

Friends of NC Plant Conservation

Field Notes

VOLUME I, ISSUE 3
FALL 2009

FRIENDS OF NC PLANT CONSERVATION

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Friends Annual Meeting

Has it really been almost a year since we gathered to launch the Friends of Plant Conservation? During that time, the board has labored to organize the group to efficiently provide assistance to the NC Plant Conservation Program. We have a refined mission, statement of core values, and strategies to accomplish our goals.

Now we want to hear from you, and have set aside a day for a couple of great speakers and participatory discussion, guided by a panel of knowledgeable folks, on the direction we need to take to be successful. This is your opportunity to influence how the Friends of Plant Conservation will move forward.

Put the date on your calendar now, send in your registration (see page 2), bring a friend with you, and plan to join your Friends.

Wednesday, November 4th, 9:30 a.m. — 4:00 p.m.
North Carolina Botanical Garden, Chapel Hill, N.C.

9:30 Gathering of Friends: Welcome, Bruce Williams, President

10:00 Rob Sutter: "Is Conserving Plant Species Still Relevant?"

11:00 Cecil Frost: "What Do We Know About the Future of our Native Flora?"

12:00 LUNCH

**12:45 Rob Evans: "Imperiled Plants and Habitats—Inextricably Linked:
NC Plant Conservation Program Vision"**

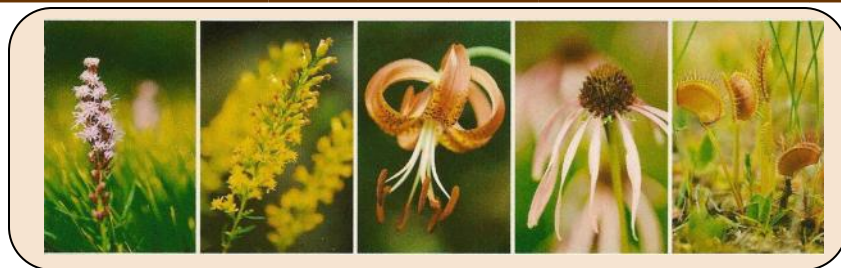
**1:00 FoPC Board member: "Preparing the Ground: Tools for Implementing
the FoPC Vision"**

**1:15 Panel Discussion: "From Seed to Fruit: Making the Vision Work
with Help From Friends" Tony Avent (others TBA), and YOU!**

2:45 Friends of Plant Conservation Business, Bruce Williams

3:00 Adjourn

Registration form on following page....



Friends Annual Meeting Registration

Name(s): _____

Address: _____

Telephone: _____ Email: _____

☐ **Registration fee \$15.00 x _____ (#in your party)** \$_____ Please

indicate lunch preference

☐ Meat sandwich Quantity: _____

☐ Vegetarian Quantity: _____

☐ I would like to pay my 2010 dues now: \$_____

☐ Student Member \$5

☐ Individual Member \$15

☐ Family Member \$25

☐ Affiliate Member \$25

☐ Sustaining Member \$50

Please include the # of members in your organization _____

☐ Life Member \$500

(Five, \$100 yearly installments)

☐ Gift _____

Total Enclosed \$_____

Send your check, made to Friends of Plant Conservation, to:

Friends of Plant Conservation

1060 Mail Service Center

Raleigh, NC 27699-1060

Email: Marlene.lkerd@ncagr.gov

Please bring your own coffee cup and BRING A FRIEND!



From the President...

The economy is slow but loss of critical natural habitat also continues at an alarming rate. The North Carolina Friends of Plant Conservation is approaching its first full year of existence. We have nearly a hundred members, a plan, and a long road to travel. Successful ventures began with small steps, enthusiasm, and a dedicated organization, but we must grow to ensure the change we desire.

A minister recently told me he was in the “soul saving” business. He said that once people understand what’s involved he can sign them up. According to this man of the cloth, the economic downturn has produced lots of candidates but it is difficult to get the word out to people that need to hear the message the most. I told him that I understand his dilemma and related our efforts (NC Friends of Plant Conservation) in the “plant saving” business.

With either pursuit, targeting education and information to a sympathetic and receptive audience is a key to success. Churches grow when friends bring friends; our organization will grow when you bring friends. If each of our current members will bring at least one new member with them to the annual meeting at the NC Botanical Garden in Chapel Hill on November 4, we can double our “charter” memberships and end our first year with nearly 200 members! Our annual meeting is going to be a first class event; an event featuring some of the best minds in the plant business. Be there and bring a friend!

We have a wonderful organization that will sell itself, so ask someone to join you at the Chapel Hill meeting, and, just maybe, they will join us to save North Carolina’s imperiled plants and habitats!

Bruce Williams

The earth we abuse and the living things we kill will, in the end, take their revenge; for in exploiting their presence we are diminishing our future.

~Marya Mannes, More in Anger, 1958



Venus Flytrap Seed Rescue

Dale Batchelor

"A pair of clippers or small knife, bug spray, a hat, and plenty of water – those were the items Laura Gadd had recommended we bring along for the June 29 Venus Flytrap seed rescue at the Boiling Spring Lakes Preserve in Brunswick County.

My husband and I were among seven volunteers joining program staff on the seed rescue. We were excited about our first Friends of Plant Conservation outing and the opportunity to assist in the maintenance of a species of "Special Concern" like *Dionaea muscipula*. Getting to explore a few fascinating Coastal Plain plant communities with a team of experts was an incredible bonus!

When we arrived, late morning, at the Boiling Spring Lakes Community Center, Laura explained a bit more about our mission to collect ripe seeds from populations of *Dionaea* and sow them into suitable habitat. Rob Evans gave our group a bit of history about the Boiling Spring Lakes Preserve, an overview of the area's ecological features, and background on the problem of poaching Venus Flytraps.

