

### Conserving Virginia's Biodiversity through Inventory, Protection and Stewardship

The Virginia Natural Heritage Program was established in 1986 to protect the state's diversity of life. The program focuses on the identification, protection and stewardship of Virginia's natural communities, and rare plant and animal species.

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#### **2009 INVENTORY WRAP UP**

Natural Heritage Inventory Scientists conducted field surveys of over 160 sites, finding 19 new conservation sites and collecting data on over 170 natural community and rare species mapped locations.

An intensive multispecies inventory was conducted on the 174 acre Powell Mountain Karst Preserve, owned by the Cave Conservancy of the Virginias, located in Wise County, Virginia. Natural Heritage biologists recorded over 400 species of vascular plants including the rare downy hawthorn (*Crataegus mollis* G5 S1), along with the Federally endangered Indiana bat (*Myotis sodalis* G2 S1 FE SE), the globally rare Small-footed myotis (*Myotis leibii* G3 S1), one new undescribed millipede (*Brachoria* sp.), a globally rare millipede (*Brachoria cedra* G1G2 S1), a globally rare cave beetle (*Pseudanophthalmus cordicollis* G1 S1), several state record invertebrates, and a host of reptiles,

amphibians, birds, amphibians, butterflies, moths and other taxa.

Natural Heritage Ecologists documented two natural communities new to the state vegetation classification: Southern Appalachian Pitch Pine Bogs (likely a G1 community) and a new subtype of Spruce - Fir Forest, Red Spruce



- Fraser Fir Forest (Evergreen Shrub Type) (G1 S1). This year ecologists also entered the 4000th quantitative

vegetation plot in the VAPLOTS database. The plots represent georeferenced sample points collected in natural communities throughout the state. Data include comprehensive abiotic and biotic attributes.

Natural Heritage Zoologists completed a comprehensive survey for freshwater mussel species throughout the Shenandoah River system, documenting mass die-off with very few mussels remaining in the entire system, a precipitous decline over the last 30 years. Major declines in water quality and alteration to the habitat are likely causes of this decline. The results of 87 mussel surveys at 84 unique sites conducted in 2008 and 2009 by DCR Natural Heritage Zoologists, with funding support from the VA Department of Game and Inland Fisheries, have been summarized in a new report. In the North Fork Shenandoah Rivers (NFSR) drainage, the Eastern Elliptio (*Elliptio complanata*, G5 S5) was the only live species observed. In the South Fork

Shenandoah Rivers (SFSR) drainage, live species include the Triangle Floater (*Alasmidonta undulata*, G4 S3S4, DCR-DNH Watchlist), Eastern Elliptio, and the Creeper (*Strophitus undulatus*, G5 S3S4, DCR-DNH Watchlist) were found in headwater tributaries, whereas only the Eastern Elliptio was found alive in the SFSR main stem. Due to degraded water quality (e.g., point and non-point pollution, past mercury contamination etc.) and river habitat alterations (e.g., dams) in both the NFSR and SFSR, the overall mussel habitat quality is poor. By far, the best mussel population found in either the NFSR or the SFSR drainage was in the South River along the boundary for DCR's Cowbane Prairie Natural Area Preserve and extending into a mitigation wetland held by the Shenandoah Mitigation Bank. This section of river warrants future monitoring efforts and water quality conservation actions.

### **NATURAL HERITAGE CONSERVATION SITES VISITED VIA GOOGLE EARTH**

Building upon a Google Earth demonstration observed at the 2008 NatureServe Conference in Pennsylvania, Natural Heritage staff developed an application that facilitated an expert review utilizing Natural Heritage data and 2007 VA Imagery via Google Earth. Using a flyover technique, all 2,100 conservation sites and the rare species and natural communities they contain were reviewed in 10 staff days. A total of 401 mapped rare species locations and 9 conservation sites were updated due to boundary adjustments and rank changes. Also, 12 mapped locations and 10 conservation sites were determined to be destroyed.

### **NATURAL HERITAGE INFORMATION – EVER GROWING, EVER CHANGING**

DCR's Information Management staff have mapped 419 new locations of rare species and exemplary natural communities; updated 1,012 existing mapped locations; and have established and mapped 71 new Conservation Sites. This year also saw great progress on clearing out a backlog of data in need of quality control, with 2,588 element occurrences and 309 Conservation Sites quality controlled.

### **PREDICTIVE RANGE MAPS DEVELOPED**

Natural Heritage staff have developed predictive distribution models for six federally endangered plant species: Virginia Sneezeweed, Sensitive Joint Vetch, Shale Barren Rock Cress, Smooth Coneflower, Swamp Pink, and Virginia Spiraea for the US Fish and Wildlife Service. This resulted in GIS layers, maps and datasets that will aid protection of these species by enabling the USF&WS to address impacts of development and habitat alteration, and to plan recovery efforts by helping focus surveys and identify potential sites for protection, restoration, and reintroduction.

