



Department of Conservation & Recreation

CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

Virginia Natural Heritage E-News

Conserving Virginia's Biodiversity through Inventory, Protection and Stewardship **Spring 2001**

NATURESERVE www.natureserve.org LAUNCHED BY ABI AND NATURAL HERITAGE NETWORK

It was one small step for ABI (Association for Biodiversity Information) and the Natural Heritage Network, and one giant leap for the field of biodiversity information as ABI publicly launched the NatureServe website. The eagerly-awaited online conservation resource provides authoritative conservation information in a searchable database for more than 50,000 plants, animals, and ecological communities of the United States and Canada. In a brief story that included a color graphic of the NatureServe home page, Science magazine (Sept. 22, 2000) described NatureServe as "a 25-year trove of field data on the plants and animals of the United States and Canada." The site is already receiving more than 1,000 unique visits per day. To view the site and provide user feedback, go to www.natureserve.org. This website is a great example of something that the Natural Heritage Network can accomplish by working together.

30th STATE NATURAL AREA PRESERVE DEDICATED



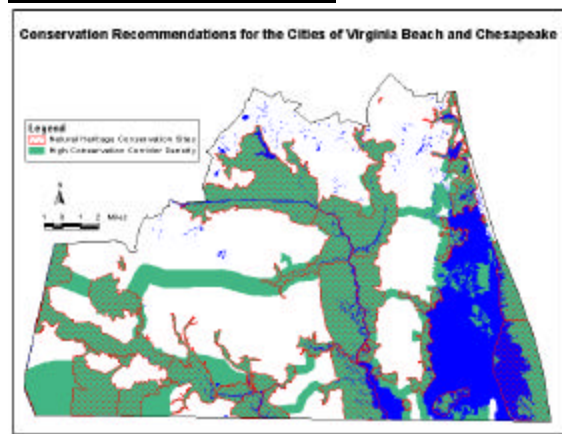
DCR held a ceremony in Cleveland, Russell County to dedicate the 30th State Natural Area Preserve. The 501 acre preserve was acquired with funds from the 1992 Park and Natural Areas Bond. Cleveland Barrens was discovered in 1995-96 by Chris Ludwig, Natural Heritage Chief Biologist and contains the globally rare Dolomite Barren community, 13 rare plants, and three known rare animals. The Nature Conservancy assisted in the site's protection. Speakers included the Honorable David Brickley, Bill Kittrell, Director-TNC Clinch Valley Program, the Honorable Clarence "Bud" Phillips, the

Honorable Phillip Puckett, Terry Porter of Mullican Lumber Company, Elbert Mosteller, and Chris Ludwig.

FIRST PHASE OF VIRGINIA NATURAL COMMUNITY CLASSIFICATION COMPLETED

Natural Heritage ecologists have completed the first installment of a planned series of reports that will present a comprehensive classification of natural communities in Virginia. The first approximation provides an updated version of the state classification which conceptually defines and describes 120 broad ecological community groups in the Commonwealth. It provides a standard for community nomenclature, as well as information useful to the field identification of communities and the prioritization of conservation sites. Future installments will develop the classification and description of community types within each of the ecological community groups. The report can be viewed and printed at <http://www.dcr.state.va.us/dnh/rare.htm>.

CHESAPEAKE AND VIRGINIA BEACH CONSERVATION PLAN



Natural Heritage prepared a Conservation Plan for the Hampton Roads Planning District Commission to assist with the NOAA-sponsored Southern Watershed Management Program (SWAMP). SWAMP seeks to protect and enhance the natural resources, sensitive lands, and water supplies of the southern watersheds

of Chesapeake and Virginia Beach while maintaining a balance with economic development opportunities. The Conservation Plan provides a science-based foundation for conserving the area's biological resources, and integrates with three other SWAMP components: an Agriculture Plan, a Multiple Benefits Conservation Plan (addressing wetlands mitigation issues), and a Rural Area Preservation Program.

The Conservation Plan addresses the social and economic benefits of retaining intact natural ecosystems and open-space as integrated components of the community. The Conservation Plan presents a set of options for landscape level conservation that provide increasing levels of natural resource conservation.

CONSERVATION LANDS PROJECT

Under a recent charge to be the official repository for the Commonwealth's "Conservation Lands Data Layer", Natural Heritage staff have been busy building a geographic information system (GIS) data layer for all the public and privately protected conservation lands in Virginia. The GIS layer contains boundaries and information on all local government, state, and federal protected lands, and lands owned or held in easement by private non-profit conservation organizations that contain natural habitat. Within the year the data will be available over a publicly accessible internet site.