Rob explained that in spite of the fact that *Dionaea* can easily be propagated using tissue culture, poachers not only continue to dig mature plants, but also collect seed, much of which is sold in Europe.

The first rescue site, near Camp Pretty Pond, turned out to be the verge right alongside the highway. At first we had difficulty seeing *Dionaea* leaves in the maze of vegetation, but gradually a chorus of surprise rose from the group as we realized we were literally standing on hundreds of Venus Flytraps. As our eyes grew more accustomed to spotting the seed stalks, it also became obvious that many had been topped. We were left to speculate whether the culprits were clipping poachers or browsing deer.

Land Management Specialist Daniel Bunce had prepared for the day by locating Flytrap populations and mowing back vegetation in some areas suitable for planting. With Rob and Laura's guidance, we gathered ripe seed pods scattering some near the parent plants. We planted the remaining seeds a bit further away from the highway in hospitable spots, often in patches of sphagnum moss.

continued on page 8...

Venus Flytrap Seed Rescue continued

Following a lakeside picnic lunch at Alton Lennon Park, we ventured to our second Preserve location. After a short walk, we were surrounded by a Long Leaf Pine Savannah that looked precisely as I had imagined Flytrap habitat would be. Here Rob pointed out the after effects of a very important tool in supporting *Dionaea* populations: controlled burns. With encroaching evergreen trees and shrubs eliminated by the fire, the herbaceous plants were rebounding.

Rob pointed out a number of interesting plants and unique associations. As we moved through the area, we found scattered populations of *Dionaea*, often in lower, wetter depressions. While we didn't find as many mature seeds for planting as we had at our first stop, we had our final reward of the day: the sight of a Flytrap in glorious full bloom.



Article and photos by: Dale Batchelor, Friends member

Rescue participants were delighted by the beautiful white flowers of a Venus flytrap in full bloom.

Photos on previous page, left to right

Photo 1 Flytrap Search: Land Management Specialist Daniel Bunce (R), Botanist Laura Gadd and Volunteer John Thomas search for Flytrap plants.

Photo 2: Plant Ecologist Rob Evans (R) helps Volunteers David and Carolyn White recognize mature *Dionaea* seed pods.

Photo 3: Volunteers Bill Switzer (L) and John Thomas (R) plant Venus Flytrap Seeds

The insufferable arrogance of human beings to think that Nature was made solely for their benefit, as if it was conceivable that the sun had been set afire merely to ripen men's apples and head their cabbages.

*~ Savinien de Cyrano de Bergerac,
États et empires de la lune, 1656*

Save the Venus Flytrap: How to generate funds to conserve

Dr. Thomas C. Gibson

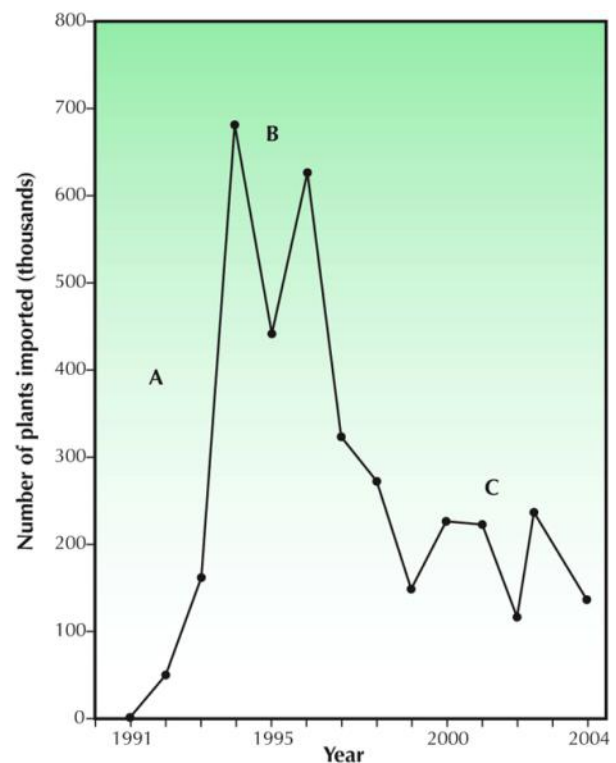
The Venus Flytrap is perhaps the world's most unique and well-known carnivorous plant (Fig. 1). Known only from a small area of coastal North and South Carolina (Boyer 1995), it has been sought after for decades, usually as wild collected plants and illegally (Gibson et al 1980). The species has been decimated by decades of massive field collecting, as well as lack of fire and drainage of its habitats. Nearly 70% of all populations monitored since 1982 have gone extinct forever (data from Shew 2002 compared with Boyer 1995; actual calculation is 69.2%). In 2002, there were less than an estimated 35,800 individual plants left in nature, (compared to the probable 2-3 million now in cultivation). At that time only 12 populations remained with about 1000 individuals in each and only 4 populations with more than 2000 individuals (9 populations of this latter greatest size have gone extinct). Serious poaching still continues, even from special preserves for the Flytrap. The species, therefore, is now under consideration for listing as endangered (R. Evans, pers. com.). Currently, it is protected by state laws and listed on APPENDIX II of CITES, an international treaty to regulate the trade in endangered and threatened species of plants and animals.

