galls are a reaction of the plant to an intrusion by an outsider, most notably an insect (wasps particularly lay their eggs in plants to provide food for the larvae) or a fungi. For more information refer to the Gall Plate.

Live Oak is growing here. Leaves of the live oak are evergreen, hence the name. The shape of the leaves are a distinctive oblong to elliptic, two to five inches in length. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. All oaks are important food for birds, squirrels, and deer. For more information, refer to the Anthophyta Plate, the Oak ID Plate, and the Acorns/Mast Plate.

Golden Silk Spider was observed here. Its huge, orb web stretched completely across the trail; the spider was also huge. In the daytime, the spider hangs upside down near the center; at night flying insects are caught in the web.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black*

drink as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Wax Myrtle is a common understory shrub in pine forests. Early settlers used the whitish berries for candle wax making the scented *bayberry* candles. For more information, refer to the Upland Pine Ecosystem Plate and the Anthophyta Plate.

Black Gum juveniles are growing here. Black gums are a common bottomland species that is an important food source for birds, especially migratory birds. Note the black spots in the leaves in the fall as they turn red and yellow. The heartwood is susceptible to rot and many are hollow becoming the homes for squirrels, raccoons, and bees. Settlers used a piece of hollow blackgum to make a beehive. For more information, see the Fruiting Patterns and Ecology Plate, the Anthophyta Plate, and the Fall Colors Plate.

Red Maple is a common bottomland species in Mississippi; the specimen here is a juvenile of the species. It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*- type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Sweetleaf is growing here. Sweetleaf, often called *horse sugar* is a common shrub in both bottomland and upland forests in Mississippi. Evergreen leaves are leathery and oblong and have a *sweet taste* that is distinctive. A fungal infection often causes this species to produce large, fleshy-green gall-like growths on the buds in the spring. For more information, refer to the Anthophyta Plate.

and gravity.

Cogon Grass is growing in the field. Cogon is an invasive Asian grass that was introduced into the entire southeast. Cogon is vigorous and prolific here. As cogon move in, it takes over, choking out native grasses that cannot compete.

Dollar Weed is growing here. Dollar weed is actually an *aquatic plant* that grows readily in sandy and wet sites [like this one]. It is considered a noxious weed because it is so prolific.

Bluestem Grass is growing here. Grasses have round, usually hollow stems that are jointed with leaves attached at the joint. The leaves are in twos and grow opposite one another all the way down the stem. Bluestem is a tufted, perennial grass that once extremely common throughout the state. It is in the *andropogon tribe* of grasses that are the most common vascular plants in the world.

Panic Grass is growing here. Panic grass, a native grass, is so-called because of its flowers, a well-developed *panicle* that is eventually covered with numerous seeds.

Helianthus was observed growing here in the fall of 2020. Helianthus is a wild sunflower; its flowers are yellow, *composite* flowers. For more information, refer to the Flower Parts Plate.

Boneset is growing here. It is an aster with small, white flowers in clusters. The plant can get quite large (to five feet or more) and grows abundantly in wet meadows and pond edges. The leaves are distinctive in that the leaves are opposite, each set at right angles to the set above and below. Boneset is in the aster family; its flowers are composite with ray and disc flowers. For more

Old Field Ecosystem. When management ends, mowed fields become old fields. Old fields do not remain fields for long, but undergo plant succession on the way to becoming forest.

Plant Succession refers to the change in plant communities through time. Succession begins in an old field when management ends. Annual grasses are invaded by perennials like goldenrod, ragweed, asters, etc. Next, bushes and trees are introduced. Over time, the old field becomes a forest.

Note the succession currently occurring in the old field. Juvenile pines are scattered about along with juvenile gallberry and titi.

Grass Species are growing here in the presence of abundant sunlight. Grasses are herbaceous plants growing close to the ground and requiring abundant light. They will grow wherever and whenever their seeds are exposed to sunlight, the seeds lying dormant in the soil for years before being exposed to light and sprouting. For more information, refer to the Humus/Erosion Plate, the Light Tolerance Plate, and the Soil Ecosystem Plate.

Goldenrod is growing here. Goldenrod has yellow fall flowers and is very prolific taking over an un-maintained field nearly completely in just a couple of years. Most allergies are caused by the associated ragweed. For more information, refer to the Gall Plate and the Goldenrod Plate.

Ragweed is growing among the goldenrods. Ragweed is a common pioneer annual found in old fields and along ditches. It is a notorious *allergy instigator*, not goldenrod. Ragweed has green inconspicuous flowers that are not visited by insects; pollination is accomplished through wind

Dwarf Sumac, or *winged sumac*, is growing here. It is so named because of the leaves that grow *on the stem* of the plant, a distinguishing characteristic. Dwarf sumac has red berries that are a food source for birds; settlers and native Americans used these berries to make a refreshing drink. For more information, refer to the Fruiting Patterns and Ecology Plate.

