



**NORTH CAROLINA
NATURAL HERITAGE PROGRAM**

2007 BIENNIAL REPORT



**Natural Resource Planning and Conservation
Department of Environment and Natural Resources
Raleigh, North Carolina**

REPORT ON ACTIVITIES OF 2005-2006

As directed by the North Carolina Nature Preserves Act (GS 113A-164.1-.11), the North Carolina Natural Heritage Program (NC NHP), part of Natural Resource Planning & Conservation, Department of Environment and Natural Resources has prepared this report to summarize program activities of occurring during calendar years 2005 and 2006.

NC NHP is the North Carolina component of a national network of natural heritage programs which reaches from Canada through the United States and into much of Latin America. Members of this network share a common methodology and a commitment to support rare species and natural area conservation. The 80 member programs of the network are affiliated through NatureServe, a private, non-profit organization based in Arlington, Virginia.

When established in 1976, NC NHP was placed in the Division of Parks and Recreation. Enabling legislation was enacted in 1985 as part of the Nature Preserves Act (113A-164.1-.11). In March of 2005, Secretary Bill Ross moved NC NHP from the Division of Parks and Recreation to the Office of Conservation and Community Affairs to become part of the One North Carolina Naturally effort of the Office of Conservation and Community Affairs. A restructuring at the end of 2006 places NC NHP under the newly-created division of Natural Resource Planning & Conservation.

2006 marks the 30th anniversary of NC NHP, which was celebrated by bringing current and former staff and conservation partners together for an evening gathering at the North Carolina Botanical Garden (NCBG). NCBG, Progress Energy and the North Carolina Association of Environmental Professionals helped to make this event a great success.

NC NHP continues working in partnership with a variety of state and federal agencies, private organizations, individuals, and corporations to: 1) identify the most significant natural areas and rare species habitats of North Carolina, and 2) support the protection of these significant natural areas so that future generations will be able to enjoy the full diversity of North Carolina's natural legacy.

Program activities of 2005 and 2006 are summarized in this report under the three major program areas of NC NHP: Inventory, Information Services, and Conservation Planning & Protection.

INVENTORY

NC NHP inventory efforts are organized in three ways: county-wide natural area inventories; protection-focused inventories within a given ownership; or inventories for a particular rare species or specific natural community such as a rare wetland type.

2005-2006 County Natural Area Inventories

A County Natural Area Inventory is a systematic search for Significant Natural Heritage Areas (SNHAs) throughout a North Carolina county. SNHAs, or “sites”, are areas of land or water identified by our biologists as being important for the conservation of our state's biodiversity. These areas often contain the best examples of natural communities and often include rare and endangered species. Natural area inventories produce reports and maps that identify and describe the most important natural areas of a county and their ecological significance. The presence of natural areas can greatly enhance the quality of life for the citizens of county.

Inventories benefit a wide range of users, from individual landowners to various government agencies. County governments and municipalities can use inventories to help plan for growth in balance with the natural environment. Planning for the conservation of natural areas in a county requires knowing the location and kinds of natural habitats present, which locations are the best and which are protected through conservation ownership. Additionally, state agencies and local land trusts rely on Natural Heritage data to make informed decisions about land and water conservation and prioritize areas for protection. Recent examples include:

- In 2005, North Carolina's General Assembly authorized a new state park at Hickorynut Gorge, in Rutherford County. Hickorynut Gorge is the site of four Nationally-significant Natural Heritage Areas: World's Edge/Sugarloaf Mountain, Bald Mountain/Round Top Mountain, Rumbling Bald/Shumount Mountain/Cedar Knob, and Chimney Rock Natural Area. Large portions of these sites are now coming into State Park's ownership through action from North Carolina's land trusts, appropriations from the state, and grants from the Natural Heritage Trust Fund.

- In 2006, The Nature Conservancy closed one of the largest land conservation deals in North Carolina history. Approximately 76,500 acres of land in 11 eastern counties was purchased from International Paper's holdings, with Natural Heritage data providing the basis for prioritizing tracts. Nearly 80% of the land is scheduled to be transferred to the N.C. Wildlife Resources Commission over several years. Protecting this land will greatly enhance the conservation of southeastern North Carolina by tying together big parcels of forestland which protect habitat for rare mussels, the federally endangered red-cockaded woodpecker, black bear and numerous rare plants.

