North Carolina Plant Conservation Program

The Year in Review

2011

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The NC Plant Conservation Program was established by Act of the N.C. Legislature in 1979.
The Program falls under the Plant Industry Division of the N.C. Department of Agriculture and Consumer Services.

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North Carolina Plant Conservation Program

2011 In Review

Preserve Establishment & Expansion

The Plant Conservation Preserve System was expanded by ~575 acres during 2011 with the support of the NC Natural Heritage Trust Fund. Expansions were completed in the mountains, Piedmont, and Coastal Plain, and one new preserve was added in the mountains (see Cedar Mountain Bog below). Tater Hill, Eastwood, Boiling Spring Lakes, and Melrose Mountain each gained a new tract. Taken together, **the Preserve system now includes 20 Preserves and approximately 13,323 acres.**

Protected Plants: Plant Conservation preserves are the only public lands established and managed specifically to protect imperiled plant species. To help accomplish PCP's mission of conserving native plant species *in their natural habitats*, each preserve was specifically designed with a core species in mind. To that end 51 species are currently protected on preserves (see pages 14-26).

Program Capacity

Nancy Stewart became the first administrative staff support person ever assigned to Plant Conservation Program. Having her regular assistance on a variety of tasks has significantly expanded the capacity and effectiveness of the Program. In addition, we have maintained a permanent two-person field crew since February of 2011. Further building our capacity, a new position has been approved and announced as of Feb, 2012. We expect this new person will allow PCP to develop comprehensive preserve management plans as well as organize and implement our increasingly multi-faceted management goals.

Clockwise from top: Rob Evans, Lesley Starke, Nancy Stewart, Jesse Phillips, Damian Smith

Outreach & Collaboration reach all time high

The number of PCP led field trips, workdays, and outreach efforts exceeded 60 over the past year. A host of different activities afforded opportunities to reach the general public, neighbors, potential partners and volunteers.

A partial list of collaborators worked with during the year

Camp Lejeune, Environmental Conservation Branch, http://www.lejeune.usmc.mil/mcb/topStoryECON.asp
Carolina Mountain Land Conservancy, www.carolinamountain.org/
Catawba Lands Conservancy, http://catawbalands.org/
City of Boiling Spring Lakes, www.cityofbsl.org/
Duke Forest at Duke University, www.dukeforest.duke.edu/
Eno River Association, www.enoriver.org
Friends of Mountains to Sea Trail, www.ncmst.org
Friends of Plant Conservation, Inc., www.ncplantfirends.org
Highlands-Cashiers Land Trust, www.hicashlt.org
Land Trust for Central NC, http://landtrustcnc.org/
Natural Resources Conservation Services, USDA, http://www.nc.nrcs.usda.gov/
NC Botanical Gardens, ncbg.unc.edu
NCDA Forest Service, http://ncforestservice.gov/
NCDA Research Station Division, www.ncagr.gov/research
NC Native Plant Society, www.ncwildflower.org
NC Natural Heritage Program, www.ncnhp.org
The Nature Conservancy, www.nature.org
UNC Asheville, www.unca.edu
USFWS, www.fws.gov/southeast/
Warren Wilson College, www.warren-wilson.edu
Volunteer Stewards,
…and numerous owners of Important Plant Conservation Areas!

Herb Amyx, newest preserve steward discusses Hebron Road Preserve with visitors.

Volunteers Really Help!

The most active, regular, and ongoing volunteer partnership over the last year or so has been with the Eno River Association (ERA). ERA has supported and expanded PCP's effectiveness by advertising numerous workdays to their extensive network of members and potential volunteers. These ERA sponsored workdays greatly expand our capacity to complete specific Preserve management tasks, in part because the volunteers aren't afraid to get their hands dirty! In addition, they don't shy away from labor intensive tasks. In 2011 we shared 7 very successful workdays averaging ~10 people per workday.

In addition, the Preserve Stewards Program has begun to reap rewards. Volunteer stewards hit the ground at several preserves across the state in the Mountains, Piedmont, and Coastal Plain.

