Volume 29: Number 1 > Winter 2012

Palmetto

Butterfly Orchid ● Forests Retreat as Sea Levels Rise ● Apalachicola River Wildlife Environmental Area

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ON THE COVER:
Salt marsh along the north shore of East Bay. See story on page 12. *Photo by Ron Blair.*

Features

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Florida's Beloved Butterfly Orchid

Encyclia tampensis

Article & Photos by Roger L. Hammer

It wasn't safe to be wandering around in Florida's wilds in 1846, but that's the year Dr. John Torrey (1796–1873) made a very noteworthy botanical discovery during one of his outings. The Second Seminole War had just ended four years prior and the Third Seminole War was brewing when he spotted a cluster of orchids growing on a tree near Fort Brooke, at present-day Tampa. Although Torrey made the very first collection of the butterfly orchid *(Encyclia tampensis)*, he is most famous in Florida for his name being commemorated in the small coniferous genus *Torreya*, and the later dedication of Torreya State Park west of Tallahassee, where the Florida Torreya *(Torreya taxifolia)* grows.

Relatively few orchids were known from Florida when Torrey made his discovery, but the state now boasts a total of 108 species and varieties of native orchids, far more than any other state (Hawaii has only three native orchids, and Alaska has more than thirty). The majority of Florida's native orchids are state-listed as either Endangered or Threatened, and although locally common, the butterfly orchid is categorized as Commercially Exploited due to illegal collecting for the booming orchid market.

Renowned British botanist John Lindley (1799–1865) was appointed to the chair of botany at University College in London, England in 1829, where he remained until 1860. Torrey sent specimens of the new orchid to Lindley, who described the species in 1847 as *Epidendrum tampense*, to acknowledge the Tampa Bay region in Florida where it had been found.

Today, Florida's beloved butterfly orchid has the distinction of being the most common and widespread native epiphytic orchid in the state, ranging throughout much of the peninsula south through the Florida Keys. It grows on trees (including palms), as well as the trunks of dead trees and fallen logs, in a wide variety of habitats. It can be found in upland hardwood forests, wooded swamps, cypress domes, pond-apple and pop ash sloughs, mangrove-buttonwood associations, and sometimes even in fire-prone pinelands and scrub. The only other place it occurs outside of Florida is in the Bahamas, although there are dubious references to it being found in Cuba, as well.

The butterfly orchid is decidedly cold tolerant, ranging further north in Florida than any other epiphytic orchid except for the green fly orchid *(Epidendrum conopseum)*, which has a range that encompasses the region from Florida's Highlands County northward as far as Louisiana and North Carolina. Needless to say, the green fly orchid and the butterfly orchid can both survive freezing temperatures, which is extraordinarily unusual for epiphytic orchids.

Butterfly orchids can vary widely in size, from stunted, sun-reddened plants growing on dead, nutrient-deficient tree trunks, even while subjected to salt spray, to lush plants in shady forests and swamps that produce long, linear, dark green leaves emerging from plump, rain-swollen pseudobulbs. South Florida botanist Chuck McCartney has likened the plants to a bunch of scallions, which they do closely resemble.

Butterfly orchid flowers can number from one to numerous, with some clusters producing stunning displays of flowers. Each flower typically has greenish-brown sepals and petals with a white lip adorned by a blotch or parallel lines of dark pink in the center. However, look at enough butterfly orchids and you will see much variation in size, color, and even scent, especially in the southernmost counties of Florida.

Left: A cluster of normal-colored flowers on a butterfly orchid in Florida's Everglades. Surviving in such harsh conditions isn't easy for an orchid, as evidenced by the number of dead pseudobulbs.

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Florida's Beloved Butterfly Orchid

Some populations produce flowers with a faint scent of honey, while others emit a subtle chocolate aroma. The butterfly orchid is at its height of flowering from May to July, but individual plants might flower at any time of year, even in mid-winter. Albino forms (forma *albolabia)* sporting chartreuse sepals and petals with a snow-white lip are quite rare in the wild.