Funding for county inventories is provided in large part by the Natural Heritage Trust Fund (NHTF). In Spring 2005 a proposal was funded by NHTF which has allowed NHP to hire additional inventory biologists and develop new procedures to streamline the inventory process. Whenever possible, matching funding is obtained from local governments or raised by a partner, usually a land trust. The commitment of the NHTF Board and the partner agencies to natural area inventories and to local conservation actions is greatly appreciated.

During 2005 and 2006, inventories were completed in Scotland, Bladen, McDowell, Rutherford, and Avery counties, with the Harnett county inventory ongoing. New inventories were begun in Caldwell, Duplin, Person, Robeson, Sampson, Transylvania and Yancey counties. This brings the

total number of completed county inventories to 76, though natural areas and rare species records exist for every county. Full copies of the county natural area reports are available from NC NHP or from local county libraries. Summaries are being developed which are available on the NC NHP website: <http://www.ncnhp.org/Pages/countysummaries1.htm>.

2005-2006 Rare Species and Natural Community Inventories

In addition to county focused inventories, NC NHP inventories the distribution and habitats of rare species of our state and the remaining high quality or rare examples of natural communities. Many of these inventories are conducted in cooperation with the Wildlife Diversity Program of the North Carolina Wildlife Resources Commission, the Plant Conservation Program of the Dept. of Agriculture and Consumer Services, and the U.S. Fish & Wildlife Service. Other partners include the NC Museum of Natural Sciences, the NC Wildflower Society and the NC Herpetological Association.

The Coastal Goldenrod study was funded by Department of Defense (DOD) Legacy Funds, and was a partnership with the USFWS and DOD. Information from this inventory will be used to develop a protection plan for this species, so as to reduce the need for listing it as Threatened or Endangered under the US Endangered Species Act. The St. Francis' Satyr study was funded by US Fish and Wildlife Service to identify the extent of the population on or near Fr. Bragg, the only habitat for this species in our state.

Table I. Rare Species and Significant Natural Community Inventories

Target Element	Partner Agency	Principal Scientists
St. Francis' Satyr <i>(Neonympha mitchellii francisci)</i>	USFWS, Ft. Bragg, NCSU	S. Hall, NC NHP
Coastal Goldenrod (<i>Solidago villosacarpa</i>)	USFWS, Department of Defense, Camp Lejeune	R. LeBlond and S. Mason, NC NHP B. Wichmann, NCSU



Coastal Goldenrod

(Solidago villosicarpa)

Photo by: Patty Matteson, USFWS

Location: French's Creek, Camp Lejeune



St. Francis' Satyr

(Neonympha mitchellii francisci)

Photo by: Stephen Hall, NC NHP

Location: Bones Creek, Fort Bragg

INFORMATION SERVICES

Compiling biological information from a wide variety of sources is a complex process. That process is crucial to developing the information needed for wise conservation and development planning, and to the environmental review function required by the national and the state environmental policy acts. Equally important is sharing that information with a wide variety of agencies, corporations, and individuals.

North Carolina is fortunate to have a variety of outstanding naturalists working independently or as part of state and federal conservation agencies, in academia, as independent consultants or in private conservation organizations. Working as part of this informal network of outstanding naturalists, NC NHP consolidates the information collected about rare species, high quality natural communities, and significant natural areas and makes it available for use in statewide and regional conservation initiatives. The information is also used to weigh the ecological significance of various sites, and to evaluate the likelihood and nature of ecological impacts. This information supports informed evaluations of the trade-offs associated with biological diversity and development projects before plans have been finalized. Finally, this information facilitates the establishment of priorities for the protection of North Carolina's most significant natural areas.

Table 2 summarizes the BIOTICS Database which contains the core of NC NHP information. This database summarizes information about the occurrences of rare species, significant natural communities, and significant natural heritage areas in North Carolina.

Table II. Summary of BIOTICS Database

Database Components	Calendar Year	
	2005	2006
Number of Elements Tracked by NC NHP	1,530	1,619
Number of Records of Element Occurrences (EOs)	22,157	22,262
Vertebrate animals	5,443	4,747
Invertebrate animals	2,410	2,216
Vascular plants	8,778	9,390
Non-vascular plants	884	1,050
Natural communities	4,315	4,460
Special animal habitats/features	327	389
Number of Significant Natural Heritage Areas Identified	2,385	2,410
Number of Managed Natural Areas Mapped	908	1,045

Information Requests

During 2005 & 2006 NC NHP responded to an uncounted number of telephone inquiries and provided more than 800 written responses to federal and state agencies, consulting firms, academic institutions, conservation organizations, and city and county governments. In addition, approximately 350 visitors came to the NC NHP offices to use information from the databases and files. During 2006, our online information database (accessible to the general public) addressed 8701 requests for rare species information summarized by county or by USGS quadrangle.