The Venus Flytrap continues to grow rapidly in popularity among plant collectors with over 682,000 plants sold internationally in 1994 and an average of 272,000 plants per year being sold since (Fig. 2). If plants average \$5-10 each retail, the current total international market value of flytraps is over \$2 million per year. These data do not include domestically propagated flytraps, which must increase total world sales to well over an estimated 5-6 million dollars per year. Fortunately, most of the public demand for Venus Flytrap plants today is met by

cloning plants via tissue-culture and seed production. (All plants were field collected until 1992, when tissue culture commenced in the USA. Large scale production by seed started in Holland in 1997. According to Shew (2002; page 14), however, "much of the trade still comes from plants grown in the wild").

Figure 2. The gross international import of live flytraps as a function of time. Data come from UNEPWCMC with kind permission.

Before 1992, when CITES trade data were first collected, the trade of flytraps was undoubtedly higher. In one year alone (about 1979), over 4,500,000 plants were dug from nature (Gibson et al., 1980). One collector estimated that 65,000 plants per week were field-dug in North Carolina by one company alone in 1981. Sutter et al. (1982) estimated between one million and four million plants sold per year. The same article by Byrd and Black (2001) cites Kral (1983) as saying, "This is one of the most exploited southeastern plants, large populations being decimated or extirpated for the novelty plant trade." In essence, a long history of field-collection has decimated this species. Trade peaked in 1994 (B) and has settled down to fluctuating between 150-250,000 plants per year (C). A ten year average is 271,934 plant sold per year. Section A may represent better detection and reporting of trade data.



Flytraps, continued...

Here, I propose that we initiate a voluntary premium to be paid at the time each Venus Flytrap is sold in the developed world (i.e., in the USA, United Kingdom, Germany, Holland, France, Canada, Japan, Australia, Czech Republic, Italy, Israel, and other countries where collectors commonly import this plant). A nominal surcharge (say, 25 cents) would be collected by wholesale nurserymen from retailers at the time they distributed the plants. Retailers would then display and collect this fee (or slightly more to cover any additional costs) as part of their sales. The money generated from such premiums would go into a central fund overseen by a committee of respected plant conservationists. They would then distribute these funds in the manner they agreed would best conserve wild populations and associated habitats. In particular, the funds would support the buying of private lands with suitable flytrap habitat, conducting research to learn optimal management policies, restoring new populations in suitable habitat lacking the plant, and protecting populations from known human threats including illegal poaching. Existing institutions that could benefit from such support include the North Carolina Plant Conservation Program, The Nature Conservancy, and the Heritage Program in South Carolina.

How large would this fund grow to conserve wild populations be? Assuming a premium of 25 cents per plant, and participation by all domestic and international wholesale dealers, the program could generate over \$250,000 dollars per year. This estimate is based on sales of 5-6 million flytraps worldwide and 1/5 of all sellers participating. The international trade alone could generate \$68,000 per year (based on 272,000 plants traded yearly).

It now appears clear that if we don't devise a mechanism to protect remaining plants and habitats, the Venus flytrap could go extinct. Only a few large populations remain and smaller populations often go extinct due to stochastic processes (Fig. 3). Consequently, the species' range may be collapsing. Concerned collectors would appreciate the opportunity to help prevent this human-driven extinction by so simple an act as donating when they buy plants. The funds generated by this surcharge could, over time, serve to protect and restore much of the species' original range, (see Roberts and Oostings, 1958, for discussion of flytrap ecology).

The success of this conservation scheme depends entirely on the concern and love of collectors who give their money voluntarily to conserve this endangered plant species. To quote Baba Dioum, "in the end, we will conserve only what we love, we will love only what we understand, we will understand only what we are taught." Each plant sold could have a special tag on it, explaining the sad endangered fate of this remarkable carnivorous plant species, reasons for the need of a premium, and how to contribute further. Most plant collectors love their plants and would welcome the chance to be educated about why plants like the flytrap need to be preserved as wild populations in natural habitats. The scheme also relies on the co-operation of concerned flytrap wholesale and retail nurseries. Many in the trade are already conservation-minded. Selling plants with a tag could become prestigious for wholesale companies. A pilot project with commercial nurseries could also serve to determine the optimal size of the premium. I suggest between 25 and 50 cents per plant.

This scheme has great potential for educating the general public about why we need to conserve biodiversity. Among all plants, the Venus Flytrap is most unique and "wonderful" (Darwin's word). It is disappearing now. Collectors can be conservationists when they contribute premiums to save wild plants and their habitats. Thus, this effort could act as a test-case and flagship for establishing similar programs designed to protect other plants and habitats.

This scheme of requesting a voluntary premium is not unusual. Already Vulcan Palms (*Brighamia insignis*) are being mass produced via tissue culture in Holland and sold to the general public to help augment its critically

