# NATURAL COMMUNITIES

This is the fourth in a series of articles describing the Natural Communities defined by the Florida Natural Areas Inventory (FNAI). This classification system must be viewed as a system of mental constructs imposed upon an infinite variety of growing, changing, intergrading, natural environments. Hence, more often than not, a given site will not precisely fit the classic description of the appropriate natural community. By practicing comparing these descriptions to vegetation observed in the field, an interested naturalist should be able to learn to identify plant communities accurately and contribute valuable site information to conservation efforts.

**by Linda Conway Duever**

## PINE ROCKLAND

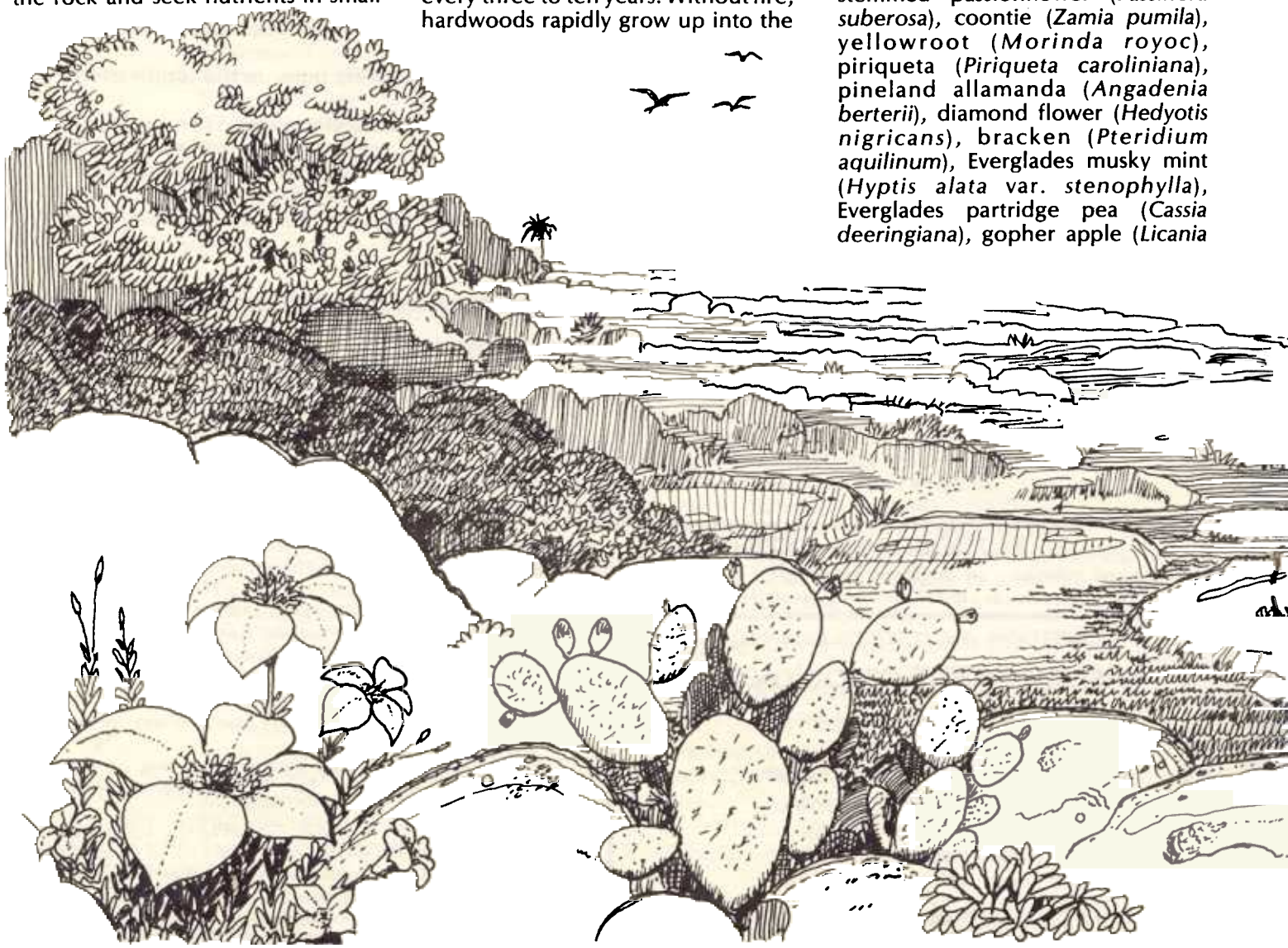
Pine Rocklands occur in southeast Florida on outcrops of Miami oolite limestone. The ground surface is typically dissected and solution-pitted, often to the point the jagged surface is termed "pinnacle rock." These communities have no real soils. The tree roots push into crevices in the rock and seek nutrients in small accumulations of sand, marl, and organic debris. The bare white rock usually creates a very harsh, dry environment, but during the wet season pockets fill with water and humidify the environment. On some sites there may even be surface flow for a month or two each year.

