

Proceedings

1997 UNC Sometimes Annual Phytogeographical Excursion to The Florida Panhandle

March 8-14, 1997

Participants:

Peter Avis, Becky Brown, Kelly Buscher, Fatih Coskun, Phil Coulling, Skye Hanford, Jon Harrod, Jay Horn, Chris Mankoff, Bob Peet, Linda Prince, Alice Stanford, Steve Seiberling, Rickie White, Ken Wurdack

Local Guides:

Guy Anglin, Tom Arrington, Vernon Compton, Sharon Hermann, Louis Provencher, H. LeRoy Rodgers

Schedule ---

Saturday, March 8

Location: I-40 west to I-85; I-85 south to I-185 (in western GA); I-185 south to Columbus GA; US-80 west to US-431 at Phoenix City AL; US-431 south to Dothan GA; US-231 south to Panama City FL; US-98 east to Pt. St. Joe; FL-30A south to FL-30E; FL-30E west to St. Joseph State Park.

Camping: SJPSP - 904-227-1327; office open 8-5

Sunday, March 9

Destinations:

[St. Joseph Peninsula State Park](#) - Coastal dunes and scrub

[Ochlockonee State Park](#)

[San Marcos de Apalache State Historic Site](#) - *Hymenocallis godfreyi*

[Leon Sinks – ANF](#) (Apalachicola National Forest)

[Rock Bluff - ANF](#)

Camping: Wright Lake Campground, ANF.

Monday, March 10

Destinations:

Savannas in southern Apalachicola NF

Meet Guy Anglin (Forest Service Botanist)

[Post Office Bay](#) area, [Tate's Hell](#) area

[Torreya Bluffs TNC Preserve](#)

Meet Rick Studenmund or Greg Seamon of TNC at office for introduction.

Location: From Tallahassee US-319 north to FL-12; west ca 2.6 miles to small sign on left side; follow road south, and at crest of hill, the accommodations will be on the right.

Lodging: Tall Timbers Research Station

Tuesday, March 11

Destinations:

[Tall Timbers Research Station](#) tour

Meet Sharon Hermann (“Plant Ecologist” at Tall Timbers)

The Stoddard Plots

Wade Tract – Thomasville, GA

[Flat Creek Bluffs](#) – Gadsden Co.

[Florida Caverns State Park](#) – Jackson Co.

Camping: Karick Lake Group Camp, Blackwater River Forest

Wednesday, March 12

Destination:

[Eglin Air Force Base \(eastern half\)](#)

Guides: Louis Provencher & LeRoy

Rodgers of TNC

Location: 5 miles south of I-10 on FL-85, turn west at Ocala Tower and meet at the back trailer of 2.

Camping: Karick Lake Group Camp, Blackwater River Forest

Thursday, March 13

Destinations:

[Eglin Air Force Base \(western half\)](#)

Topsail Hill State Park

Guide: Louis Provencher of TNC

Camping: Karick Lake Group Camp, Blackwater River Forest

Friday, March 14

Destination: [Blackwater River State Forest](#)

Guides: Vernon Compton & Tom Arrington

Directions for return trip: FL-87 north from Milton, becoming GA-41; at Brewton US-31 north to US-84; US-84 west to I-65; I-65 north to I-85; I-85 north to I-40; I-40 east to Chapel Hill.

Site descriptions ---

St. Joseph Peninsula State Park

Recorders: Chris Mankoff and Ken Wurdack

Location: Gulf Co. - St. Joseph Point Quad. From US98/30 take FL30A to FL30E.

FL30E traverses the length of St. Joseph Peninsula and most St. Joseph Peninsula State Park facilities are in the vicinity of Eagle Harbor.

{After spending the night at campsites 111-113, we arose and at 8:20 AM began a walking circumnavigation of the beach and coastal scrub to the north of the campground. All the sites were on a bright white sand}

Site 1-1A: Scrub west of campground and just behind beach dunes:

<i>Ceratiola ericoides</i>	<i>Pinus elliotii</i>
<i>Chrysoma pauciflosculosa</i>	<i>Polygonella sp.</i>
<i>Conradina canescens</i> - in full flower	<i>Quercus geminata</i>
<i>Croton punctatus</i>	<i>Q. myrtifolia</i>
<i>Physalis angustifolia</i>	<i>Rubus trivialis</i>

Site 1-1B: After walking north along the outer dunes, we headed east into the bayward maritime scrub dominated by *Pinus clausa* and mixed oaks.

<i>Ceratiola</i> - 5	<i>Quercus geminata</i> - 7
<i>Cladonia</i> - 7.5	<i>Q. myrtifolia</i>
<i>Pinus clausa</i> - 7	<i>Serenoa repens</i> - 4

Site 1-1C: Eastward was a dune swale with some standing water and surrounded by a fairly well developed canopy:

<i>Hypericum myrtifolia</i>	<i>Pinus elliotii</i>
<i>Ilex glabra</i>	<i>Sphagnum ssp.</i>
<i>I. cassine</i>	<i>Utricularia sp.</i>
<i>I. vomitoria</i>	<i>Vaccinium</i>
<i>Juncus sp.</i>	<i>Xyris flabelliformis</i>
<i>Lyonia</i>	

Tree cores in the vicinity of the swale:

Pinus clausa: 80, 80, 90 years
Pinus elliotii: >77 years

We followed a paved road from near the swale back to the campground and running through rather beaten (large groups of dead trees, apparently from Hurricane-generated salt spray) maritime scrub.

Reference:

Kurz, H. 1942. Florida dunes and scrub, vegetation and geology. Florida Geological Survey Bulletin 1123. 154 pp.

Ochlockonee River State Park

Recorders: Chris Mankoff and Ken Wurdack

Location: Wakulla Co.; Sopchoppy Quad. East of SR319 (S of Sopchoppy). We stopped on the entrance road and walked north into the fire-maintained maritime longleaf flatwoods community

Site 1-2: Longleaf pine-wiregrass flatwoods; soils sand-silt spodosol with 40 cm to white sand.

Aristida beyrichiana

Eriocaulon compressum

E. decangulare

Heliathus radula

Hypericum microsepalum

Persea borbonia

Pinguicula lutea

Pinus pumila

Pinus palustris

Pityopsis sp

Quercus geminata

Quercus pumila

Serenoa repens

Vaccinium darrow

Vaccinium myrsinites

Xyris spp.

The flatwoods graded to a gum depression with *Nyssa biflora*, *N. ogeeche*, *Eriocaulon*, and *Xyris* and then rose to a more xyric ridge of longleaf and wiregrass and dominated by *Hypericum microsepalum*, *Quercus pumila*, and *Vaccinium myrsinites*, with *Serenoa* becoming more dominant with increased elevation.

As we departed the park, we briefly visited a *Hypericum* pond on the north side of the road, perhaps with *H. brachyphyllum* as the dominant, though we forgot to write this down.

San Marcos de Apalache State Historic Site

Recorders: Chris Mankoff and Ken Wurdack

Location: Wakulla Co., St. Marks Quad. - San Marcos de Apalache on the southern edge of St. Marks and at the junction of the St. Marks and Wakulla Rivers. Through St. Marks follow brown signs to San Marcos de Apalache State Historic Site.

Site 1-3: Natural vegetation can be found south of the main fort ruins along a trail to site #5, the early fort site. There is an interpretative museum with facilities.

This strategic site on the peninsula at the junction of 2 major rivers has served as a military bastion since the mid-1700's. The site protects the remains of a Spanish fort (built 1750s-1785) which was taken over by the US Army in 1821 and subsequently the Confederacy during the Civil War (keeping the Union at bay until 1865).

The reason for our visit was to examine the type and presently only known locality for *Hymenocallis godfreyi* (Smith and Darst, 1994) which Ken really, really, really wanted to visit (the stop was an attempt to mollify him and Jay after abandoning attempts to visit the Bay Co. *Eriocaulon nigrobacteatum* fens). The spider lily was evident along the trail (to the early fort site) through the sawgrass (*Cladium jamaicense*) marsh, although no plants were discovered in flower. Inquiries with the ranger (Bonnie Allen) revealed that burns were now made in the spring and not winter which formerly had promoted spring flowering. (The person in charge of this was none other than UNC graduate and *Dicerandra* guru, Robin Huck, on whose committee Bob had served.) Effort was made

to inform the custodians of this plant about its existence and biological requirements. The plant appears to have been collected at this site by the early southern botanist Ferdinand Ruge in the 1840's (Smith and Darst, 1994) and remarkably appears to have persisted despite over 200 years of intensive disturbance (though this also may cast doubts on its origins or the Pleistocene speciation hypothesis - see Smith and Darst, 1994).

Reference:

Smith, G. L. and M. Darst. 1994. A new species of *Hymenocallis* (Amaryllidaceae) in the Florida panhandle. *Novon* 4: 396-399.

Leon Sinks, ANF

Recorders: Chris Mankoff and Ken Wurdack

Location: Leon Co., Lake Munson Quad. West side of FL 319, 0.5 mi north of Wakulla Co. line. Parking area with facilities and well developed interpretive trail system heading out of the west end of the parking lot.

Site 1-4: We took the Sinkhole Trail (bypassed the Magnolia Sink loop with Bushwack Bob) and took the Crossover Trail back to the parking area starting point. The sinks are highly variable in size, moisture and depth - allowing a range of microhabitats and resulting floristic variability. The area is designated a special interest area within the Apalachicola National Forest.

In the dry uplands just beyond the facilities trailhead was observed *Astragalus obcordatus* in full flower. Longleaf pine seedlings were abundant and formed a near turf in places, indicating that the previous fall had been a truly exceptional mast year. The uplands of much of the site had recently been burned, and it appeared as though this fire was long overdue (hardwood encroachment and wire grass suppression were getting to be problems).

Site 1-4A: Plametto Sink - a very rich, moist sink with a well developed herbaceous layer on the funnel (*Smilax pumila*, *Parthenocissus*, & *Mitchella* were conspicuous). The floor of the sink was wet (no standing water); with abundant palmettos, *Cornus foemina* and Cyperaceae.

Carya sp.

Cornus foemina

Crotalaria

Liquidambar styraciflua

Magnolia grandiflora

Mitchella repens

Ostrya virginiana

Parthenocissus quinquefolia

Quercus michauxii

Rubus trivialis

Smilax pumila

Site 1-4B: The uplands in the vicinity additionally contained

Bumelia lanuginosa

Conopholis americana

Carpinus caroliniana

Ilex opaca

Pinus glabra

Quercus alba

Q. falcata

Site 1-4C: Hammock Sink (Little Dismal Sink) - large sink with with deep blue-green water concealing an extensive underwater cave system. The sink basin is about 30 feet deep, formed in Miocene carbonates (Rupert, 1993). A boardwalk extends over the water and allows nice views of the deep blue hole.

Bumelia reclinata
Chionanthus virginicus
Cornus foemina
Magnolia grandiflora
Myrica heterophylla
Quercus virginiana

Site 1-4D: Big Dismal Sink - the deepest sink in the area (250' in diameter and 130' deep) with 50' near vertical walls supporting extensive pteridophyte growth on seepage. Nearly became Bob's tomb in the quest to identify the ferns. Big Dismal formed at the crest of a sand hill associated with the Lake Munson Sand Hills, which resulted in its large funnel and great depth (Rupert, 1993).

Amsonia tabernaemontana *Symplocos tinctora*
Osmunda cinnamomea *Thelypteris quadrangularis*

Site 1-4E: We then bushwacked to Black Sink across dry recently burned sandhills containing:

Agalinis sp. *Pityopsis*
Asclepias humistrata *Stylisma patens*
Berlandiera pumila
Opuntia humifusa

Lost Stream Sink:

Corallorhiza wisteriana *Lithospermum caroliniense*

Reference:

Rupert, F. 1993. Karst features of northern Florida. pp 49-61 in S. A. Kish (ed.)
 Geologic field studies of the Coastal Plain in Alabam, Georgia, and Florida.
 Southeastern Geological Society, Guidebook 33.

Rock Bluff

Recorders: Chris Mankoff and Ken Wurdack

Location: Leon Co., Ward. Quad. About 3 mi southwest of Bloxham at the end of FR390 and ca 1 mi northwest of junction with SR375. T2S, R4W, S30.

Site 1-5: We parked at the end of the road and briefly surveyed the unimpressive bluff to the north overlooking the river. Lacking a topo map, we failed to find Rock Bluff proper (just a little ways to the south) and spent most of the time along a well-traveled trail heading northwest of the parking area and crossing the Ocklockonee River floodplain and then downstream along the river. Rather buggy (but not like the steepheads).

On the alluvial flats

Acer barbatum
Aesculus pavia
Carpinus caroliniana
Halesia caroliniana
Ilex opaca

Liquidambar styraciflua
Marnolia grandiflora
Pinus glabra
Sebastiania ligustrina
Taxodium distichium

Along the bluff:

Aesculus pavia
Carya sp.
Halesia carolina

Leucothoe axillaris
Viola affinis
Quercus michauxii

Post Office Bay Area, Apalachicola National Forest

Recorders: Steve Seiberling and Jay Horn

Location: Liberty County, Florida; Sumatra Quadrangle.

We met U.S. Forest Service botanist Guy Anglin at the grocery store in Sumatra first thing in the morning. Several participants were tempted to buy baseball caps bearing such witty and insightful sayings as “A man without a wife is like a dog without a leash”, and “The problem with getting to work on time is that it makes the day so long.” (To our knowledge no hat purchases were actually made.) From Sumatra we traveled north to our first site on the Apalachicola National Forest

According to Guy Anglin, the Post Office Bay area has more clay in the soil than many of the neighboring areas, such as Tates Hell. The narrow endemic, *Harperocallis flava*, occurs on the Apalachicola National Forest along Hwy. 65. About 3,000 plants, or clumps of plants, have been found in this area (Leonard & Baker 1983). Wiregrass helps maintain suitable conditions for *Harperocallis*, but also competes with it. Alas, we were too early to see the *Hyperocallis*.

References:

- Clewell, A.F. 1971. The vegetation of the Apalachicola national forest: An ecological perspective. Unpublished report.
- McDaniel, S. 1968. *Harperocallis*, a new genus of the Liliaceae for Florida. *J. Arnold Arb.* 49:35-40.
- Leonard, S.W. and W.W. Baker. 1983. Additional populations of *Harperocallis flava* McDaniel (Liliaceae). *Castanea* 48:151-152.
- USDA Forest Service. 1984. Soils and vegetation of the Apalachicola National Forest. 165 pp.

Site 2-1A: *Pleea* phase savanna on W side of Hwy. 65

Location: West side of FL 65, 0.5 mile N junct 379 in Sumatra. R7W, T5S. Section 13, Apalachicola National Forest.

The soil in the savanna contained significant amounts of clay. According to Guy, these more clayey soils become very hard later in the year when dry. The soil in much of the savanna was saturated with water, or even had a layer of standing water an inch or more deep.

The dominant species in the savanna were *Pleea tenuifolia*, *Aristida beyrichiana* [Gulf Coast analog of *A. stricta*], and *Rhynchospora* spp. Small longleaf pine saplings were scattered throughout the site, but apparently it was too wet for their successful growth (or over zealous botanists had removed them.) Clumps of *Serenoa repens* occurred in areas with slightly drier conditions. Black titi and swamp titi occurred in the wetter margins of the savanna, along with pond cypress and *Hypericum chapmanii* (easily distinguished by its springy bark). Many of the pitcher plants here (primarily *S. flava*) were in bloom.