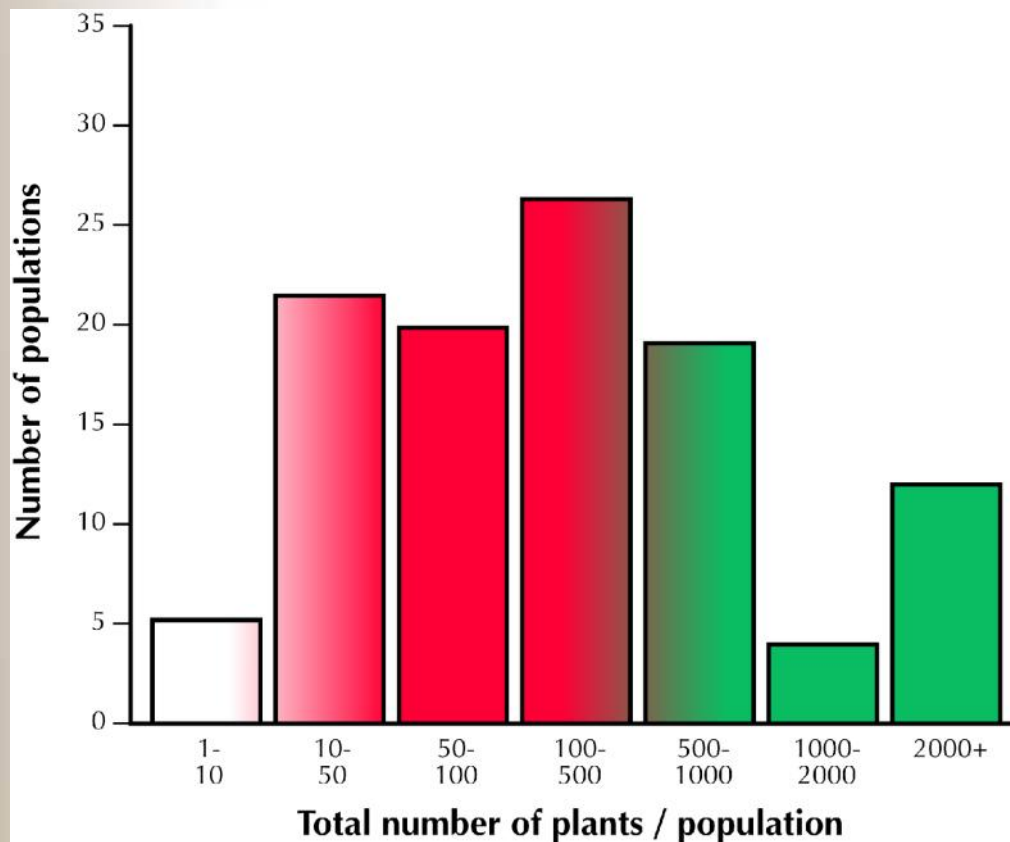
Flytraps continued...

endangered wild populations in Hawaii (Marinelli 2005). Similarly, the Australian Government is permitting the sale of propagated plants of *Wollemia nobilis* in order to protect this ancient conifer's single population and to fund other plant conservation projects. In general, a much more comprehensive and larger international fund could be set up, based on premiums, to protect all rare, threatened, and endangered plants of horticultural value (Gibson, in progress).

Readers, who would like to see Venus Flytraps in nature, are directed to the Green Swamp Preserve (15,907 acres), near Supply, North Carolina. Readers who would like to contribute to this fund or buy a flytrap can easily find the conservation organizations listed above and sources of plants on the internet. Culture requirements of the Venus Flytrap are well known (see D'Amato 1998). This remarkable carnivorous plant can...with everyone's caring and a small donation per plant... generate funds to protect its own vanishing populations in nature.

Figure 3. Distribution of wild population sizes in 1992 (data courtesy of Boyer 1995). Note only a few large populations existed then. Most of the smaller ones are expected to go extinct through stochastic processes. It is important to compare this distribution with that generated from Shew's (2002) more recent data to test this hypothesis of stochastic extinction. A threshold of 100-500 individuals is considered currently to be the general size for stochastic processes to be operating (D.M. Waller, personal communication).

Dr. Thomas C. Gibson



Flytraps continued...

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Acknowledgements:

Dr. Robert Evans and M. Boyer contributed support, population size data, and criticisms of the concept presented here. Dr. Wendy Strahm helped by contributing the Marinelli paper. Dr. Donald M. Waller read the manuscript and improved it; the errors are mine. I dedicate this article to him in recognition of his quintessential kindness, generosity, and his delight in the synthesis of ecology and conservation biology.

Dr. Thomas C. Gibson
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Madison, Wisconsin 53706
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What is your opinion?...

Recently, Dr. Gibson sent an article to the International Carnivorous Plant Society suggesting that they participate in his project to generate funds for plant and habitat conservation. He stated:

The ICPS could form, through its Conservation Committee, a policy of "1% for Carnivorous Plant Conservation" (henceforth 1%CPC), modeled after the highly successful program of orchids called "1% for Orchid Conservation," ... a program operated by the Orchid Conservation Coalition since 2005. Carnivorous plant societies and wholesale and retail nursery businesses that would participate in 1%CPC would commit to budget 1% or more of their net revenue towards "in situ" carnivorous plant conservation projects of their choice. Through 1%CPC, we would create a network of carnivorous plant societies and businesses to raise money for such projects. The goal is to raise awareness of the magnitude of the worldwide destruction of carnivorous plant bogs, in part through articles written on this tragedy. Once aware, individuals can make the right choices. Carnivorous plant societies and businesses worldwide can participate.

For businesses to participate in the 1%CPC program, they would contribute 1% of the price of purchased carnivorous plants towards a central fund, operated by the Conservation Committee, which in turn would disperse money for special bog habitat preservation projects. Aficionados of carnivorous plants would have two ways to easily participate in these special projects: by buying plants from participating businesses and by asking their own society to donate funds. Hopefully, 1%CPC would spark greater participation in "in situ" bog conservation by individuals adding another dimension to growing carnivorous plants per se.

The challenge to you, as a Friends of Plant Conservation member, is to advise your board:

1. Does Dr. Gibson's proposal make sense for us here in North Carolina?

2. Should the Friends of Plant Conservation Board explore the possibility of promoting this approach throughout the state of North Carolina?

3. Is there a role that you, personally, would like to play should the Board decide to pursue this idea?

Send your comments to: Bruce Williams, President
Friends of Plant Conservation
1060 Mail Service Center
Raleigh, NC 27699-1060

Or email to: cbw.3@earthlink.net

*What greater delight is there than to behold the earth appareled
with plants as with a robe of embroidered works. . .*

John Gerard, 1663



Pinguicula lutea, courtesy Skip Pudney,
[http://www.pbase.com/skipp35/
green_swamp_and_stuff_2009](http://www.pbase.com/skipp35/green_swamp_and_stuff_2009)

Imperiled in North Carolina by the Natural Heritage Program
(see table on page 7).