L: Eno River Association workday participants on a cold February morning in Durham with their "booty" of collected tires and trash near an abandoned home site on the Hebron Road Preserve.
R: Volunteer A.J. Bullard assists with Pondberry monitoring project.
Bottom left: Organizing volunteers for tree planting at Ochlawaha Preserve
Bottom right: Stewards Kathy Schlosser and Mimi Westervelt count *Helianthus schweinitzii* stems at Harvest Field.

Burning Program

PCP staff had one of the most successful burning seasons since the Program's inception. The 4 person staff, with the occasional assistance of volunteers, was able to conduct 10 burns during the 2 month spring burning season. In addition, partners, both paid and unpaid, have made possible 5 more burns. Despite these successes, there are at least 60 more burns needed this year if we are to keep pace (or catch up) with our targeted burn cycle across the existing preserve system. Recognizing that expanding the compressed burning season is needed, we attempted two prescribed burns in December and saw the completion of an additional 5 in January and February.

L:NCDA&CS employee Scott Cannady helps light a prescribed fire at the Pondberry Bay Preserve in Sampson County.

R: PCP staff Lesley Starke keeps the fire under control at Hebron Road.

Bottom: Volunteer Kurt Schlimme (Eno River Association) assists by patrolling a fire line.

Epic Flytrap Surveys

Building on a long term project to better understand how Venus flytraps respond to different management regimes and natural factors, PCP expanded the scope of a study to include all of the best flytrap sites in the state. Over a 2 week period staff and 8 volunteers sampled nearly 800 plots across 7 sites believed to be the best remaining natural habitats for the species in the world. Data analyses are underway that will inform efforts to conserve this species in NC. Unfortunately, during the survey we discovered several instances of poaching from supposedly "protected" sites and found one of the reportedly best sites has been completely destroyed.

PCP staff, NCDA & CS specialist Rick Gregory, Hervie McIver (The Nature Conservancy) counting Venus flytraps during sampling at the Shaken Creek Savanna site.

Replanting confiscated poached flytraps. Twice in 2011 local law enforcement confiscated poached flytraps and returned them to PCP. A total of 103 flytraps have since replanted in PCP Preserves.

Boiling Spring Lakes

One of the largest contiguous tracts within the Plant Conservation Preserve system, the "Back Bay" tract at Boiling Spring Lakes has lacked management attention in the past due in part to decades of fire suppression, awkward boundary lines, and the presence of sizeable pocosins and critical soils. However, returning fire to the tract is absolutely necessary for the benefit of the host of rare plants known nearby. In collaboration with the NC Division of Forest Resources (DFR), PCP staff spent several weeks locating the property boundary and mowing preliminary control lines around the perimeter as well as strategic locations throughout the interior in early 2011. These efforts paid off in Jan 2012, with the execution of an extremely successful prescribed fire, the first ever recorded on the tract. DFR deployed 5 tractor plow units, numerous staff, and a spotter plane that were essential to executing this technically difficult burn. A small crew provided by TNC also helped make the burn a success.

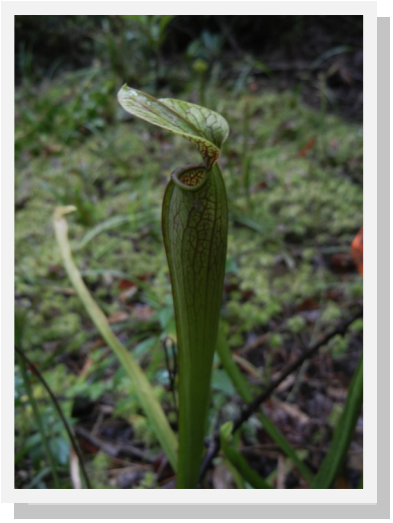
Plant Conservation Program's mowing machine at work reducing heavy fuel loads along the edge of the Back Bay tract at Boiling Spring Lakes.

Research Project:

Staff have been working collaboratively with Dr. Jeff Glitzenstein, Research Associate and Beadle Fellow at Tall Timbers Research Station in Florida, to study the effects of mechanical restoration of pine savanna habitats. Ground cover plots were established, sampled, and treated in several areas of the Boiling Spring Lakes Plant Conservation Preserve and re-census of these plots will take place in 2012. While we expect this research to have broad and long-term implications, an immediate benefit has been the field surveys conducted by Jeff in parts of the Preserve where he has thus far located 82 new populations of rare plants.

