

U. dichotoma and *U. helix* were known to occur there (Lowrie 1987, 1989; Taylor, 1989) but were not found. However the 27 species we observed in the wild was an amazing experience which made the expedition unforgettable. It was also interesting to note the environment in which each species was found, which should assist in the cultivation of these amazing plants.

ACKNOWLEDGMENTS:

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CATTLE AS SARRACENIA STEWARDS?

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Behold the cow. From an anthropocentric view it stands there with a rather placid and bored facial expression as it nibbles forage or chews cud. Its weighty and ponderous body is balanced on four relatively small hooves that thus bear tremendous weight on each hoof that is transferred to the ground as it lumbers about the pasture, seemingly crushing all beneath those hooves. Appearing to eat everything green in sight, large quantities of nitrogenous waste products are passed very frequently. Due to its fermentative digestion, we are told that each cow passes significant quantities of methane that contributes to the greenhouse effect.

Not something you would want in your sarracenia patch, you say? Well, think again, maybe.

Stewards care for things. In terms of sarracenia bogs and savannas that are preserved by various conservation agencies, public or private, stewards are appointed either as volunteers or employees to provide security, and to actively work on the land to prevent any further deterioration that may have begun, or perhaps to reverse a decline. Those of you who have read my comments on this regularly have seen me praise the conserving agencies generously, but frequently criticize resulting stewardship which may very well be out of the original conserving agency's hands. Whether stewards are volunteers or are paid, once a responsibility is undertaken we all expect some knowledgeable activity because each preserve has its point below which it may well never recover to even the level at the time of conservation.

Let us look at two plots of land. One is privately owned and the owner wishes to do anything he can to get rid of the sarracenias on his land. The other piece of property has not been so attacked, in fact it has been under "management" for several years to preserve sarracenias, has just recently been purchased by a highly respected conservation group, and yet it is declining at an alarming rate in spite of all this love.

Our first piece of land is located in Toombs County, Georgia near the town of Lyons and in the famous Vidalia onion country. It is on a small family farm located on an obscure sideroad that parallels that historic north-south artery, US 1. The owner has an economically wise mixed approach to his farm with various crops and some beef cattle.

As one approaches his cow pasture on the road, the sight pictured in Figure 1

greet you. At one sloping corner of his cattle pasture is a very large yellow blur inside his fence that turns out to be healthy masses of shoulder to shoulder *Sarracenia flava* and associated CP. The area approaches two acres of his pasture at this lower corner and further observation confirms that this is a typical middle south Georgia seep slope. The first time I saw this 16 or 17 years ago, I pulled the car over and got out to take some photos from the roadside. A battered pickup pulled over and a man who proved to be the farmer got out. Someone taking pictures of his pasture comes under the heading of suspicious in that part of the country. After all, I could have been an IRS agent or a potential developer who wanted to asphalt his whole farm. If you do field work, you live and flow with these attitudes to get along. I explained that I was interested in the fantastic show of the plants on his property.

Rather than expressing some pride in them as I have had many property owners do, he scowled and explained that he wanted to get rid of every blasted one of them because the cows obviously did not eat them, they kept the spot wet (his concept) and there was little grass where they were so they were reducing pasturage for his cows. I looked over the barbed wire at cattle widely spaced in the pasture, some standing around in the sarracenias, not doing anything in particular, certainly not eating the pitchers. I asked him if he had ever seen cattle eat the pitchers. A few were bent or askew where the cattle had walked through them, but the narrow passage their legs and hooves required seemed to do little lasting damage judging by the healthy crop of plants I saw. No, he said, they do not eat the pitchers. A few younger calves sniff at them or try a nibble, but as they grow older they seem to learn that pitchers are not forage. However, he and I had both seen cattle nuzzle down between plants and eat grasses and weeds, thus doing some effective weed control.

I asked him what he had tried to improve his pasturage. He tried to burn them in all seasons, but that seemed to make the plants "worse".