Last year, on a canoe trip into Everglades National Park with my wife, Michelle, we encountered a scattered population of butterfly orchids that were remarkably different than normal, so I returned solo with my camera and canoe the following day. This was undertaken with much cause for concern and wariness, not because of the thick clouds of tormenting Everglades mosquitoes and deer flies, nor even the large and belligerent alligators and crocodiles, but because two months earlier a pair of manatees flipped my canoe in an Everglades creek near Coot Bay. I've heard that manatees are called "gentle giants," but try skidding a canoe up on top of a submerged manatee and you'll think differently. My 16' Kevlar canoe suddenly went airborne, with mud, water, and detritus flying in every direction, landing hard on the port gunwale and filling half the canoe with water. I braced to keep from flipping as the water careened toward the starboard side, but the errant sea cow's friend decided it was high time to skedaddle, too. As it barreled beneath my canoe its enormous paddle-like tail sent me flying like a boulder being slung from one of those medieval catapults. Personally, I refrain from calling them gentle giants.

May 13, 2011 found me in the same solo canoe with expensive camera gear on board, fully aware that I'd be paddling in manatee territory and would have to stand up in order to photograph the orchids. What worked best was pushing two stakeout poles into the mud on each side of the canoe and firmly attaching the poles to the center thwart with stout bungee cords. That setup held the canoe stable enough to stand and photograph from using a tripod, or to disembark and climb the dead trees, killed

A stunning flower with a solid pink lip, pink lateral lobes, and sepals and petals accented with pinkish-purple.

A remarkably pretty flower with cinnamon sepals and petals fading to mustard yellow. The inflorescences on this plant stood uncharacteristically straight upright.

Looking white from afar, this plant had flowers with creamy-white sepals and petals accented with pink, and an unusually wide lip.

The green sepals and petals with a matrix of brown made these flowers stand out among the normal-colored flowers on the same tree.

in 1960 by Hurricane Donna, where the orchids were growing along a three-mile stretch of mangrove shoreline. It proved to be well worth the effort and monetary risk, even though I had to perform some maneuvers that would make any Cirque du Soleil acrobat profoundly jealous.

This variation is undoubtedly the result of an unsettled gene pool. Dr. Carlyle Luer, in his marvelous book, *The Native Orchids of Florida*, wrote, "Natural hybridization in the distant past probably accounts for the variations in color pattern, size, and scent, which are commonly found in the southeastern part of the peninsula. Genes from species such as *E. phoenicia* and *E. plicata* probably still circulate although the parent plants have long ago disappeared."

The only thing to add is that Luer's observations hold true for the entire southern tip of the peninsula and the Florida Keys. Orchid growers who have selfed flowers of *Encyclia tampensis* and propagated them from seed have found that the resulting plants produce flowers of widely varying colors, indicative of a hybrid swarm. Selfing refers to pollinating a flower with its own pollen.

The next time you're exploring southern Florida's wilds in late spring or early summer pay close attention to flowering butterfly orchids. If you can stand the mosquitoes, you just might encounter some floristic gems to admire and photograph. If you're in a canoe with your camera gear, heed my advice and be extremely wary of the not-so-gentle giants.

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About the Author

Roger L. Hammer is a retired professional naturalist, botanist, and author of *Everglades Wildflowers, Florida Keys Wildflowers, Exploring Everglades National Park*, and *Florida Icons–50 Classic Views of the Sunshine State* (Globe Pequot Press). He was the keynote speaker at the Florida Native Plant Society's 17th Annual Conference, and was the recipient of the Marjory Stoneman Douglas Award from the Dade Chapter of the Florida Native Plant Society, and the Green Palmetto Award in Education from FNPS. Roger lives in Homestead with his wife, Michelle.

Left to right: Turtle Creek; Withlacoochee Gulf Preserve, Waccasassa Bay, Yankeetown, Florida. *Photos by Jennifer Seavey.*

Coastal Forests Retreat

That sea levels are rising is hardly new news–they have been doing so since the end of the last major glaciation some 18,000 years ago. The current rate of rise, a little more than a tenth of an inch per year, is also not that unusual–6000-8000 years ago the seas were often rising ten times faster. What is different today and the reason for concern is that back then in response to rapidly rising waters, coastal dwelling Floridians just picked up and moved uphill, leaving their villages, burrows, nests, and rooted parents behind. Today it is not so easy to move uphill, for humans nor the rest of the biota, but move we must.