Gallberry is growing here. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Bluestem Grass is growing here. Grasses have round, usually hollow stems that are jointed with leaves attached at the joint. The leaves are in twos and grow opposite one another all the way down the stem. Bluestem is a tufted, perennial grass that once extremely common throughout the state. It is in the *andropogon tribe* of grasses that are the most common vascular plants in the world.

Panic Grass is growing here. Panic grass, a native grass, is so-called because of its flowers, a well-developed *panicle* that is eventually covered with numerous seeds.

Going down the trail ... yaupon, wild blueberries, greenbrier vines, and saw palmetto can be observed.

Muscadine is growing here, covering bushes. Muscadines are an important food for birds and mammals. Settlers used them for food, jellies, and wines; the vines were made into baskets. Muscadine exhibits the *whorled* technique of vine climbing. For more information, refer to the Fruiting Patterns and Ecology Plate and the Vine Adaptations Plate.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Snag, or standing dead trees, are critical for wood-pecker habitat as woodpeckers generally make no nests in live trees. Note the pine snag here.

Wild Blueberry is growing here. Spring berries are an important food for mammals and birds. The edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of what you are eating though; holly berries may make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Bowl and Doily Spider was observed here. Bowl and Doily spiders are tiny spiders that make their webs in the shape of a bowl (or a dome) with an irregular net web over the bowl. Spiders in the genus *Lyniphia* exhibit this behavior. They also rely on speed to catch any prey that lands in their webs.

Greenbrier is growing here—watch out for the thorns! Greenbrier is a very persistent evergreen vine. It exhibits the *whorled* method of climbing; a modified leaf wraps around the object being climbed. Thorny stems control herbivore grazing. For more information see the Vine Adaptation Plate.

Titi is growing here in the understory of the forest. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey lovers.

Greenbrier is growing here all over some of the titi. Greenbrier is a very persistent evergreen vine. It exhibits the *whorled* method of climbing; a modified leaf wraps around the object being climbed. Thorny stems control herbivore grazing. For more information see the Vine Adaptation Plate.

Wax Myrtle is growing here, a common understory shrub in pine forests. Early settlers used the whitish berries for candle wax making the scented *bayberry* candles. For more information, refer to the Upland Pine Ecosystem Plate and the Anthophyta Plate.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Japanese Tallow is growing here. Tallow is an imported prolific pest that interferes with natural succession and with the growth of important food trees for birds and mammals. Tallow leaves turn brilliant red in fall. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Note. In the old field now ...

make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Wax Myrtle is growing here in the xeric soil. Wax myrtle is a common understory shrub in pine forests. Early settlers used the whitish berries for candle wax making the scented *bayberry* candles. For more information, refer to the Upland Pine Ecosystem Plate and the Anthophyta Plate.

Eastern Red Cedar is growing here in the xeric soil. Cedars are a non-flowering tree that has a soft, aromatic wood highly resistant to insects and rot; it is commonly used to make cedar chests. Settlers used juvenile cedar trees for long-lasting fence posts. For more information, refer to the Coniferophyta Plate.

Post 16. Ecotone. The old field is in front of the post, the forest ecosystem is behind it. Note abundant light and herbs in the old field. Note, low light conditions and abundant litter in the forest ecosystem.

Loblolly Pine is growing here behind the post, high above it all in the canopy. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Groundsel tree is growing here in the understory along the edge of the forest. Groundsel tree is common along ditches and forest edges. In the fall, winter, white flowers cover the entire bush in white and is very distinctive.

Saw Palmetto is growing here, ahead and to the left. Palmetto varies in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

Nine-Banded Armadillo signs can be observed here, i.e., the small holes dug into the sandy soil. Armadillos are mammals with a leathery “armor shell.” Armadillos dig for their food [ground insects, grubs, and worms] with their long, sharp claws which they also use to dig out their nests.

7. Note. As we turn left to continue along the trail, we are heading downslope again. Observe the ecosystem as it changes.

Harvestman was observed here in the fall of 2020. Most people call these daddy-long-legs, but are called harvestmen because of their increased numbers in the fall around the time of harvest. They are arachnids like spiders, but are not spiders. They feed on decaying vegetation and are preyed upon by centipedes and other predators of the forest floor.

Southern Red Oak is growing here, a big one. Southern Red Oak is a common upland and bottomland *red* oak species. The acorns are important as mast for deer and birds. Settlers used this tree for shade and the wood for furniture and tools. Refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Moss/Bryophyte is growing on the trunk of the red oak, an indicator of abundant moisture. It is the magnificent green *carpet-like* plant growing in association with algae. Mosses

are a non-seed bearing plant that reproduces by spores. They *must* have standing water to reproduce. For more information, refer to the Bryophyte Plate.