He tried mowing them in various seasons with a similar result. Initially, of course, he had let his cattle loose in them, but the sarracenias flourished, and he felt they were



Figure 1— A fine stand of *Sarracenia flava* in a seep slope pasture alongside a back road in Toombs County, Georgia.

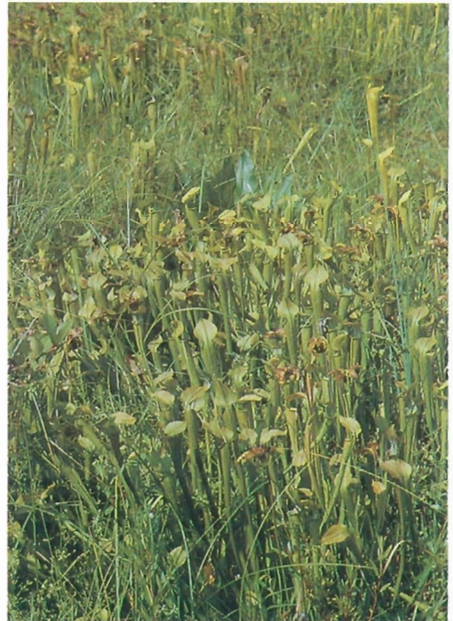


Figure 2— *S. rubra ssp. jonesii* in a stand near Etowah, NC. Note decline with abundant grasses and other weeds after exclusion of cattle.

getting still "worse". I silently hoped he would never spray, or try channeling the slope drainage and plowing. So far, he has not.

After a few more pictures, I left him with a puzzled expression still on his weathered face. Whenever I am in that part of the country, I drive by the location, and over the years the *sarracenia*s have continued to do very well. I never spoke with the owner again, and possibly heirs have the farm by now. The last I saw the place about four years ago, the same startling yellow blur of pitcher plants was still there. Clearly, the cattle were not doing physical damage at all. A possible degree of fertilization did not seem to bother the *sarracenia*s, nor did compaction from cattle hooves. They did not forage on the pitchers although a few tentative nibbles may have convinced the cattle of the pitchers' sour taste to a cow. And the cows weeded—Browsing whatever other palatable forbs that would begin to grow between the pitcher plants. As is more usual than not, the whole pasture, including the grassy part, was overgrazed, and the cattle would wander onto the seep slope looking for whatever might be growing between the pitcher plants.

In this particular set of circumstances, the cattle could not have been making a better contribution than if they were trained and paid for it!

Now let us travel several hundred miles to the north, into the mountain plateaus of south western North Carolina, near the crossroads of Etowah just a few miles west of Hendersonville—*S. rubra ssp. jonesii* country! The name alone quickens the heart of the *sarracenia* field botanist.

In this general area, Dr. Edgar Wherry traveled in the 1920's and 30's and described several bogs of this plant. In later years he revisited the same areas and noted how most of them had been handily converted to golf courses, potato farms and at least one major appliance factory. This prompted Dr. Wherry to write me that it was ill advised for an older botanist to return to former favorite field sites because he or she will almost always be disappointed. How right he was!

But, near one of these destructive golf courses where he saw plants off the main highway, there is on a back road a small farm that for years held the best overall remaining location for *jonesii*. It is also one of the two sites I know of for the green pitched/yellow flowered variant.

The site is in a property line fenced corner of a pasture and is a seep slope. Above this lower, wetter corner, is continuation of cattle pasture, and above that, croplands. The little location is no more than a quarter or third of an acre, but what a beauty it was.

I was first led to the location close to twenty-five years ago by a very active, elderly retired gentleman who field botanized for a hobby. He had retired to Hendersonville from scientific instrument sales work in New England, and I do not remember how we connected, but we botanized for a number of years after. At that time, the bog held the two variants of *jonesii*, along with *S. purpurea* and hybrids between the two. It was an amazing sight—Large clumps of the pitcher plants had little space between them. The pitchers were fine, tall specimens and flowering was dazzling each spring.