North Carolina Imperiled Plants: Pinguicula lutea, P. pumila, butterworts

Pinguicula species, or butterworts, may one day edge out Venus Flytraps as the darlings of the poaching set, those swaggering thieves of our forests and fields.

What's the attraction? These little plants, besides being small and attractive, have marvelously engineered leaves that capture and consume insects. Not just another carnivorous plant, *Pinguicula* species (pin-'gwek-yə-lə) have adapted themselves to feed on the tiniest of insects, including gnats and small mosquitoes. Who could ask for more?

Worldwide, there are about 80 species of these often-overlooked little plants of the bladderwort family (Lentifulariaceae). Though growing plentifully where found, actual populations tend to be sparsely distributed, with colonies separated by great distances.¹ We have three species in North Carolina, all in the coastal plain: *P. caerulea*, *P. pumila*, and *P. lutea*.

Both *P. lutea* and *P. pumila* are ranked as Significantly Rare—

It is the bright yellow flowers that set *P. lutea* apart from the others, which generally have bright pink, lavender, blue, or white flowers. The flowers have a long spur that



Pinguicula worldwide distribution
<http://www.mobot.org/MOBOT/research/Apiweb/orders/>

is bent at about half of its length and are pollinated by bees seeking the nectar prize at the end of the spur. To reach that prize, however, the bees must crawl into the blossom and in doing so, slide their bellies along a fuzzy structure on the lower edge of the flower. That forces the bees back up against anthers on the upper side of the flower, filling the bees with pollen to transfer to the next flower.² Petal size, number, and shape can vary.

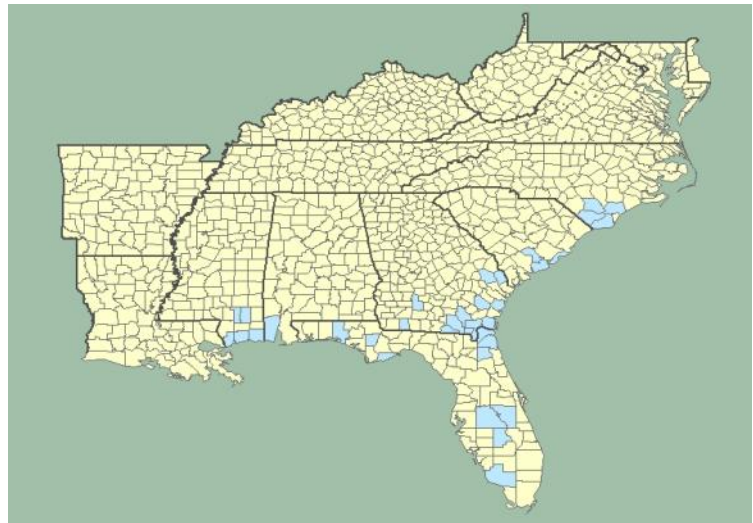
Pinguicula continued...



continued on page 7...

There is no mistaking the yellow-green leaves. Known as flypaper traps, the leaves, growing in basal rosettes, have short hairs that secrete a sticky mucilage. That mucilage ensnares the insects that make the mistake of landing on a leaf (much the same way you can't seem to get rid of rubber cement on your hands). Once stuck, the edge of the leaf begins to roll over around the insect, never completely closing, but sufficiently so to create a bowl-like shape that keeps insects from breaking free. Shorter surface glands secrete digestive enzymes that consume the trapped prey, then absorb it.

If you look closely at the leaves above, you will see just how effective they are at trapping their dinner.



Populations of *P. lutea* recorded at the UNC Herbarium (counties shaded in blue).

P. lutea flower. Notice the flattened and bent spur. c. Skip Pudney

Pinguicula continued...



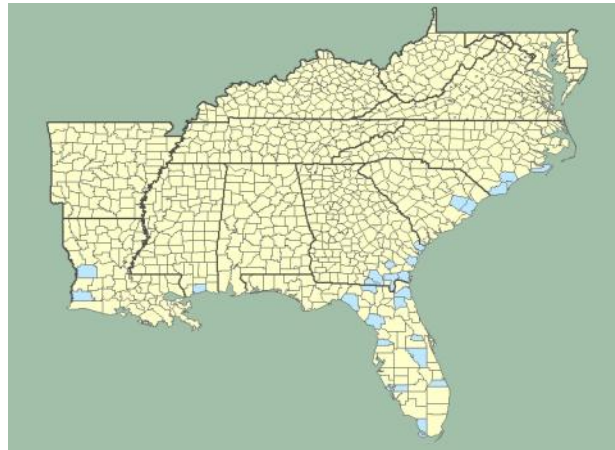
P. pumila
From USDA Plants Database

In case you wonder what kind of monster bee it is that has a tongue long enough to reach the bottom of the spur on that *P. lutea*, take a look at the photo of *P. pumila*.

Granted, *P. pumila* (small butterwort) is diminutive, but none of the species is large. For all the beauty of macro-photography, it can make it difficult to tell the true size of a plant. *P. lutea* grows from 4 to 20 inches, while *P. pumila* ranges from 2 to 6 inches tall. The yellow butterwort flower is larger, too, but we're talking millimeters.



P. caerulea c. Skip Pudney



P. pumila distribution, UNC Herbarium.
Counties shaded in blue



Photo by FNPS at Picasweb.
http://lh5.ggpht.com/_VnEJfsH_TbA/Sd_EJs8fqvI/AAAAAAAAABdY/_HTRqthTrKA/P4060011.jpg

When not in bloom, it can be difficult to distinguish one butterwort from another. Both of these species grow in sandy, peaty soil, often in pine savannahs and wet pine flatwoods.³ *P. lutea* grows in drier areas than *pumila*. Both bloom from late March through May.