Francis E. "Jack" Putz

As Sea Levels Rise

The effects of sea level rise are often difficult to differentiate from the myriad of other drivers of coastal change, but the expanses of dead trees looming over Gulf Coast marshes is compelling evidence. The story unfolds very clearly in Yankeetown's Withlacoochee Gulf Preserve (www.withlacoocheegulfpreserve.com) where saltwater intrusion due to over-pumping from the aquifer is not the confounding factor that it is near large cities. The comparatively small tidal fluxes in the Gulf also help in differentiation of the signal of sea level rise from the noise of tides. Another advantage of the Yankeetown marshes and coastal forests is that they are perched atop a stable limestone platform and not on subsiding mucks like in the Mississippi Delta. Finally, as a study site or the destination for an outing, Withlacoochee Gulf Preserve is startlingly beautiful.

What you first see when you approach the coast near Yankeetown are breathtaking expanses of saltmarsh dotted with forested islands of mostly cedars and palms. After gazing at these splendid vistas for a while, an over-abundance of dead trees may become evident. Those adventurous souls that venture out into the marsh might be surprised to stumble over tree stumps in dense swards of black needlerush or in the more sparse patches of glassworts and saltworts. Closer inspection of a forested island in the sea of saltmarsh will reveal many more dead trees, especially in low-lying areas. The really astute observer will notice that while the canopy on the healthier-looking islands might still be dominated by cabbage palms and red cedars, with perhaps even a few scraggly slash pines and live oaks, the understory is choked with marsh elder, lycium, and other saltmarsh shrubs, not tree seedlings and saplings.

Faculty and students from the University of Florida have been investigating coastal forest decline and replacement by saltmarsh in the Yankeetown area since the mid-1990s (Williams et al. 1999, Castanada and Putz 2007, DeSantis et al. 2007). These studies revealed that the die-off described above is mostly a consequence of chronic stresses of sea level rise coupled with the punctuated disturbances of storms and droughts. Data from regularly monitored permanent sample plots on forested islands supported by field and greenhouse experiments reveal that salt is the principal culprit; the abundance of cabbage palms and red cedars is a consequence of

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Above: Declining cabbage palm forest, Turtle Creek, Waccasassa Bay. *Photo by Jennifer Seavey.*

their relatively high tolerance of salinity. That increased flooding is not the main driver of forest replacement by saltmarsh is made obvious by a drive west out State Road 40 towards the Yankeetown Boat Ramp.

South of State Road 40, the fresh waters of the Withlacoochee River wash away the salt, while areas to the north of the road are completely exposed to the effects of sea level rise. The health and diversity of the river side forests is testimony to this occasional cleansing by fresh water. At the same elevation, the northern forests are species-poor and obviously in declining health while those to the south are lush with live oaks, red maples, green ashes, slash pines, hop trees, slippery elms, and occasional cabbage palms and red cedars.

Greenhouse experiments involving potted plants grown in salt solutions in colorful plastic swimming pools confirmed the ranking of tree species' salt tolerance observed in the field. Cabbage palms and red cedar were tolerant of up to 8 parts per thousand salt, about quarter the strength of open ocean water. Other tree species were not nearly as tolerant, dying when exposed to concentrations as low as 2 parts per thousand. For salt-sensitive species, even the occasional sea surge, especially if followed by dry conditions, can be fatal. As sea levels rise, so do the impacts of surges along with soil salinities to the point that, one after another, these salt-sensitive species first fail to reproduce and then die out entirely, leaving the palms and cedar to flourish for a few decades before they too succumb.

To gauge how salt exposure affects trees in the field, we have been monitoring tree mortality, recruitment, and growth in permanent sample plots since 1994. Measuring the growth rates of most trees simply involves stretching a tape around their circumference every few years, but for palms the method is more exciting. Because palm stems do not grow in diameter once they emerge from their below-ground establishment-growth phase, changes in their above-ground stem diameter is not useful as an index of vigor. Fortunately, each palm leaf leaves a scar at its node when it falls; monitoring palm growth rates and estimating tree ages involves monitoring leaf production rates and measuring internode lengths. To keep track of which leaves were new, we dabbed paint on the youngest

leaf present at the time of each census; for short palms this operation involved the use of a pole with a paint brush attached to the end, but tall ones needed be ascended with our handy tree bicycle.