Algae is growing profusely on the trunk of the red oak in association with moss. Algae are not plants, but protists. They are usually associated with water environments. Growing on the trunks is an indication that it is wet enough in the shade of this great canopy for these specific algae to survive *out of water*.

Resurrection Fern is growing on the trunk of the red oak. This fern is an epiphyte, which means it grows on another plant. It is called resurrection fern because, during dry times it loses most of its water turning a shriveled brown. When it rains again, the plant “comes back to life,” turning green again.

Black Gum is growing here, a big one! Black gums are a common bottomland species that is an important food source for birds, especially migratory birds. Note the black spots in the leaves in the fall as they turn red and yellow. The heartwood is susceptible to rot and many are hollow becoming the homes for squirrels, raccoons, and bees. Settlers used a piece of hollow blackgum to make a beehive. For more information, see the Fruiting Patterns and Ecology Plate, the Anthophyta Plate, and the Fall Colors Plate.

Water Oak is growing abundantly here; water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

It is a common bottomland species in Mississippi. Red maple features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*-type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Water Oak is growing here behind the thicket in the understory. Water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Dog Fennel can be observed here in abundant sunlight. Dog fennel is the long-stalked, fibrous perennial plant growing behind the brush pile. Dog fennel is commonly seen at the edges of fields and ditches; fall flowers are so tiny, they can hardly be seen.

Note. On the right hand side of the road at the old field corner, a cluster of pines with close-spacing can be observed. Below the juvenile pines are yaupon, wax myrtle, and a cedar tree. The size of the trees and its associates is indicative of a dry site.

Xeric Soils. In dry soils [xeric means dry], even pines with the aid of mycorrhizae grow slowly if at all. This site is dry because of abundant sand. Rainwater percolates downward below the reach of roots very rapidly. This is a super sandy loam that is mostly sand.

Yaupon is growing here in the xeric soil. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to

Wax Myrtle is growing low here with yaupon in the understory below the pine canopy. It is a common understory shrub in pine forests. Early settlers used the whitish berries for candle wax making the scented *bayberry* candles. For more information, refer to the Upland Pine Ecosystem Plate and the Anthophyta Plate.

Yaupon is growing here, fairly low along the ground along with wax myrtle. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Erosion is prevalent here in the road as it slopes. Water running down the uncovered land creates *gully erosion* as it races down the road towards the ephemeral stream. It is important to note that there is less erosion where groundcover protects the sides of the roads. For more information, refer to the Soil/Organic Matter Plate.

Greenbrier is growing here—watch out for the thorns! Greenbrier is a very persistent evergreen vine. It exhibits the *whorled* method of climbing; a modified leaf wraps around the object being climbed. Thorny stems control herbivore grazing. For more information see the Vine Adaptation Plate.

Thicket Habitat. Thickets such as this greenbrier thicket to the right are important habitat for small mammals that *must* have a place to hide from predators. Such thickets are the home for voles, mice, and rabbits.

Red Maple is growing behind the thicket in the understory.

Tree Huckleberry is growing in this area. Tree huckleberry is similar to blueberries with the exception of it being more tree-like than shrub-like. Huckleberries will get rather large exceeding ten feet in height. Like blueberries, spring berries are an important food for mammals and birds. The edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of what you are eating though; holly berries will make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Redbay is growing here, on the left. It is a small tree abundant along swamp edges and in pine barrens. Leaves are dark green; flowers are so small as to be rarely observed; fruit is a dark, blue drupe. For more information, refer to the Anthophyta Plate.

Chinquapin is growing here, on the left. It is a small, bushy tree with chestnut-like nuts that are an important food for squirrels, birds, and deer. The spring flowers are a distinctive bottle-brush shape with strong, sweet smell; larger ones may have flowers enough for it to be actually *smelled* before it is *seen*. For more information, refer to the Anthophyta Plate.

Note. Pines still rule the canopy, but less so ...

Muscadine is growing here. Muscadines are an important food for birds and mammals. Settlers used them for food, jellies, and wines; the vines were made into baskets. Muscadine exhibits the *whorled* technique of vine climbing. For more information, refer to the Fruiting Patterns and Ecology Plate and the Vine Adaptations Plate.

Dwarf Sumac, or *winged sumac*, is growing here. It is so named because of the leaves that grow *on the stem* of the plant, a distinguishing characteristic. Dwarf sumac has red berries that are a food source for birds; settlers and native Americans used these berries to make a refreshing drink. For more information, refer to the Fruiting Patterns and Ecology Plate.

Red Maple is a common bottomland species in Mississippi; the specimen here is a juvenile of the species. It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*- type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Tree Huckleberry is growing in this area. Tree huckleberry is similar to blueberries with the exception of it being more tree-like than shrub-like. Huckleberries will get rather large exceeding ten feet in height. Like blueberries, spring berries are an important food for mammals and birds. The edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of what you are eating though; holly berries will make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Tallow is an imported prolific pest that interferes with natural succession and with the growth of important food trees for birds and mammals. Tallow leaves turn brilliant red in fall. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Dog Fennel can be observed here. Dog fennel is the long-stalked, fibrous perennial plant growing behind the brush pile. Dog fennel is commonly seen at the edges of fields and ditches; fall flowers are so tiny, they can hardly be seen.