The other *Pinguicula* we have here in North Carolina is *P. caerulea*, which is about the size of *P. lutea* but with blue flowers. *P. caerulea* grows more abundantly than the others.

continued on page 9

Pinguicula continued....

Name		Status		Rank	
Province: habitat	Common name	NC	US	NC	Global
<i>Pinguicula lutea</i> C: savannas (New Hanover)	Yellow Butterwort	SR-P	-	S2	G4G5
<i>Pinguicula pumila</i> C: savannas (Carteret, Onslow, Pender)	Small Butterwort	SR-P	-	S2	G4

Natural Heritage Program List of Rare Plant Species of North Carolina 2008, Edited by Misty Franklin Buchanan, Botanist and John T. Finnegan, Information Systems Manager

Will these little plants share the fate of Venus flytraps, disappearing from the landscape right under our noses?

There are many factors, working synergistically, threatening these plants. Among those are invasion of habitat by nonnative plant species, habitat degradation or destruction by human activities, and over-collection by wildcrafters and poachers.

Protecting the plants in their habitats is the mission of the N. C. Plant Conservation Program. That includes documentation of status, acquisition and management of appropriate sites, and providing information to the general public on the economic, utilitarian, and intrinsic value of these sites and plants. Friends of Plant Conservation can assist with these activities. Watch your newsletter or contact any board member for ways that you can help.

Katherine Schlosser

Acknowledgement:

Many thanks to Skip Pudney for the use of his photos. You can see more of his gorgeous photography at <http://www.pbase.com/skip35>

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- 3 Weakley, Alan. *Flora of the Carolinas, Virginia, Georgia, northern Florida and Surrounding Area*. Working draft, April 2008. UNC Herbarium, NC Botanical Garden, UNCCH.

Pinguicula continued....



Managing for Pondberry : Is there any reason to expect fire could be important for this species?

Rob Evans
Plant Conservation Program

North Carolina has established two Plant Conservation Preserves for this species. Both sites are Carolina Bay wetlands. The primary natural process, and arguably the most important, in this habitat is flooding. Bay sites have perched water tables of varying depths and duration throughout the year and some populations of rare species associated with Bays appear to fluctuate extensively in relationship with the hydroperiod. For these, and other reasons, we don't tend to think immediately of Carolina Bays as a typical "fire-prone" habitat. However, these Bays are usually embedded in longleaf pine dominated uplands that are highly fire prone, and probably burned every 2-3 years historically. Fires would burn across the uplands and penetrate into the Bays unless standing water was present. In almost all known cases, other than the presence of standing water, there is no barrier to the spread of fire into the Bays.

For this reason we might expect species found in the Bays in natural condition to survive, if not benefit, from periodic fires. For example, Pond Cypress a dominant tree in many Carolina Bays appears to tolerate fire quite well and even develops epicormic sprouts after burning like several other fire adapted species (i.e Pond Pine and Shortleaf Pine). It has been suggested that occasional fires in Pond Cypress dominated wetlands helps facilitate or maintain dominance of the Pond Cypress (see Figure 1). Although Pondberry is not associated with Pond Cypress and/or Carolina Bays rangewide, it has been suggested that **fire** may aid germination of Pondberry seeds while decreasing the abundance of competing hardwoods (Aleric no date)



Figure 1. "Wildfire in Antioch Bay". Note the Pond Cypress overstory and herbaceous dominated understory, with light "surface" fire spreading from the right margin. Image courtesy of Bruce Sorrie

However, numerous observations and lines of evidence suggest the Plant Conservation Preserve Bays are no longer in natural condition (is anyplace?). Both sites have been partially ditched and extensively logged in the

Pondberry, continued....

past resulting in altered hydrology and vegetation. The Bays MAY be drier as a consequence and have greater fuel loads, both of which could lead to more severe fires than would have occurred under “natural” conditions. For example, the most intact Bay, at the Pondberry Preserve, is no longer dominated by Pond Cypress but rather has a heavy overstory of loblolly pine across much of the Bay (See Figure 2).

I have observed loblolly establishing adjacent to Pond Cypress stems, where they appear to outcompete, eventually overtop, and possibly lead to mortality of the Pond Cypress. In addition, the heavy pine density (as shown in Figure 2) may be creating both a drying effect on the wetland (through additional pumping of surface and subsurface water) as well as adding surface fuel (in the form of needle drop) and subsurface fuel (fine roots).



Figure 2. “Degraded Conditions at Pondberry Bay”. No Pond Cypress stems in the overstory, herbaceous understory lacking/dense pine litter, loblolly stems dominant; note sparse & spindly stems of Pondberry in foreground. Image by Rob Evans

We identified a root mat, largely from loblolly pines, over 2 feet thick in portions of the Bay. The anticipated effect of a burn penetrating the site in current condition would be far different than if the site supported an open canopy of pond cypress (as in Figure 1). From the perspective of Pondberry, a fire under these conditions (especially in the dry season when wildfires are most likely to occur) would have great potential to be an intense burn penetrating the subsurface duff. Such fires tend to burn for long periods and generate tremendous heat, with the potential to destroy the clonal shrub clumps of any Pondberry present (as well as destroy mature Pond Cypress where present). Just such an event may have occurred in the past at another of NC’s Pondberry sites. The Bladen County site (now considered extirpated) apparently experienced a “severe fire” which damaged the Pondberry population (Tucker 1983) and may have contributed to its eventual disappearance. Population declines of Pondberry in South Carolina have also been attributed to fires that originating for the same reasons (Glitzenstein personal communication).