Species observed:

<i>Aristida beyrichiana</i>	<i>Nyssa ursina</i>
<i>Aster eryngiifolius</i>	<i>Pinguicula ionantha</i> [edge]
<i>Calopogon barbatus</i>	<i>Pinguicula lutea</i>
<i>Chaptalia tomentosa</i>	<i>Pinguicula planifolia</i> [edge]
<i>Cliftonia monophylla</i>	<i>Pinus palustris</i>
<i>Cyrilla racemiflora</i>	<i>Pleea tenuifolia</i>
<i>Euphorbia inundata</i>	<i>Rhynchospora</i> spp.
<i>Helenium vernale</i>	<i>Sarracenia flava</i>
<i>Hypericum chapmanii</i> [edge]	<i>Sarracenia psittacina</i>
<i>Hypericum microsepalum</i>	<i>Serenoa repens</i>
<i>Lophiola americana</i>	<i>Sporobolus floridanus</i>
<i>Lycopodium alopecuroides</i>	<i>Taxodium ascendens</i> [edge]
<i>Lycopodium carolinianum</i>	<i>Xyris ambigua</i>
<i>Marshallia tenuifolia</i>	

Site 2-1B: Wet depression between E side of Hwy. 65 and railroad tracks, across from *Pleea* phase savanna

Location: Same as the previous site only directly across the road.

Standing water, up to knee high, had collected in this small depression adjacent to the road (probably a borrow pit) and parallel running railroad track. *Hypericum brachyphyllum* was dominant. *Sarracenia flava* was also common here (along the edge of the depression), along with *Pinguicula planifolia*.

Species observed:

<i>Bartonia verna</i>	<i>Pinguicula planifolia</i>
<i>Drosera capillaris</i>	<i>Polygala cymosa</i>
<i>Erigeron verna</i>	<i>Sabatia bartramii</i>
<i>Hypericum brachyphyllum</i>	<i>Sarracenia flava</i>

Site 2-2: Post Office Bay

Location: South side of FR 180; T4S, R8W, Section 22 of the Apalachicola National Forest.]

Savannas and wet depressions. We observed four community types at this site: a longleaf pine flatwoods with an adjacent flatwoods/savanna ecotone, a largely treeless wet savanna, a gum depression, and a cypress depression.

Site 2-2A: A small gum depression was located next to the lower edge of the longleaf pine savanna. The wetland was dominated by *Nyssa biflora* with scattered *Taxodium ascendens*, and an occasional *Magnolia virginiana*. *Ilex myrtifolia*, *Eriocaulon compressum* and *E. decandularia* occurred on the edges of the depression.

Species observed:

Carex glaucescens (?)
Epidendrum conopseum
Eriocaulon compressum
Eriocaulon decangulare
Ilex myrtifolia
Magnolia virginiana

Nyssa biflora
Polypodium polypodioides
Smilax laurifolia
Styrax americana
Taxodium ascendens
Tillandsia bartramii

Site 2-2B: The longleaf flatwoods/ecotone had been burned during the past winter. The soil in this portion of the site was a yellow sand. The overstory was dominated by *Pinus palustris*, with *Aristida beyrichiana*, *Baptisia lanceolata*, *Quercus minima*, and *Quercus pumila*, common in the understory. Bracken fern was also very common in parts of the savanna. Unusual species observed in this area included *Baptisia simplicifolia*, *Nolina atopocarpa*, and *Phoebanthus tenuifolia*.

Species observed:

Aletris lutea
Aristida beyrichiana
Asclepias tuberosa
Aster adnatus
Aster linariifolius
Baptisia lanceolata
Baptisia simplicifolia
Carphephorus paniculatus
Cirsium lecontii

Angelica dentata
Cnidioscolus stimulosus
*Dichanthelium*spp.
Erigeron vernus
Eupatorium album
Eupatorium rotundifolium
Gaylussacia dumosa
Helianthus angustifolius
Helianthus heterophyllus

Helianthus radula
Hieracium spp.
Muhlenbergia expansa
Nolina atopocarpa
Osmunda cinnamomea
Osmunda regalis
Phoebanthus tenuifolia
Pinus palustris
Pityopsis graminifolia
Pteridium aquilinum
Quercus margaretta ?

Quercus minima
Quercus pumila
Rhexia alifanus
Rhynchosia spp.
Serenoa repens
Stylosanthes spp.
Vaccinium darrowii
Viola esculenta
Viola septemloba
Xyris caroliniana
Zigadenus densus

Site 2-2C: The open, nearly treeless wet savanna was adjacent to the longleaf savanna described above. However, it lay at a slightly lower elevation, and possessed a more clay-rich soil. Only a few individual longleaf and slash pines were scattered across the savanna. Guy speculated that retention of more water and/or the existence of a dense sod layer may limit tree establishment there. *Helianthus heterophyllus* (cat-tongue plant) was common in the transition between the drier longleaf savanna and the open wet savanna. Wiregrass was the principal dominant species in the open savanna. Slash pine was more common on the edge of the savanna adjacent to a cypress depression, apparently preferring the wetter conditions. Anthills were scattered throughout the area, creating drier conditions where violets and *Cirsium* tended to colonize.

Species observed:

Aristida berychiana
Chaptalia tomentosa
Cirsium lecontei
Drosera capillaris
Drosera tracyi
Eriocaulon compressum
Helenium vernale
Helianthus heterophyllus
Pinguicula ionantha
Pinguicula planifolia
Pinus palustris

Pinus elliotii
Polygala cymosa
Polygala ramosa
Rhynchospora chapmanii
Rudbeckia graminifolia
Sarracenia flava
Sarracenia psittacina
Scleria baldwinii
Utricularia subulata
Xyris ambigua
Zigadenus densus

Site 2-2D: A pond cypress dominated depression was adjacent to the wet open savanna. Species composition of the overstory was similar to the above gum depression, except that here *Taxodium* was the more common species. Slash pines were growing on the edges of the wetland, even in standing water. *Pieris* and *Clethra* were noticed growing on the trunks of cypress trees. The largest cypress trees were located in the middle of the depression. *Carex* spp. were common. Guy encountered a water moccasin on the knee of a cypress tree, which caused some excitement and a change in botanizing habits.

Species observed:

Carex spp.
Clethra alnifolia
Nyssa biflora
Osmanthus americanus

Pieris phillyreifolia
Pinus elliotii
Styrax americana
Taxodium ascenden

Site 2-3: Dry longleaf pine savanna subjected to recent growing-season burn

Location: South side of FR 123, 0.5 miles west of 123C.

This dry longleaf/wiregrass savanna had been subjected to a growing season burn. The effect on the understory was most notable in the flowering of the dominant wiregrass. In contrast, the wiregrass in the winter burn savanna, described above (site 2-2), showed no signs of flowering. Longleaf pine, the dominant overstory species here, was broadly spaced.

Species observed:

Aristida beyrichiana
Arundinaria tecta
Ctenium aromaticum
Eupatorium rotundifolium
Gaylussacia mosieri
Helianthus radula
Myrica heterophylla
Pinus palustris

Rubus trivialis
Serenoa repens
Quercus minima
Quercus pumila
Stachydeoma graveolens
Verbesina chapmanii
Vitis spp.
Xyris caroliniana

Site 2-4A: The “Old shoe” site, as named bny Angus Gholson. Longleaf pine savanna #2 subjected to growing season burn and adjacent habitats

Location: Compartment 76; Unmapped side road to esat off 379 ca 1 mile south of junction witi FR 123.

The longleaf pine savanna close to the road had been subjected to growing season burns. The dominant understory species, (*Aristida beyrichiana*, *Helianthus heterophylla*, and *Ctenium aromaticum*) all showed signs of responding to the burning regime. *Pinguicula pumila* was present here. Red cockaded woodpeckers were also observed at the site.

A very open savanna, adjacent to the recently burned *Pinus palustris* savanna, was also dominated by wiregrass, but with few scattered trees. *Pinguicula ionantha* was noted on the far edge of the savanna, next to a cypress stinger. *Pinus elliotii* once again occurred in the wettest portion of the savanna, on the margins of the wet cypress depression.

Species observed:

Chaptalia tomentosa
Drosera spp.
Eriocaulon compressum
Eriocaulon decangulare
Magnolia virginiana
Myrica heterophylla
Pinguicula ionantha

Helenium vernale
Helianthus heterophyllus
Ilex myrtifolia
Lachnocaulon anceps
Pinus elliotii
Pinus palustris
Utricularia subulata

{Bob subsequently announced that we would be stopping for lunch, much to the surprise and relief of van 67. Lunch was eaten at Cotton Landing (T5S, R8W, Sect 7), on Kennedy Creek, a tributary of the Appalachicola River.}

Site 2-5: Seepage bog and savanna

Location: Liberty County, FL, Kennedy Creek Quadrangle. North side of FR 106, 0.2 mile northeast of CR 379; T4S, R8W, Sect 11.

The open longleaf pine/wiregrass savanna at this site graded into a seepage bog containing various pitcher plants, sundews and other hydrophilic species. The soils here, as in many other parts of the Post Office Bay area, contained significant amounts of clay, especially in the lower, wettest spots. Soils in the higher, drier areas consisted of a yellow sand with some fine clay. The upland area differed from others we had seen in the area in that no oak species were present. We speculated that this may be due to the increased clay content of the soil here.

Species observed:The seepage bog:

Calopogon barbatus
Centella asiatica
Drosera capillaris
Aristida berychiana
Drosera filiformis var. *tracyi*
Erigeron verna
Lophiola americana
Lycopodium alopecuroides

Lycopodium carolinianum
Pleea tenuifolia
Polygala polygama
Rudbeckia graminifolia
Sarracenia flava
Sarracenia psittacina
Taxodium ascenden

The savanna:

Aristida beyrichiana
Ctenium aromaticum
Eryngium integrifolium
Euphorbia inundata
Lachnocaulon anceps

Lobelia paludosa
Macbridea alba
Pinus palustris
Polygala polygama
Serenoa repens

Verbesina chapmanii

Zigadenus densus

Guy Anglin pointed out an exotic population of *Dionaea muscipula* on the south side of the FR 106 at this same site. Apparently planted in the 1970's, they appear to have become well established. (See Clewell [1985], p. 345.)

Tates Hell Area, Appalachian National Forest

Recorders: Steve Seiberling and Jay Horn

Location: Franklin County, Fort Gadsden Quadrangle. Ca 7 miles south of Sumatra on FL 65, turn east on FR 143. South of 143, past cypress stringer, slightly past left junction where 143 rejoins after circle.

Site 2-6: Savanna and adjacent Cypress depression

Location: [Franklin Co.. Dirt road off Rt. 65 south of Sumatra.]

The overstory in this savanna consisted of broadly scattered longleaf pine. The soil in the drier upland area was mostly sand and the site sloped relatively steeply down to the cypress stringer immediately to the west. The cypress depression on the edge of the savanna contained very old but short and stunted (bonsai) *Taxodium ascendens*. One 15 cm dbh individual was cored and determined to be approximately 250 years old. Despite their age, none of the trees were much larger than 15 cm dbh. The *Pieris*, *Clethra*, and *Tillandsia* were all growing on the cypress trees. *Parnassia* was relatively abundant in the savanna.

Species observed:

The cypress depression:

Carex intumescens
Clethra alnifolia
Pieris phillyreifolia
Sarracenia flava

Taxodium ascendens
Tillandsia bartramii
Utricularia inflata

The savanna:

Agalinis spp.
Aletris lutea
Aster eryngiifolius
Ctenium aromaticum
Eryngium aquaticum
Euphorbia inundata
Gaylussacia dumosa
Lycopodium appressum
Lycopodium carolinianum
Myrica heterophylla
Parnassia caroliniana
Pinguicula ionantha

Pinguicula lutea
Pinguicula pumila
Pinus palustris
Polygala lutea
Pteridium aquilinum
Rhexia alifanus
Rudbeckia spp.
Serenoa repens
Tofieldia recemosa
Woodwardia virginica
Zigadenus glaberrimus

Site 2-7: Open longleaf pine/wiregrass savanna

Location: Continue on FR 143 past sharp turn to north; site is ca 150 meters on right (east).

This savanna was also characterized by broadly scattered longleaf pines. Wiregrass was dominant in the understory. The soil was fine sand with some silt. The savanna sloped gradually downward to a cypress depression. The pitcher plants, sundews and other hydrophilic species occurred mostly on the wet edge adjacent to the cypress depression. We saw a box turtle and very small frogs in the wet part of the savanna.

Species observed:

The savanna:

<i>Agalinis</i> spp.	<i>Parnassia carolinianum</i>
<i>Aristida beyrichiana</i>	<i>Pinguicula lutea</i>
<i>Aster eryngiifolius</i>	<i>Pinus palustris</i>
<i>Balduina uniflora</i>	<i>Pleea tenuifolia</i>
<i>Bartonia verna</i>	<i>Polygala lutea</i>
<i>Calopogon barbatus</i>	<i>Polygala polygama</i>
<i>Carphephorus pseudoliatris</i>	<i>Rhexia alifanus</i>
<i>Chaptalia tomentosa</i>	<i>Rhynchospora oligantha</i>
<i>Ctenium aromaticum</i>	<i>Rhynchospora</i> spp.
<i>Drosera capillaris</i>	<i>Serenoa repens</i>
<i>Eriocaulon compressum</i>	<i>Syngonanthus flavidulus</i>
<i>Euphorbia inundata</i>	<i>Utricularia subulata</i>
<i>Justicia crassifolia</i>	<i>Xyris ambigua</i>
<i>Lycopodium carolinianum</i>	

The cypress depression:

<i>Drosera capillaris</i>	<i>Sarracenia flava</i>
<i>Hypericum chapmanii</i>	<i>Sarracenia psittacina</i>
<i>Lycopodium alopecuroides</i>	<i>Utricularia</i> spp.
<i>Pinguicula planifolia</i>	<i>Xyris serotina</i>

{After leaving Tates Hell we returned to Sumatra and dropped off our able Forest Service guide, Guy Anglin, at the grocery store. A minor delay ensued due to the inadequate toilet paper supply in the restroom. From Sumatra we traveled north to The Nature Conservancy Appalachicola Bluffs and Ravines Preserve.}

Appalachicola Bluffs and Steepheads

Recorders: Steve Seiberling and Jay Horn

We were met enthusiastically by The Nature Conservancy Preserve Manager, Rick Studenmund, and his faithful assistant, Greg Seamon, at the visitors center. He explained how the upland area at the preserve had been cleared, windrowed, and planted in slash pine several decades ago. The resulting plantations had been an economic failure since slash pine on dry sites has been found to enter a period of very slow growth ten or twenty years following establishment.

After the introduction, we traveled to a part of the preserve containing numerous ravines and steepheads known as the Garden of Eden. The density of the mosquito population suggested that our visit took place well after the Fall. . (This is the only portion with a reasonably intact pine community on the uplands.)

Site 2-8: Ravines, steepheads and bluffs

Location: [Garden of Eden Road off Rte. 12; ca 1.5 miles north of FL 20 in Bristol. Parking area on right at curve in dirt road.]

