

**NORTH CAROLINA  
NATURAL HERITAGE PROGRAM**

**2005 BIENNIAL REPORT**



**OFFICE OF CONSERVATION AND COMMUNITY AFFAIRS  
Department of Environment and Natural Resources  
Raleigh, North Carolina**

## **REPORT ON ACTIVITIES OF 2003-2004**

As directed by the North Carolina Nature Preserves Act (GS 113A-164.1-.11), the North Carolina Natural Heritage Program (NC NHP) of the Office of Conservation and Community Affairs, Department of Environment and Natural Resources has prepared this report to summarize program activities of occurring during calendar years 2003 and 2004.

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 2003, 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.

In its new role, NC NHP continued 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 2003 and 2004 are summarized in this report under the three major program areas of NC NHP: Inventory, Information Services, and Natural Area 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.

#### 2003-2004 County Natural Area Inventories

County natural area inventories are systematic searches for the best examples of natural habitats and locations of rare species in a North Carolina county. Natural area inventories produce reports and maps that identify and describe the most important natural areas of a county and their ecological significance. These natural areas are reservoirs of biological diversity, and are sanctuaries for rare native plants and animals whose survival may be in jeopardy. The presence of natural areas can greatly benefit the quality of life for the citizens of county.

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. Natural area inventories help counties plan for growth and development by identifying those natural resources important for maintaining biological diversity and protecting the quality of life. The value of county inventories for wise planning purposes was recognized recently when Durham county was honored with an award from the National Association of Counties for sponsoring a county-wide inventory of natural and cultural resources.

Funding for county inventories is provided in large part by the Natural Heritage Trust Fund (NHTF). Whenever possible, additional 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.

At the end of 2004, county-wide natural area inventories were completed for 72 counties, 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 will be available from the NC NHP website <[www.ncnhp.org](http://www.ncnhp.org)>.

County inventories often supply decision-makers with valuable information about significant natural heritage areas, helping to facilitate their protection. Recent examples include:

- A majority of the Big White Bay Natural Area in southern Cumberland County was recently purchased by N.C. Division of Parks and Recreation to be added to the Bushy Lake State Natural Area. Big White Bay is one of the largest Carolina bays in the region and is considered state-significant because it contains excellent rare natural communities, as well as populations of eastern fox squirrel and three rare plant species.

- The Wake County Department of Parks and Recreation is planning to incorporate the recently-published Wake County Natural Areas Inventory when selecting lands to purchase with its recently approved open space bonds.

During 2003 and 2004, inventories were completed in Cleveland, Hoke, Lincoln, and New Hanover counties. In addition, updates were completed for Orange and Wake counties. These were two of the earliest county inventories completed (1987 and 1987 respectively) and in each case, the local government requested updates because of the rapid urbanization of the county. New inventories were begun in Avery, Bladen, Harnett, McDowell, Rutherford, and Scotland counties.



2003-2004 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 Nongame and Endangered Wildlife 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 Wildflower Society and the NC Herpetological Association.

The U.S. Fish and Wildlife Service continues to fund status surveys of rare species which have been proposed for listing as endangered or threatened or where information is needed to guide the recovery of listed species. These inventories are listed in Table 5.

**Table 1. Rare Species and Significant Natural Community Inventories**

Target Element	Partner Agency	Principal Scientists
Eastern Arogos Skipper <i>Atrytone a. arogos</i>	US Fish and Wildlife Service (USFWS)	S. Hall, NC NHP
Coastal Goldenrod, <i>Solidago villosacarpa</i>	USFWS, Camp Lejeune	R. LeBlond and B. Sorrie, NC NHP
WRC Aquatic Species	NHTF, NC DOT, WRC	NC WRC Aquatic Nongame Staff
St. Francis' Satyr <i>Neonympha mitchellii francisci</i>	USFWS, Ft. Bragg, NCSU	S. Hall, NC NHP
Thorne's Beaksedge <i>Rhyncospora thornei</i>	USFWS	R. LeBlond and B. Sorrie, NC NHP
Venus flytrap moth, <i>Hemipachnobia subporphyrea</i>	USFWS, The Nature Conservancy	S. Hall, NC NHP; J.B. Sullivan, Consultant

## **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 attempts to consolidate the information collected about rare species, high quality natural communities, and significant natural areas and make it available to the public 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 4 summarizes the Biological and Conservation 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. It is built upon information provided by some of the best ecological scientists and naturalists from North Carolina and throughout the Southeast. The information provided by these scientists is compiled by NC NHP staff into the NC NHP databases and is used to set priorities for additional field investigations and conservation actions.