Swamp Privet is growing here. Privet is an introduced/non-native species and has become a pest growing where yaupon, wax myrtle, and dogwood normally proliferate in a pine forest. These three species are important as food for birds and mammals. For more information, refer to the Fruiting Patterns Plate.

Post 15. Note. As we move along the road to the edge of the field, notice how herbs become prominent once again.

Loblolly Pine is growing here high above it all in the canopy. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Cogon Grass is growing on the ground in the field and along the edge where it can get enough light. Cogon is an invasive Asian grass that was introduced into the entire southeast. Cogon is vigorous and prolific here. As cogon move in, it takes over, choking out native grasses that cannot compete.

right hand side of the road. This pool holds water because an impervious clay underlies its bottom. Inside the pool is very soft mud/muck filled with composting leaves and detritus that has fallen in. The pool is considered ephemeral; during drought the pool will dry out as the water table recedes. These pools are an important source of breeding ground for amphibians and drinking water for larger animals. For more information, refer to the Groundwater, Wetlands, and Springs Plate.

Amphibians use pools such as this to lay their eggs. Many types of frogs will come to an area such as this and lay eggs when water levels are high. Similarly, salamanders will also lay their eggs in the water. Amphibians are also there to eat the invertebrate larvae that are swimming in the pool such as mayflies, dobsonflies, and caddisflies.

Down the trail ...

Smilax vine is growing here down the trail. Smilax is the genus of all greenbriers, but most people call the large varieties just smilax. It is a tough, woody vine with large spines that will cut and tear at clothing and skin. The bright green terminal bud of growing smilax is edible and steams to taste just like asparagus.

Black Cherry is growing here; it is laying over on the left hand side of the road, just off the road. Black cherry is easily identified by its characteristic bark and leaves; it is an important food for forest mammals and birds. The bitter fruit was used by early settlers for making juices and wine and as a curative for colds, fevers, and coughs. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Japanese Tallow is growing here on the right of the trail.

Saw Palmetto is growing here, down the trail. Palmetto varies in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

8. Note that we are continuing to move downslope and into a darker regime. Pines are still dominant, but there's a thick subcanopy now and notice the prevalence of sweetleaf in the understory that creates a thick blanket of leaf litter and darkness on the ground, both of which inhibit the herb layer.

Sweetleaf is growing here, forming a classic sweetleaf grove. Sweetleaf, often called *horse sugar* is a common shrub in both bottomland and upland forests in Mississippi. Evergreen leaves are leathery and oblong and have a *sweet taste* that is distinctive. A fungal infection often causes this species to produce large, fleshy-green gall-like growths on the buds in the spring. For more information, refer to the Anthophyta Plate.

Loblolly Pine is growing here. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Live Oak is growing here. Leaves of the live oak are evergreen, hence the name. The shape of the leaves are a distinctive oblong to elliptic, two to five inches in length. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves.

All oaks are important food for birds, squirrels, and deer. For more information, refer to the Anthophyta Plate, the Oak ID Plate, and the Acorns/Mast Plate.

Southern Magnolia can be observed here. Southern Magnolia is both the state tree and flower. Magnolia seeds are encased in a cone and are important food for birds, especially migratory birds. Curiously, magnolia trees are pollinated by beetles. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Red Maple is a common bottomland species in Mississippi; the specimen here is a juvenile of the species. It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*- type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Redbay is growing here. It is a small tree abundant along swamp edges and in pine barrens. Leaves are dark green; flowers are so small as to be rarely observed; fruit is a dark, blue drupe. For more information, refer to the Anthophyta Plate.

Muscadine is growing here; note it's clinging to the gallberry. Muscadines are an important food for birds and mammals. Settlers used them for food, jellies, and wines; the vines were made into baskets. Muscadine exhibits the *whorled* technique of vine climbing. For more information, refer to the Fruiting Patterns and Ecology Plate and the Vine Adaptations Plate.

Gallberry is growing here. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms

Titi is growing here, especially on the right side of the trail. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey lovers.

Black Gum is growing here below the pines and magnolias. Black gums are a common bottomland species that is an important food source for birds, especially migratory birds. Note the black spots in the leaves in the fall as they turn red and yellow. The heartwood is susceptible to rot and many are hollow becoming the homes for squirrels, raccoons, and bees. Settlers used a piece of hollow blackgum to make a beehive. For more information, see the Fruiting Patterns and Ecology Plate, the Anthophyta Plate, and the Fall Colors Plate.

