

IN THE AFTERMATH OF HURRICANE MICHAEL

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On Wednesday, 10 October 2018, just after 7 a.m. local time, Hurricane Michael slammed into the Florida Panhandle between Panama City Beach and Mexico Beach packing maximum sustained winds of 250 km/h, just under the wind speed that would have designated it as a Category 5 hurricane (Fig. 1). It will go down in history as one of the strongest and most devastating storms ever to make landfall in the United States, and the worst hurricane ever to impact the Florida Panhandle.

The country was still reeling from the record-breaking rains and subsequent flooding from Hurricane Florence, a slow-moving Category 4 storm that caused severe damage in the Carolinas and dumped a total of 913 mm of rain in Elizabethtown, North Carolina in September. Perhaps the nearly non-stop news coverage of Florence led to a kind of media overload, because many people in the western states were not even aware of Hurricane Michael's landfall, or its terrible path of destruction, despite the nearly \$12 billion in damages and 54 fatalities.

If there was a bright spot to be found in the story of Hurricane Michael, it was that the storm moved quickly inland into Georgia, and within 12 hours after making landfall, it had already been downgraded to a tropical storm. In Tallahassee, where I live, we were told the sustained winds would remain under 80 km/h with possible gusts of up to 113 km/h. We had survived worse than that during previous hurricanes, so my wife and I were shocked when at about 4 p.m. local time, a sustained wind gust shook our house, toppled a massive 25-m oak tree and demolished my greenhouse as we watched. Minutes later we lost power.

With the storm passing so close to the Apalachicola National Forest, I decided to drive out and inspect the damage on Sunday, 14 October. However, so many trees were down that the Forest was officially closed, and we had to wait until the following Sunday to reach the sites I was most familiar with. Though fallen trees had been cleared from the highway, many more — mostly pines — had snapped like matchsticks, while others had been stripped of their bark (Fig. 2). Although we had been warned of possible flooding as the storm approached, I was shocked at just how little rain we actually got. The water levels in many of the ponds I regularly visit were actually lower than the last time I had been there in September. Despite a NASA satellite that indicated rainfall in the 15 to 25 cm range, my own rain gauge registered less than 5 cm, a far cry from previous hurricanes and even many strong summer thunderstorms.

Back roads throughout the Apalachicola Forest were still impassible due to downed trees and in places, thick piles of debris, but I was able to visit most of my usual stops. *Sarracenia flava* was, as best as I could tell, the only carnivorous plant that sustained significant damage from the storm (Fig. 3). I can just imagine the pitchers being whipped around by the gusty winds and hit by flying debris. Though wet leaves and branches covered much of the area, making it difficult to walk safely — I

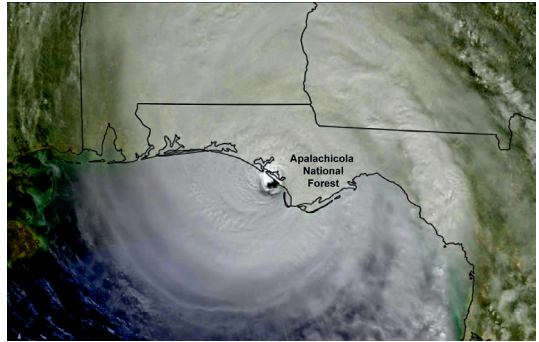


Figure 1: The eye of Hurricane Michael makes landfall just west of the Apalachicola National Forest. Image from NOAA.



Figure 2: Apalachicola National Forest after the hurricane on 21 October 2018.



Figure 3: *Sarracenia flava* in September before (left) and after the hurricane on 21 October 2018.

did take several spills that day, though none were too serious — several sites where large colonies of *S. rosea* and *S. psittacina* are found appeared to be relatively unharmed, though the difficulty of traversing the debris field meant I could only do a spot check. Our native *Pinguicula* also appeared to be in fine condition. The single colony of *S. minor* I often visit was unreachable, but the plants are surrounded by tall grasses which should have offered at least some protection.

One of the big surprises was seeing some sites where the wind actually created new clearings where shallow water had collected. One of these was just south of the famous radio tower site (Fig 4). There I saw large populations of *Utricularia* flowers swaying in the breeze. I am not an expert on Utrics, but I believe these to be *U. cornuta* or *U. juncea*. I can say with certainty that I have never seen these in flower at this particular site. At the edges of ponds and ditches, the purplish flowers of *U. resupinata* seemed extraordinarily abundant.

I managed to save a large box turtle whose shell indicated he'd had an unpleasant encounter with an automobile sometime in the past and was fortunate enough to see a rare river otter crossing the road. Otherwise, we mainly encountered a wide assortment of butterflies and several groups of turkey vultures. Oddly, the Forest was not filled with the typical wide range of bird calls and songs. Perhaps they had moved to safer ground and had not yet returned.



Figure 4: The wind created new clearings with *Utricularia* growing in shallow water.

If I had to sum it all up, considering the size and strength of Hurricane Michael, things could have been far worse. Though we were not allowed to get close to Mexico Beach, it's clear that the coastline has been forever changed and it will take years or even decades for these communities to look like they did before Hurricane Michael. From experience, I know the Forest will recover quickly and though there are bound to be some changes, by next year all the plants, not just CP, will have a fresh start.

For me, I lost the best shade tree and worse, most of my CP collection (though I was able to locate about 45 of 200+ *Sarracenia* in among the debris piled in our yard, as well as that of our neighbors). Due to the extreme damage to the pitchers, it will be 2019 before I even know exactly what I was able to recover. According to our insurance, we suffered over \$10,500 in damages — and our deductible for hurricanes is \$5,800! It will take many years for our home (and the homes of our neighbors) to even begin to return to normal. It is very hard not to become overwhelmed by the clean-up and repair tasks that lie ahead, or to be depressed by the number of plants I lost. I just repeat to myself, “This could have been so much worse.” Then I try my hardest to actually accept that.

It is up to people far smarter than me to determine whether the recent storms that have caused so much damage are a symptom of natural or man-made climate change. To me, the weather has definitely changed in Tallahassee since I lived here in the 1970s and 1980s, with more droughts, less summer rainstorms, more hurricanes, and warmer winters (when we have a winter at all). For the sake of the planet, future populations and the plants we love, I can only hope that we all choose to do the right thing and protect our global environment.