### **NATURAL HERITAGE INFORMATION AIDS DECISION MAKING**

In 2009 Natural Heritage staff responded to 2,287 formal information requests. DCR's Natural Heritage staff have also worked hard in recent years to better provide information to local governments and land trusts. 64% of the Coastal Zone localities have been provided Natural Heritage conservation information and training. In addition, 14 land trusts working in the Coastal Zone also have Natural Heritage conservation information. Statewide, 40% of the localities and 37% of the land trusts are utilizing Natural Heritage conservation information.

### **RECENT NATURAL AREA PROTECTION PROJECTS**

South Quay Sandhills, Cypress Bridge Swamp, Sweet Springs, and Crawford's Knob Natural Area Preserves were added to the State Natural Area Preserve System in 2009 and six tracts were added to existing preserves for a total of 3,789 new natural area preserve acres protecting 49 mapped locations of exemplary natural communities and rare



plant and animal species. Included was the 1,100 acre addition to Crow's Nest, Stafford County.

### **KARST PROGRAM LOSES FUNDING**

DCR's Karst Protection Program lost funding in the end of the year due to budget cuts. With 4000+ caves in Virginia and the significant water quality services and challenges these systems face, this comes a significant blow to Virginia. Successes for the program have included workshops and on-site visits with local government staff, and state and federal staff throughout western and southwestern Virginia to help them understand the complexities of karst and the importance of above ground actions on their drinking water supplies in karst regions; the successful remediation of Batie Creek in Lee County, which will likely also lead to removal of the Lee County cave isopod from the federal endangered species list; hundreds of teachers, informal educators, and thousands of students reached through DCR's karst education efforts using Project Underground; working cooperatively with the Virginia Cave Board to protect the caves and karst of Virginia, and spread awareness through publications like the Cave Owner's Newsletter and Virginia Cave Week; the preservation of Blue Spring in Frederick County and the establishment of the Ogdens Cave Natural Area preserve; development of the Virginia Karst Hydrology Atlas; site visits, trainings, and technical consultations with Urban Programs staff to help them better address karst issues; conceptualization and development of the Chesapeake Bay Headwaters Academy, an annual environmental education program training teachers about the hydrology and biology of the bay headwaters region; review of hundreds of Virginia Outdoor Foundation easements and development of protective



easement language for karst features; the development of conservation sites for all of Virginia's significant caves; protecting drinking water and water quality by making sure that karst issues were adequately addressed in the new stormwater management regulation and stormwater management handbook; assisting the Department of Emergency Management in last minute, late night responses to sinkhole spills and DEQ in determining the fate of fluids from leaking underground storage tanks; completion of the Warren County Enterprise Zone karst study and identification of Crooked Run as an impaired stream.

### **NATURAL AREA MANAGEMENT**

Natural Heritage staff are responsible for managing the Commonwealth's 59 Natural Area Preserves containing 49,531 acres and supporting 557 mapped locations for rare plant and animal species and significant natural communities. In 209, Natural Heritage Stewardship staff implemented 23 federally funded projects on the state natural area preserve system totaling \$1,062,879 to improve rare species habitat, enhance public access, and control exotic invasive species. These included eleven NRCS-Wildlife Habitat Incentives Program-funded habitat restoration projects totaling \$409,028; five Virginia Recreational Trails Program-funded public access enhancement projects totaling \$483,219; and six U.S. Fish and Wildlife Service-funded invasive species projects totaling \$215,811.

Twelve prescribed fire projects to restore and maintain rare species habitats and natural communities on natural area preserves, burning a total of 869 acres were successfully completed. In addition, DCR Natural Heritage burn crew members assisted key partners including the US Fish & Wildlife Service, The Nature Conservancy, and State Parks with 20 additional prescribed burns, statewide.

Natural Heritage staff hosted six open-



house events, statewide, in October and November 2009. Events were held at Pinnacle NAP in Russell County, Buffalo Mountain NAP in Floyd County, Grassy Hill NAP in Franklin County, Crow's Nest NAP in Stafford County, Dameron Marsh and Hughlett Point NAPs in Northumberland County, and Savage Neck Dunes NAP in Northampton County. Over 300 individuals attended the open house events, many making a first time visit to a state natural area preserve.



Public hunts were managed at Crow's Nest NAP, Dameron Marsh NAP, Hughlett Point NAP, and Savage Neck Dunes NAPs in order to benefit habitats, maintain appropriate species population levels, and provide outdoor recreational experiences.

*Bob McDonnell, Governor*

*Doug Domenech,  
Secretary of Natural Resources*

*David A. Johnson, Director  
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Selected in 1994 by The Nature Conservancy and  
2007 by NatureServe as the  
Outstanding Natural Heritage Program  
in the Western Hemisphere

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