Pondberry, continued...

Management Goals

The Plant Conservation Program has made management of Pondberry populations and restoration of habitat a priority using the Pondberry Preserve as a starting point. Our priorities include reducing and eventually eliminating the amount of loblolly pine present. At the moment we are considering the best means to do, considering that we would like to avoid the use of heavy logging equipment which could create rutting or other physical damage to the site, while having the potential to damage non-target vegetation (especially Pondberry and Pond Cypress). Volunteers anyone! Further, we would like to reduce the litter accumulation and organic buildup on the soil surface. To some extent this will be a by-product of the loblolly reduction and removal, but cool season fires will also be used in the early stages of this process. Finally, until the Bay has been restored, we must try to protect the Bay from potentially damaging, severe wildfire until interior fuels have been substantially reduced.

In 2008, the restoration process began. Plant Conservation Program staff were joined by volunteers from NCDA & CS who helped construct a hand fire line through a substantial portion of the Bay. This line allowed for prescribed fire ignition of most of the surrounding uplands (unburned since Preserve acquisition) as well as an experimental portion of the Bay itself. The fire substantially reduced fuel loads and the likelihood of wildfire igniting from the adjacent road and spreading unchecked into the Bay. In addition, the fire crept through the experimental portion of the Bay (intentionally ignited under moist conditions) resulting in light surface fuel reduction with small, isolated pockets of duff removal. In a small portion of the Bay, conditions are approaching our desired future condition for the site (see Figure 3). Stay tuned as we hope to continue the restoration story in the near future!



Figure 3. “Partially Restored Conditions at Pondberry Bay”. Small Pond Cypress stem in the middle, several older Cypress stems around periphery, herbaceous understory healthy and flowering, loblolly stems absent (note decaying logs and stumps). Image by Rob Evans

Scientists Warn Restoration-based Environmental Markets May Not Improve Ecosystem Health

ScienceDaily (Aug. 14, 2009) — While policymakers across of the globe are relying on environmental restoration projects to fuel emerging market-based environmental programs, an article in the July 31 edition of *Science* by two noted ecologists warns that these programs still lack the scientific certainty needed to ensure that restoration projects deliver the environmental improvements being marketed.

Markets identify the benefits humans derive from ecosystems, called ecosystem services, and associate them with economic values which can be bought, sold or traded. The scientists, Dr. Margaret Palmer and Dr. Solange Filoso of the University of Maryland Center for Environmental Science Chesapeake Biological Laboratory, raise concerns that there is insufficient scientific understanding of the restoration process, namely, how to alter a landscape or coastal habitat to achieve the environmental benefits that are marketed.

"Both locally and nationally, policymakers are considering market-based environmental restoration programs where the science does not yet conclusively show that environment health will improve once the 'restoration' is completed," said Dr. Palmer. "These programs may very well make economic sense, but the jury is still out whether or not the local environment will ultimately benefit."



At present, the demand in ecosystem service markets is driven by regulations that require those who harm the environment to mitigate or provide offsets for their environmental impacts. But in the regions throughout the world, including the Chesapeake Bay, many people hope that voluntary markets will expand outside of a regulatory context and result in a net gain of ecosystem services rather than just offsets for lost ecosystem services.

Examples include markets for flood protection created by restoring floodplains or wetlands and markets for improving water quality by restoring streams or rivers.

The scientists outline what should be done before markets expand further: recognize that restoration projects generally only restore a subset of the services that natural ecosystem provide, complete a limited number of projects in which direct measurements are made of the response of biophysical processes to restoration actions, and identify easily measured ecosystem features that have been shown to reflect the biophysical processes that support the desired ecosystem service.

"There is an inherent danger of marketing ecosystem services through ecological restoration without properly verifying if the restoration actions actually lead to the delivery of services," said Dr. Filoso. "If this happens, these markets may unintentionally cause an increase in environmental degradation."

This work is supported in part by a Collaborative Network for Sustainability grant from the U.S. Environmental Protection Agency.

Restoration of Ecosystem Services for Environmental Markets. *Science*, July 31, 2009

Rob Evans: Report on staff activities, April–July 2009

We thought you might be interested in reading about some of the activities of the N. C. Plant Conservation Program staff.

- Several weeks were spent on habitat management at the Boiling Springs Lakes Preserve, including use of a Skid Steer Loader w/Forestry Cutter that pulverizes tall shrubs. They have been working on fire lines and scrub pine removal, reducing fuel tonnage so prescribed fires can be scheduled.
- Completed a survey of flytraps on the BSLP site. He discovered that little seems to be known about the ecology of the plants beyond density patterns and such.
- Two burns in the area have had good results. Flytraps, now flowering, were found in areas where they had not been seen before. Also spotted several Red Cockaded Woodpecker cavities and reported them to the Wildlife Resources Commission. Found *Erythrina herbacea* L., coral bean or red cardinal, on nearby private land. [Note: This species, listed as Significantly Rare at the periphery of its range in NC, is Imperiled in NC, Globally secure; and reported in Brunswick, Carteret, and New Hanover counties in maritime forests] Staff is hoping to find it on Preserve land as well. Populations of the plants have declined by 70% over the past two years.
- NCCP and NCBG conducted a joint burn at Penny's Bend.
- Attended a meeting with the Natural Heritage Trust Fund at which it was learned that due to the economy, all of the numerous applications, including those for 5 properties submitted by NCCP, are on hold.
- During a presentation to a Sandhills group, distributed Friends membership cards.
- Continuing negotiations with the Mountains-To-Sea group concerning requested access across NCCP preserves for trails. Trying to find a way to avoid this, or at least mitigate any potential damage (one Significantly Rare plant species is in the proposed trail corridor). NCCP Board will address the issue. More public education to help the public understand the intent of a preserve might be of value.
- A Durham public school has encroached upon a sensitive area of a neighboring preserve. Staff is working with the school to remedy the problems.
- Met with EPA to expand a preserve. The proposed land has been degraded (an old tomato field). Restoration will be costly. A Sagittaria species (Endangered) has been found on the site.
- An unexpected source of volunteers—hunters sentenced to volunteer work—assisted with the removal of turkey oaks from a site.