Wild Persimmon is growing here on the right. Persimmon is a common bottomland tree in Mississippi that yields a small orange fruit (actually a many-seeded berry) that is food for birds and mammals. Settlers used the bark to make an astringent and the fruit to make wine. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Brushy Bluestem Grass is growing here along the ditch edge. Grasses have round, usually hollow stems that are jointed with leaves attached at the joint. The leaves are in twos and grow opposite one another all the way down the stem. Bluestem is a tufted, perennial grass that once extremely common throughout the state. It is in the *andropogon* tribe of grasses that are the most common vascular plants in the world.

Ephemeral Pool. Note the pool in drainage branch on the

Gallberry is growing here. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Japanese Tallow is growing here. Tallow is an imported prolific pest that interferes with natural succession and with the growth of important food trees for birds and mammals. Tallow leaves turn brilliant red in fall. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Note. There are lots of pine trees growing here, close together; and they are not very big. Note too the near absence of a subcanopy.

Post 14. Note. As we move down the road, the pines become larger, towering above everything, as we approach the branch and more water. Sweet Bay helps form the canopy here with a blackgum subcanopy. Note also, the abundance of leaf litter and the dwindling number of herbs.

Loblolly Pine is growing here in the canopy. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Sweet Bay Magnolia, a common bottomland species in the Magnolia family, shares the canopy with the pines. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

thickets. Gallberry is considered a good honey plant.

Saw Palmetto is growing here, down and to the left. Palmetto varies in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

Note. As we move down the trail, we are continuing down slope as we transition between a pine forest and a hardwood forest.

9. Ecotone. As we move into the ephemeral stream branch, we move into the literal break between the upland pine forest and the bottomland hardwoods. Not how the once dominant pines are giving way to hardwoods because they cannot compete.

Ephemeral Stream. Note that this drainage branch flows only when there is abundant rainfall. The sandy and muddy bottom consists of materials washed here from the eroded upland soils. Any species living in this environment must be adapted to flooding on a regular basis. Animal tracks, especially of raccoon, opossum, and armadillo are common on stream beds like this.

Sand Deposition is apparent here; sand eroded from the upland soils is carried by surface waters until a flat area is reached that slows the water down causing it to drop its load of materials, in this case sand.

Loblolly Pine is growing here in abundance. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to

a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Yellow Poplar or Tuliptree is growing here. Poplars are one of the largest growing trees in the southeast often attaining diameters of eight feet and heights of two hundred feet. Poplars are a very common bottomland tree often making canopies of nearly pure stands. The leaves resemble tulips, hence the name. The flowers are visited by bees and butterflies, especially tiger swallowtails. Tuliptree is a much used wood today; natives used it for dugout canoes. For more information, refer to the Anthophyta Plate.

Red Maple is a common bottomland species in Mississippi; the specimen here is a juvenile of the species. It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*- type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Poison Ivy is growing here on the red maple near the post. Note how they are growing up from the ground like a rigidly-stalked plant. This is the way poison ivy *searches* for a plant to support it. Poison ivy is a harmful species; it is distinguishable from similar species by three leaflets and a *hairy-looking stem*. Heed the old warning: “leaflets three . . . let it be!” Poison ivy, if handled, will cause a rash. Poison ivy grows along the ground in much the same way as it climbs; small rootlets are attached to the vine or *stolon* attaching it to the ground in several places where small limbs grow upward. For more information, refer to the Poison Ivy Plate and the Vine Adaptation Plate.

Slash Pine is growing here, a large one about 20 or so feet behind the post. Slash pines more readily grow in wet areas than loblollies; indeed, most of the pines in the branch are

Stokes Aster. was growing here in the fall of 2020. In the same family as sunflower, the aster family, stokes aster can be purple, white, or blue. The example here was purple.

Greenbrier is growing here—watch out for the thorns! Greenbrier is a very persistent evergreen vine. It exhibits the *whorled* method of climbing; a modified leaf wraps around the object being climbed. Thorny stems control herbivore grazing. For more information see the Vine Adaptation Plate.

Switch Cane is growing here, which is usually indicative of a wet area; here it is indicative of water seepage from up-slope. Switch cane commonly forms canebrakes: areas dominated by cane in understory. In canebrakes, the herb layer is mostly absent due to heavy mulch and darkness. Cane is an annual dicot growing to full height every year and dies to the ground in winter like a grass.

Muscadine is growing here. It’s the vine covering bushes on the other side of the road. Muscadines are an important food for birds and mammals. Settlers used them for food, jellies, and wines; the vines were made into baskets. Muscadine exhibits the *whorled* technique of vine climbing. For more information, refer to the Fruiting Patterns and Ecology Plate and the Vine Adaptations Plate.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Bracken Fern was growing here in the fall of 2020. One of the most abundant vascular plants in the world, it is an abundant fern in pine uplands and associated wetlands and bottomland hardwoods ecosystems. Ferns are a non-seed bearing plant that reproduces by spores. Ferns, or Pterophytes, are a primitive plant that became much of the world's supply of coal 400+ million years ago. This particular variety is distinguished by its alternate pinnae (fern *leaf*). For more information, refer to the Pterophyta Plate.