A new web-based information system was being developed in 2006 to help alleviate the workload associated with written information requests and improve service to users of the data. This system will be available to conservation partners and consultants using a password provided by NHP. This system has already been implemented in the NHP workroom and has replaced the paper maps. The interface is designed to provide real-time data to the user directly from our BIOTICS Database, with minimal training.

Environmental Review

Another important and frequent use of NC NHP data is the review of the potential environmental impacts of major state or federal actions. NC NHP continues to assist with NC DENR environmental reviews, though not officially part of the clearinghouse process. Our database provides state and federal agencies with the most reliable source of information about potential impacts to rare species.

Publications

NC NHP produces three reference publications listed below. These publications are used by staff of numerous federal and state agencies, including Fort Bragg, Camp Lejeune, NC Dept. of Transportation, NC Wildlife Resources Commission, NC Plant Conservation Program, as well as by, environmental consultants, academicians, and amateur naturalists. The publications are provided at cost upon request. In addition, NC NHP provides copies of these publications as digital files on its web page. Lists of 2005 and 2006 reports are included as Appendix A.

Natural Heritage Program reference publications:

- III. Natural Heritage Program List of the Rare Animal Species of North Carolina;
- IV. Natural Heritage Program List of the Rare Plant Species of North Carolina; and
- V. Classification of the Natural Communities of North Carolina, Third Approximation.

Copies of county natural area inventory reports or rare species accounts are also available upon request or through the web page www.ncnhp.org/Pages/publications.html.

CONSERVATION PLANNING & PROTECTION

Strategic Conservation Planning Tool

NCDENR has recognized the need to develop a strategic planning process to coordinate and implement the state's conservation efforts for the next 25 years. As a result, NHP has been given the lead on the development of the North Carolina Strategic Conservation Plan (SCP), initiated during 2006. After completion of the first iteration, the plan will be updated semiannually to reflect current conditions.

The SCP will identify and prioritize the essential high quality natural resources across the state, as well as the crucial land gaps identified in a strategic and scientifically-based network of supporting ecosystems. This planning tool will to highlight areas of opportunity for collaborative conservation that contribute to sustaining the most significant natural resources across the state. The plan consists of a series of natural resource assessments that highlight essential supporting land and water areas across the state. This assessment series is composed of GIS data layers, which can be used by individual organizations, state and local agencies, or funding groups to inform decisions about conservation and/or compatible land use planning in North Carolina. Any combination of the assessment data layers can be studied to inform and add value to local conservation and land use planning goals and missions. However, on a statewide basis, it is the goal of this analysis to show those areas that meet the overall needs of the larger landscape.

Statewide Assessment of Conservation Priorities at the Landscape Level

Prior to the initiation of the Strategic Conservation Planning Tool, NHP was awarded a contract from the Ecosystem Enhancement Program (EEP) in 2006 to identify and evaluate large, blocks of habitat still serving ecological functions at the landscape level, i.e., that have high landscape integrity. Landscape units are identified and evaluated based on the concentration of indicator species, using observations obtained from ground-surveys. The outcome will be a map of "core areas" that serve as residential habitat for species within the indicator guilds. This project will also identify "connectors" between the core areas. This project is ongoing and data resulting from it will be incorporated into the state's Strategic Conservation Planning Tool.

2005-2006 Dedications and Registries

Numerous natural areas have gained protection as Dedicated Nature Preserves or Registered Natural Heritage Areas during the 2005 and 2006 calendar years. In all, almost 66,000 (65,915) acres were newly dedicated and 12 new sites were added to the registry, bringing the number of Registered Areas to 345. To-date, nearly 600,000 acres have been registered and 212,947 acres are dedicated throughout the state.