During 2004 NC NHP moved its databases to Biotics, a new software which integrates information from geographic information systems and an Oracle database. This software was developed by NatureServe; it has the ability to support geographically explicit information about each element occurrence. In order to improve the accuracy and completeness of these more complex records, the NC Dept. of Transportation and the US Forest Service provided funding to support data entry.

### **Information Requests**

During 2003 & 2004 NC NHP responded to an uncounted number of telephone inquiries and provided more than 600 written responses to federal and state agencies, consulting firms, academic institutions, conservation organizations, and city and county governments. In addition, approximately 650 visitors came to the NC NHP offices to use information from the databases and files.

**Table 2. Description of Biological and Conservation Database**

Database Components	Calendar Year	Calendar Year
	2003	2004
Number of Elements Tracked by NC NHP	1,429	1,468
Number of Records of Element Occurrences (EOs)	20,282	20,403
Vertebrate animals	5,433	5,406
Invertebrate animals	1,967	1,786
Vascular plants	7,886	8,076
Non-vascular plants	596	622
Natural communities	4,065	4,188
Special features	335	325
Number of Significant Natural Heritage Areas Identified	2,120	2,182
Number of Managed Natural Areas Mapped	767	924

**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. REPLACE WITH INFO ON USE OF DATA BY OTHER AGENCIES

**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, environmental consultants, academicians, naturalists and are provided at cost upon request. In addition, NC NHP provides copies of these publication as digital files on its web page. Lists of 2003 and 2004 reports are included as Appendix A.

Natural Heritage Program reference publications:

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

Copies of county natural area inventory reports or rare species accounts are also available at cost upon request or through the web page [www.ncnhp.org/Pages/publications.html](http://www.ncnhp.org/Pages/publications.html).

## **PROTECTION**

### **Protection Information**

NC NHP facilitates protection of significant natural areas by providing individuals, corporations and public agencies information about the importance of natural areas and their management. In 1999 and 2000, NC NHP participated in several protection planning efforts. NC NHP joined with The Nature Conservancy to identify protection priorities of the Mid-Atlantic and Piedmont ecoregions, the Amphibolite Mountains of northwestern North Carolina, and the Bladen Lakes region. NC NHP also did a conservation assessment of the southeast Coastal Plain of North Carolina. This study incorporated a landscape level assessment and relied upon data from the Museum of Natural Sciences and the Gap Program of the Biological Research Division of the US Geological Survey.

NC NHP also undertook the identification and protection of special wetlands owned by forest product corporations. This effort which included extensive field work to support registry nominations of lands owned or managed by timber corporations was supported by a grant from Region 4 of the Environmental Protection Agency.

Extensive information about significant natural areas on the Highlands District of Nanatahala National Forest, the Croatan National Forest and the Uwharrie National Forest was provided to the US Forest Service. This information will be used in the development of the national forest management plans. Field work and reports for Pisgah and Nantahala National Forests will continue for several more years.

NC NHP conducts site-specific fieldwork to support agency and land trust protection actions. During 1999 and 2000, work was conducted for the Conservation Trust of North Carolina, the NC Coastal Land Trust, the NC Coastal Federation, and The Nature Conservancy. This work is supported by the Natural Heritage Trust Fund.

### **2003-2004 Dedications and Registries**

A number of natural areas have gained protection as Dedicated Nature Preserves or Registered Natural Heritage Areas during the 2003 and 2004 calendar years. In all, almost 12,000 (11,695) acres were newly dedicated and over 14,000 (14,558) acres were added to the registry. To-date, over 600,000 acres are registered and almost 150,000 acres are dedicated throughout the state.