The uplands area contained overstory longleaf pine and wiregrass in fruit. A pink-flowered form of *Illicium floridanum* occurred in one of the steepheads. Other species observed in the ravines included *Bumelia* spp. *Halesia* spp., *Ilex coriacea*, *Vaccinium arboreum*, and *V. ellioti*.

At this point the mosquitoes became sufficiently vicious that the recorder abandoned his responsibilities and began walking very quickly. For more information on the species at the site go write them down yourself. Or, if you wish, see the report prepared by Cecil Frost for the 1987 PGE Proceedings.]

Rare or unusual species observed:

Astragalus obcordatus [Sandhill]
Calamintha dentata [Sandhill]

Carex baltzellii
Croomia pauciflora

Woody Plants from collective memory:

Acer rubrum
Arundinaria gigantea
Bignonia capreolata
Berchemia scandens
Bumelia feruginosa
Carya alba
Carya glabra
Castanea pumila
Euonymus americana
Gelsemium sempervirens
Halesia carolina

Hydrangea quercifolia
Ilex opaca
Illicium floridana
Juniperus virginiana
Liquidambar styraciflua
Magnolia ashei
Magnolia grandiflora
Magnolia pyramidata
Nyssa biflora
Osmanthus americana
Persea borbonia

Pinus glabra
Pinus palustris
Pinus taeda
Platanus occidentalis
Prunus carolinana
Quercus alba
Quercus austrina
Quercus geminata
Quercus hemisphaerica
Quercus michauxii
Quercus nigra
Quercus shumardii
Symplocos tinctoria

Rapidophyllum hystrix
Sabal minor
Schizandra glabra
Sebastiania fruticosa
Smilax auriculata
Smilax bona-nox
Smilax pumila
Taxodium disticum
Taxus floridana
Torreya taxifolia (dead stems)
Vaccinium arboreum
Vaccinium elliotii
Vitis rotundifolia

References:

Means, D.B. 1985. The canyonlands of Florida. *The Nature Conservancy News* 35(5):13-17.

{Desanguinated and exhausted from hiking the mountainous trails of the Florida panhandle, we set off to find our home for the night at Tall Timbers Research station.}

Tall Timbers Research Station

Local Guide: Sharon Hermann

Recorders: Jon Harrod, Skye Hanford

Location: Leon County; Beachton GA-FL Quadrangle. From Tallahassee, take US-319 north to FL-12. Follow FL-12 west about 2.6 miles and look for small sign on left (South side of road; entrance is just east of radio tower).

Soils and Topography: Sites associated with Tall Timbers are located in the Tallahassee Red Hills. Upland soils are primarily ultisols of Miocene age. These soils have a fine clay texture (Platt and Schwartz 1990) but are relatively well drained. Tallahassee Red Hills soils are fairly rich in nutrients compared to other Florida soils supporting "high pine" vegetation (Myers 1990). The topography of the area is gently rolling though actually quite steep by Florida standards.

The day started with a tour of the research facilities led by our guide, Sharon Hermann, the research plant ecologist on staff at Tall Timbers.

Site 3-1: The Stoddard Plots. Our first field stop of the day was at the Stoddard fire research plots, on the grounds of Tall Timbers itself. A series of 0.2 ha plots was established in 1959 in second growth (post-agricultural) loblolly and shortleaf pine stands (Platt and Schwartz 1990). These plots are burned at intervals ranging from once a year to once every 75 years. Annual burns on these sites reduce the density

and richness of woody species and prevent tree regeneration. The canopy is very open and savanna-like, and the ground layer is dominated by broomsedge (*Andropogon virginicus*). Burning has not led to the recolonization of the site by wiregrass (*Aristida beyrichiana*) or other species characteristic of pristine longleaf pine communities. The number and density of woody species increases with interval between burns.

Site 3-2: The Wade Tract: The Wade Tract is located immediately southeast of Thomasville, Georgia, approximately 15 minutes from Tall Timbers. Access to this unique, privately-owned area is restricted and *must* be arranged through Tall Timbers. The 80 ha Wade Tract is one of the largest stands of old-growth longleaf pine in existence (Platt *et al.* 1988). It escaped heavy human impacts in this area where agriculture was widespread due to its use as a quail plantation. The gently rolling uplands are relatively dry in nature; community dominants are longleaf pine and wiregrass. Tree ages extend to 300-350 years, and large flat-topped individuals are common.

The tract was burned annually in March for about 50 years. Tall Timbers has recently persuaded the landowner to switch to a 2-year rotation to increase survivorship of young longleaf pine. The current fire regime differs in seasonality and lacks the variability of the presettlement regime (early summer fires every 1-5 years; Platt *et al.* 1988). Sources of mortality for mature pines include windthrow, lightning strikes, and pine beetles. Some salvage logging of dead trees has taken place since the 1960s.

The Wade Tract has been the site of research into the demography of longleaf pine populations and the effects of adult longleaf density on juvenile survivorship (Platt *et al.* 1988, Grace and Platt 1995). Hamrick (Hamrick *et al.* 1993) followed up on this by examining the genetic differences with age and size classes of longleaf. Current research involves the importance of coarse woody debris in the longleaf pine ecosystem, in particular, the effects of longleaf pine CWD on small scale variation in fire intensity, microclimate, and juvenile survivorship.

One thing we noticed on the Wade Tract and in the old-growth areas of Eglin A.F.B., was the high density of scars on pines relative to second-growth stands such as the Green Swamp. Many of these scars had the triangular shape and basal location characteristic of fire scars; others may be the result of past land use (e.g. boxing for naval stores) or natural disturbance (e.g. mechanical damage caused by falling trees). Mature longleaf pines are generally considered to be highly resistant to damage by low-intensity surface fires. However, our anecdotal observations suggest that fire-scarred trees may be a characteristic of old-growth longleaf pine ecosystems. Scarring may increase the likelihood of pine beetle infestation (Schowalter 1985). Damaged longleaf pines exude highly flammable resins; fire scarring may thus increase the likelihood of more extensive damage in subsequent fires. In either case, the effect would be to increase mortality of canopy pines. Effects of fire scars on the survivorship of longleaf pines may warrant further study.

Our host, Sharon Hermann, informed us that 416 species of vascular plants had been vouchered from the Wade Tract. Our emphasis at this site was more on canopy dynamics and less on floristics. The following species were observed:

<i>Aristida beyrichiana</i>	<i>Pinus palustris</i>
<i>Carya alba</i>	<i>Pityopsis graminifolia</i>
<i>Cassia nictitans</i>	<i>Polygala nana</i>
<i>Castanea pumila</i>	<i>Quercus falcata</i>
<i>Ceanothus americanus</i>	<i>Quercus hemisphaerica</i>
<i>Cnidoscolus stimulosus</i>	<i>Quercus margaretta</i>
<i>Dichantherium</i> sp.	<i>Quercus minima</i>
<i>Gaylussacia frondosa</i>	<i>Quercus pumila</i>
<i>Helianthemum carolinianum</i>	<i>Rhus copallina</i>
<i>Helianthus radula</i>	<i>Smilax glauca</i>
<i>Hieracium</i> sp.	<i>Vaccinium tenellum</i>
<i>Houstonia</i> sp.	<i>Viola septemloba</i>
<i>Liquidambar styraciflua</i>	

References:

- Grace, S. L. and W. J. Platt. 1995. Effects of adult tree density and fire on the demography of pregrass stage juvenile longleaf pine. *Journal of Ecology* 83:75- 86.
- Hamrick, J.L., W.J. Platt and M. Hessins. 1993. Genetic variation in longleaf pine. *Tall Timbers Fire Ecology Conference* 18:193-204.
- Myers, R. L. 1990. Scrub and high pine. pp. 150-193 in R. L. Myers and J. J. Ewel, eds. *Ecosystems of Florida*. University of Central Florida Press, Orlando.
- Platt, W. J., G. W. Evans, and S. L. Rathbun. 1988. The population dynamics of a long-lived conifer (*Pinus palustris*). *The American Naturalist* 131:491-525.
- Platt, W. J. and M. W. Schwartz. Temperate hardwood forests. pp. 194-230 in R. L. Myers and J. J. Ewel, eds. *Ecosystems of Florida*. University of Central Florida Press, Orlando.
- Schowalter, T. D. 1985. Adaptations of insects to disturbance. pp. 235-252 in S. T. A. Pickett and P. S. White, eds. *The Ecology of Natural Disturbance and PatchDynamics*. Academic Press, New York.

Apalachicola River Bluffs

Recorders: Jon Harrod, Skye Hanford

Site 3-3: Flat Creek Slopes

Location: Gadsden Co. – Rock Bluff Quad. Bluffs along the Apalachicola River near boat landing at the mouth of Flat Creek and southwest of I-10 rest area. Approached from the south on Aspalaga Rd., ca 3 miles north of its junction with SR270. T3N, R7W, S25-26.

Site description: These mesic, calcareous slopes just above the floodplain are

often called Dirca Slopes due to the high density of *Dirca palustris* (leatherwood) on the slopes. Many of the species that we found in the Florida Caverns are here as well. Thirteen species of vines were found, and the area had a rich understory of ferns and herbs. The site also supports mesophytic species disjunct from north. Some limestone outcrops also exist here and the fern, *Adiantum capillus-veneris* was seen on the rocks. Dead *Torreya* logs were. Disturbance factors consist of the destructive forces of man, and the occasional groups of botanists trampling through the understory. The road was flooded beginning where it reached the Apalachicola floodplain; thus, we did not drive to the landing, nor visit the steep southwestern end of the bluff easily accessible at that point. This is not the same as the famous botanical locality at Aspalaga Landing which lies ca 0.6 mi to the SW, but the area is where Hardy Bryan Croom first discovered *Taxus floridana*.

Species: (*=vine)

<i>Acer barbatum</i>	<i>Magnolia pyramidata</i>
<i>Acer rubrum</i>	<i>Onoclea sensibilis</i>
<i>Adiantum capillus-veneris</i>	<i>Onosmodium virginicum</i>
<i>Aesculus pavia</i>	<i>Oxalis sp</i>
<i>Ampelopsis arboreum*</i>	<i>Parthenocissus quinquefolia*</i>
<i>Arisaema dracontium</i>	<i>Phlox divaricata</i>
<i>Arisaema triphyllum</i>	<i>Platanus occidentalis</i>
<i>Aristolochia serpentaria*</i>	<i>Pinus glabra</i>
<i>Berchemia scandens*</i>	<i>Polygonatum biflora</i>
<i>Bignonia capreolata*</i>	<i>Polystichum acrostichoides</i>
<i>Calyocarpum lyonii</i>	<i>Ptelea trifoliata</i>
<i>Campsis radicans*</i>	<i>Pteris multifida</i>
<i>Carpinus caroliniana</i>	<i>Quercus muhlenbergii</i>
<i>Carya sp.</i>	<i>Quercus nigra</i>
<i>Celtis laevigata</i>	<i>Quercus shumardii</i>
<i>Cercis canadensis</i>	<i>Rhapidophyllum hystrix</i>
<i>Conopholis americana</i>	<i>Sanicula sp</i>
<i>Croomia paufiflora</i>	<i>Schisandra glabra*</i>
<i>Decumaria barbara*</i>	<i>Selaginella apoda</i>
<i>Dioscorea sp.*</i>	<i>Senecio sp</i>
<i>Dirca palustris (cover =7)</i>	<i>Serenoa repens</i>
<i>Euonymus americanus</i>	<i>Smilax sp.*</i>
<i>Euonymus atropurpurea</i>	<i>Solidago sp.</i>
<i>Fagus grandifolia.</i>	<i>Staphylea trifoliata</i>
<i>Fraxinus sp.</i>	<i>Thalictrum thalictroides</i>
<i>Halesia diptera</i>	<i>Thelepteris kunthii</i>
<i>Hepatica americana</i>	<i>Torreya taxifolia (dead stems)</i>
<i>Hydrangea quercifolia</i>	<i>Toxicodendron radicans*</i>
<i>Ilex opaca</i>	<i>Trillium lancifolium</i>
<i>Lithospermum tuberosum</i>	<i>Ulmus alata</i>
<i>Liquidambar styraciflua</i>	<i>Ulmus rubra</i>
<i>Liriodendron tulipifera</i>	<i>Vaccinium elliotii</i>
<i>Lygodium japonicum</i>	<i>Viola walteri</i>
<i>Magnolia grandiflora</i>	<i>Vitis rotundifolia*</i>

*Vitis sp.**

References:

- Chapman, A.W. 1985. *Torreya taxifolia*: a reminiscence. *Bot Gaz.* 10:250-254.
Delcourt, H.R. and P.A. Delcourt. 1977. Presettlement magnolia – beech climax of the Gulf Coastal Plain: Quantitative evidence from the Apalachicola River Bluffs, North Central Florida. *Ecology* 58:1085-1093.

Florida Caverns State Park

Site 3-4: Nature Trail

Recorders: Jon Harrod, Skye Hanford

Location: Jackson Co., Florida; Mariana Quadrangle. Off of SR166 about 3 miles north of Marianna.

Site description: Situated on the Chipola R., the Florida Caverns State Park (Figure 1) consists of a mesic deciduous hardwood forest situated over limestone. Mitchell (1963) states that it is "known for its unique flora, many members of which are considered relic constituents of a once widespread mesic forest"- certainly itself a rather quaint, relic Clemensian interpretation persisting from the early 1900s. An overturned tree, which provided a good photo opportunity, illustrated the importance that limestone has in the formation and structure of soil and plant communities; all the soil was taken with the roots leaving a limestone layer on the ground. Soils in this area are generally red clays and yellow sandy clays. There exist many limestone outcroppings with their own characteristic plants and soils. The topography of this area includes clay hills, calcareous slopes and bluffs, and river floodplains (Mitchell, 1963). The area which we visited around the nature trails near park headquarters primarily consisted of the calcareous slopes and bluffs with many limestone outcroppings (Figure 2). Disturbance history would include the erosion and solution of limestone, anthropogenic intrusion and land development. Many species are disjunct and rare (e.g., *Isopyrum biternatum*, *Polymnia laevigata*; Mitchell 1963). A new species that had been previously confused with similar species was described as *Forestiera godfreyi* in 1985 by Loran C. Anderson. Earlier, this distinct species had been included in either *F. acuminata* or *F. pubescens*. Plants of *F. godfreyi* are generally intermediate between these two species and produce fruits that are dark blue, and they can be found as an abundant thicket on top of the natural tunnel on the caverns trail. *Aquilegia canadensis* var. *australis* was at its prime during our visit. A quick look at Blue Hole Spring revealed the panhandle endemic *Nuphar luteum* ssp. *ulvaceum* in the deeper, undisturbed (no swimmers) parts of the spring and its run..