FNAI recognizes three types of Pine Rockland, all dominated by South Florida slash pine (*Pinus elliottii* var. *densa*). Keys Pine Rockland has an understory of *silver palm (*Coccothrinax argentata*), *brittle thatch palm (*Thrinax microcarpa*), and tropical shrubs. Dade Pine Rocklands have a shrubby tropical understory characterized by an extraordinary number of endemic species. Temperate species make up the bulk of the understory in Big Cypress Pine Rockland.

All of these are fire-maintained communities which normally burn every three to ten years. Without fire, hardwoods rapidly grow up into the canopy, and within about 25 years, Pine Rockland develops into Rockland Hammock.

Typical Pine Rockland shrubs include saw palmetto (*Serenoa repens*), rough velvetseed (*Guettarda scabra*), myrsine (*Myrsine floridana*), poisonwood (*Metopium toxiferum*), wax myrtle (*Myrica cerifera*), blackbead (*Pithecellobium guadalupense*), long-stalked stopper (*Psidium longipes*), pineland snowberry (*Chiococca pinetorum*), varnish leaf (*Dodonaea viscosa*), tetrazygia (*Tetrazygia bicolor*), locustberry (*Byrsonima cuneata*), cockspur (*Pisonia rotundata*), marlberry (*Ardisia escalloniodes*), sweet acacia (*Acacia pinetorum*), black torch (*Erithalis fruticosa*), rhacoma (*Crossopetalum rhacoma*), bustic (*Dipholis salicifolia*), and indigoberry (*Randia aculeata*).

Smaller plants include corky-stemmed passionflower (*Passiflora suberosa*), coontie (*Zamia pumila*), yellowroot (*Morinda royoc*), piriqueta (*Piriqueta caroliniana*), pineland allamanda (*Angadenia berterii*), diamond flower (*Hedyotis nigricans*), bracken (*Pteridium aquilinum*), Everglades musky mint (*Hyptis alata* var. *stenophylla*), Everglades partridge pea (*Cassia deeringiana*), gopher apple (*Licania*



# of Florida's Rocklands

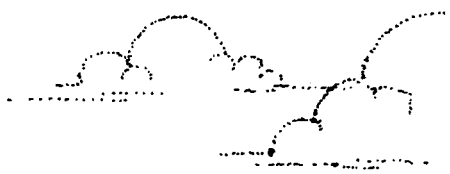
*michauxii*), pineland croton (*Croton linearis*), Galactia spp., large-flower polygala (*Polygala grandiflora*), pine pink (*Bletia purpurea*), Bahama senna (*Cassia bahamensis*), and pineland brake (*Pteris longifolia*), and pineland fern (*Anemia adiantifolia*).

Prominent grasses are wiregrasses (*Aristida* spp.), pineland broomsedge (*Andropogon cabanisii*), *Schizachyrium semiberbe*, and lopsided Indian grass (*Sorghastrum secundum*).