Above: A tree bicycle provides researchers access to taller trees. *Photo by Jennifer Seavey.*

On the forested islands in the salt-marsh, as salinity increased, growth and survival rates declined in all species, including palms and cedars. We also noticed that in response to high but still tolerable salinities, the leaves that cabbage palms slowly produced were small, and the few fruits and seeds they managed to produce were also small.

Based on the absence of seedlings and saplings of tree species still present in the canopies of forested islands, we concluded that salt tolerance increases with tree size. For cabbage palms, we used the growth rate and internode count data to estimate how many years had elapsed since the last successful reproduction. In forests below about 25 cm elevation that are tidally flooded at least 50 times per year, the overstory palms are truly the living dead–their leaves are about half normal size, they grow at a small fraction of the rate of trees away from sea water, and they last produced seedlings way back in the 1940s (Williams et al. 1998).

While the death of huge swaths of forests along our coasts may seem like a bleak image and a harbinger of a dismal future, it is important to remember that the forests are being replaced by saltmarshes, which have their own virtues. Simultaneously, saltmarshes must in turn be replaced by mud flats, oyster bars, and sea grass beds, but those transitions have been less well studied. In any event, sea levels have risen and fallen repeatedly over the past few million years, inundating villages, forests and saltmarshes. Although we need to do all we can to reduce the accumulation of carbon dioxide and other heat-trapping gases in the atmosphere, we also need to adapt to the unavoidable impacts of global climate change including sea level rise.

Even if we stopped emitting greenhouse gases tomorrow, sea levels would continue to rise for at least the next century and coastal ecosystems would continue to need to adapt to these rapidly changing conditions. Given that emissions are increasing, not decreasing, and the rate of sea level rise is accelerating, not decelerating, the need for adaptation grows daily (Geselbracht et al. 2011). For now the best we can do for the species in our coastal ecosystems is to provide them unimpeded opportunities to move uphill. We also need to determine which species will require our assistance in their migration, but providing pathways for upslope migration should be the priority.

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About the Author

Francis E. "Jack" Putz is a professor of conservation biology at the University of Florida, Gainesville, where he teaches courses on the ecology and management of local and tropical ecosystems. His research spans topics from fire ecology and silviculture to experimental archaeology and ethnobotany.

Taking part in the Land Management Review of the Apalachicola River Wildlife and Environmental Area and the appealing surrounding areas.

Catherine Bowman and Ron Blair

Discoveries in the Vast Apalachicola River Wildlife Environmental Area

As longtime members of the Florida Native Plant Society's Tarflower Chapter, we have taken numerous trips through the Apalachicola National Forest to observe the insectivorous plants in the wet prairies along Highway 65 and explore the steep heads, ravines, and high Apalachicola River bluffs north of Bristol. However, we had limited knowledge of the ecosystems near the mouth of the River, surrounding the charming town of Apalachicola. In September 2011, we had an opportunity to participate in the Land Management Review (LMR) of the Apalachicola River Wildlife and Environmental Area (ARWEA) which encompasses the final leg of not only the Apalachicola River, but the St. Marks River, the Little St. Marks River and East River, plus numerous freshwater and tidal creeks and bayous, as they merge into the Apalachicola Bay and the Gulf of Mexico.

Above: Location map showing ARWEA and surrounding features.
Based on map art prepared by Bill Hood, Lotspeich and Associates, Inc.

The approximately 86,000-acre ARWEA, located in Franklin and Gulf Counties, is bordered on the west by the Ed Ball Wildlife Management Area, on the north by the Apalachicola National Forest and the Apalachicola River Water Management Area, on the east by Tate's Hell State Forest, and the south by the Apalachicola River National Estuarine Research Reserve and Apalachicola Bay Aquatic Preserve.