Cinnamon Ferns are growing here. Ferns are a non-seed bearing plant that reproduces by spores. Ferns, or Pterophytes, are a primitive plant that became much of the world's supply of coal 400+ million years ago. Cinnamon fern is the most common fern species in Mississippi. For more information, refer to the Pterophyta Plate.

Comfort Root is growing here. Comfort root is an hibiscus with large, white to cream flowers bearing red centers that flower all summer. It is common to all coastal Mississippi counties and commonly grows in thickets. The leaves have the habit of sticking to clothing and a casual walk through such a thicket results in many of these leaves having to be picked off.

Mistflower was growing here in the fall of 2020, growing along the side of the ditch. Mistflower is an aster with fall purple flowers that look fuzzy. Often grows in association with helianthus.

Helianthus was observed growing here in the fall of 2020. Helianthus is a wild sunflower; its flowers are yellow, *composite* flowers. For more information, refer to the Flower Parts Plate.

slash. Slash pine is easily distinguished from others by *medium-long* needles, two to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Net-veined Chain Fern are a fern species. Ferns are a non-seed bearing plant that reproduces by spores. Ferns, or Pterophytes, are a primitive plant that became much of the world's supply of coal 400+ million years ago. This particular variety is distinguished by its alternate pinnae (fern *leaf*). For more information, refer to the Pterophyta Plate.

Cinnamon Ferns are a fern species. Ferns are a non-seed bearing plant that reproduces by spores. Ferns, or Pterophytes, are a primitive plant that became much of the world's supply of coal 400+ million years ago. Cinnamon fern is the most common fern species in Mississippi. For more information, refer to the Pterophyta Plate.

Redbay is growing here. It is a small tree abundant along swamp edges and in pine barrens. Leaves are dark green; flowers are so small as to be rarely observed; fruit is a dark, blue drupe. For more information, refer to the Anthophyta Plate.

Black Gum is observed here, growing in the "branch." Black gums are a common bottomland species that is an important food source for birds, especially migratory birds. Note the black spots in the leaves in the fall as they turn red and yellow. The heartwood is susceptible to rot and many are hollow becoming the homes for squirrels, raccoons, and bees. Settlers used a piece of hollow blackgum to make a beehive. For more information, see the Fruiting Patterns and Ecology Plate, the Anthophyta Plate, and the Fall Colors Plate.

Sweet Bay Magnolia, a common bottomland species in the Magnolia family, is growing here with a buttressed bole. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Buttressed Bole. The swollen bases of the trees in this area called *buttressed boles*; buttressed boles have the dual purpose of lowering the center of gravity of wetland trees (so they are less prone to blowing over) and for exchanging gases when inundated with water.

Japanese Climbing Fern is growing here. It is the only climbing fern found in Mississippi. Japanese Climbing Fern is an imported fern that has been completely naturalized into southern forests. Single leaves extend from the underground rhizome with leaflets branching off the petiole; they may reach lengths of three meters making them the longest leaves of any plant in North America. For more information, refer to the Pterophyta Plate.

Note. The abundance of bare ground—and yet no herbs are growing due to the absence of light.

Royal Fern is growing here near but before the number 10 post. Royal fern is easily distinguishable by its two *pinnae* (fern leaf) that are widely separated. Ferns are a non-seed bearing plant that reproduces by spores. Ferns, or Pterophytes, are a primitive plant that became much of the world's supply of coal 400+ million years ago. For more information, refer to the Pterophyta Plate.

Rotting Log/Nutrient Cycle. Note that trees take up

deer. For more information, refer to the Anthophyta Plate, the Oak ID Plate, and the Acorns/Mast Plate..

Redbay is growing here. It is a small tree abundant along swamp edges and in pine barrens. Leaves are dark green; flowers are so small as to be rarely observed; fruit is a dark, blue drupe. For more information, refer to the Anthophyta Plate.

Muscadine is growing here. Muscadines are an important food for birds and mammals. Settlers used them for food, jellies, and wines; the vines were made into baskets. Muscadine exhibits the *whorled* technique of vine climbing. For more information, refer to the Fruiting Patterns and Ecology Plate and the Vine Adaptations Plate.

Post 13. Ecotone. Note how we are now moving out of the woods and onto a service road with ditches. The ditches accumulate water and, in the higher light regime along the road, give rise to more abundant and more diverse plants.

Goldenrod is growing here. In fall of 2020, the goldenrod here was flowering and covered with bees. Goldenrod has yellow fall flowers and is very prolific taking over an unmaintained field nearly completely in just a couple of years. Most allergies are caused by the associated ragweed. For more information, refer to the Gall Plate and the Goldenrod Plate.

