

Dry-downs & Aestivation

Spring dry-downs are an important and regular occurrence in Southwest Florida and at Corkscrew. They are essential for the survival of the swamp as a whole. So there is no need to be concerned; plus, it is a great opportunity to educate the visitors.

Last October, a visitor from the U.K. sent an email to David Anderson, president of Audubon of Florida, which read: "My family and I had a great vacation in Florida this June. We visited Corkscrew Swamp for the second time in our lives and were astonished to see that all the lettuce lakes had dried up. ... [Will] the lakes recover? Have you any news?"

That question is typical of what is asked every year in April and May.

The ebb and flow of water is a regular occurrence. It is healthy and a necessity for the swamp.

Many plants such as cypress trees can't reseed in water and must have a dry-down in order for new seedlings to get a fast start and grow enough that their crowns are above the water level when the summer rains return.

Animals, herps, fish, and birds all have adaptations that enable them to survive dry-downs as well, but dry-downs do mean a change for them. There are two basic strategies: stay and tough it out, or move on.

Warm-blooded animals, including wading birds, require daily food and don't have a choice. They travel to areas that provide food and water.

Cold-blooded animals don't need to feed daily to survive, so they do have a choice. Many stay.

Sirens such as the Two-toed Amphiuma, as well as salamanders and lungfish, burrow deeply into the bottom mud and create a (nearly) moisture-impervious cocoon in which they



In June, 2001, the north lake dried enough that grasses emerged. For a short while, it and the south lake became meadows.

await the return of the water.

The technical term for this spring/summer hibernation-like system shut down is *aestivation* (from the Latin *aestas*, summer).

Other animals do the same thing. Everything from Apple Snails to Crayfish to Water Moccasins aestivate. The snails and crayfish burrow into the soil while it is still damp, while water snakes find a cool, protected shelter safe from predators such as beneath exposed roots at tree bases to await the return of the water.

A dry-down is essential for the Apple Snails for another reason. It allows emergent vegetation needed by the snails to get a start.

Turtles may either stay or go. Some like the Chicken Turtle wander far afield and dig down into the dirt or litter to await the rainy days. Red-bellied Turtles dig down into the bottom mud so that only their nostrils protrude above the surface.

Alligators can travel, walking several miles over land, and seem to have a water-seeking orientation which brings them to safety in the nearest river, pond, canal, or lake. They are also

capable of digging long horizontal burrows into muddy banks, or of digging out a hole in the lake bottom. In previous years, gators have dug burrows in the south lake and crawled in to wait.

Many herps that aestivate are able to slow their metabolism greatly. Oxygen consumption and heart rate drop significantly and fat is metabolized much more slowly. Because large individuals store more fat and consume less oxygen per unit weight than small ones, they are able to survive much longer periods of aestivation.

Frogs settle into the bottoms of cracks in the

muddy bottom to wait. Treefrogs find a nice spot in a *Tillandsia* or other protected nook.

Some fish can survive in wet mud for short periods of time, up to several days, but none of them can really survive a full dry-down.

So most fish have different strategies. Some are great dispersers and they seek out permanent water bodies (canals, deep ponds) for the dry season, and as soon as the marsh re-floods, they move great distances back to the forest. Other species are prolific breeders and while individuals may die, the species as a whole rebounds quickly. Gambusia, for example, can sustain a 90% kill and still be at full numbers in the fall because of their rapid reproductive cycle.

Other aquatic invertebrates adapt to the dry season by timing their reproduction so that an immature life form (larvae or eggs) is in the soil growing and the adult emerges when the water returns.

Dry-downs are also when more mammals such as bear, bobcat, and deer move into areas normally too wet for them and are seen from the boardwalk.