In researching the area and reading the management plans in preparation for participating on the LMR team, we learned that state acquisition began in 1974 with lands along the Apalachicola River as a means to protect the water quality and natural communities that support the local seafood industry. Early impacts to this portion of the River included extensive dredging to allow for barge traffic and the harvest of hardwood trees. The acquisition of lands supporting salt marshes were added followed by timberlands and other private holdings.

The most noticeable features within the current ARWEA are the vast acres of flood plain forest, supporting stands of cypress, swamp tupelo and other wetland hardwood trees, with more southerly fringes of an undulating mosaic of lush salt marsh vegetation. To the west and east of the central wetlands, the lands are managed to balance the protection of the plant and animal communities with the needs of the area's long-time human residents and visitors. Prior to the state's acquisition, the lands beyond the swamps and marshes had long been used for

Left: A remaining slash pine with artificial Red-cockaded Woodpecker nesting cavity. The surrounding area is underplanted with longleaf pine. *Photo by Ron Blair.*

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the growth of primarily slash pine plantations. Past land managers and the current management team have developed management techniques that focus on the restoration of diverse native plant communities, including dry prairie, longleaf pine flatwoods, and wet prairies, while allowing the continuation of hunting and providing for other recreational activities such as off-road bicycling and hiking. We were surprised to learn that this area has long been one of the favorite squirrel hunting sites in this part of the state and the management practices continue to provide for this activity.

Within some drier areas on the west side of the ARWEA, where previous human impacts included pine plantations and farm fields, dry prairies that were direct-seeded with material from donor sites now support a diversity of native herbaceous species that benefit a variety of wildlife. Approximately 160 acres of fields in this already disturbed area are managed with the planting of annual grain crops for seasonal public dove hunting. Former timberlands on the east side of the ARWEA are managed primarily to restore habitat for the Endangered Red-cockaded Woodpecker (RCW, *Picoides borealis)*. Because of the extensive acreage of planted slash pine and the range of wet and dry soil conditions on which they occur, it was not practicable or desirable to remove all slash pine and replant with longleaf pine.

The majority of the slash pine plantations had developed dense high shrub layers that needed to be reduced in order to conduct prescribed burns. The management team tested burning alone, herbicide treatment followed by burning, and roller chopping followed by burning, in order to derive a management plan that would result in the desired reduction of shrubs while being cost effective.

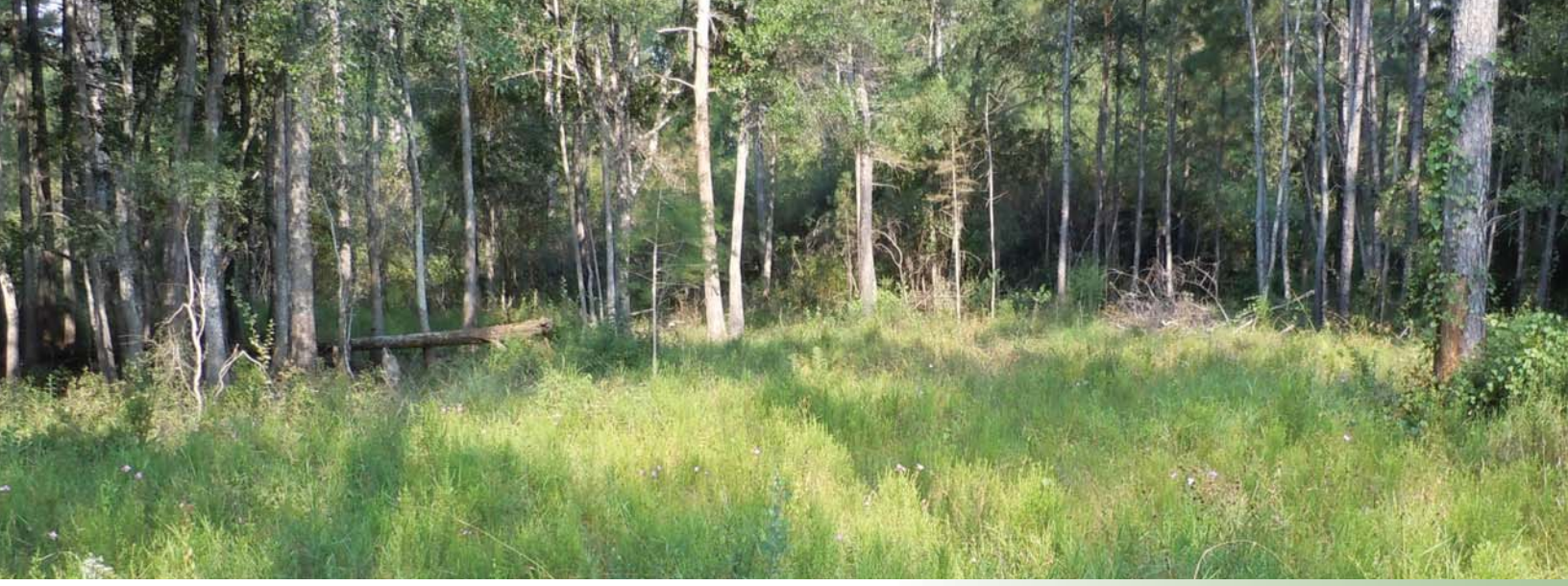
In order to support viable Red-cockaded Woodpecker colonies, pine communities need to have trees of sufficient girth and reduced heart wood density to allow the birds to excavate nest cavities. At the ARWEA, slash pines are generally not of sufficient age, and there are virtually no remaining longleaf pine. In this instance, land managers have been generating revenue by allowing the harvest of some slash pine over time, and under-planting the resultant sparse canopy with longleaf pines. During this interim period of canopy replacement, artificial nest cavities have been inserted into some of the larger slash pine trees, and are successfully in use by RCWs. It is intended that the ARWEA will form a link between RCW colonies within Tate's Hell to the east and managed forests to the north.