Erythrina herbacea L., coral bean (USFS)

Continued on page 16...

Staff report continued...

- The 2008 Ginseng Harvest data were provided to the federal government in May, a requirement to allow ginseng exports to occur from NC. Although the price significantly dropped (to about \$250-350 per dried pound) from reported highs in 2007 (~ \$900 per dried pound) predictions that these prices would translate to lower harvests proved to be false. In 2008, 11,543 pounds of dried wild ginseng were certified for export out of the state while the 2007 harvest season, yielded 12,863 pounds. 2007 was a record harvest for North Carolina, nearly double the amount (increase of over 6,100 pounds) recorded for the previous harvest season, making North Carolina the leading harvest state in the US. It is estimated that one pound = 385 plants (that's a whopping 4,389,000 plants, give or take). One of the biggest unknowns is the actual percentage of wild ginseng left in NC, as many plants harvested have been "planted" over the years, sometimes with seed from outside NC.
- Initiated a seed collection/planting project for Venus flytraps after discovering that poachers not only take whole plants, but when seeds are ripe, they harvest the seed pods and leave the plants. There is a huge international market for the seeds. Staff watched plants on the preserve and when seeds were ready, gathered a small group of volunteers to find, collect, and scatter the seed in a prepared area. Also noted that plants rescued from a poacher earlier in the spring and re-planted seem to be doing well. The NCCP Scientific Committee will consider a policy prohibiting the direct sale of any plant part collected from public land (whole plant to seed). Properly collected seed (ie, with permit) could still be used to grow plants which could be sold. (*see article by Dale Batchelor on page 4*).

Rob Evans

Field Notes is a quarterly publication of the Friends of the North Carolina Plant Conservation Program Foundation, Inc. The contents reflect the opinions of the Friends, and are not necessarily those of the NC Department of Agriculture.

Articles, photos, events and comments may be submitted to:

Friends of Plant Conservation
Attn: Kathy Schlosser
1060 Mail Service Center, Raleigh,
NC 27699-1060

or via email to

kathyschlosser@triad.rr.com

Calendar of Events...

Oct. 20, 2009 Friends of Plant Conservation board meeting, NCBG 9:30 a.m.

Nov. 4, 2009 Annual Meeting of Members
Cecil Frost and Rob Sutter
"The Future of Native Flora"



NC Plant Conservation Board 2009 Meeting Schedule *

November 16, 2009, Winston Salem, NC

NC Plant Conservation Scientific Committee 2009 Meeting Schedule *

September 15, 2009, Location TBD

December 8, 2009, Location TBD

*If you are interested in attending any of these meetings, please notify Rob Evans at Rob.Evans@ncagr.gov



OTHER EVENTS OF INTEREST

"Unquenchable: America's Water Crisis and What to Do About It"

Thu Sep 24th, 7pm

Warren Wilson College, Canon Lounge

The Environmental Leadership Center is proud to launch its annual speakers series with Robert Glennon, author of "Unquenchable," recent guest of the Daily Show with Jon Stewart, and Morris K. Udall Professor of Law and Public Policy, University of Arizona
free and open to the public



Fall 2009: Global Climate Change: Challenges and Options in North Carolina and Beyond

Four evenings of lectures by eminent UNC-Chapel Hill scholars who will address global climate change and its impact closer to home.

Climate Change: Prospects for North Carolina

Thursday, October 8, 7–9 pm. Course #2623

Lawrence E. Band, Voit Gilmore Distinguished Professor and Director of the Institute for the Environment, UNC-Chapel Hill

Public Policy and Planning for Climate Change

Thursday, October 15, 7–9 pm. Course #2624

Richard "Pete" Andrews, Thomas Willis Lambeth Distinguished Professor of Public Policy and Chair of the Department of Public Policy, UNC-Chapel Hill
Climate change poses major challenges and policy choices both for America and North Carolina. One such challenge is in determining what North Carolina can do—and what makes sense for us to do—to mitigate the rapid pace of global warming.

Climate Change and the Carolina Coast

Thursday, October 29, 7–9 pm. Course #2625

Brent A. McKee, Mary and Watts Hill Jr. Distinguished Professor and Chair of the Department of Marine Sciences, UNC-Chapel Hill

North Carolina has one of the most vulnerable coastal zones in the United States in terms of projected climate change impacts. Projected acceleration in the rate of sea level rise and predictions of an increased intensity of Atlantic tropical storms could result in an unprecedented loss of coastal environments and ecosystems.

The Energy Landscape: Options for the Future

Thursday, November 5, 7–9 pm. Course #2626

John Papanikolas, Associate Professor of Chemistry and Deputy Director of the UNC Energy Frontier Research Center

Energy is at the heart of our economic well-being. But limited oil and gas supplies and the impacts of global warming caused by fossil fuels are leading to increasing uncertainty about our energy future.

Registration

The fee is \$10 per lecture, or \$30 for all four lectures.

Due to space limitations, advance registration is required and available on a first-come, first-served basis. Phone: Call 800-845-8640 or 919-962-2643.

Courses are held at the Friday Center, which offers ample free parking.