Florida's Living Fossil:

What are we learning about our native cycad

Florida houses relics of a bygone era. In one site on the Georgia border two conifers —*Taxus floridana* and *Torreya taxifolia*—endure since before the last ice age. Growing around Miami is *Psilotum nudum*, a plant more primitive than most ferns. But surely our most intriguing living fossil is *Zamia floridana*, the only cycad from the mainland United States.

Many Names, Many Questions

Zamia floridana has a distinction—the most names of any cycad. For years it was known as *Zamia integrifolia*, and sometimes *Zamia pumila*. The many scientific names highlight a poor understanding of the species and its relatives, but they also show how the plants in Florida have some interesting variation north to south: wide-leaflet and narrow-leaflet plants can be found here. The plants, commonly called "coontie," were used by Native Americans as a food, and also by 19th and 20th century settlers as a source of industrial starch.

Tracy Magellan, SE Florida

Those scientific and common names prompt two questions: How do our *Zamia* relate to other Caribbean zamias? And, what impacts did early and modern Floridians have on these plants?

A New Look at Old Plants

Our research team—people from MBC, USDA, FIU, FTBG, NYBG and international colleagues—has looked carefully at *Zamia* in Jamaica, Puerto Rico, The Bahamas, and the Dominican Republic for a number of years (see MBC Newsletters from Fall 2008, Fall 2009, Spring 2010, and here on page 3).

Another critical piece of the puzzle is here in our home state. With generous support from the National Science Foundation (see page 7), our *Zamia* team worked through the spring and summer to collect over 800 DNA samples, numerous herbarium specimens, and precise, fine-scale geographic data, to better understand the big picture throughout the region.

Southeastern Florida: Alan Meerow and Tracy Magellan performed fieldwork in the most populated part of the state. Over the course of long days afield, they were able to find 13 specimens in Broward County and 24 in Palm Beach County—perhaps demonstrating the effects of modern urban growth.

Everglades National Park: Javier Francisco-Ortega and Alan braved mosquitoes to sample the very abundant zamias on Long Pine Key, a Pine Rockland 'island' in the Everglades. Park rangers also showed us many zamias, which had been planted out as reintroductions—early 20th century industry had taken the original plants.

Southwestern Florida: The Florida State Park team generously ferried Javier and Alan out to Cayo Costa on their crew boat. Javier and Alan also covered sites in Oscar Scherer State Park and Koreshan State Park on this leg of the trip—3 diverse populations.

Northeastern Florida: Patrick Griffith and Alan traveled to the Georgia state line, sampling *Zamia* populations from the Canaveral Seashore northward to Amelia Island. *Zamia* plants in Ocala National Forest grew in sand and full sun among cacti, turkey oak, and ground lichen—certainly very different than the humid coastal forests of Faver-Dykes. At Tomoka State Park, some zamias were concentrated on an ancient shell mound—perhaps these are descendants from an old Tomokan garden? And, at one site, the team came face to face with a legendary cycad—the Palatka Giant.

Michael Calonje, NW Florida

Northwestern Florida: Michael Calonje and Chad

Husby went the farthest distance, all the way to the Big Bend National Wildlife Refuge, sampling *Zamia* from Crystal River Preserve State Park to Ichetucknee Springs and between. More interesting associations with Native American shell mounds were noted at the Lower Suwannee National Wildlife Refuge.

Moving Forward

The Florida fieldwork ties in with the large scale Caribbean project—with over 2,000 samples collected—and will help illuminate cycad evolution in this unique island region. At Alan's Chapman Field lab, Dayana Salas-Leiva and Kyoko Nakamura are working hard to genotype each leaflet with new DNA markers they are developing. The results of this expert labwork, combined with precise geographic data, will help tell the story of our local cycad—where did it come from, how does it relate to other Caribbean zamias, and how have the people of Florida impacted the plants?

We are very grateful for the help and support of the Federal and State land managers in Florida who kindly permitted access and sampling for this work. In many cases these professionals offered information, transport (by truck or by boat), and expert advice on managing mosquitoes, alligators, snakes and ticks.

Contact: patrick@montgomerybotanical.org

"Our *Zamia* team worked through the spring and summer to collect over 800 DNA samples"

Chad Husby, NW Florida

Alan Meerow, NE Florida