And there were cattle. They freely grazed the entire pasture including the bog. Again, as in Toombs County, Georgia, the cattle did not eat the pitchers and did little mechanical damage to them outside of a few pitchers bent over. In fact, Fred Case and I separately suggested that the cattle might actually contribute to vegetative proliferation by breaking the horizontal rhizomes that lie just beneath the ground surface. This is a recognized technique for propping in culture.

At any rate, there were the cattle, nibbling and "manicuring" the grasses and weeds down, and the plants were doing great. I visited the site several times over those early years and it stayed about the same. The farm was in private hands and the owner seemed to have a benign attitude toward the pitcher plants, then some pride when he received more and more attention over them.

The first move was an attempt at management. It must have seemed reasonable to someone that the cows could do more harm than good, or were not even neutral, so

barbed wire was strung diagonally across that corner to fence the cattle out. The cattle did not mind, but I think the pitcher plants did.

Decline began rapidly. Figure 2 shows a typical part of the area close up and you can see the abundant grass and weed growth and smaller clumps of plants a couple of years after the diagonal. To be fair, the adjacent deciduous trees on the lower and north fence line also grew and their branches spread over the bog causing more shading of part of it, but the open part began to recede more and more towards the lower shaded part.

Then the farm was purchased by a reputable private conservation organization. The only change was a few stakes driven into the ground to act as baseline survey markers for counting the fewer and fewer plants. It was suggested that old farming practices of applying fertilizers and other chemicals to the higher ground had tainted the lower bog corner and this was depressing pitcher plants, but the same practices had been in place for years when I first saw the bog and all through the time I knew it until the cattle were excluded.

Some well trained botanists and ecologists with the conservation organization and the US Fish and Wildlife Service are looking into it. They say they "have not quite got a handle on the continual decline" of this once magnificent stand. When they said that it suddenly occurred to me how old I was and how young these well trained people were. In several areas of this one State alone, they were "saving and managing" areas that excited them but that in actuality were mere faint shadows of the former glory of pitcher plant bogs in years past. Perspective is important.

There, then, is a tale of two bogs. One persisting in spite of mighty efforts by an owner to destroy it, another withering in spite of thoughts to save it. Do I advocate letting the cattle back into that mountain farm bog? Hardly. This bog survived for probable millions of years before farms and herded cattle, but the forces molding the bogs then were probably in parallel to what the cattle did to help them in these more recent times. Maybe the bored, placid cattle are trying to tell us something.

Literature Review

Gardner, Rob. 1994. Growing carnivorous plants at home. Newsl. NC Wild Flower Preservation Soc. 6:1 1-13.

Rob Gardner is a highly skilled grower of plants and is a curator at the North Carolina Botanical Garden. In this brief article he introduces sarracenias, and then describes his experience and suggestions for growing these plants outdoors. Since this is a State Society directed bulletin, the instructions aim mainly toward that state's milder climate. (Outdoor artificial bogs ranging from sunken wading pools to holes lined by plastic sheeting, along with soil light and water recommendations are described.

Sheridan, Phil. 1991. Noteworthy collections: Maryland. *Castanea* 56: 71-72.

Phil (along with Bill Scholl) has made some unusual plant discoveries in Maryland, among them the following CP: *Sarracenia purpurea* (first collection from Charles County and western shore), *Drosera rotundifolia* (declining populations) and *Drosera capillaris* (one of more northern extensions of this species).

Sheridan, Philip M. 1993. 1) A unique habitat for *Drosera rotundifolia* L. (Droseraceae) on the Blackwater River, Virginia. 2) The Virginia pitcher plant bogs, part one: Poo Run. *Virginia Journal of Science* 44: 122. (Abstracts).

In abstract 1) above, the author describes *Drosera rotundifolia* on two vertical clay seepage's on the Blackwater River. Bends in the river result in erosion with water seeps flowing from between the upper sandy layer over wet, impermeable clay. This seep provides excellent habitat for the sunned. In abstract 2), the author recounts the history of Poo Run, a floristically significant wetland located near Petersburg, VA. It