The varied plant communities also support numerous other listed plant and animal species, and land management practices address goals that pertain to restoring habitat for these species as well. The frosted flatwoods salamander (*Ambystoma cingulatum*) is one such species whose critical habitat–ephemeral wetland–is being addressed at the ARWEA. Land managers have developed a unique process for improving these seasonally ponded wetlands, by removing adjacent overgrown shrubs and re-establishing a diverse wet prairie fringe. The nearest documented occurrence of this listed salamander is a few miles to the north, within similar habitat. Future monitoring will hopefully document this species in the cautiously restored habitats at the ARWEA. According to the FWC 25 November 2009 ARWEA Species Management Strategy, other focal wildlife species on the site are:

Pituophis melanoleucus mugitus	Florida pine snake
Gopherus polyphemus	Gopher tortoise
Elanoides forficatus	Swallow-tailed kite
Aimophila aestivalis	Bachman's sparrow
Sitta pusilla	Brown-headed nuthatch
Accipiter cooperii	Cooper's hawk
Colinus virginianus	Northern bobwhite
Haliaeetus leucocephalus	Southern bald eagle
Ursus americanus floridanus	Florida black bear
Sciurus niger shermani	Sherman's fox squirrel
Myotis austroriparius	Southeastern bat
A variety of listed and non-listed wading birds.	

Florida Natural Areas Inventory (FNAI) listed plant species occurrences within or adjacent to the ARWEA, as presented in Table 5 of the FWC *2002 – 2007 Conceptual Management Plan for Apalachicola River Wildlife and Environmental Area* (this is currently being revised based on the September 2011 LMR) are:

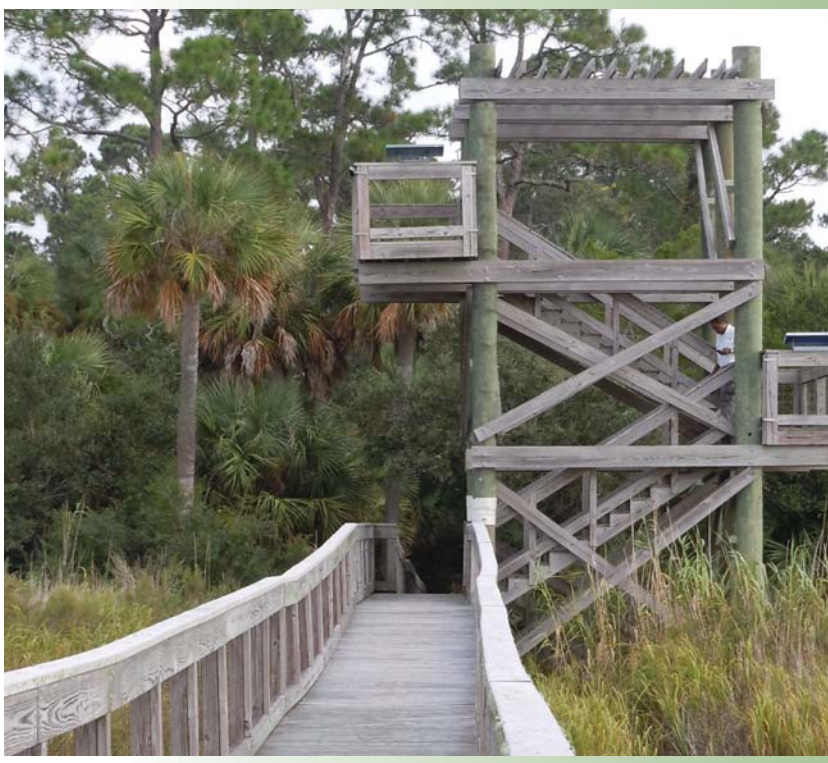
Asclepias viridula	Southern milkweed
Baptisia simplicifolia	Scare-weed
Cuphea aspera	Tropical waxweed
Calycanthus floridus	Eastern sweet shrub
Eurybia spinulosus	Pinewoods aster
Gentiana pennelliana	Wiregrass gentian
Hymenocallis henryae	Henry's spiderlily
Justicia crassifolia	Thickleaf waterwillow
Leitneria floridana	Corkwood
Lilium catesbaei	Catesby's lily
Linum westii	West's flax
Macbridea alba	White birds-in-a-nest
Nolina atopocarpa	Florida beargrass
Oxypolis filiformis subsp. *greenmanii*	Giant water-dropwort
Parnassia caroliniana	Carolina grass-of-Parnassus
Rhexia parviflora	Apalachicola meadowbeauty
Sideroxylon thornei	Thorne's buckthorn
Scutellaria floridana	Florida skullcap
Verbesina chapmani	Chapman's crownbeard



Above: Restored ephemeral wetland with diverse herbaceous fringe. *Photo by Ron Blair.*

We became informed about one of the important water oriented recreational opportunities, which is offered at the ARWEA. Through the expansive swamp and salt marsh ecosystem winds some 130 miles of marked kayak/canoe trails, for which the Florida Fish and Wildlife Conservation Commission (FWC) has produced a very nice, field-hardy (waterproof) paddling guide. Spring, winter and late fall would be particularly comfortable times to enjoy some serious solitude and opportunities to view, feel and smell the seasonal changes in the salt marshes and the swamps that knit together all those creeks, bayous and rivers. We did not experience paddling during the review, as the swamps and salt marshes are not the focus of active land management practices; but we look forward to future trips. The FWC reports in their paddling guide that one might see, for example, brilliant yellow prothonotary warblers and the courting displays of swallow-tailed kites in the spring, beautiful foliage in the fall, and nesting bald eagles in the winter.

The ARWEA recreational facilities also include hiking trails, boat ramps, potential camping sites, handicapped access areas, boardwalks, and secure bike racks for those who would like to use off-road bike shuttling as part of multi-day paddling trips. This was an excellent area to combine some wilderness experience with learning about Apalachicola's interesting history. Appendix 5 of the FWC *Nature-Based Recreation Master Plan* for the ARWEA lists Bloody Bluff, Creels Town, Creels Side Camp, a turpentine plant, an African American cemetery, and numerous Native American camps and burial sites as some of the 27 cultural sites in the area. Great restaurants and charming lodgings provided welcome endings to our long days of gaining knowledge and sharing thoughts about some fascinating natural communities and meeting the dedicated people who manage them.