Species Composition:

Calcareous slopes and bluffs: rocky outcrops with a rich abundance of herbs and shrubs; high density of *Carpinus* and *Ostrya*. In portions *Polymnia laevigata* was a rank groundcover dominant. On top of the first rock area *Forestiera godfreyi* was a dominant (R = limestone outcrop)

<i>Acer barbatum</i>	<i>Liquidambar styraciflua</i>
<i>Aristolochia serpentaria</i>	<i>Lonicera japonica</i>
<i>Adiantum capillus-veneris</i>	<i>Magnolia grandiflora</i>
<i>Aesculus pavia</i>	<i>Magnolia virginiana</i>
<i>Aquilegia canadensis</i> var.	<i>Magnolia pyramidata</i>
<i>australis</i> (R)	<i>Morus rubra</i>
<i>Arisaema dracontium</i>	<i>Nothoscordum bivalve</i>
<i>Arundinaria gigantea</i>	<i>Ostrya virginiana</i>
 	<i>Oxalis violacea</i>
<i>Asplenium heterochromum</i> (R)	<i>Pachysandra procumbens</i> (R)
<i>Bignonia capreolata</i>	<i>Passiflora lutea</i>
<i>Carpinus caroliniana</i>	<i>Persea borbonia</i>
<i>Cnidioscolus stimulosus</i>	<i>Phlox divaricata</i>
<i>Campsis radicans</i>	<i>Pinus glabra</i>
<i>Celtis laevigata</i>	<i>Podophyllum peltatum</i>
<i>Cercis canadensis</i>	<i>Polymnia laevigata</i> (R)
<i>Clematis</i> sp.	<i>Polymnia uvedalia</i>
<i>Collinsonia</i> sp.	<i>Prunus serotina</i>
<i>Cornus florida</i>	<i>Pteris cretica</i> (R)
<i>Decumaria barbara</i>	<i>Quercus muhlenbergii</i>
<i>Dioscorea quaternata</i>	<i>Quercus shumardii</i>
 	<i>Ranunculus carolinianus</i>
<i>Dryopteris</i> sp. (R)	<i>Rhapidophyllum hystrix</i>
<i>Euonymus atropurpureus</i>	<i>Rubus</i> spp.
<i>Euonymus americanus</i>	<i>Sanguinaria canadensis</i> (R)
 	<i>Senecio glabellus</i>
<i>Euphorbia commutata</i>	<i>Serenoa repens</i>
<i>Fagus grandifolia</i>	<i>Thelypteris</i> sp
<i>Forestiera godfreyi</i> (R, in part)	<i>Tilia americana</i> var. ?
<i>Fraxinus americana</i>	<i>Torreya taxifolia</i> (planted)
<i>Galium circaezans</i>	<i>Toxicodendron radicans</i>
<i>Hydrangea quercifolia</i> (R)	<i>Trillium decipiens</i>
 	<i>Trillium maculatum</i>
<i>Ilex decidua</i>	<i>Viola walteri</i> (R)
<i>Isopyrum biternatum</i>	<i>Youngia japonica</i> (R)
<i>Juniperus virginiana</i>	<i>Zephyranthes atamasco</i> (R)
<i>Laportea canadensis</i>	

Floodplain: Overlap of species from calcareous slopes and bluffs; oaks being dominant in the canopy

<i>Acer barbatum</i>	<i>Halesia diptera</i>
<i>Carpinus caroliniana</i>	<i>Ilex opaca</i>
<i>Carya</i> sp.	<i>Juniperus virginiana</i>
<i>Celtis laevigata</i>	<i>Lonicera japonica</i>
<i>Dichantherium</i> sp.	<i>Melica mutica</i>
<i>Euonymus americana</i>	<i>Ostrya virginiana</i>
<i>Forestiera</i> sp.	<i>Phlox divaricata</i>

Quercus laurifolia
Quercus lyrata
Quercus michauxii
Quercus muhlenbergii

Quercus nigra
Rubus sp.

Sabal minor
Senecio glabellus
Smilax sp.
Tillandsia usneoides
Viburnum rufidulum
Viola sp.

References:

- Anderson, Loran C. 1985. *Forestierag godfreyi* (Oleaceae), A new species from Florida and South Carolina. *Sida* 11(1):1-5.
- Mitchell, Richard S. 1963. Phytogeography and floristic survey of a relic area in Marianna Lowlands, Florida. *Am. Mid. Nat.* 69(2):328-366.

Eglin Air Force Base – East Side

Disclaimer: GPS readings for this day and the next two are usually reported where available, even though carefully examination suggests that many if not most are unreliable. Those so badly placed as to end up in the Gulf of Mexico have been dropped, but others are retained for entertainment value.

Local Guides: Louis Provencher and H. LeRoy Rodgers

Recorders: Linda Prince, Kelly Buscher, Pete Avis

Directions to Eglin Air Force Base: Take I-10 to state highway 85 just south of Crestview. Head south on 85. For locations of each specific site, see maps and the given GPS coordinates.

Ownership and Permission: Eglin Air Force Base is owned by the U.S. Government and many areas are restricted. Access for excursions was organized by Louis.

{After a night of camping at Karick Lake Group Campground, we met with Louis Provencher and H. LeRoy Rodgers of The Nature Conservancy at approximately 7:45 am and proceeded to traverse the lands of Eglin Air Force Base. Prior to departing for the field, Louis gave a quick overview of the base, its habitats and surroundings and some of TNC's projects being conducted in the base.}

Eglin Air Force Base is located in the western portion of the Florida panhandle east of Pensacola roughly 70 kilometers and just north and west of the Choctawhatchee Bay. The base contains almost half a million acres while sprawling over three counties (Okaloosa, Santa Rosa, Walton). For the military, Eglin provides testing grounds for conventional weapons such as the Tomahawk missile. Since the base is somewhat restricted from development except for particular government activities such as helicopter firing practice, much of the natural landscape has remained intact since the base's inception in the late 1930's.

The lands that make up Eglin were divided amongst private holdings and the Choctawhatchee National Forest prior to the creation of the base. During this pre-base period much of the landscape was subject to activities such as timbering and turpentine; therefore, abundant old-growth longleaf pine communities are not common. An exception, however, is the Patterson Natural Area which contains >1200 ha of contiguous old-growth.

A variety of natural habitats exist in the base. The area is typified by its abundant longleaf pine and oak sandhill communities. Eglin contains one of the largest public holdings of these communities anywhere. Additional habitats include sand pine dominated scrub, flatwoods, seepage slopes, narrow riparian zones, coastal wetlands, and some barrier islands. One unique and rare community type somewhat common along stream edges on Eglin is that characterized by floating pitcher plant mats.

The weather at Eglin is commonly warm and moist throughout most of the year. Lightning storms are frequent. In no other area of the eastern U.S. are tropical storm and hurricane landfalls as frequent. Many portions of the base and local surroundings exhibit the remains of damage brought on by the two most recent hurricanes to hit the area, Erin and Opal.

A substantial number of threatened and endangered species inhabit the base. The red-cockaded woodpecker population is among the top five largest populations in the southeast even though the basal area of the longleaf pine in many of the areas is below the suggested (North Carolina research) minimum. The worldwide distribution of the Okaloosa darter (*Ethoestoma okaloosae*) is within the boundaries of the base. In terms of endemics, Eglin ranks with Lake Wales Ridge and the Everglades according to The Nature Conservancy.

Site 4-1: Longleaf pine-wiregrass upslope

Location: Walton Co. – Niceville SE Quadrangle. Along Military Road (MR) 201.

GPS: N 3387027, E 560216

Soils: No cores taken but we suspect that soils are mostly just yellowish-brown Lakeland sand

Floristic composition (coverage for dominants, scientific name, common name):
(Due to some miscommunication, the upslope was not fully characterized.)

Canopy:

(6-7)	<i>Pinus palustris</i>	longleaf pine
(3)	<i>P. clausa</i>	sand pine

Subcanopy/shrub layer:

(5-6)	<i>Quercus geminata</i>	sand live oak
(8-9)	<i>Quercus laevis</i>	turkey oak

Herbs/ground cover:

(7)	<i>Aristida beyrichiana</i>	wire grass
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Site 4-2: The Longleaf-wiregrass upland to *Cliftonia* seep gradient

Location: Walton Co. – Niceville SE Quad. This is in the drainage of East Rocky Creek, south of MR201.

GPS: N 3385161, E 565650.

The suburbans stopped along a ridge and we hopped out of the trucks and into open longleaf-wiregrass woods that sloped steadily downward towards *Cliftonia* and *Cyrilla* dominated seeps (see Figure 1). The upslope canopy consisted of fairly old longleaf (one cored pine was 130+ years) pine, whereas the shrubs were predominantly deciduous oaks. The understory was heavy with wiregrass. Louis indicated that these slopes were of high “quality” since *Pityopsis graminifolia* was abundant. At Eglin, he stated, this plant is not found along roadsides and seems to be negatively sensitive to disturbance, unlike it is elsewhere. Towards the bottom of the pine slope *Ilex glabra* became more abundant than the oaks in the shrub layer. At the bottom where seepage was present, the vegetation shifted to wet, titi-dominated shrub and seep areas. Pond pine was distinctive in the canopy of this area. In the more open, less shrubby seep areas hydrophytes such as pitcher-plants and sundews were abundant.

The primary natural disturbance here is fire. The tree core indicated several fires within the recent past and several trees had easily identifiable fire-scars. Although the shrub layer oaks were generally abundant, some areas such as where we had departed from the vehicles were devoid of any small oaks. This patchiness of oak density might reflect the mosaic nature of fire in this habitat. A secondary disturbance that has a profound effect on the understory and soil of this area is the rooting and digging of feral pigs.

Soils: Entisolic (brownish-organic) ~0 to 10 cm top and then all spodosolic (sandy, grey with a little clay)

Floristic composition (coverage for dominants, scientific name, common name):

Cliftonia Seep:

Canopy:

Pinus serotina pond pine

Subcanopy/shrub layer:

(8-9) <i>Cliftonia monophylla</i>	black titi
<i>Ilex glabra</i>	gallberry
<i>Magnolia virginiana</i>	weetbay magnolia
<i>Myrica cerifera</i> var. <i>pumila</i>	dwarf wax myrtle
<i>Myrica heterophylla</i>	northern bayberry
<i>Persea palustris</i>	swampbay
<i>Quercus laevis</i>	turkey oak
<i>Vaccinium darrowii</i>	

Herbs/ground cover:

<i>Aletris</i> sp.	colic-root
<i>Andropogon</i> sp.	broomsedge
<i>Chaptalia tomentosa</i>	pineland daisy
<i>Drosera tracyi</i>	sundew
<i>Eriocaulon compressum</i>	pipewort
<i>Eriogonum tomentosum</i>	wild buckwheat
<i>Lachnocaulon (anceps?)</i>	bog-buttons
<i>Lupinus diffusus</i>	sky-blue lupine
<i>Lycopodium</i> sp.	clubmoss
<i>Pinguicula primuliflora</i>	butterwort
<i>Pityopsis aspera</i>	grass-leaved golden aster
<i>Pityopsis graminifolia</i>	
(6-7) <i>Sphagnum</i> sp.	
<i>Viola primulifolia</i>	primrose-leaved violet
<i>Xyris caroliniana</i>	yellow-eyed grass
<i>Pocosin/Bay Forest on South side of ridge:</i>	
<i>Cliftonia monophylla</i>	black titi
<i>Drosera capillaris</i>	pink sundew
<i>Ilex glabra</i>	gallberry
<i>Pleea tenuifolia</i>	
<i>Rhynchospora plumosa</i>	beaked-rush
<i>Sarracenia purpurea</i>	red pitcher plant (pink form)
<i>Sarracenia rubra</i>	red pitcher plant

Upper slope:

Canopy:

(6-7) <i>Pinus palustris</i>	longleaf pine
(3) <i>P. clausa</i>	sand pine
<i>Subcanopy/shrub layer:</i>	
(5-6) <i>Quercus geminata</i>	sand live oak
(8-9) <i>Quercus laevis</i>	turkey oak

Herbs/ground cover :

(8-9) <i>Aristida beyrichiana</i>	wire grass
<i>Anthaenantia rufa</i>	
<i>Baptisia hirsuta</i>	
<i>Dalea pinnata</i>	
<i>Hedyotis procumbens</i>	

Animal observed: Pocket Gopher

Site 4-3: Little Alaqua Creek – Home of the Okaloosa darter

Location: Walton Co. – Portland Quad. North and south side of bridge over Little Alaqua Creek along MR200/201.

GPS: N 3386046 E 572861.

After spending more than an hour at site 4-2, we loaded up and drove to this shallow stream where the endangered Okaloosa darter thrives. As mentioned previously, the entire range of this fish species is located within the several streams that drain the base. Additionally, the riparian areas of these streams provide corridors for black bears which have a population of about 70 within the base. We peered from the bridge into the waters and some descended to the stream edges to have a closer look.

The vegetation along this stream was dominated by titi shrubs. Other shrubs packed in as well to make this riparian band very thick although narrow.

Floristic composition:

Subcanopy/Shrub Layer:

<i>Cliftonia monophylla</i>	black titi
<i>Cyrilla racemiflora</i>	titi
<i>Hypericum</i> sp.	St. John's-wort
<i>Lyonia lucida</i>	fetterbush
<i>Myrica cerifera</i>	wax myrtle
<i>Myrica heterophylla</i>	northern bayberry

Herb/ground cover:

<i>Arundinaria gigantea</i>	switch cane
<i>Pinguicula primuliflora</i>	butterwort
<i>Viola primulifolia</i>	primrose-leaved violet
<i>Woodwardia aerolata</i>	netted chain fern

Site 4-4: New Home *Pleea*-dominated seepage slopes

Location: Walton Co. – Portland Quad. South side of MR200/201 near “New Home” on the west side of Blount Mill Creek.

Unlike site 4-2 where a text book version of the seep phenomenon could be observed, the seepage slopes here are extraordinarily unique. Typically, a seep such as that in site 1 forms at the base of a moderate to steep slope. Water from precipitation that has percolated through sand which overlies Citronelle and collected in an aquifer flows out from the ground at a fairly constant rate at the slope bottom. In Figure 1, it can be easily imagined that rain falling on the upper slope and ridge would quickly pass into the sands and then some time later, exit at the base of the slope. Site 4-4, however, is a much more subtle version of this. Instead of just one slope, there are several in this area that tilt mildly (< 30 degrees) into each other along a faint ridge. On the opposite side of the ridge, similar slopes drain off the ridge in the other directions. This composition of landforms allows for a rolling appearance. To differentiate these slopes even further, the vegetation is marked by the consistent presence of *Pleea tenuifolia*. Amongst the *Pleea* many other grass and herb species are abundant. Spread throughout the slopes were small clumps of shrubs and short pines. In the areas of the emerging seep water, more hydrophillic species were dominant such as *Drosera* spp., *Chaptalia tomentosa*, *Utricularia subulata* and *Sarracenia psittacina*. R. K. Peet exclaimed gleefully that a *Pleea*-dominated slope was to him “a totally foreign concept.”

The disturbance regimes of these slopes include both fire and feral pig destruction. The effect of fire in these slopes was strongly evident in the last slope visited at this site which had been burned recently (Feb. 18, 1997). Unlike the rather obviously diverse slopes we first walked through, the recently burned slopes were charred and poor in species. The abundance of sphagnum and wiregrass clumps was evident. Pig disturbance has much harsher effects on the soil and the herbs and grasses than fire. Large areas greater than 10 to 15 square meters had been fully churned over as if the area had been tilled with a tractor. The response of the vegetation to this disturbance was not clear, but it could be surmised that it would have significant detrimental effects.