Cedar Mountain Bog

With the support of the NC Natural Heritage Trust Fund (NHTF) Cedar Mountain Bog, near Brevard, became the newest Plant Conservation preserve in December 2011. The site features the only apparently stable population of the federally and state endangered mountain sweet pitcher plant (*Sarracenia jonesii)* in NC. However, several other rare species have declined on-site, and related evidence has suggested an overall decline in site quality. To address this decline, staff began an overall site restoration project by documenting and then removing approximately 21 tons of small trees and saplings that had invaded the bog since the 1970's. PCP's restoration efforts around the bog were expanded significantly through partnerships with the Carolina Mountain Land Conservancy (CMLC) and USFWS. An additional work crew, funded through this partnership and supervised by PCP, removed invading white pines around the bog perimeter.



Mountain sweet pitcher plant, endangered species at the newly established Cedar Mountain Bog Preserve; the crew (including 3 PCP staff, CMLC volunteers) conducted extensive restoration work on site.

Pondberry Bay:

Efforts to restore longleaf pine and associated groundcover across parts of this 2000+ acre Preserve continued and expanded in 2011. Reintroducing and maintaining a regular fire program across the Preserve remains a critical need. Most of the prescribed burns we conducted in 2011 were "growing season" fires that produced extensive flowering and seeding of the understory plants. This set the stage for seed harvesting in the Fall. With the use of loaner equipment provided by the NC Wildlife Resources Commission, PCP staff collected a significant volume of seed which we will use in restoration efforts elsewhere on the Preserve, particularly in pre-existing loblolly plantations.

Plant Conservation Program staff operating seed harvesting equipment in growing season burn unit at Pondberry Bay Preserve.

Our goals to expand longleaf pine acreage were given an unexpected boost due to an arson fire that destroyed the loblolly pines in one of the large plantations on site. Salvaging the dead and dying loblolly afforded the opportunity and need to replant approximately 154 acres with longleaf pine seedlings. In other portions of the Preserve where long leaf remnants persist, PCP staff spent 4 weeks carefully hand-thinning and removing invading loblolly stems.

Ochlawaha Restoration Yields Success

After years of planning, this former mountain bog site began a significant recovery in 2011. An extensive hydrologic restoration project was completed mostly on a recently acquired former agricultural field. During the project, considerable non-native soil (or "overburden") was removed to re-expose the original hydric soils, a deleterious drainage ditch was filled, and more natural stream channels and associated features were created to mimic a more natural wetland. In one small portion of the project area, we discovered that ~125 bunched arrowhead (*Sagittaria fasciculata*) rosettes had emerged! One month later, with the help of a new Preserve Steward, PCP Staff noted that these rosettes had rhizomatously expanded into ~1600, far more plants than had ever been historically reported from the site.

A cluster of bunched arrowhead rosettes in recently exposed mucky soils of the Ochlawaha Bog restoration project.

<u>Restoring the Grande Savane</u>: Eno Diabase Sill Preserve

An early map of the Piedmont region (circa 1718) labeled a large section of North Carolina, the "Grande Savane". While no detailed descriptions document exactly what this landscape actually looked like, most ecologists seem to agree the historic landscape has nearly faded from memory. PCP has been working to restore what we believe is a fragment of such a landscape.

Open grown oaks over species rich understory, with Eastern gamagrass and other prairie associated species, at the Eno Diabase Sill Preserve.

Efforts have included extensive hand removal of small stems of red cedar and loblolly pine, repeated prescribed burning, and removal of invasive plants. The work has exposed remnant oaks, and a rich ground cover of grasses and forbs. Recent vegetation sampling with the Carolina Vegetation Survey suggests that this site may be the richest, floristically, in the Piedmont region.

Plant Conservation Program Preserve System Executive Summary

Total Preserves= 20 closed, 22 total including pending. Mountains=9, Piedmont=7 (2 pending), Coastal Plain=4

Total Area = 13,323 acres

Total Protected Plant Species= 51 species, new species in 2011 are shown in red; 9 species are federally listed and marked with *.