Above: Members of the review team gather at Whiskey George Creek Landing. Observation tower at Sand Beach pier on the north shore of East Bay, where maritime hammock can be seen bordering the salt marsh. *Photos by Ron Blair.*

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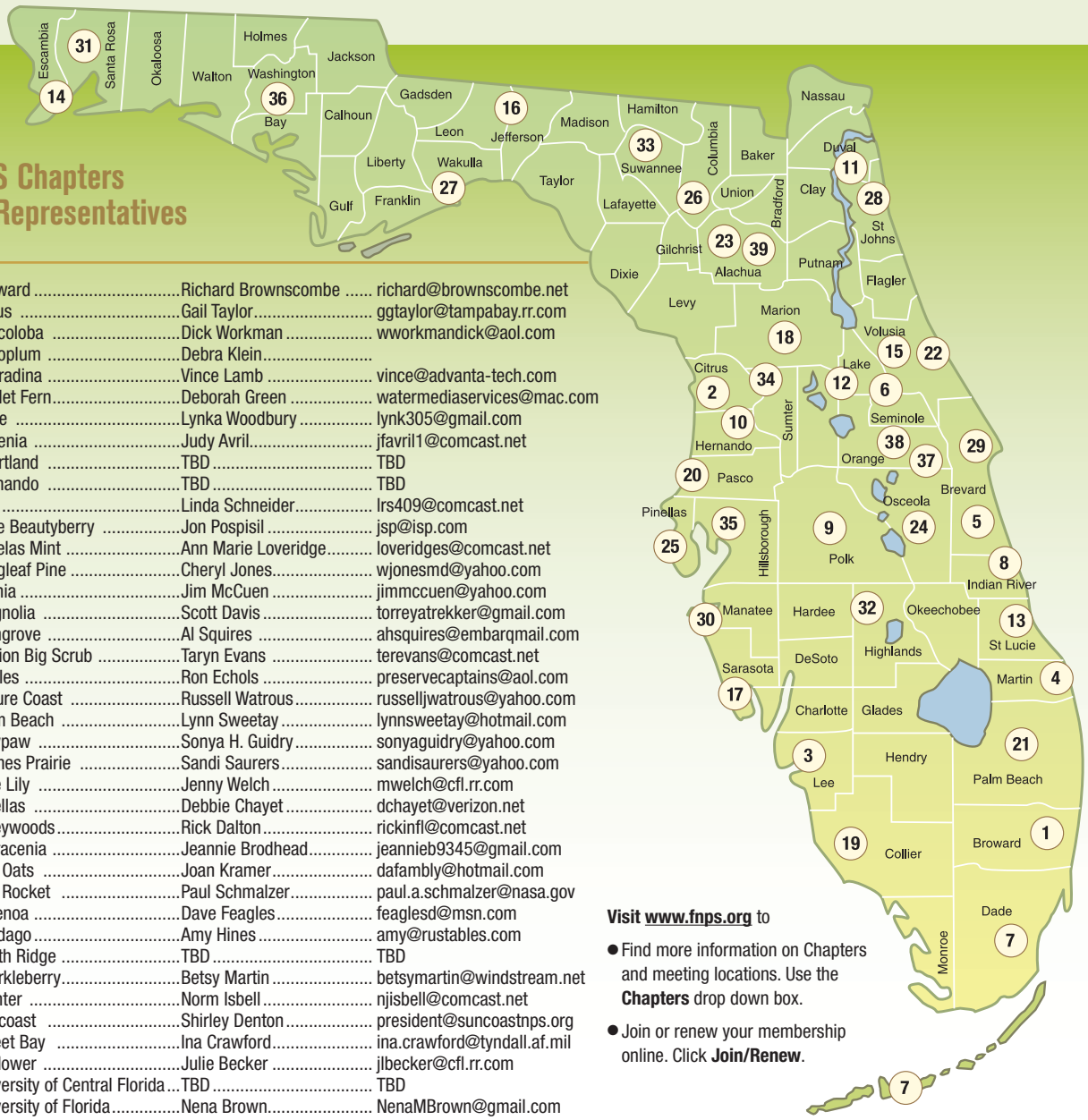

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Volunteer opportunity: volunteer needed for Okaloosa/Walton County area.

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