The following species are endemic to Pine Rocklands: *Blodgett's wild mercury (*Argythamnia blodgettii*), *Brickellia mosieri*, tragia (*Tragia saxicola*), Everglades painted leaf (*Poinsettia pinetorum*), and Pine partridge pea (*Cassia keyensis*), *Chamaesyce conferta*, *C. *deltoidea* var. *adhaerens*, *wedge spurge (*C. deltoidea* var. *deltoidea*), *Garber's spurge (*C. garberi*), *C. pinetorum*, *Porter's hairy-podded spurge (*C. porteriana* var. *keyensis*), Porter's broom spurge (*C. porteriana* var. *scoparia*), *pineland jacquemontia (*Jacquemontia curtissii*), **Dichromena floridensis*, *sand flax (*Linum arenicola*), *tiny polygala (*Polygala smallii*), **Digitaria pauciflora*, *pineland milk pea (*Galactia pinetorum*), *Galactia smallii*, **Tephrosia angustissima*, *Florida gama grass (*Tripascum floridanum*), *slender queen's delight (*Stillingia sylvatica* ssp. *tenuis*).

Rare species which occur in Pine Rockland as well as in other communities include: *Bahama sachsia (*Sachsia bahamensis*), *little strongback (*Bourreria cassinifolia*), *beach creeper (*Ernodea littoralis*), *coastal vervain (*Verbena maritima*), *white ironwood (*Hypelate trifoliata*), small-flowered lily-thorn (*Catesbaea parviflora*), holly-leaf rhacoma (*Crossopetalum ilicifolium*), Big *necklacepod (*Sophora tomentosa*), and Krug's holly (*Ilex krugiana*).

The remaining privately owned tracts of Pine Rockland are in the Miami and Big Pine Key areas where they are severely threatened by rapid residential development. There are extensive areas of Pine Rockland protected in Everglades National Park, Big Cypress National Preserve, and the National Key Deer Refuge, but these habitats are not ideal for all the rare and endemic species. Some species are found only in the Miami area and much of the critical pineland habitat of the endangered Key deer lies outside the Big Pine refuge.



## ROCKLAND HAMMOCK

Hardwood forest "hammocks" develop on rocklands protected from fire. They may grow on virtually bare rock, with roots entwined around boulders and reaching into crevices for nourishment, but extended periods without fire can allow the accumulation of several inches of organic soil. In South Florida suitable upland sites are usually islands surrounded by water or wetlands. Sometimes a slightly lower "moat" encircles the island, giving it an additional buffer. (Scientists speculate that these features are the result of a combination of factors including windthrow of peripheral trees, erosion by surface flows diverted by the hammock, reduced periphyton growth and marl accumulation at the shady forest margin, and perhaps more rapid dissolution of the limestone due to acidic runoff.) Although hammocks do not normally flood, they are dependent upon high water tables to keep their wetland firebreaks effective and to maintain reservoirs in solution features to keep interior humidity high and temperatures moderate. The hammock's dense domed canopy is also critical to the interior microclimate. It not only fends off desiccating winds and frost, but it deflects storm winds and prevents extensive structural damage during hurricanes.

There are Temperate Rockland Hammocks dominated by live oak (*Quercus virginiana*) and laurel oak (*Q. hemisphaerica*) in North Florida, especially in the Gainesville and Brooksville areas, but the classic isolated islands of tropical vegetation are found primarily in the Miami area, the Everglades, and the Keys. FNAI recognizes five different types in this part of the state. The Miami hammocks where live oak is mixed with tropical species are Miami Ridge Hammock. The tall forests of Jamaica dogwood (*Piscidia piscipula*), mahogany (*Swietenia mahagoni*), gumbo limbo (*Bursera simaruba*), wild tamarind (*Lysiloma latisiliqua*), and other tropicals in the Upper Keys

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are Keys Hammock Forest.

The Lower Keys' shorter "scrubbier" forest of Jamaica dogwood with poisonwood (*Metopium toxiferum*), seagrape (*Coccoloba uvifera*), *brittle thatch palm, etc., is Keys Hammock Thicket. If this is a sparse shrub community with cacti and other spiny, xerophytic plants, it is considered Thorn Scrub. If it is a well-developed hardwood forest with an understory of cacti and agave and perhaps a few emergent *tree cacti (*Cereus robinii*), it is classified as Cactus Hammock. The East Everglades, Pinecrest, and Long Pine Key areas each have a particular hammock type, but there is considerable species overlap and FNAI has not yet defined the criteria for distinguishing them.