Ragweed is growing among the goldenrods. Ragweed is a common pioneer annual found in old fields and along ditches. It is a notorious *allergy instigator*, not goldenrod. Ragweed has green inconspicuous flowers that are not visited by insects; pollination is accomplished through wind and gravity.

Wolf Spider was observed here running along the leaf litter. Wolf spiders do not weave webs, but are *hunters* preferring to stalk the leaves on the ground for prey.

Note. Ecotone. To the left of the trail is the branch and the bottomland hardwoods. To the right is up-slope and upland pines.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Tree Huckleberry is growing in this area. Tree huckleberry is similar to blueberries with the exception of it being more tree-like than shrub-like. Huckleberries will get rather large exceeding ten feet in height. Like blueberries, spring berries are an important food for mammals and birds. The edible berries are easily distinguishable from berries in the holly family (the latter are *not* good to eat) by the presence of a *star* on the end of the berry; holly berries have a dot. Be sure of what you are eating though; holly berries will make you sick. For more information, refer to the Fruiting Adaptations and Ecology Plate.

Live Oak is growing here, a juvenile. Leaves of the live oak are evergreen, hence the name. The shape of the leaves are a distinctive oblong to elliptic, two to five inches in length. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. All oaks are important food for birds, squirrels, and

nutrients from the ground for growth and, upon death, decay with the aid of saprophytes such as fungi and bacteria returns these nutrients to the ground for plant re-growth; this is recycling, nature's style. For more information, refer to the Soil Ecosystem Plate and the Nutrient Cycling Plate.

Rabbit Scat was observed here. Small, brownish pellets were left by a rabbit, usually on a log, stump, or other elevated spot. Rabbit scat is a common sight in areas frequented by rabbits; without actually seeing a rabbit, we can determine that one lives here.

10. Note. We are moving out of the branch now, moving upland into an ecosystem with more light and more abundant herbs. Note too that with the abundance of bushes and plants, visibility becomes hindered.

Upland Pine Ecosystems are characterized by abundant pines in the canopy, abundant bushes/shrubs/small trees in the understory such as yaupon, and wax myrtle, and an herb layer dominated by small vines such as poison ivy, Virginia creeper, etc. Simply put, pines cannot compete with hardwoods when water is abundant, but are vigorous when it is scarce. For more information, refer to the Upland Pine Ecosystem Plate and the Community Concept in the Upland Pine Ecosystem Plate.

Sandy Loam soil type is associated with upland sites in Mississippi. Sandy loam contains sand and varying amounts of silt and clay. Water and nutrients readily move through this ecosystem and down to the ephemeral stream below. Sites like these are considered *upland pine sites* because of the plant assemblages that tend to grow there. Upland Pine Ecosystems thrive in such sandy loam out-competing hardwoods for available water. For more information, refer to the Soil Ecosystem Plate.

Loblolly Pines are growing here, big ones, in the canopy. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Mycorrhizae. At least part of the reason that pines out-compete hardwoods in sandy loams, is through their relationship with fungi. Fungi are essentially masses of thread-like mycelia that are literally everywhere in the soil. These threads attach themselves to root hairs of the pines. Through this link, a mycorrhizae, the fungus brings water and nutrients to the pine in exchange for sugars.

Witch Hazel is growing here. Witch hazel is a common understory shrub or small tree in bottomlands and moist uplands. Witch hazel is preferred wood the settlers used for *water divining*. An astringent made from the inner bark was used by settlers (and is still available) for its analgesic properties.

Gallberry is growing here. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Switch Cane is growing here, which is usually indicative of a wet area; here it is indicative of water seepage from up-slope. Switch cane commonly forms canebrakes: areas dominated by cane in understory. In canebrakes, the herb layer is mostly absent due to heavy mulch and darkness. Cane is an annual dicot growing to full height every year and dies to the ground in winter like a grass.

Saw Palmetto is growing here to the right. Palmetto varies

white and is very distinctive.

Post 12. Note. As we move towards post 12 and beyond, we move into a higher light regime. As we do, the forest becomes thicker.

Gallberry is growing here, below the canopy in a thicket. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Gallberry Thicket. Thickets such as the gallberry thicket are important habitat for small mammals that *must* have a place to hide from predators. Such thickets are the home for voles, mice, and rabbits.

Switch Cane is growing here, contributing to the thicket. Cane is usually indicative of a wet area; here it is indicative of water seepage from up-slope. Switch cane commonly forms canebrakes: areas dominated by cane in understory. In canebrakes, the herb layer is mostly absent due to heavy mulch and darkness. Cane is an annual dicot growing to full height every year and dies to the ground in winter like a grass.