Three slopes were visited at this site. The first two were juxtaposed on opposite sides of a the ridge and the third was to the east of the second. Only two of the three were well characterized, however.

Site 4-4A: The “Pig Pits” – An unburned *Pleea*-Seepage Complex

GPS: N 3386322, E 574583.

Soil: 0-10 cm a wet, organic sandy clay; >10 cm eluviated grayish sand

Floristic composition:

Canopy:

- | | | |
|-------|------------------------|----------------|
| (2-3) | <i>Pinus elliotii</i> | slash pine |
| (2-3) | <i>Pinus palustris</i> | long leaf pine |

Subcanopy/shrub layer:

- | | | |
|-----|-----------------------------------------------|-------------------|
| | <i>Castanea pumila</i> (or <i>alnifolia</i>) | chinquapin |
| | <i>Hypericum brachyphyllum</i> | St. John’s-wort |
| (2) | <i>Ilex glabra</i> | gallberry |
| | <i>Ilex vomitoria</i> | Yaupon holly |
| (2) | <i>Magnolia virginiana</i> | sweetbay magnolia |
| | <i>Persea</i> sp. | swamp or redbay |
| | <i>Vaccinium darrowii</i> | |

Herbs/ground cover:

- | | | |
|-------|------------------------------|-------------------------|
| (3-4) | <i>Andropogon</i> sp. | broomsedge |
| (8-9) | <i>Aristida beyrichiana</i> | wire grass |
| | <i>Centella asiatica</i> | pennywort |
| | <i>Chaptalia tomentosa</i> | pineland daisy |
| | <i>Drosera filiformis</i> | sundew |
| | <i>Drosera tracyi</i> | sundew |
| | <i>Eriocaulon compressum</i> | pipewort |
| | <i>Helenium brevifolium</i> | |
| | <i>Balduina uniflora</i> | |
| | <i>Panicum</i> sp. | |
| | <i>Pinguicula planifolia</i> | butterwort |
| (7-8) | <i>Pleea tenuifolia</i> | |
| | <i>Polygala lutea</i> | wild batchelor’s button |

	<i>Polygala nana</i>	wild batchelor's button
(3-4)	<i>Rhynchospora oligantha</i>	
	<i>Sarracenia psittacina</i>	pitcher plant
	<i>Utricularia subulata</i>	bladderwort
	<i>Xyris platylepis</i>	yellow-eyed grass
	Unidentified bryophyte	

Site 4-4B: Opposite side of ridge slope

Floristic composition:

Subcanopy/shrub layer:

<i>Ilex glabra</i>	gallberry
<i>Pinus palustris</i>	

Herbs/ground cover:

	<i>Coreopsis gladiata</i>	
	<i>Drosera filiformis</i>	sundew
	<i>Drosera tracyi</i>	sundew
	<i>Juncus effusus</i>	soft rush
(9)	<i>Rhynchospora oligantha</i>	
	<i>Rhynchospora</i> sp.	
	<i>Sarracenia flava</i>	yellow pitcher plant
	<i>Utricularia subulata</i>	bladderwort

Animals observed: a bevy of quail, a snake and a skink.

Reference:

Orzell, S.L. and E.L. Bridges. *Eriocaulon nigrobacteatum* (Eriocaulaceae), a new species from the Florida panhandle, with a characterization of its poor fen habitats. *Phytologia* 74:104-124.

Site 4-5: A drive-by of sand pine removal plots – one of TNC's research projects.

Location: Walton Co. - Plot 6B, south side of MR205 (FL282) and east of Alaqua Creek.

One of the research goals of TNC's efforts on the base is the restoration of longleaf-wiregrass communities. With fire suppression and other past management practices, much of the original longleaf communities are now sand pine dominated communities. In the restoration efforts, therefore, they attempt to determine which sand pine eradication and longleaf groundcover vegetation method is most effective. At this site, we observed one of the treatments in this comparative sand pine removal method experiment.

This treatment was the full removal of all trees followed by burning of a large area. For this particular experiment, the other treatments included similar removal but in smaller-sized areas. Within the treatment area, many 10m x 40m plots were

established in which plant species and coverage and soil chemistry were measured with the overall focus of seeing how sand pine reinvades. The preliminary conclusion appears to be that the larger area treatments have less sand pine reinvansion than the treatments of smaller areas.

At the time, most of the vegetation consisted solely of *Dicanthelium* and other weedy and early successional species. Eventually, *Andropogon* is expected to establish dominance. This will then provide a satisfactory pyrogenic medium for the subsequent community which they hope will be fire-maintained. The southeastern corner of this plot has a disjunct population of *Calamintha dentata*.

Lunch: After viewing site 4-5 briefly, we loaded up and sped to a picnic area next to the Choctawhatchee Bay (a once freshwater but, now, thanks to the army, brackish water bay). For lunch, we ate tasty sandwiches and fine cookies. Upon exit, Phil backed into a tree.

Site 4-6: "Burn me" Flatwoods

In an attempt to find some decent pine flatwoods, we backtracked about a mile and pulled off on the north side of the highway and hurdled the drainage ditch along side of it. The site was dominated in the canopy by slash and longleaf pines, and the understory was packed with shrubbery. A cleansing by fire might have been worthwhile here. The soils were sandy and coarse.

On the way back to the vans, a member of the Mayaceae was visited in the drainage ditch. This was a new family for the trip.

Floristic composition:

Canopy:

<i>Pinus clausa</i>	sand pine
<i>Pinus elliottii</i>	slash pine
<i>Pinus palustris</i>	long leaf pine

Subcanopy/shrub layer:

<i>Ilex glabra</i>	gallberry
<i>Ilex vomitoria</i>	yaupon holly
<i>Lyonia lucida</i>	fetterbush
<i>Magnolia virginiana</i>	sweetbay magnolia
<i>Persea</i> sp.	swamp or redbay
<i>Serenoa repens</i>	saw palmetto
<i>Vaccinium elliottii</i>	blueberry

Herbs/ground cover:

<i>Andropogon</i> sp.	broomsedge
<i>Drosera capillaris</i>	sundew
<i>Lachnocaulon anceps</i>	bog buttons
<i>Polygala lutea</i>	wild batchelor's button
<i>Polygala nana</i>	wild batchelor's button

<i>Smilax</i> sp.	greenbriar
<i>Utricularia subulata</i>	bladderwort
<i>Viola primulifolia</i>	primrose-leaved violet
<i>Vitis rotundifolia</i>	grape
<i>Roadside ditch vegetation</i>	
<i>Bacopa caroliniana</i>	blue hyssop
<i>Bacopa monnieri</i>	
<i>Mayaca fluviatilis</i>	bog-moss
<i>Mikania chordifolia</i>	

Animals observed: ruby-throated hummingbird

Site 4-7: Scrub oak and sand pine scrub – the search for the snow-white sands.

Location: Walton County; Destin Quadrangle. FL 20 along east side of Little Trout Creek and north of Villa Tasso.

GPS: N 3371064, E558455.

Scrub can often be located by its anthropogenic indicators: junk piles, garbage, old refrigerators. Thus, as we hustled along the perimeter of the base in search of our first visit to real scrub, we stopped at a typical pile of refuse near a two track and headed into the scrub. Louis had previously visited this area and found a very interesting spot within the scrub that had pure white sand and a few plant species not found anywhere else in that particular area. So we pushed through these woods looking for that spot. Although the spot was not found, we did receive an adequate introduction to Florida scrub.

The canopy in this area was dominated by sand pine, whereas the shrub-layer consisted of significantly dense evergreen oaks. The ground cover was sparse but unique in being dominated by crunchy mats of mint-green and grey reindeer lichen. The density of the shrub and tree vegetation made for hard foot travel and would not be a place to easily hunt quail with a shotgun. Besides the fact that quail don't live in these habitats, getting a shot off in a place like this would be impossible. The presence of the pastel-like lichen covering the ground, though, provided a surreal, snowy feel.

Unlike many scrubs, fire evidence was not common and there was some discussion as to the degree to which fire plays a role in this system. Hurricane damage, however, was strongly evident. Snapped trees and clogs of brush and fallen wood were abundant trademarks of the most recent hurricane. Other disturbances here include the dumping of garbage but most of this was relegated to the immediate areas adjacent to the entrance roads.

Floristic composition:

Canopy:

(7-8) *Pinus clausa* sand pine

Subcanopy/shrub layer:

Ilex opaca american holly

Magnolia virginiana sweetbay magnolia

Persea borbonia red bay

(7) *Quercus geminata* sand live oak

(7) *Quercus myrtifolia* myrtle oak

(5-6) *Serenoa repens* saw palmetto

(5) *Vaccinium arboreum* Sparkleberry; tree blueberry

Herbs/ground cover:

(5) *Chrysoma pauciflosculosa*

(8) *Cladonia* sp. reindeer lichen

(5) *Conradina canescens* conradina

Croton argyranthemus silver croton

Pteridium aquilinum bracken fern

Smilax sp. greenbriar

Animals observed: osprey, kingfisher

Site 4-8: Log-truck Hill and the Riparian *Pieris*

Location: Okaloosa Co. – Spencer Flats Quad. North side of MR124D along Blue Spring Creek.

GPS: Parking spot N 3392701, E 552119; near one patch of *Pieris* -- N 3392859, E552396.

In hopes of finding an allegedly interesting depression/pond, we travelled far into an obscure section of the base. This depression, or pond, was in theory adjacent to one of the base's many streams. The pond (Kemmons Pond) was of interest since unique flora supposedly encircles its perimeter. In this case, the map indicated that it was three streams east of a particular crossroads. As we approached the crest of the third stream valley, we encountered several logging trucks that impeded our passage to the bottom. After some negotiation, we pulled off to the side of the road, parked, looked at the logs being hauled off to the sawmill, and then headed down to the stream. The objective was to find the pond. But the pond was not present.

To the delight of hungry botanists, however, a rare finding mediated the absence of the desired objective. *Pieris phillyreifolia*, a commonly climbing shrub typically associated with cypress in bay swamps or sinkhole depressions, was growing most interestingly as a dense groundcover with no *Taxodium* trunk within sight. To the untrained eye, these abundant clumps of plants would have been quickly passed by as just another ericaceous shrub. To skilled botanists, however, this riparian population was a marvel to ponder, examine and photograph.

The knee-high thickets of this *Pieris* extended along the thin ecotone between the upland slash pine community (now well logged) and the *Cliftonia* and *Serenoa* dominated stream edges. Both sides of the stream we walked contained abundant patches of *Pieris*. While most of the group examined the flora, a few went further to see if the pond could be located. From a small ridge, they could see that the pond was nowhere near, so we headed back towards the vehicles by way of the clear-cut. The rumble of skidders and semis accompanied our pace.

Floristic composition:

Canopy:

Pinus palustris Longleafy pine

Subcanopy/shrub layer

Cliftonia monophylla black titi
Crataegus lacrimata weeping crataegus
Ilex glabra gallberry
Lyonia lucida fetterbush
Magnolia grandiflora bullbay magnolia
Quercus spp. oaks
Serenoa repens saw palmetto
Vaccinium spp. blueberries

Herbs/ground cover:

Arundinaria gigantea cane
Calamintha coccinea
Cnidioscolus stimulosus bull-nettle, mala mujer
Conradina canescens conradina
Pieris phillyreifolia
Pinguicula primuliflora butterwort
Pteridium aquilinum bracken fern

{After departing from the *Pieris* and dropping off Louis and LeRoy back at the TNC trailers, we headed for the Gulf shore dunes on Santa Rosa Island. With the sun slowly dropping off to the west, some were more excited about swimming in the gulf than examining dune vegetation.}

Site 4-9: Okaloosa Area of the Santa Rosa Island National Seashore

Location: Okaloosa Co. – Fort Walton Beach Quad. Santa Rosa Island, north side (Choctawhatchee Bay side of spit) of US98 and southeast of Fort Walton Beach.

On the spit side of the dunes, the vegetation inhabits the open sand sparsely except for patches of sea oats and colonies of *Hydrocotyle* which spread prostrate and plentifully along the sand. The majority of the vegetation, though, existed together on the scrub mounds or dune swales that collectively made the sandy landscape more heterogeneous. The scrub mounds were dominated by sand pine and a handful of shrubs such as scrub oaks, bays and scrub rosemary. Interesting herbs hid in the various crannies of the mound. The swales were predominantly herbaceous in vegetation with combinations of herbs, grasses and vines forming

dense patches.

Disturbance at these dunes would likely be results of extreme weather. Wind would constantly be an environmental variable that would likely shape much of the morphology of both the landscape and many of the larger statured plants such as pines. Sea spray might also be a significant component of the environment to which the biota of these areas must adapt. Tidal actions and periodic storms and hurricanes would have more drastic affects with the variety of moisture and morphological rearrangements that commonly result from these forces. Indeed, we are told that the entire eastern end of the island was essentially swept clean of dunes and vegetation by Hurricane Opal.

Floristic composition:

Canopy:

(3-4) *Pinus taeda* loblolly pine

Subcanopy/shrub layer:

(2) *Ceratiola ericoides* scrub rosemary
(2) *Ilex vomitoria* yaupon holly
(2) *Magnolia grandiflora* bullbay magnolia
(2) *Myrica cerifera* wax myrtle
(2) *Persea borbonia* redbay
(3) *Quercus geminata* sand live oak
(3) *Rubus trivialis* southern dewberry

Herbs/ground cover:

Cakile constricta sea-rocket
Capsella rubella
Centella asiatica pennywort
(2) *Cnidioscolus stimulosus* bull-nettle, mala mujer
(2) *Conradina canescens* conradina
Gaillardia aestivalis
Helianthemum arenicola rock-rose, sun-rose
(5) *Hydrocotyle umbellata* marsh pennywort
(1) *Linaria floridana*
(1) *Oenothera* sp. evening primrose
(2) *Physalis angustifolia* sand ground-cherry
Polygonella polygama jointweed
Smilax auriculata catbrier
Uniola paniculata sea oats
(2) *Vitis* sp. grape

Swale vegetation:

(4) *Cuscuta* sp. dodder, love-vine
(4) *Distichlis spicata* saltgrass
(5) *Juncus* sp. rush
Spermolepis echinata
(6) *Spartina patens* marshhay cordgrass, saltmeadow

Many members of the excursion, crossed the highway and went swimming while the final botanizing was conducted. Upon the completion of the botany, all members gathered at the gulf shore. Many swam. Phil showed off his skivvies. Small rays broke the surface. The sun went down.

After a change of clothes, we ate dinner at the Royal Orchid (864-3344; along FL 85, north of the Cinco Bayon Bridge) in Niceville. Delicious Thai cuisine that came highly recommended lived up to its recommendation. After this fine meal, we returned to our campsite and promptly went to bed.

Literature:

Provencher et al. 1997. Initial Post-Treatment Analysis of Restoration Effects on Plants, Invertebrates, and Birds in Sandhill Systems at Eglin Air Force Base, Florida. Annual Report to Natural Resources Division, Eglin Air Force Base, Niceville, FL.

Provencher et al. 1996. Pre-Restoration Analysis of Plants, Invertebrates, and Birds in Sandhill Systems at Eglin Air Force Base, Florida. Annual Report to Natural Resources Division, Eglin Air Force Base, Florida.