Typical Rockland Hammock woody species include white stopper (*Eugenia axillaris*), Spanish stopper (*Eugenia foetida*), mastic (*Mastichodendron foetidissum*), inkwood (*Exothea paniculata*), marlberry, bustic, lancewood (*Nectandra coriacea*), strangler fig (*Ficus aurea*), wild coffee (*Psychotria nervosa* and *P. sulzneri*), crabwood (*Ateramnus lucidus*), black ironwood (*Krugiodendron ferreum*), Simpson's stopper (*Myrcianthes fragrans*), myrsine, satinleaf (*Chrysophyllum oliviforme*), cabbage palm (*Sabal palmetto*), blolly (*Guapira discolor*), hogplum (*Ximenia americana*), paradise tree (*Simarouba glauca*), prickly lime (*Zanthoxylum fagara*), white torchwood (*Amyris elemifera*), hackberry (*Celtis laevigata*), Guiana plum (*Drypetes laterifolia*), milkbark (*Drypetes diversifolia*), shortleaf fig (*Ficus citrifolia*), hold-me-back vine (*Pisonia aculeata*), bitterbush (*Picramnia pentandra*), wild dilly (*Manilkara bahamensis*), blackbead (*Pithecellobium guadalupense*), catclaw (*Pithecellobium unguis-cati*), soapberry (*Sapindus saponaria*), strongbark (*Bourreria ovata*), darling plum (*Reynosia septentrionalis*), Gulf greytwig (*Schoepfia chrysophylloides*), West Indian cherry (*Prunus myrtifolia*), saffron plum (*Bumelia celastrina*), cinnamon bark (*Canella winterana*), Jamaica caper (*Capparis cynophallophora*), limber caper (*Capparis flexuosa*), princewood (*Exostema caribaeum*), seagrape (*Coccoloba uvifera*), coffee colubrina (*Colubrina arborescens*), soldierwood (*Colubrina elliptica*), *geiger tree (*Cordia sebestena*), myrtle-of-the-river (*Calyptranthes zuzygium*), and spicewood (*Calyptranthes pallens*). Coontie (*Zamia pumila*), yellowroot (*Morinda royoc*), dildo cactus (*Cereus pentagonus*), *Thelypteris kunthii*, *Oplismenus hirtellus*, *Lasiacis divaricata*, and *Dichanthelium commutatum* are likely understory species.

Epiphytes may be abundant. Most common are resurrection fern (*Polypodium polypodioides*), needle-leaved airplant (*Tillandsia setacea*), solf-leaved wild pine (*Tillandsia valenzuelana*), and butterfly orchid (*Encyclia tampensis*).

Rare Rockland Hammock plants include *powdery catopsis (*Catopsis berteroniana*), *cow-horn orchid (*Crytopodium punctatum*), *night-scented epidendrum (*Epidendrum nocturnum*), *banded wild pine (*Tillandsia flexuosa*), *Florida royal palm (*Roystonea elata*), *lignumvitae (*Guaiacum sanctum*), *manchineel (*Hippomane mancinella*), *white ironwood (*Hypelate trifoliata*), *Florida thatch palm (*Thrinax floridana*), *prickly apple (*Cereus gracilis*), *fragrant wool-bearing cereus (*Cereus eriophorus* var. *fragrans*), *tree cactus (*Cereus robinii*), *cupania (*Cupania glabra*), *clusia (*Clusia rosea*), and *yellowheart (*Zanthoxylum flavum*).

Hammocks are extremely threatened by residential development, since they are frequently the only spots of high ground within tracts of otherwise undevelopable wetlands, and their big shady trees are attractive to homebuyers. Many fine hammocks have already been destroyed, and others, such as the great Brickell Hammock which once extended for miles along Biscayne Bay, have been reduced to fragments. Public indignation is rising over the devastation of the Keys Hammock Forests on Key Largo for condominium construction, but the botanically interesting Keys Hammock Thickets and Thorn Scrubs of the Lower Keys may actually be in even more jeopardy because they are not in the conservation spotlight. This is another situation where native plant enthusiasts need to speak out for preservation of "scrubby" habitats that do not have the public appeal of magnificent forest.