Sweetleaf is growing here in abundance in the subcanopy. Sweetleaf, often called *horse sugar* is a common shrub in both bottomland and upland forests in Mississippi. Evergreen leaves are leathery and oblong and have a *sweet taste* that is distinctive. A fungal infection often causes this species to produce large, fleshy-green gall-like growths on the buds in the spring. For more information, refer to the Anthophyta Plate.

for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Sweet Bay Magnolia is a common bottomland species in the Magnolia family. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Redbay is growing here. It is a small tree abundant along swamp edges and in pine barrens. Leaves are dark green; flowers are so small as to be rarely observed; fruit is a dark, blue drupe. For more information, refer to the Anthophyta Plate.

Water Oak is growing here; water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Oak Galls were observed on the leaves of a water oak here; look for them. Leaf galls on oaks resemble small round muscadine berries attached to the leaf. Galls are a reaction of the plant to an intrusion by an outsider, most notably an insect (wasps particularly lay their eggs in plants to provide food for the larvae) or a fungi. For more information refer to the Gall Plate.

Groundsel tree is growing here, down the trail, on the left. Groundsel tree is common along ditches and forest edges. In the fall, winter, white flowers cover the entire bush in

in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

Water Oak is growing here; water oak is a very common *red oak* in southern wetlands and bottom lands. Early settlers used this and other oaks to *tan* leather with the brown pigment *tannin* common in the bark and leaves. The acorns are important as mast for deer and birds. For more information, refer to the Oak ID Plate, the Anthophyta Plate, and the Acorn-Mast Plate.

Sweet Bay Magnolia is a common bottomland species in the Magnolia family. The red seeds encased in a cone are food for birds, especially migratory birds. The silvery undersides of the leaves is distinctive when the wind blows the leaves up showing the silver color. For more information, refer to the Fruiting Patterns and Ecology Plate and the Anthophyta Plate.

Yellow Poplar or Tuliptree is growing here. Poplars are one of the largest growing trees in the southeast often attaining diameters of eight feet and heights of two hundred feet. Poplars are a very common bottomland tree often making canopies of nearly pure stands. The leaves resemble tulips, hence the name. The flowers are visited by bees and butterflies, especially tiger swallowtails. Tuliptree is a much used wood today; natives used it for dugout canoes. For more information, refer to the Anthophyta Plate.

Red Maple is a common bottomland species in Mississippi; the specimen here is a juvenile of the species.

It features a three-pointed leaves that turn brilliant red in the fall. Seeds are *samara*- type for optimum seed dispersal. For more information, refer to the Anthophyta Plate.

Sweetleaf is growing here. Sweetleaf, often called *horse sugar* is a common shrub in both bottomland and upland forests in Mississippi. Evergreen leaves are leathery and oblong and have a *sweet taste* that is distinctive. A fungal infection often causes this species to produce large, fleshy-green gall-like growths on the buds in the spring. For more information, refer to the Anthophyta Plate.

Titi is growing here. Titi is a wetland shrub or small tree that exhibits white drooping spring and summer flowers (racemes) that are visited by bees. Titi honey is a dark honey that is prized by honey lovers.

Black Gum is observed here. Black gums are a common bottomland species that is an important food source for birds, especially migratory birds. Note the black spots in the leaves in the fall as they turn red and yellow. The heartwood is susceptible to rot and many are hollow becoming the homes for squirrels, raccoons, and bees. Settlers used a piece of hollow blackgum to make a beehive. For more information, see the Fruiting Patterns and Ecology Plate, the Anthophyta Plate, and the Fall Colors Plate.

Yaupon is growing here. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food for birds. For more information, refer to the Fruiting Patterns and Ecology Plate.

Post 11. Note. We are still in the upland pine ecosystem where pines rule the canopy. There is also abundant gallberry forming thickets along with yaupon and palms.

Loblolly Pine is growing here; it dominates the canopy. Loblolly is a common pine species throughout Mississippi. It is easily distinguished from others by *medium-long* needles, three to a sheath, and its distinctive *platy* bark. For more information, refer to the Coniferophyta Plate.

Saw Palmetto is growing here in abundance. Palmetto varies in size from a foot in height to eight feet high. Leaves are one to three feet wide and are fan-shaped. Palmetto size is indicative of habitat. If living in a wetland they will be large; if living in a sandy upland, they will be small. Spring flowers are small and white; fruit is black and less than a half inch in diameter.

Gallberry is growing here in abundance, forming a thicket. Gallberry is a holly closely-related to yaupon. It is an evergreen low shrub with black fruit that is food for many birds including wild turkey. It is widely distributed in pine lands where it commonly forms thickets. Gallberry is considered a good honey plant.

Gallberry Thicket. Thickets such as the gallberry thicket are important habitat for small mammals that *must* have a place to hide from predators. Such thickets are the home for voles, mice, and rabbits.

Yaupon is growing here, all along this section of trail. Yaupon is a common *holly* species in pine and wetland understories. Yaupon leaves were used by local Native Americans to make the *black drink* as a spring tonic. Its scientific name is *Ilex Vomitoria* giving some indication as to the result of drinking the tonic. It is an important food