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A Frenzy of Frogs and Fish

Many make the move to small, temporary ponds

Florida is known for water. From freshwater springs and rivers down to coastal estuaries and the blue ocean, water is everywhere in our state. Here in Highlands County, our landscape is filled with lakes. But what about in the Florida scrub, the high dry sandy ridges that run throughout our region? Dig down into these sandy soils and you will soon hit water, except at the highest elevations. Even here, scattered throughout the scrub, the shallow depressions in the sand become seasonal ponds that typically fill and dry during our wet season from June through November. But seasonal rainfall and sandy soil mean that water is not necessarily available for long.

Once the rains start in late spring, groundwater rises, seasonal ponds fill, and activity starts to pick up. Step outside your home in the evening, and you can hear a myriad of frogs calling, looking for mates. The high-pitched chirps of Oak Toads mix with the rapid Morse-code-like tapping of the Pinewoods Treefrog, among others. The choruses can be quite deafening. Pinewoods Treefrogs are especially abundant in the scrub. Colorful tadpoles of this species are found in the majority of ponds on Archbold's property throughout the summer months. Other species, such as the Gopher Frog, live in dry upland habitats and can travel a mile or more to reach the seasonal ponds to breed and lay eggs. Heavy rains in the cooler months will also stimulate the Gopher Frogs to breed. When large numbers of Gopher Frogs are broadcasting their snore-like calls, the collective sound is reminiscent of ocean waves breaking on a shoreline.

Frogs are not the only creatures taking advantage of the newly filled ponds. Laura Elston, research assistant in the Restoration Ecology & Herpetology (study of reptiles and amphibians) program said, "Small fish, such as the Everglades Pygmy Sunfish and the Eastern Mosquitofish, can use shallow connections, such as sand roads or shallow ditches, to move from more permanent waterbodies to the seasonal wetlands embedded within the drier uplands of the scrub. Studies at Archbold have found that these small-bodied fish are able to disperse surprisingly far from lakes and other permanent water, as

they seek to exploit newly available shallow-water habitat and food. They seek food items such as aquatic insect larvae and tadpoles. If these fish do not follow retreating water levels, they may become trapped in rapidly drying ponds in the fall and winter, and they in turn become an important food item for birds and other animals in the scrub.”

Through ongoing research, Archbold researchers aim to shed more light on the relationships between fish, frogs, and the physical characteristics of the seasonal ponds they inhabit within the scrub. “There is still a lot we don’t know about what controls timing of breeding by different frogs and who can survive and thrive in these ponds,” says Betsie Rothermel, Program Director for Restoration Ecology and Herpetology. “Factors such as pond size, the length of time a pond holds water, and pH—a measure of the water’s acidity level—can all influence whether a certain species of frog or fish will be present or not.” For the past year, her program at Archbold has set minnow traps and collected water chemistry data from ponds within the scrub, and is currently doing another round of sampling. The captured frogs and fish are released once they have been identified and counted. “One of the questions we have been trying to answer,” says Laura, “is what effect extreme weather patterns can have on the seasonal ponds. For example, after the extremely wet winter of 2015-2016, there were more watery connections between ponds, allowing fish to travel farther into the scrub. But during the drought this past winter, the ponds dried down and eliminated fish, so we expect to see more tadpoles this summer.”

Even in a relatively dry habitat like the Florida scrub, there can be a surprising amount of aquatic life. Animals that rely on seasonal ponds to complete their life cycles demonstrate amazing resiliency considering the extreme variation among seasons, and from year to year, in their habitats. There are many relationships still to be explored between fish, amphibians, and their environment. Continuing studies of these ponds can teach us more about the remarkable animals that call the Florida scrub home.

Photo 1: Gopher Frogs can travel long distances to reach seasonal ponds. Photo by Betsie Rothermel.



Photo 2: Pinewoods Treefrogs are common at Archbold, and their tadpoles can be found in many seasonal ponds at the Station. Photo by Rebecca Tucker.



Photo 3: Pinewoods Treefrog tadpole found during seasonal pond sampling. Photo by Betsie Rothermel.