## COASTAL ROCK BARREN

Between a Rockland Hammock or Pine Rockland and a rocky shoreline there is often a transition zone called a Coastal Rock Barren. Whereas many ecotones between communities are simply vague boundaries where species from the two mix, this one is a distinct community with species of its own. Salt spray, wind, and occasional inundation by storm tides make this too severe an environment for a forest to develop, but the marine influences are not so extreme as to altogether prohibit terrestrial vegetation. The result is an open rocky flat with stunted shrubs, succulents, and sparse herbaceous plants rooted here and there in crevices and mounds of debris. Littoral Rock Pavement is a technical term which has been used for similar environments in the Caribbean.

FNAI distinguishes three Coastal Rock Barren Plant Communities. Halophyte Rock Barren is the most common. This is the typical upper zone of a rocky shore corresponding to the Beach Dune of a sandy coast. Saltwort (*Batis maritima*), glasswort (*Salicornia virginica*), and sea purslane (*Sesuvium* spp.) sprawl among the rocks and buttonwoods (*Conocarpus erecta*) and scattered small mangroves — usually black mangrove (*Avicennia germinans*) and white mangrove (*Laguncularia racemosa*), but sometimes red mangrove (*Rhizophora mangle*).

Cactus Barren generally occurs a bit farther back from the shore on extremely flat sites where there is an exceptionally broad transition zone between ocean and hammock. This commonly is characterized by scattered cacti, agaves, and the following herbaceous species: blue jacquemontia (*Jacquemontia pentantha*), flame acanthus (*Dicliptera sexangularis*), Keys indigo (*Indigofera keyensis*), purple sida (*Sida ciliaris*), fuzzy hibiscus (*Hibiscus poeppigi*), and *Cyperus elegans*. Cactus Barren may be so interspersed with Thorn Scrub that the two cannot be meaningfully separated.

The peculiar Big Pine Key site where *strumpfia (*Strumpfia maritima*) grows on a rock barren with pockets of reddish marl has been termed a Strumpfia Barren.

Coastal Rock Barren species include prickly pear (*Opuntia dillenii* and *O. Triacantha*), dildo cactus, agave (*Agave decipiens*), Spanish bayonet (*Yucca aloifolia*), sea oxeye (*Borrichia arborescens*), *joewood (*Jacquinia keyensis*), *bay cedar (*Suriana maritima*), marsh samphire (*Philoxerus vermicularis*), railroad vine (*Ipomoea pes-caprae*), sea daisy (*Borrichia frutesens*), chaff flower

(*Alternanthera flavescens*), *beach creeper, Indian mallow (*Abutilon permolle*), love vine (*Cassytha filiformis*), *Cienfuegosia yucatanensis*, Keys dayflower (*Commelina erecta* var. *angustifolia*), *Desmanthus vigatus* var. *depressus*, rockland morning glory (*Evolvulus convolvuloides*), hairy milk pea (*Galactia spiciformis*), bladder mallow (*Herissantia crispa*), white lantana (*Lantana involucrata*), Christmas berry (*Lycium carolinianum*), seaside gentian (*Eustoma exaltatum*), marsh lavender (*Limonium carolinianum*), coastal pimpernel (*Samolus ebracteatus*), *Phyllanthus carolinensis* ssp. *saxicola*, portulaca (*Portulaca oleracea* and *P. rubricaulis*), and *Sida acuta*.

Grasses known to occur in this community include salt jointgrass (*Paspalum vaginatum*), Key grass (*Monanthochloe littoralis*), green sprangle top (*Leptochloa dubia*), dropseed (*Sporobolus virginicus*), and Chapman's panicum (*Panicum chapmanii*).

There are patches of Halophyte Rock Barren scattered all through the Keys and the Caribbean, but the other Florida types of rock barrens are critically endangered communities. There is only one Florida site dominated by *strumpfia, and Conrad's Crazy Cactus Patch in Long Key State Park is the only good Cactus Barren of appreciable size remaining. (There are some nice pieces mixed in with Thorn Scrub in Cactus Hammock on Big Pine Key.) This is one of the Florida communities most often destroyed out of ignorance; it is generally regarded as a worthless "transition zone" in development plans, yet it is preferred habitat for many of the above species, a number of which are endemic to the Keys.

*Species flagged with an asterisk are on the FNAI Special Plant list. Information on populations of these plants should be sent to Suzanne Cooper, Botanist, at the Florida Natural Areas Inventory, 254 East Sixth Avenue, Tallahassee, Florida 32303 (904/224-8207).