Rodgers, H.L. and L. Provencher. 1997. Analysis of sandhill vegetation of a Northwest Florida Military land. Manuscript.

Eglin Air Force Base – West Side

{The early (pre-dawn) morning, our second at Karick Lake, greeted us with gray, foreboding skies, a portent of weather to come later in the day. We managed to gulp down breakfast (and for some, Jon's (aka Mangrove Man's) excellent coffee) in time to depart by 6:30 in order to meet Louie by 7:00 at the TNC mobile home. LeRoy was unable to accompany us this day, but once again we left #297 behind and piled into the remaining 'Burbans and Louie's truck.}

Local Guide: Louis Provencher

Recorders: Rebecca Brown and Philip P. Coulling

Site 5-1: Floating Pitcher Plant Bog

Location: Okaloosa Co. – Holt SW Quad. From Crestview, proceed south on FL85 to FL123. Drive south on 123 until it intersects again with FL85. Continue south on 85 to FL 189. Drive west on 189 to Eglin MR234. Follow 234 to Live Oak Creek. North side of road is restricted.

Our first stop of the day was a brief one to see the floating pitcher plant (*Sarracenia leucophylla*) bog near Live Oak Creek. Such bogs, characterized by a floating mat of pitcher plants on the surface of the water, are chiefly restricted to the Florida panhandle. At this site *Sarracenia* shared dominance with *Orontium*. Along the water's edge grew *Magnolia virginiana*, *Cliftonia*, and *Lyonia*. This stop also

afforded our first glimpse of *Chamaecyperus thyoides* on the trip. Various members of the PGE clambered through the vegetation and waded into the water to obtain the ideal angles for photographs. Bob nearly left Clewell on a branch, but it was dutifully and successfully retrieved.

Species Composition:

Bog:

Eriocaulon sp.

Chamaecyperus thyoides

Cliftonia monophylla

Dulichium arundinaceum

Magnolia virginiana

Nymphaea sp.

Orontium aquaticum

Sarracenia leucophylla

Margin:

Lyonia lucida

Osmanthus americanus

Pieris phillyreifolia

Rhododendron serrulatum (?)

Smilax pumila

Upland:

Andropogon virginicus

Chamaecyperus thyoides

Pinus palustris

Quercus laevis *Quercus myrtifolia*

Serenoa repens

Smilax bona-nox

Tradescantia hirsutiflora

Yucca filamentosa

Pteridium aquilinum

Quercus geminata

Quercus hemisphaerica

Site 5-2: Patterson Natural Area

Location: Okaloosa Co. ; Navarre Quadrangle. Plot 2C, bisected by NS ruining road east of Prairie Creek. North of MR676.

We next drove through the Patterson Natural Area (PNA), an extensive section of old-growth longleaf pine flatwoods containing individuals 300-400 years old. Eglin supports perhaps the largest extent of longleaf pine systems on public land in the country, and the PNA is arguably the largest single stand of "relatively undisturbed" longleaf (> 420 ha -- proponents of the Wade Tract may differ in opinion). Although the area has never been clearcut, stand thinnings have occurred. The area likely escaped the intense disturbance associated with turpentine and grazing. The PNA supports a dense population of red-cockaded woodpeckers (RCWs). We passed through stands of various ages, including one that had evidently experienced a very intense fire fairly recently, as indicated by the numerous dead trees and the abundance of *Andropogon*. We also passed a former old field with abundant small pine seedlings. We drove past flatwoods containing a mixture of longleaf and slash pines, with abundant *Serenoa repens* in the ground layer and some evidently wetter areas with taller *Cliftonia*. The zoologically inclined noted a white-tailed deer

(*Odocoileus virginianus*). All this driving instead of stopping was necessitated by the narrow window of availability of the region before the helicopter Gatling Gun practice scheduled for 11:00 am.

We stopped in Range 78, plot 2C. We had not been able to visit this site the day before, as it was classified as “hot,” and even now were not allowed to take photographs. (Plant specimens, increment borings, soil samples, GPS coordinates OK, but no pictures.) We can arbitrarily divide this site into two units, separated by the road.

Site 5-2A: East side of Road; Upland with Lakeland soils.

GPS: N 3371223, E 521136.

This site contains old-growth longleaf pine, some individuals of which have been cored by Bill Platt (the current boss of our dearly departed lab mate, Geum Decoster). The stand supports the highest local species richness observed at Eglin, with up to 60 species / 0.5 x 2 m plot. At a larger spatial extent, Provencher *et al.* (1996) found values of > 260 spp. from 36 subsampled 200-acre (91-ha) plots, with richness values of 66-123 spp. / 12,800 m² in fire-suppressed and in otherwise disturbed plots, and 77-154 spp. / 12,800 m² in frequently burned savannas. Some selective logging had occurred at this site, and the eye of Hurricane Opal hit the stand in 1996 as evidenced by scattered snags and a few snapped-off individuals. A soil profile revealed mesic, coarse undifferentiated yellow sand of the Lakeland series. Pine seedlings and saplings were both notably sparse, although scattered longleaf individuals still in the grass stage did occur. There was no evidence for the clumped recruitment distribution observed at the Wade Tract. We cored two longleaf individuals, aged 280+ yr (43 cm dbh) and 220+ yr. Numerous individuals had flat-topped crowns characteristic of older trees that have lost apical dominance. Some coarse woody debris (CWD) was present, consisting of almost as much oak as pine.

Species dominance was patchy and heterogeneous in space and perhaps in time as well. Five reasonably distinct cover types were identifiable: (a) *Serenoa repens*, (b) *Vaccinium darrowi*, (c) *Schizachyrium scoparium* - *Pityopsis*, (d) *Aristida beyrichiana* - *Pityopsis*, and (e) *Quercus minima*. (Cover values on the species list below represent average cover across the site and do not reflect locally higher cover). A transition zone occurred in which *Aristida* was replaced by *Schizachyrium* and *Andropogon gyrans* and oak cover decreased. In general, higher grass cover indicates a shorter fire return interval, and higher cover of oaks and other shrubs (e.g., *Serenoa*) indicates a somewhat longer fire return interval. Such local variation, however, may reflect microsite conditions or past fire edges more than local variation in fire frequency.

Site 5-2B: West side of Road; Upland with Troupe soils, and a shallow swale.

GPS: N 3370998, E 520623.

The stand on the other side of the road experienced a hot fire in 1993 and contained many more pine seedlings and few old trees. More intense selective logging probably occurred in this stand. This stand also contained more large *Quercus laevis* (10-20 cm dbh). Several pines were snapped off at 1-2 m height, likely the result of Opal, and CWD appeared higher. We aged one longleaf at ca 150 yr., with obvious growth release 70-yr. BP. We also observed a RCW cavity tree with *Q. hemisphaerica* and *Smilax bona-nox* growing on it.

The ground cover oaks, largely of fire sprout origin, continued to cause taxonomic difficulties. We debated the relative merits of *minima* vs. *geminata*, while also pondering the possibility of *hemisphaerica*. Nevertheless, some spatial patterns were evident, such as higher oak cover, as well as *Serenoa* and *Gaylussacia dumosa* on slightly elevated areas, and more abundant *Aristida* and *Schizachyrium* on lower elevations. We also observed *Aristida mohrii*, a Florida endemic. The challenges of keying out sterile graminoids prompted the following exchange.

Bob: "Is there sex?"

Linda: "There's leftovers."

Bob: "We'll take the leftovers."

As we moved "downhill" (elevation change of ca 1.5 m) towards a swale, we crossed from the Lakeland sand to the Troupe series, characterized typically by a spodic horizon within 2 m. A soil sample revealed higher silt and clay content and a slight O horizon. Below ca 60 cm was wet, more finely textured sand.

The transition zone to the swale supported a higher density of mature longleaf. *Calamovilfa curtissii* (which we saw on our last trip to Florida, at Kennedy Space Center) dominated the treeless swale itself, with *Serenoa* and *Ilex glabra* on the margin. *Calamovilfa curtissii* has a discontinuous populations on the Atlantic coast of Florida and in the panhandle. The closely related sister species, *C. brevipilis*, occurs on the coastal plain of North Carolina and in the New Jersey Pine Barrens. A moist opening was present at the lowest point of the swale. On the south side was a dense clump of *Q. laevis* with *Schizachyrium*.

Lakeland Series Soils:

<i>Andropogon gyrans</i>	<i>Croton argyranthemus</i>
<i>Eriogonum tomentosum</i>	<i>Desmodium strictum</i>
<i>Aristida beyrichianum</i> (7)	<i>Dichantherium</i> spp.
<i>Aristida mohrii</i> (endemic)	<i>Eryngium yuccifolium</i>
<i>Aristida purpurescens</i>	<i>Eupatorium album</i>
<i>Aster adnatus</i>	<i>Galactia floridana</i>
<i>Aster linariifolius</i>	<i>Gaylussacia dumosa</i> (5)
<i>Aster tortifolius</i>	<i>Helianthemum carolinianum</i>
<i>Ceanothus microphyllus</i> (locally 4-5)	<i>Hedyotis procumbens</i>
	<i>Hypericum suffruticosum</i>

Lechea sessiliflora
Lespedeza intermedia (?)
Liatris sp.
Myrica cerifera (var. *pumila* ?)(4)
Opuntia humifusa
Phlox nivalis
Pinus palustris (6) (300-400 years old)
Pityopsis aspera
Pityopsis graminifolia (2 sp = 5)
Pteridium aquilinum (4)
Quercus geminata (locally 6)
Quercus incana
Quercus laevis (4-5)
Quercus margaretta
Quercus minima (8)
Quercus myrtifolia

Quercus pumila (3)
Rhynchospora grayi
Sabal palmetto
Serenoa repens (6)
Schizachyrium scoparium (4-5)
Schrankia microphylla
Scleria ciliata
Scutellaria sp.
Smilax auriculata
Smilax bona-nox
Solidago odora
Sporobolus junceas
Tradescantia hirsutiflora
Tragia smallii
Vaccinium darrowii (4)
Viola septemloba
Yucca filamentosa

Higher Pine density area with Troupe Soil:

Andropogon gyrans
Andropogon ternarius
Andropogon virginicus
Aster adnatus
Chamaecrista sp.
Elephantopus elatus
Hypoxis junceas
Panicum variegatum
Phlox nivalis

Pterocaulon pycnostachyum
Quercus chapmanii (?) (Despite Louis) *Quercus margaretta* (with gall)
Schizachyrium scoparium
Tephrosia mohrii (?)
Vaccinium arboreum

Depression clearing:

Andropogon capillipes - wettest
Calamovilfa curtissii - mid
Dichanthelium sp (= ensifolium?) - mid
Eupatorium recurvans – mid
Ilex glabra - edge

Lachnocaulon minus
/beyrichianum
Rhynchospora sp. – mid
Serenoa repens - edge
Xyris caroliniana - edge

Site 5-3: East Bay Flatwoods – Wet Site

Location: ON the west side of the road south from Patterson, outside the danger area.

GPS: N 3266373, E 521840.

Our next stop was brief but exciting, as we were treated to the defensive (?) display of a well-camouflaged bittern, which captured our attention for some 10 or 15 minutes. *Andropogon*, *Ilex glabra*, *Hypericum*, *Cliftonia* and *Magnolia virginiana* dominated a seepage area adjacent to the road. Almost all longleaf individuals exhibited fire scars, except for the smallest trees in the lowest, wettest portion of the seep. Beyond were perhaps natural slash pine flatwoods, which are probably seasonally wet, with *Ilex* and *Cliftonia* as important associates

Also at this stop Ken's botanical curiosity was rewarded by an attack of yellowjackets.

By road (higher ground):

Cliftonia monophylla
Gelsemium rankinii

Ilex glabra
Smilax auriculata

In the wet area:

Eriocaulon sp.
Centella asiatica
Dichantherium
Hypericum (2 spp.)
Lycopodium alopecuroides
Magnolia virginiana
Myriophyllum sp.
Panicum sp.
Pinus palustris

Pinus elliottii
Rhynchospora sp. (dominant)
Sarracenia flava
Sarracenia leucophylla
Scleria sp.
Smilax laurifolia
Sphagnum sp.
Xyris sp.

Site 5-4: East Bay Flatwoods -- Higher Longleaf Pine

Location: Okaloosa Co. – Navarre Quad. East side of MR259 on south edge of East Bay Swamp.

GPS: N 3366093, E 522473.

Next we stopped at some higher elevation longleaf flatwoods with a titi dome in a depression. The area had burned quite recently, perhaps within a week. Five vegetation zones were recognized. These were (in order from road to depression) (a) *Aristida beyrichiana* (cover = 5) - *Serenoa repens* (6) – *Pityopsis graminifolia*, (b) *Calamovilfa curtissii* (6), (c) *Ilex glabra* (8), (d) *Sphagnum* (6) - *Eriocaulon compressum* ? (6), and (e) *Cyrilla* (8? 9?). Additional cover values accompany the following species list. Cover was difficult to estimate due to the recent fire. There were crayfish mounds throughout.

Flatwood:

Eriogonum tomentosum
Aristida beyrichiana (4)
Calimovilfa curtissii (candidate sp)

Carphephorus odoratissimus
Helianthus radula (3)
Ilex glabra (7) (burned black)
Opuntia sp.
Pinus palustris (6)
Pityopsis graminifolia
Quercus laevis (5)
Serenoa repens

Wetter Flatwood:

Eriocaulon compressum (6)
Chaptalia tomentosa
Drosera tracyi
Helianthus radula
Ilex glabra

Lyonia lucida (6?)
Rhynchospora (dominant)
Sphagnum sp. (6)
Xyris ambigua

Shrub Dome:

Eriocaulon compressum
Cliftonia monophylla (8? 9?)
Drosera sp.
Gaylussacia dumosa (*frondosa*)
Ilex glabra
Lachnocaulon sp.

Lycopodium sp.
Lyonia lucida
Magnolia virginiana
Myrica inodora
Sarracenia purpurea var.
Smilax laurifolia

Site 5-5: East Bay Flatwoods – Dry Site

Location: Okaloosa Co. – Navarre Quad. West side of MR259 and north of Wynnehaven beach.

GPS: N 3365253, E 522042.

This site proved to be quite interesting. The stop began as a seemingly brief one with more xeric longleaf flatwoods on Lakeland series sand. But some of the more astute botanists noticed what appeared to be a depression in the distance that was entirely treeless and supported an apparent monoculture of some shrub. Bob, displaying little faith in the long-distance botanizing abilities of his students, doubted their postulated identification of *Hypericum* and dispatched Pete for a brief reconnaissance. Pete reported the occurrence of *Hypericum* and we all ventured out to investigate the depression. We identified the species as *H. chapmanii* (8), which grew up to 2 m tall. Also present and locally abundant was *Ilex myrtifolia* (6, but locally higher). *Pinguicula planifolia* (3) abounded in the wetter areas. (Where was Geum to appreciate the veritable plethora of *Pinguicula* on this trip?) Wiregrass was absent.

Longleaf pine, *Aristida*, *Serenoa*, and various oaks (which continued to present taxonomic difficulties) dominated the flatwoods portion. *Ilex glabra* was locally

abundant, particularly near the transition from flatwoods to depression, where it achieved a cover of 7. We also observed *Lophiola*, which like *Pleea* exhibits an interesting distribution with largely continuous presence in wet savannas across the Gulf Coast to the Apalachicola N.F., then isolated populations in the outer coastal plain and sandhills of North Carolina.