Four new nature preserves were dedicated, totaling over 2,000 (1,925) acres. These include Significant Natural Heritage Areas within the Wildlife Resource Commission's Northwest River Marsh Game Land, the Division of Coastal Resource's Endor Iron Furnace and Bentonville Battleground, and the North Carolina Zoological Park. Additionally, two nature preserve dedications, Green River Game Land and North River Game Land, were amended to include an additional 9,000 (9,770) acres of protected land.

Eight new natural areas were added to the registry and eight existing ones were expanded on the Croatan National Forest in an updated registry agreement, signed in 2004 by the US Forest Service, adding almost 12,000 (11,948) acres to the registry. Several private landowners also made the commitment to preserving natural areas within their ownership. Duke University protected twelve new natural areas located within their forest lands, adding over 1,200 (1,220) acres to the registry. International Paper focused on protection of riparian corridors within the Upper Tar River Basin, registering almost 1,400 (1,390) acres.

#### Ecosystem Enhancement Program Preservation Review Committee

In response to a request from the newly established Ecosystem Enhancement Program (EEP), NC NHP convened a committee (membership listed below) to review projects proposed for preservation mitigation using criteria approved by the EEP technical team (Appendix B). More than 60 proposed projects were reviewed by the committee. In addition to committee review, each tract was visited by NC NHP staff and major ecological characteristics were documented.

**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

#### Aquatic Ecosystem Protection

Aquatic ecosystems continue to be the most imperiled systems in North Carolina, and threats to aquatic fauna (e.g., freshwater mussels, fish, crayfish, aquatic snails, and macroinvertebrates) remain a concern to the conservation community. In the past year, the NC Natural Heritage Program (NHP) has developed an Aquatic Significant Natural Heritage Area (ASNHA) database, in which nearly 130 core stream segments that provide habitat for the most rare aquatic species have been identified. In addition, surveys with partner agencies (NC Wildlife Resources Commission, NC Department of Transportation, NC Division of Water Quality, NC Museum of Natural Sciences) continue to provide information on the habitat and distribution of rare aquatic species throughout North Carolina.

Data from these surveys have guided numerous conservation initiatives, including:

- NC Division of Water Quality's site specific management plans for waters containing federally listed species, specifically in the Little Tennessee, Goose Creek and Tar River basins.
- USDA's Natural Resources Conservation Service is giving extra support to agricultural producers who adopt land management practices that reduce non-point source pollution and moderate water temperature in watersheds that support Special Aquatic Habitats. NRCS is using the Farm Bill's "flagship" conservation program, called the "Environmental Quality Incentives Program" (EQIP) to play an important role in assisting agricultural producers with

- conservation, restoration, and enhancement of fish and wildlife habitat on working lands – especially in areas where at-risk species or populations can be stabilized or recovered.
- The Ecosystem Enhancement Program has been directing preservation mitigation efforts in NHP's identified Aquatic Significant Natural Heritage Areas to mitigate for stream and wetland impacts resulting from highway construction projects.
  - The NC Department of Environment and Natural Resources, in cooperation with NC Wildlife Resources Commission, NC Department of Transportation and US Fish and Wildlife Service, has launched an Aquatic Education Program that is aimed at educating local government officials on Cumulative and Secondary Impact Issues, with particular attention focused on effects to rare aquatic resources.
  - NC Wildlife Resources Commission is currently developing a Comprehensive Wildlife Conservation Strategy, and NHP's rare aquatic species information is an integral component to the River Basin Species and Habitat Assessments and Conservation Strategies Sections of this plan.