Acmispon helleri

Agalinis virgata

Amorpha georgiana var. confusa

Arethusa bulbosa (Cedar Mt. Bog)

Asclepias pedicellata

Astragalus michauxii

Baptisia australis var. aberrans

Berberis canadensis

Carex trisperma

Chelone cuthbertii (Cedar Mt. Bog)

Cirsium lecontei

Delphinium exaltatum

Dichanthelium aciculare ssp. neuranthum

Dionaea muscipula

Echinacea laevigata*

Eleocharis elongata

Geum geniculatum

Helianthus schweinitzii*

Houstonia Montana*

Ilex collina

Lachnocaulon minus

Liatris helleri*

Lilium canadense spp. editorum

Lilium grayi

Lilium philadelphicum var. philadelphicum

Lilium pyrophilum

Lindera melissifolia*

Lithospermum canescens

Litsea aestivalis

Ludwigia suffruticosa

Lysimachia asperulifolia*

Lysimachia fraseri

Micranthes pensylvanica

Persicaria hirsuta

Pinguicula pumila

Platanthera grandiflora

Polygala hookeri

Rubus dalibarda (Cedar Mt. Bog)

Rhynchospora harperi

Rhynchospora pleiantha

Ruellia purshiana

Sagittaria fasciculata*

Sarracenia jonesii (Cedar Mt. Bog)*

Scleria reticularis

Scutellaria leonardii

Silene ovate

Sisyrinchium dichotomum*

Spiranthes lacinata

Symphyotrichum georgianum

Symphyotrichum laeve var. concinnum

Utricularia cornuta

All data are accurate as of Feb. 15, 2012

REGIONAL BREAKDOWN

Mountains: 9 Preserves totaling 2093 acres

Piedmont: 7 Preserves totaling 1005 acres

Coastal Plain: 4 Preserves totaling 10, 226 acres

Species with No Protection by Region

Mountains = 20 species

Piedmont = 12 species

Coastal Plain = 17 species

Species and Populations Count update:

Total species currently protected on PCP Preserves = 51 (includes Cedar Mt. Bog).

The current # of populations of protected plants to be 84 (this includes Cedar Mt. Bog).

All data accurate as of February 15, 2012

MOUNTAINS:

Bat Fork Bog	15.85 acres
Cedar Cliff Mountain	71.87 acres
Cedar Mountain Bog	43.35 acres
Dulany Bog	33.13 acres
Melrose Mountain	349.46 acres
Ochlawaha Bog	34 acres
Paddy Mountain	259.28 acres
Tater Hill	1174 acres

PIEDMONT:

Denson's Creek	44.72 acres
Eastwood	299.62 acres
Eno River Diabase Sill	265.25 acres
Harvest Field	29.36 acres
Hebron Road	58.81 acres
Long Mountain/Poison Fork	248.28 acres
Mineral Spring Barrens	60.3 acres

COASTAL PLAIN:

Big Pond Bay	86 acres
Boiling Spring Lakes	7141 acres
Hog Branch Ponds	913.7 acres
Pondberry Bay	2083 acres

PLANT SPECIES ON PRESERVES:

Bat Fork Bog, Henderson County

Extant Records

Federal: *Sagittaria fasciculata*, Flowers May-July

State: *Lilium canadense spp.* Editorum Flowers June-July; Fruits late July-Sept

Records Needing Updated Confirmation

Historical Records

Federal: *Sarracenia jonesii*, Flowers/Fruits May; July

State: *Platanthera integrilabia*, Flowers July-Sept

NHP Tracked

Arisaema triphyllum ssp. Stewardsonii

Dedrolycopodium dendroideum

Thalictrum macrostylum

Cedar Cliff Mountain, Jackson County

Extant Records

State: *Silene ovate*, Flowers Aug- Sept

Records Needing Updated Confirmation

Historical Records

Federal: *Sarracenia jonesii*, Flowers/Fruits May; July

State: *Celastrus scandens*, Flowers May-June; Aug-Sept

Silene ovate, Flowers Aug-Sept

NHP Tracked

Entodon sullivantii

Hackelia virginiana

Hexalectris spicata

Macrocoma sullivantii

Mannia californica

Physica pseudospeciosa

Scopelophila ligulata

Sedum glaucophyllum

Tortula ammonsiana

Tortula fragilis

Usnea agulata

Cedar Mountain Bog, Transylvania County

Extant Records

Federal: *Sarracenia jonesii*, Flowers June

State: *Arethusa bulbosa*, Flowers June

Chelone cuthbertii, Flowers Aug-Sept

Dalibarda repens, Flowers July

Records Needing Updated Confirmation

Federal: *Helonias bullata*, Flowers Mar-May

Historical Records

State: *Thermopsis fraxinifolia*, Flowers May-July

NHP Tracked

Dulany Bog, Jackson County

Extant Records

State: *Lysimachia fraseri*, Flowers June-Aug; Sept-Oct

Records Needing Updated Confirmation

Historical Records

NHP Tracked

Thaspium pinnatifidum

Rhododenron vaseyi

Melrose Mountain, Polk County

Extant Records

Federal: *Sisyrinchium dichotomum*, Flowers May-June

Records Needing Updated Confirmation

Historical Records

State: *Carex radfordii*, Flowers May-June

Thermopsis fraxinifolia, Flowers/ Fruits May-July; July-Oct

NHP Tracked

Hackelia virginiana

Lejeunea cavifolia

Symphyotrichum laeve var. laeve

Ochlawaha Bog, Henderson County

Extant Records

Federal: *Sagittaria fasciculata*, Flowers May-July

Records Needing Updated Confirmation

Historical Records

Federal: *Sarracenia jonesii*, Flowers May; July

State: *Hasteola suaveolens*

NHP Tracked

Dedrolycopodium dendroideum

Hexastylis rhombiformis

Thalictrum macrostylum

Paddy Mountain, Ashe County

Extant Records

Federal: *Houstonia Montana*, Flowers July-Aug

Liatris helleri, Flowers July-Sept

Records Needing Updated Confirmation

Historical Records

NHP Tracked

Allium allegheniense

Carex roanensis

Hackelia virginiana

Rhytidium rugosum

Rohlia lescuriana

Tater Hill, Watauga County

Extant Records

State: *Carex trisperma*, Flowers June

Delphinium exaltatum, Flowers Aug-Sept

Ilex collina, Flowers May-June; Sept-Oct

Lilium grayi, Flowers June-July; Aug-Sept

Lilium philadelphicum var. philadelphicum, Flowers June-July; Aug-Sept

Micranthes pensylvanica, Flowers April-June

Records Needing Updated Confirmation

Geum geniculatum, Flowers late June-Aug; Aug-Sept

Packera schweinitziana, Flowers May-July

Platanthera grandiflora, Flowers June-early July

Historical Records

State: Polemonium reptans var. reptans, April-May; June

Turritis glabra, May-June; July-Aug

NHP Tracked

Aconitum reclinatum

Cardamine clematitis

Carex baileyi

Carex roanensis

Corallorhiza maculata var. maculata

Meehania cordata

Packera crawfordii

Platanthera flava var. herbiola

Rhytidium rugosum

Denson's Creek, Montgomery County

Extant Records

Federal: *Helianthus schweinitzii*, Flowers Sept-Oct

Records Needing Updated Confirmation

Historical Records

NHP Tracked

Eastwood, Moore County

Extant Records

State: *Lilium pyrophilum*, Flowers late July-mid Aug

Records Needing Updated Confirmation

Historical Records

State: *Spiranthes eatonii*, Flowers Feb-May

NHP Tracked

Dichanthelium sp. 9

Trichostema setaceum

Eno River Diabase Sill, Durham County

Extant Records

Federal: *Echinacea laevigata*, Flowers late May-July

State: *Baptisia australis var. aberrans*, Flowers April-May

Berberis canadensis, Flowers April-May; Sept-Oct

Delphinium exaltatum, Flowers July-Sept

Lithospermum canescens, Flowers April-May

Ruellia humilis, Flowers May-Sept

Ruellia purshiana, Flowers May-(June)