The site possibly burned 2-3 months ago. Although the stand contained several flat-topped pines, the only tree we cored was dated at 85+ years. A soil profile revealed wet, black sand that became muckier and sandier with depth and water at 60-70 cm. In the narrow zone of transition to *Hypericum*, we observed only ca 6 cm of black, organic sand, with gray, moist sand below, wetter than the upland Lakeland.

Flatwoods:

<i>Agalinis</i> sp.	<i>Opuntia</i> sp.(with gopher tortoise bites)
<i>Andropogon virginicus</i> var. <i>glauca</i>	<i>Polygala nana</i>
<i>Aristida beyrichiana</i> (8)	<i>Quercus geminata</i>
<i>Cladina</i> sp. (reindeer moss)	<i>Quercus laevis</i> (5)
<i>Conradina</i> sp.(3)	<i>Quercus minima</i>
<i>Crataegus</i> sp.	<i>Quercus pumila</i> (6)
<i>Gaylussacia mosieri</i>	<i>Serenoa repens</i> (6)
<i>Helianthus radula</i> (3)	<i>Vaccinium corymbosum</i>
<i>Ilex vomitoria</i>	<i>Viola septemloba</i>
<i>Lyonia lucida</i>	<i>Xyris caroliniana</i>
<i>Pinus palustris</i>	

Gradient zone:

<i>Ilex decidua</i>	<i>Ilex glabra</i> (7)
	<i>Rhexia</i> sp.

Wetter Depression Area:

<i>Aristida</i> sp.	<i>Lophiola americana</i>
<i>Dichanthelium</i> sp.	<i>Pinguicula planifolia</i> (3)
<i>Drosera</i> sp.	<i>Rhynchospora</i> sp.
<i>Eriocaulon compressum</i>	<i>Xyris ambigua</i>
<i>Eriocaulon lineari</i>	<i>Xyris caroliniana</i>
<i>Hypericum chapmanii</i> (8)	
<i>Ilex myrtifolia</i> (6, locally higher)	

Wettest:

<i>Aristida</i> sp.	<i>Ilex glabra</i>
<i>Hypericum chapmanii</i>	<i>Pinguicula planifolia</i>
<i>Ilex decidua</i>	

The roads became a bit rougher as we drove on toward our lunch destination. The deep (but dry) sands of the previous day gave way to water-filled ditches and undulating topography. A detour around one such ditch caused the antennae to become dislodged from their upright (but not fully locked) positions atop the 'Burbans. After order (and communication) had been restored, the following

exchange took place between #67 and #71, reprising dialogue from earlier in the week.

Pete: "We are erect."

Bob: "It's good to be erect, at least while driving in."

With respect to the undulating topography, however, we were not so lucky. Pete, fearlessly in command of the wheel in #67, took one bump with full force, causing the coolers in the back to fly into the air. The plastic cooler landed hard on the styrofoam cooler, the latter evidently transferring all its energy to the former, which flew across the back seat nearly striking Rickie and Skye in the back of their heads. The styrofoam cooler suffered fatal injuries as we soon discovered. The top was cracked and water spilled into the back of the van (where it was soaked up by ever creative Chris using newspaper remnants). We ate (no need to worry about leftovers) amid a stand of mature *Chamaecyperus* off MR211 on the west side of the base just north of Boiling Creek, with the rapport of Gatlin gunfire in the distance.

Chamaecyperus thyoides
(forest)
Nymphoides indica

Orontium aquaticum
Sarracenia leucophylla
Woodwardia areolata

Site 5-6: Wet Prairie, Whitmier Island

Location: Santa Rosa Co. – Harold SE Quad. Middle of Whitmier Island and south of MR717 which traverses the "island". [GPS UTM 3384741 N, 512558 E]

The road to Whitmier Island was also paved, so to speak, with adventure. After passing the turnoff to the alluring and enigmatic "Chez Whitmier," we again encountered deep water. Although Louie passed through without difficulty, Bob stopped short and got out for an empirical investigation. He waded in to search for the shallowest passage, reminding the senior author of a less successful venture to the Croatan many years ago. Both 'Burbans slogged through without trouble, the passengers enjoying themselves thoroughly.

We stopped at a wet, largely treeless prairie that possibly lies in the greater floodplain of the Yellow River. *Aristida* (8), *Ctenium* (5), *Eriocaulon* (4), *Ilex glabra* (3), and *Lycopodium* (2) dominated the site, with scattered individuals of *Taxodium ascendens* (locally 6) and *Pinus elliotii* (5). We also observed *Bartonia verna*, a rare gentian relative. A distinct depression was dominated by *Cyrilla*, *Cliftonia* and *Magnolia virginiana*.

The soil near the depression was characterized by an upper 10 cm of organic silty sand; followed by ca 20 cm of finer-textured, gray clayey sand; and finally yellow clayey sand with higher clay content. This finer, siltier sand is more similar to soils in the Apalachicola National Forest than to typical Eglin soils.

Prairie:

<i>Andropogon</i> sp.	<i>Pinguicula lutea</i>
<i>Aristida beyrichianum</i> (8)	<i>Pinus elliotii</i> (5)
<i>Aronia arbutifolia</i>	<i>Polygala lutea</i>
<i>Agalinis</i> sp.	<i>Polygala ramosa</i>
<i>Bartonia verna</i>	<i>Pteridium aquilinum</i>
<i>Bigelovia nudata</i>	<i>pseudocaudatum</i>
<i>Carphephorous pseudoliatrus</i>	<i>Quercus geminata</i>
<i>Chaptalia tomentosa</i>	<i>Rhexia alifanus</i>
<i>Coreopsis gladiata</i>	<i>Rhexia leutia</i>
<i>Ctenium aromaticum</i> (5)	<i>Rhynchospora chapmanii</i>
<i>Dichanthelium</i> sp.	<i>Sarracenia flava</i>
<i>Drosera rotundifolia</i>	<i>Sarracenia leucophylla</i>
<i>Erigeron vernus</i>	<i>Sarracenia psittacina</i>
<i>Eriocaulon compressum</i> (4)	<i>Sarracenia rubra</i>
<i>Helenium vernale</i>	<i>Scleria</i> sp.
<i>Helianthus heterophyllus</i>	<i>Smilax laurifolia</i>
<i>Hypericum</i> sp.	<i>Sphagnum</i> sp.
<i>Ilex glabra</i> (3)	<i>Taxodium ascendens</i> (locally 6)
<i>Ilex myrtifolia</i>	<i>Utricularia</i> sp.
<i>Ilex opaca</i> (near road)	<i>Vaccinium fuscatum</i> (?)
<i>Liquidambar styraciflua</i>	<i>Viburnum nudum</i>
<i>Lycopodium alopecuroides</i> (2)	<i>Xyris ambigua</i>
<i>Magnolia virginiana</i>	

Dome:

<i>Eriocaulon compressum</i>	<i>Sarracenia flava</i>
<i>Cyrilla racemiflora</i>	<i>Smilax laurifolia</i>
<i>Ilex coriacea</i>	<i>Sphagnum</i> sp.
<i>Magnolia virginiana</i>	<i>Taxodium ascendens</i>
<i>Pinus elliotii</i>	

Site 5-7: Dry Flatwoods without *Aristida*

Location: Okaloosa County; Floridale Quadrangle

GPS: N 3388490, E 520485.

Bob, ever engaging in his pursuit of wiregrass -- and its vacant niche on the landscape -- was interested in examining some dry flatwoods that lacked *Aristida beyrichiana*. Southern wiregrass has an interesting distribution in this part of the Gulf Coastal Plain. Although found in nearly every county in Florida (and present in all three counties spanned by Eglin), it much more sparse west of the Apalachicola River. *Aristida* occurs no farther north in Alabama than four of the counties bordering Florida, and it has been verified in only the most southeastern Mississippi county (Peet 1993). Farther west and north the dominant grasses of longleaf stands are typically one or more species of *Schizachyrium* and *Andropogon* (Harcombe *et al.*

1993). The composition of forbs, however, is usually more similar between eastern and western longleaf stands. Preliminary vegetation analysis suggests that Eglin stands are intermediate in ground-layer composition between these eastern and western phases (Provencher *et al.* 1996).

We stopped briefly at a longleaf pine - turkey oak stand in which much of the turkey had been killed by a very intense fire. Nevertheless, this species continued to dominate the site (cover = 7), with *Pinus palustris* (6) as a co-dominant. *Schizachyrium* and *Andropogon* dominated the ground layer, together attaining cover of 5. Other common ground-layer associates were *Yucca filamentosa*, *Vaccinium darrowii*, and *Quercus geminata*. We also noticed the absence of *Chrysoma*.

<i>Andropogon virginicus</i>	<i>Pinus palustris</i> (6)
<i>Aristida mohrii</i>	<i>Quercus geminata</i>
<i>Aristida purpurescens</i> (?)	<i>Quercus laevis</i> (7)
<i>Balduina angustifolia</i>	<i>Schizachyrium scoparium</i>
<i>Cnidocolus stimulosus</i>	<i>Smilax bona-nox</i>
<i>Crataegus lacrimata</i>	<i>Sporobolus junceus</i>
<i>Croton</i> sp.	<i>Tradescantia hirsutiflora</i>
<i>Dichanthelium</i> sp. (hybrid)	<i>Vaccinium darrowii</i>
<i>Lupinus diffusus</i>	<i>Yucca filamentosa</i>

{Back in the 'Burbans, it was obvious that the trip was beginning to wear on some folks. Fatigue had set in (did we really leave the campsite at 6:30 this morning?) and many of the PGE participants had especial difficulty staying awake during our last minutes touring Eglin. The still conscious occupants of #67 amused themselves by noting Steve's various head positions while sleeping or by attempting to toss jellybeans into Rickie's slightly ajar mouth as he dozed. Even Bob began to show some signs, perhaps, of over-botanizing. The following is a transcript of his CB transmission after leaving Site 7.

Bob: "Nowhere along where we've been driving do you get any *Aristida stricta*, *beyrichiana*. Whatever -- wiregrass."

We returned to the TNC trailer, thanked Louie for his generous and educational guidance through Eglin for two days, fired up #297 again and set off for Topsail State Park. We didn't really know where we were going after crossing the Mid-Bay Bridge (toll both ways). Bob tried to prepare the vehicles behind his by announcing that we should "be ready for erratic turning." After much driving around and separation of vehicles, we managed to believe that we had our bearings straight. Louie had suggested that we turn onto a road entering from the east, but when that didn't seem too promising owing to recent development we turned around, which required a left turn (that is, three left turns in all) back to the highway. We then made another left (those boldness coefficients were certainly up now) and drove to the dunes of Topsail State Park.}

Site 5-8: Maritime Scrub

Location: Walton Co.; Miramar Beach Quad. From Destin, drive east on FL 98/30. Between Morris Lake and Campbell Lake, turn right (south) onto Topsail Bluff Road (west junction of SR30 and 30a). The road ends at Topsail Hill, a 40 ft. inner dune. **GPS:** N 3359915, E 566680; these coordinates are nearly 0.9 mi NE of where we were.

Topsail State Park supports maritime scrub on a series of dunes. Upon arriving we noticed several dead sand pines, most of which did not show any apparent evidence of wind damage, thus eliminating a hurricane as the likely source of mortality. We proposed several other hypotheses: (1) fire (though there were few distinct, large fire scars), (2) salt spray from Hurricane Opal, and (3) overwash. The dunes closer to the beach were characteristically dominated by scrub oaks, mostly *Quercus chapmanii* and *Q. myrtifolia*, though we also identified *Q. geminata* and possibly *Q. hemisphaerica*. Where was Bill Ehinger -- Bee-ul --when we needed him? As we moved back from the beach, oaks decreased in importance and *Ceratiola ericoides* and *Pinus clausa* increased. At least two species of *Cladonia* were also present, together attaining a cover of 6. Otherwise, the distribution of vegetation was notably patchy.

At this site we encountered for the first time -- surprisingly -- *Licania michauxii* (the plant formerly known as *Chrysobalanus oblongifolius*). And for at least a few seconds, all were stumped by *Polygonella macrophylla*, a local endemic, until Jay pointed out the characteristic ochreate stipules. We also identified (after much effort) the endemic *Crataegus michauxii*.

We wandered down to a small pond, dominated by *Taxodium ascendens* and *Nymphaea*, with *Myrica cerifera* and *Ilex glabra* on the margins. We heard what might have been some ilk of chorus frog. The light was growing dim -- too little for pictures -- so we wandered back towards the beach to glimpse once again the crystal green Gulf water. As some folks waded in, Chris wandered far up the beach, then appeared to strip and jump in the water. Phil, Pete, Jon and Rickie looked at one another briefly, then tossed off their shoes, abandoned their hand lenses, and bolted off to join Chris. Becky and Kelly followed suit, so to speak, the opposite direction down the beach. It has been some time since so many folks got naked on one of Bob's PGEs. HP's all around.

Inner Dunes:

Andropogon sp.
Ceratiola ericoides
Cladonia spp.
Cnidocolus stimulosus
Conradina sp.

Crataegus michauxii
Chrysoma pauciflosculosa
Chrysopsis cruiseana
(endemic)

Chrysopsis gossypina
Helianthemum arenicola
Hypericum reductum
Ilex glabra
Linaria floridana
Lechea sp.
Licania michauxii (gopher
apples)
Lupinus westianus
Magnolia grandiflora
Opuntia pusilla
Osmanthus americanus
Paronychia patula

Pinus clausa
Polygonella macrophylla
Polygonella polygama
Quercus chapmanii
Quercus geminata
Quercus margaretta
Quercus myrtifolia
Rumex hastatulus
Serenoa repens
Smilax auriculata
Smilax bona-nox
Tradescantia hirsutiflora
Yucca filamentosa
Xyris caroliniana

Wet Disturbed area:

Cyperus sp.
Dichantherium sp.
Drosera rotundifolia
Eleocharis sp.

Juncus sp.
Rhynchospora sp.
Utricularia subulata

Lake:

Ilex glabra
Myrica cerifera var. *cerifera*
Nymphaea odorata

Pinus elliotii
Taxodium ascendens
Tillandsia usneoides

Outer Dune:

Uniola paniculata
(Among other things)

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{After the males returned from their ceremonial bonding experience, most of the crew headed back to the 'Burbans in the dim twilight, while Skye went to fetch the bathing women. The women had some difficulty finding the way back, but Linda serving as a lighthouse on top of a van and others making sufficient noise aided them. Soon thereafter, Pete's impropriety with the headlights caught Kelly by surprise. Order and decorum were soon restored, and Pete apologized profusely for his action. As we got on our way, it began to rain and quite suddenly became a whopper of a thunderstorm. This added to our confusion over the location of the restaurant we had made our destination, but after stopping for directions, we eventually found it (though we never did see that elusive Winn-Dixie). Accolades to the drivers. The Paz, however, proved to be disappointing. The service was abysmally slow, the margaritas dreadfully weak, and the food exceptionally unexceptional. Nevertheless, we did manage to catch the last few minutes of UNC's victory over Fairfield, which gave Dean Smith record-tying win number 876. At least the rain had stopped by the time we left.