Twenty new nature preserves were dedicated, totaling 52,799 acres. These include Significant Natural Heritage Areas within the following game lands, parks, and preserves: Alligator River Game Land, Boiling Spring Lakes Plant Conservation Preserve, Shocco Creek Game Land, Roanoke Island Marshes Game Land, Neuse River Game Land, Gull Rock Game Land, Bald Head Island State Natural Area, Gorges State Park, Hammocks Beach State Park, Mount Mitchell State Park, Picture Creek Barrens Plant Conservation Preserve, Green Swamp Nature Conservancy Preserve, Okeewemee Woodland Plant Conservation Preserve, Paddy Mountain

Plant Conservation Preserve, Pondberry Bay Plant Conservation Preserve, Tater Hill Plant Conservation Preserve, Cold Mountain Game Land, Croatan Game Land, Sandhills Game Land, Stones Creek Game Land.

Additionally, eight existing nature preserve dedications were amended to include an additional 13,116 acres of protected land. These include: Crowders Mountain State Park, Hanging Rock State Park, South Mountains State Park, Roanoke River Wetlands Game Land, Columbus County Game Land, Three Top Mountain Game Land, South Mountains Game Land, and Caswell Game Land.

Twelve new natural areas were added to the registry, totaling 246 acres. Ten of the sites were registered by Progress Energy in 2006 as additions to the original 1993 agreement, indicating the success NHP has had in encouraging this partnership. The other two sites, Broad Creek Marshes and Swamp and Meherrin River Aquatic Habitat, were registered by Weyerhaeuser Company in 2005. In April, 2005, owners of Registered Natural Heritage Areas were surveyed to determine changes to the areas and current landowner status.

Ecosystem Enhancement Program Preservation Review Committee

During 2005-2005, NC NHP continued to lead the committee (membership listed below) tasked with reviewing projects proposed for preservation mitigation using criteria approved by the EEP technical team (Appendix B). The aim of the partnership is to provide a fair economic return to landowners while preserving the state's natural areas for future generations through voluntary land-protection agreements. More than 70 proposed projects were reviewed by the committee during 2005-2006. In addition to committee review, each tract was visited by NC NHP staff and major ecological characteristics were documented in a written report.

EEP PRC agency membership:
 Clean Water Management Trust Fund
 Division of Water Quality
 Ecosystem Enhancement Program
 NC Natural Heritage Program
 Wildlife Resources Commission
 U.S. Fish and Wildlife Service

The committee was dissolved at the end of 2006 with all current preservation mitigation need having been met. As of July 22, 2006 – the initiative's third anniversary – EEP had acquired about 35,700 acres of natural areas, with 14 tracts being transferred to the state for use as parks or game lands. The tracts include about 200 miles of stream buffers and more than 7,800 acres of wetlands in high-quality riparian and wetland areas throughout the state. At the end of 2006, 89 separate projects had closed.

Aquatic Ecosystem Protection

Threats to aquatic species, such as freshwater mussels, fish, crayfish, amphibians, snails, and macroinvertebrates, continue to be of concern to the conservation community. During 2005-2006, NHP's Freshwater Program staff was increased to two full-time freshwater ecologists (one serving river basins west of, and including, the Yadkin-Pee Dee River basin, and one serving river basins east of the Yadkin-Pee Dee River basin); a part-time freshwater data technician position was also added. These positions are funded through Aquatic Inventory grants from the NHTF, with matching funds provided by the NC Wildlife Resources Commission.

NHP continues to collaborate with partner agencies (NC Wildlife Resources Commission, NC Department of Transportation, NC Division of Water Quality, NC Museum of Natural Sciences) to survey for rare aquatic species across North Carolina. At the end of 2006, NHP hosted its 4th annual meeting to coordinate inventory efforts and share information about freshwater surveys and conservation efforts across the state.

Through the county inventory process, aquatic site descriptions are being updated and included in County Inventory reports. In conjunction with the county inventory process, as well as part of DENR's Aquatic Education Program, NHP staff is working with local governments to incorporate Natural Heritage Data into their planning efforts, including in the design of ordinances and zoning plans. Freshwater program staff have given presentations on planning for growth to local governments, elected officials, and developers throughout the state.

Information from NHP's Freshwater Program has been essential in building conservation partnerships throughout the state, including the Chatham Conservation Partnership, the Greater Uwharries Conservation Partnership, and the Albemarle-Pamlico Conservation and Communities Collaborative.

NATURAL HERITAGE TRUST FUND

Up until 2005, the Natural Heritage Program provided staff support to the Natural Heritage Trust Fund. In 2005, a full-time Executive Director was hired by the Natural Heritage Trust Fund. The North Carolina Natural Heritage Program no longer provides staff to support this program, but continues to work very closely with the Director and the Trust Fund Board.