Scuterllaria leonardii, Flowers April-May

Symphyotrichum laeve var. concinnum, Flowers Sept-Oct

Records Needing Updated Confirmation

Historical Records

State: *Trifolium reflexum*, Flowers April-May

NHP Tracked

Agastache nepetoides

Aphanorrhegma serratum

Carex meadii

Dichanthelium annulum

Ephemerum cohaerens

Fleischmannia incarnata

Hexalectris spicata

Liatris squarrulosa

Matelea decipiens

Parthenium auriculatum

Prunus pumila var. susquehanae

Scirpus pendulus

Silphium terebinthinaceum

Solidagao rigida var. glabrata

Harvest Field, Randolph County

Extant Records

Federal: *Helianthus schweinitzii*, Flower Sept-Oct

Records Needing Updated Confirmation

Historical Records

NHP Tracked

Hebron Road, Durham County

Extant Records

Federal: *Echinacea laevigata*, Flower late May-July

State: *Symphyotrichum laeve var. concinnum*, Flower Sept-Oct

Lithospermum canescens, Flower April-May

Records Needing Updated Confirmation

Historical Records

NHP Tracked

Dichanthelium annulum

Fleischmannia incarnata

Liatris squarrulosa

Parthenium auriculatum

Silphium terebinthinaceum

Solidago rigida var. glabrata

Long Mountain/Poison Fork, Montgomery County

Extant Records

Records Needing Updated Confirmation

Historical Records

NHP Tracked

Amorpha schwerinii

Stewartia ovata

Mineral Spring Barrens, Union County

Extant Records

Federal: *Helianthus schweinitzii*, Flowers Sept-Oct

State: *Acmispon helleri*, Flowers (June-) July-Aug (-Sept)

Dichanthelium aciculare ssp. Neuranthum, Flowers May-Nov

Symphyotrichum georgianum, Flowers early Oct-mid Nov

Records Needing Updated Confirmation

Historical Records

NHP Tracked

Pseudognaphalium helleri

Big Pond Bay, Cumberland County

Extant Records

Federal: *Lindera melissifolia*, Flowers Mar-April; Aug-Sept

State: *Litsea aestivalis*, Flowers Mar-April; May-June

Records Needing Updated Confirmation

Historical Records

NHP Tracked

Spiranthes eatonii

Boiling Spring Lakes, Brunswick County

Extant Records

Federal: *Lysimachia asperulifolia*, Flowers mid May-June

State: *Agalinis virgata,* Flowers *late Sept-Oct*

Asclepias pedicellata, Flowers July-Aug

Dionaea muscipula, Flowers June

Eupatorium leptophyllum, Flowers Sept-Nov

Persicaria hirsuta (Morris)

Pinguicula pumila (Morris)

Spiranthes laciniata (Morris)

Utricularia cornuta (Morris)

Records Needing Updated Confirmation

State: *Cirsium lecontei*, Flowers June-Aug

Polygala hookeri, Flowers June-Aug

Historical Records

State: *Bacopa caroliniana*, Flowers May-Sept

Drosera filiformis, Flowers June-Aug

Myriophyllum laxum, Flowers June-Oct

Platanthera integra, Flowers July-Sept

Platanthera nivea, Flowers May-Sept

NHP Tracked

Andropogon perangustatus

Lysimachia loomsii

Petlandra sagittifolia

Rhynchospora alba

Rhynchospora breviseta

Scleria verticillata

Sphagnum fallax

Hog Branch Pond, Cumberland County

Extant Records

State: *Amorpha georgiana var. confusa*, Flowers late May-July

Dionaea muscipula, Flowers June

Ludwigia suffruticosa, Flowers June-Oct

Records Needing Updated Confirmation

State: *Eleocharis elongate*, Flowers July-Aug

Lachnocaulon minus, Flowers May-Oct

Rhynchospora harperi, Flowers July-Sept

Rhynchospora pleiantha, Flowers July-Sept

Scleria reticularis, Flowers June-Sept

Historical Records

State: *Platanthera nivea*, Flowers May-Sept

NHP Tracked

Sphagnum fallax

Pondberry Bay, Sampson County

Extant Records

Federal: *Lindera melissifolia*, Flowers/Fruits March-April; Aug-Sept

State: *Astragalus michauxii*, Flowers late April-June

Litsea aestivalis, Flowers Mar-April; May-June

Rhexia aristosa, Flowers June-Sept

Records Needing Updated Confirmation

Historical Records

NHP Tracked