We returned to Karick Lake to find that a few tents had been displaced and a few others had gotten a little damp. Linda abandoned her plan to search for *Franklinia* - - as every good student of *Theaceae* must do at least once -- so this would be the last night of the trip for all of us. Yet no one seemed to have either the energy or the interest in trying to start a campfire with wet wood, and we all turned in rather quickly. There was no rowdiness, no Bacchanalian escapades, no Essence.}

Blackwater River State Forest

Local Guides: Tom Arrington & Vernon Compton

Recorders: Alice Stanford and Rickie White

{*Lesson #1: Always stake down one's tent.* Corollary to the lesson: The more beautiful the weather in the morning, the more important lesson #1 becomes.}

Blackwater Wildlife Management Area includes 186,475 acres of land in both Okaloosa and Santa Rosa Counties. It lies in the Southern Pine Hills District (Myers

and Ewel 1990), with underlying soils in the Citronelle (sand, gravel, clay) and Chipola (marl, sandy limestone, sand, clay) formations.

Site 6-1: Big Juniper Creek Floodplain and Levee

Location: Santa Rosa Co. – Spring Hill Quad. From the crossroads at Munson (Munson Country Store - home to the worlds' largest supply of Ken's favorite green gooey marshmallow-like processed food product), proceed south on Munson Highway (County Road 191). Take the first left (Sandy Landing Road), pass over Sweetwater Creek, then take the fourth right (all four roads will be dirt and mud). The dirt (mud) road will curve to the left, but stay straight rather than turning towards the right. The road becomes rather slick, muddy, and narrow as one approaches the small parking area (turnaround?) at the end.

GPS: Parking area N 3407466, S 510580.

Two state forest representatives, Tom Serviss and Vernon Compton, explained that the area around Big Juniper Creek had been an extremely popular but unofficial recreation area. Unfortunately, the damage done by the four wheel drive vehicles barreling directly up to Big Juniper Creek was too much for the ecosystem. The area's threatened and endangered flora suffered greatly, so the road was closed and a restoration project was implemented three years ago. The trail which now exists leads over a small creek which is home to the local endemic *Lilium iridollae*, which exists only in Escambia, Santa Rosa, Okaloosa, and Walton Counties (Clewell 1985) and adjacent Alabama.

Between the stream and Big Juniper Creek lay an interesting mix of Atlantic white cedar (*Chamaecyparis thyoides*) and scrub overtopped occasionally by a pine or two. The soil was extremely sandy throughout. Few oaks were noted in the area, and the white cedar appeared to be regenerating. This phenomenon is all the more interesting since Clewell (1971) reported that Atlantic white cedar cannot compete well with scrub without occasional low intensity burns. However, a fire which is too hot will damage the older cedars as well and may make way for species such as gum and pond pine. Cedar, therefore, walks an "ecological tightrope". Finally, a striking feature of the area was the coexistence of dry scrub plants with plants normally associated with very wet areas. The enigmatic *Conradina* in the area was first found west of Milton in 1949 (Hood 1868, FLAS) and later at Indian Ford just to the southwest of our site. Whether it represents *Conradina glabra*, an endangered species at the top of steepheads along the Apalachicola River, or is an undescribed species remains to be determined.

Chamaecyparis thyoides
(L.) BSP
Cladium sp.
Conradina glabra Shinnery
Cyrilla racemiflora L.
Hypericum sp.

Ilex opaca Ait.
Pteridium aquilinum (L.)
Kuhn
Quercus nigra L.
Quercus virginiana Mill.
Rubus sp.

On the walk towards the creek, we briefly passed through a small *Pinus palustris* area

containing *Rhexia* sp. & *Serenoa repens*.

The Big Juniper Creek banks consisted of a levee separating the relatively swift tannin-filled river from an old, dry oxbow lake. On the bank was a well-developed *Chamaecyparis* forest with a *Kalmia latifolia* understory (one of the few sites for *Kalmia latifolia* in FL). The plants included:

<i>Acer rubrum</i> L.	<i>Myrica heterophylla</i> Raf.
<i>Bignonia capreolata</i> L.	<i>Osmanthus americanus</i>
<i>Chamaecyparis thyoides</i>	<i>Osmunda regalis</i> L.
(L.) BSP	<i>Persea paustris</i> (Raf.)
<i>Conradina glabra</i> Shinnery	Sarg.
<i>Cyrilla racemiflora</i> L.	<i>Polygala nana</i> (Michx.) DC.
<i>Gaylussacia</i> sp.	<i>Quercus geminata</i> Small
<i>Gelsimium sempervirens</i>	<i>Schizachyrium</i> sp.
<i>Helianthus radula</i>	<i>Serenoa repens</i> (Bartr.)
(Pursh)T&G	Small
<i>Ilex coriacea</i> (Pursh)	<i>Symplocos tinctoria</i> (L.)
Chapm.	L'Her.
<i>Kalmia latifolia</i> L.	<i>Smilax pumila</i> Walt.
<i>Leuconthoe axillaris</i>	<i>Viola primuliflora</i> L.
<i>Lilium iridollae</i> Henry	<i>Vitis rotundifolia</i> Michx.
<i>Lyonia lucida</i> (Lam.) K.	<i>Xyris iridifolia</i> Chapm.
Koch	(submerged in creek run)
<i>Magnolia virginiana</i> L.	<i>Woodwardia areolata</i> (L.)
<i>Mitchella repens</i> L.	Moore

Old oxbow:

<i>Carex</i> sp.	<i>Rubus</i> sp.
<i>Ilex myrtifolia</i> Walt.	<i>Schizachyrium</i> sp.
<i>Lonicera sempervirens</i> L.	<i>Serenoa repens</i> (Bartr.)
<i>Magnolia grandiflora</i> L.	<i>Smilax glauca</i> Walt.
<i>Osmunda regalis</i> L.	<i>Taxodium distichum</i>
<i>Pinus elliotii</i> Engelm.	<i>Woodwardia virginica</i> (L.)
<i>Rhyncospora</i> spp.	

Both the oxbow depression and levee possessed well developed stands of large, old trees. The soils again were very sandy, signs of the long standing relationship between the sediments of the river and the floods which occur frequently within the floodplain. It was noted that *Serenoa repens* was sparse since the northern limit of its range is the Blackwater River State Forest. Once one crosses the border into Alabama, there is virtually no *Serenoa*.

Kalmia hirsuta (with only two locations in the Blackwater Forest) was found in the flatwoods near the parking area, along with *Pinus palustris*, *Aronia arbutifolia*, *Cliftonia monophylla*, *Magnolia virginiana*, and replanted *Aristida beyrichiana*. Although the old road bed was conspicuous, it was apparent

that many (wo)man hours had been given to the task of restoring the area to a more natural state.

Site 6-2: Sweetwater Trail

Location: Santa Rosa Co. – Munson Quad. GPS: N 3414134.769765 and E 514188.115801. From Munson crossroads (and Munson Country Store), travel east on State Road 4. Take a left on Krull Lake Rd. into Krull Recreation Area, drive past the park station and bridge, and park at the lake. The Sweetwater Trail is an interpretive, boardwalk-style trail which winds its way through the Sweetwater Creek floodplain forest.

The first small stretch included a small creek where some aquatic and semi-aquatic species grew:

<i>Arnoglossum</i> sp.	<i>Orontium aquaticum</i> L.
<i>Cacalia</i> sp.	<i>Osmunda cinnamomea</i> L.
<i>Centella asiatica</i> (L.) Urban	<i>Pinus glabra</i> Walt.
<i>Egeria densa</i> Planch.	<i>Sarracenia leucophylla</i>
<i>Eleocharis</i> sp.	Raf.
<i>Eriocaulon decangulare</i> L.	<i>Thelypteris</i> sp.
<i>Hypericum</i> sp.	<i>Viburnum nudum</i> L.
<i>Mayaca fluviatilis</i> Aubl.	<i>Vitis rotundifolia</i> Michx.
<i>Mimosa strigillosa</i> T. & G.	

The floodplain forest itself consisted of a mesic overstory of *Chamaecyparis*, *Taxodium*, *Populus*, and other trees. The soil was saturated, and localized hurricane disturbance could easily be seen. Hurricanes Erin and Opal passed directly through the forest in 1996 with 90-110 mph sustained gusts (Class 3 hurricane). The following species were seen:

<i>Acer rubrum</i> L.	<i>Osmanthus americanus</i>
<i>Chamaecyparis thyoides</i> L.	<i>Pinus taeda</i> L.
<i>Cornus florida</i> L.	<i>Polypodium polypodioides</i>
<i>Cyrilla racemiflora</i> L.	<i>Populus deltoides</i>
<i>Gelsimium sempervirens</i>	<i>Quercus nigra</i> L.
<i>Ilex cassine</i> L.	<i>Quercus phellos</i> L.
<i>Ilex coriacea</i> (Pursh)	<i>Quercus virginiana</i> Mill.
Chapm.	<i>Serenoa repens</i> (Bartr.)
<i>Ilex opaca</i> Ait.	Small
<i>Liquidambar styraciflua</i> L.	<i>Taxodium distichum</i> (L.) L.
<i>Lyonia</i> sp.	Rich.
<i>Magnolia grandiflora</i> L.	<i>Vaccinium elliotii</i> Chapm.
<i>Magnolia virginiana</i> L.	

In addition, *Gelsemium sempervirens* and *Ilex opaca* sprouts seemed to be particularly common on new tip-up mounds.

The trail led to a slope which contained a unique assemblage of plants including:

<i>Bignonia capreolata</i> L.	<i>Quercus nigra</i> L.
<i>Baptisia lanceolata</i> (Walt.) Ell.	<i>Quercus phellos</i> L.
<i>Bigelovia nudata</i> (Michx.) Britt.	<i>Quercus virginiana</i> Mill.
<i>Illicium floridanum</i> Ellis	<i>Rhododendron</i> sp.
<i>Liriodendron tulipifera</i> L.	<i>Symplocos tinctoria</i> (L.) L'Her.
<i>Magnolia grandiflora</i> L.	<i>Smilax glauca</i> Walt.
<i>Oxydendron arboreum</i> (L.) DC.	<i>Smilax pumila</i> Walt.

Site 6-3: Ironstone Hill

Location: Santa Rosa Co. – McLellan [sic], FLA-ALA Quad. T6N, R27W, S31. At Munson Country Store, take County Road 191 North. Pass over Big Juniper Creek. Near McCellan, turn left off County Road 191 onto Sellersville Road. Follow Sellersville Road a number of miles (past Sellersville) until you see two roads diverging in a yellow wood... excuse me, follow Sellersville Road until you see two roads going off to the right at the same point. Follow the second road on your right (Camp Henderson Road) through the ruts (be careful after rain as you may get stuck). The largest hill on the right (north side of road) is the most notable ironstone outcropping. Note: Camp Henderson Rd. and Sellersville Rd. are both FR2.

This area, with a 60-foot relief, is a major outcropping of sandstone on spodic soils. There are a number of places where these outcroppings occur, most notably near Aiken, SC, near Sandhills Wildlife Refuge, SC, and Ft. Bragg, NC. The soil leaches and moves the iron down. When the iron hits the impermeable kaolinic clay, it precipitates out to become some sort of cemented sandstone material. This sandstone is left standing after erosional forces have weathered the surrounding area. At the top of this hill we found yellow clay. As we dug, we hit a clay lens of some sort, indicating that something deposited clay here recently (perhaps marine sediment?). Although the terraces on Eglin were probably of Miocene origin, these terraces may be even older. The top is extremely dry and baked, leading to low diversity:

<i>Aristida beyrichiana</i> (sparse)	<i>Penstemon australis</i> Small
<i>Carphephorus</i>	<i>Pinus palustris</i> Mill.
<i>odoratissimus</i>	<i>Polygala lutea</i> L.
<i>Chaptalia</i>	<i>Polygala nana</i> (Michx.) DC.
<i>tomentosa</i> Vent.	<i>Pteridium aquilinum</i> (L.) Kuhn
<i>Cyrilla racemiflora</i> L. var. ?	<i>Schizachyrium scoparium</i>
<i>Gaylussacia dumosa</i>	<i>Simplocos tinctoria</i>
<i>Helianthus radula</i>	<i>Vaccinium darrowii</i> Camp
<i>Hypericum suffruticosum</i>	<i>Viola septemloba</i> LeConte
<i>Ilex glabra</i> (L.) Gray	
<i>Myrica cerifera</i> L.	

Site 6-4: Seepage bog

Location: Santa Rosa Co. – Spring Hill Quad. From Munson Crossroad, take County Road 191 south. Travel over Big Juniper Creek and over another, smaller creek. Take a right on Buddy Hardy Road. Take a right on Three Notch Trail, the first unpaved road after passing some houses. At stop sign, continue straight. Pass Sullivan Cemetery on right. About 1/2 mile past cemetery, take a left on the dirt road. On the left (south side) is a large seepage bog. (Note: this is not the most direct route from Munson.)

GPS: N 3412040, E 505503.

This area was very interesting because of the distinct vegetational zonation caused by the differences in the water table as you moved downslope. The plants found include:

In the flatwood:

Aristida beyrichiana
Aster adnatus Nutt.
Baptisia lanceolata
Ceanothus microphyllus
Cnidosculus stimulosus
Dichanthelium sp.
Eriogonum tomentosum Michx.
Galactia sp.
Helianthus radula (
Ilex glabra (L.) Gray
Malvaceae (*Hibiscus aculeatus*?)
Pinus elliotii Engelm.
Pinus palustris Mill.
Vaccinium darrowii Camp

At this point, *Ctenium* began:

Aristida beyrichiana Trin. & Rupr.
Aster walteri Alex.
Bigelovia nudata (Michx.) Britt.
Cirsium sp.
Chaptalia tomentosa Vent.
Ctenium aromaticum (Walt.)
Wood
Drosera brevifolia Pursh
Drosera capillaris Poir.
Drosera rotundifolia L.
Lachnocaulon anceps (Walt.)

Morong
Liatris sp.
Lycopodium sp.
Pinguicula lutea Walt.
Pinguicula primuliflora Wood &
Godfrey
Viola septemloba LeConte
Viola primulifolia L.
Xyris caroliniana Walt.

Grading down to a bog:

Aristida beyrichiana
Chaptalia tomentosa Vent
Drosera tracyi

Eriocaulon decangulare L.
Ilex glabra (L.) Gray
Lachnocaulon

Lycopodium appressum
Lycopodium carolinianum L.
Muhlenbergia sp.
Myrica cerifera L.
Polygala lutea L.
Rhexia sp.
Rhyncospora sp.
Sarracenia flava L.

Sarracenia leucophylla
Sarracenia psitticina Michx.
Smilax laurifolia L.
Smilax pumila Walt.
Syngonanthus
Xyris ambigua
Xyris brevifolia Michx.

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{This was the end of the road. We set our sails back to Chapel Hill, some Suburbans full of Indigo Girls, Bob Dylan, and Michelle Shocked songs, others full of trivia. Jay pronounced himself the winner of the Wendy's All-American Kid's Game, though this decision was protested by Ken. Nasty accusations of cheating ensued, but eventually everyone returned to Chapel Hill in one piece.}