The NHTF website is available at: <http://www.ncnhtf.org/>

NATURAL HERITAGE PROGRAM STAFF

NC NHP is only able to accomplish the work described above because of its knowledgeable staff, and the assistance of its cooperators and supporters. The staff of the Program are listed below; those marked with * are supported through grants or contracts.

Raleigh Staff (Permanent)

Kim Douglass, Conservation Planner*
 John T. Finnegan, Information Systems Manager*
 Misty Franklin, Botanist
 Stephen P. Hall, Invertebrate Zoologist*
 Harry E. LeGrand, Jr., Zoologist*
 Suzanne Mason, Environmental Biologist*
 Sarah McRae, Aquatic Ecologist *
 Scott M. Pohlman, Protection Specialist
 Linda P. Pearsall, Director
 Ann M. Prince, Protection Specialist (½ time)*
 Michael P. Schafale, Community Ecologist
 Kristen Sinclair, Inventory Manager*

Raleigh Staff (Temporary)

Jame L. Amoroso, Inventory Data Assistant*
 Judith Ratcliffe, Aquatic Data Assistant*

Field Staff (Permanent)

Richard J. LeBlond, Inventory Specialist*
 Shawn C. Oakley, Inventory Specialist*
 James Padgett, Inventory Specialist*
 Edward Schwartzman, Inventory Specialist*
 Bruce Sorrie, Inventory Specialist*
 Angie Rodgers, Aquatic Ecologist*

Major Activities Planned for 2007 and 2008

- I. Complete County Natural Area Inventories in Caldwell, Robeson, Transylvania, and Yancey counties; continue inventories in Anson and Stanly counties; begin four new county inventories.
- II. Continue to develop and refine North Carolina's Strategic Conservation Planning Tool, including development of the wildlife habitat maps.
- III. Continue the statewide assessment of conservation priorities at the landscape level.
- IV. Publish a new NHP brochure to distribute to landowners and new partners.
- V. Establish the NHP web-based information system for conservation partners and consultants.

APPENDIX A

**North Carolina Natural Heritage Program
Publications and Reports
2005 & 2006**

NC NHP PUBLICATIONS and CONTRACT REPORTS**2005**

- Hall, S.P. and Haddad, N. 2005. Rearing Studies of Larval *Neonympha mitchellii francisci* and *N. areolata*. I. Test of Host Plant Preferences. Report to the Endangered Species Branch, Fort Bragg, NC.
- LeBlond, R.J. 2005. Survey for Coastal Goldenrod (*Solidago villosicarpa*) in 2005. Interim report to U.S. Fish and Wildlife Service, Raleigh, N.C.
- LeBlond, R.J., and G.S. Grant. 2005. Natural Area Inventory of Bladen County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C.*
- LeGrand, H.E., Jr. 2005. An Inventory of the Significant Natural Areas of Scotland County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C.*
- Oakley, S.C. 2005. An Inventory of the Significant Natural Areas of McDowell County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C.*
- Schafale, M.P. 2005. Atlantic Coastal Plain Northern Wet Pine Savannas and Flatwoods Element Integrity Assessment protocol. Report to NatureServe for EPA.
- Shelingoski, S., R.J. LeBlond, J.M. Stucky, and T.R. Wentworth. 2005. Flora and soils of Wells Savannah, an example of a unique savannah type. *Castanea* 70: 101-114.

*Supported by a grant from the Natural Heritage Trust Fund.

NC NHP PUBLICATIONS and CONTRACT REPORTS**2006**

- Franklin, M. A., J. M. Stucky, T. R. Wentworth, C. Brownie, and T. Roulston. Limitations to fruit and seed production by *Lysimachia asperulifolia* Poir. (Primulaceae), a rare plant species of the Carolinas. *Journal of the Torrey Botanical Society* 133(3), 2006, pp. 403-411.
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- Hall, S.P. 2006. Statewide assessment of conservation priorities at the landscape level. Northern Coastal Plain Region. Report to the Ecosystem Enhancement Program. Raleigh, NC.
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- Padgett, J. P. 2006. An Inventory of the Significant Natural Areas of Rutherford County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C.*
- Smith, P., A. Kelly and K. Sinclair. 2006. An Inventory of the Significant Natural Areas of Avery County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C.*

*Supported by a grant from the Natural Heritage Trust Fund.