## **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; they are an exceptionally knowledgeable and dedicated group.

### **Raleigh Staff (Permanent)**

Jennifer Dennis, Natural Heritage Trust Fund Administrative Assistant<sup>1</sup>  
John T. Finnegan, Information Systems Manager<sup>1</sup>  
Stephen P. Hall, Invertebrate Zoologist<sup>1</sup>  
Harry E. LeGrand, Jr., Zoologist<sup>1</sup>  
Sarah McRae, Aquatic Ecologist<sup>1</sup>  
Shawn C. Oakley, Inventory Specialist<sup>1</sup>  
Scott M. Pohlman, Protection Specialist  
Linda P. Pearsall, Director  
Ann M. Prince, Protection Specialist (½ time)<sup>1</sup>  
Michael P. Schafale, Community Ecologist  
Kristen Sinclair, Inventory Manager<sup>1</sup>

### **Raleigh Staff (Temporary)**

Jame L. Amoroso, Botanical Assistant  
Brenda Wichmann, Botanical Assistant  
Gustavo Valezquez, Botanical Assistant

### **Field Staff**

Richard J. LeBlond, Inventory Specialist<sup>1</sup>  
Shawn C. Oakley, Inventory Specialist<sup>1</sup>  
James Padgett, Inventory Specialist<sup>1</sup>  
Peter Smith, Inventory Specialist<sup>1</sup>  
Bruce Sorrie, Inventory Specialist<sup>1</sup>

<sup>1</sup>Position supported by receipts.

## **NATURAL HERITAGE TRUST FUND**

At the request of the Board and the Secretary of DENR, NC NHP provides staff support to the Natural Heritage Trust Fund (NHTF). NHTF was created by the General Assembly in 1987. It is administered by a Board consisting of twelve citizens appointed by the Governor, President Pro Tempore of the Senate, and the Speaker of the House. NHTF receives a portion of the receipts from the sale of personalized license plates and a percentage of the real estate transfer tax. The monies in the Natural Heritage Trust are distributed through competitively-based grants to state agencies for the inventory and purchase of sites with exceptional natural or cultural values.

In 2003 and 2004, NC NHP assisted the NHTF with four board meetings and the associated site visits. In addition, NC NHP prepared correspondence and annual reports to the General Assembly and worked with grant recipients to dedicate lands under the Nature Preserves Act. Copies of the NHTF reports and descriptions of the sites acquired are available from NC NHP.

## APPENDIX A

**North Carolina Natural Heritage Program  
Publications and Reports  
2003 & 2004**

## NC NHP PUBLICATIONS and CONTRACT REPORTS

### 2003

- Hall, S.P. 2003. Survey for the Saint Francis' Satyr (*Neonympha mitchellii francisci*) and Associated Ecosystems at Fort Bragg Exclusive of Artillery Impact Areas. Report to the Endangered Species Branch, Fort Bragg, North Carolina by the North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C.
- LeBlond, R.J. 2003. Natural Area Inventory of New Hanover County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C
- LeGrand, Jr. H.E. 2003. An Inventory of the Significant Natural Areas of Wake County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C
- Oakley, S.C. 2003. An Inventory of the Significant Natural Areas of Cleveland County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C

### 2004

- Diamond, P. 2004. Natural Areas Inventory of Davidson County, North Carolina. North Carolina Zoological Park, DENR; Yadkin-Pee Dee Lakes Project; and North Carolina Natural Heritage Program, Office of Conservation & Community Affairs, DENR, Raleigh, N.C.\*
- Hall, S.P. and J. Bolling Sullivan. 2004. Status Survey for *Hemipachnobia subporphyrea* Based on Larval Presence and Feeding Sign; Interim November 2004. Report to U.S. Fish and Wildlife Service, Raleigh Field Office, Raleigh, NC
- LeBlond, R.J. and M. Franklin. 2004. Management guidance template for species at risk on DOD installations: *Solidago villosicarpa*. Report to U.S. Fish and Wildlife Service, Raleigh Field Office, Raleigh, NC
- Sorrie, B.A. 2004. An Inventory of the Significant Natural Areas of Hoke County, North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C.\*
- Sather, D.H., S. Hall, B. Sorrie, and R. Shaw. 2004. An Inventory of Natural Areas and Wildlife Habitats Orange County, North Carolina. Environment and Resource Department, Orange County, N.C. and North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, DENR, Raleigh, N.C.\*

\*Fully or partially supported by a grant from the Natural Heritage Trust Fund.

North Carolina Natural Heritage Program  
Department of Environment and Natural Resources  
1601 Mail Service Code  
Raleigh, North Carolina 27699-1601  
919-715-4195  
[www.ncnhp.org](http://www.ncnhp.org)