CEDARS NATURAL AREA PRESERVE ADDITIONS

DCR added 274.5 acres to the Cedars Natural Area Preserve in Lee County. The new additions contain exemplary prairie glades, one of three sites in the world for the Running glade clover, and a suite of other rare plants. The total acreage for The Cedars Natural Area Preserve will now be 531 acres.



Running glade clover (*Trifolium calcaricum*)
(G1/S1)

HICKORY HOLLOW DEDICATED INTO NATURAL AREA PRESERVE SYSTEM

The Hickory Hollow Natural Area in Lancaster County has been formally dedicated as Virginia's 29th Natural Area Preserve. The Northern Neck of

Virginia Chapter of the Audubon Society used chapter funds and private gifts as well as a grant from the Virginia Land Conservation Fund to purchase the 254 acre site from Lancaster County, which had originally proposed to develop an industrial park on the site. The natural area contains a mature bottomland hardwood forest. The dedication ceremony was highlighted by presentations from Mr. Henry Bashore and Mr. Tom Teeple of the Northern Neck Audubon and DCR Director David Brickley and Secretary of Natural Resources John Paul Woodley. More than forty friends of Hickory Hollow attended the ceremony.

CAT PONDS PLACED ON VIRGINIA REGISTRY OF NATURAL AREAS

Cat Ponds in Isle of Wight County has 14 rare species and communities including one rare natural community, seven rare plant species, a rare damselfly, four rare amphibians, and the state endangered chicken turtle. The landowner has been awarded a plaque and certificate for placing his property on the Department of Conservation and Recreation's Virginia Registry of Natural Areas.



Cat Ponds, Isle of Wight County

NEW SMALL WHORLED POGONIA OCCURRENCE FOUND AT QUANTICO MARINE CORPS BASE

Surveys for the rare orchid small whorled pogonia (*Isotria medeoloides*) (G2G3/S2) were conducted in 2000 by Natural Heritage field botanists in selected timber compartments at Quantico Marine Corps Base. The survey resulted in the finding of one new occurrence. This species has been listed as Threatened under the federal Endangered Species Act and endangered under the Virginia Endangered Plant and Insect Species Act. Twelve occurrences of this species have previously been found on the Base. Small whorled pogonia is an orchid found in the eastern and midwestern US and Ontario, Canada in second or third growth hardwood forests.

ENDANGERED PLANT LOCATED IN ALLEGHANY COUNTY

Three occurrences of shale-barren rockcress (*Arabis serotina*) were located in Alleghany County by Natural Heritage field botanists. This plant is listed Endangered under both the federal Endangered Species Act and the Virginia Endangered Plant and Insect Species Act. All occurrences were located on the James River District of the George Washington National Forest during a shale barren inventory for the U.S. Forest Service. Two of the occurrences were located along Blue Suck Run southwest of Longdale Furnace and the third along Johns Run west of Covington. The largest occurrence was comprised of 11 flowering individuals and 19 rosettes.

HISTORICAL SENSITIVE JOINT-VETCH POPULATION REDISCOVERED

A population of the federally threatened plant species sensitive joint-vetch (*Aeschynomene virginica*) (G2/S2), last documented in 1939 along Back River at Colonial National Historical Park, was rediscovered in 2000 by a Natural Heritage field botanist. Sensitive joint-vetch is a member of the pea family found in fresh to slightly brackish tidal marshes from New Jersey to North Carolina. Eighteen populations are extant in Virginia. The Colonial NHP population, once apparently along the Back River channel and unsuccessfully searched for over the last decade, is currently found in an interior marsh location associated with the edge of an old road through the marsh that leads to a former ferry landing. The survey was conducted under a contract with Colonial NHP that focuses on lands that will be involved in the upcoming anniversary of the founding of Jamestown.



Sensitive joint-vetch (*Aeschynomene virginica*) (G2/S2)

INVENTORY REPORTS FOR FEDERALLY LISTED PLANTS COMPLETED

Reports detailing inventories for two plant species listed as Threatened under the Federal Endangered Species Act were recently completed. A report on sensitive joint-vetch (*Aeschynomene virginica*) was submitted to VDACS, and a report on seabeach

amaranth (*Amaranthus pumilus*) was submitted to the U.S. Fish and Wildlife Service. No new populations of either of these species were found in 2000. Seabeach amaranth has not been found in Virginia since 1972.

WESTVACO NATURAL HERITAGE INVENTORY

Thanks to The Nature Conservancy and Westvaco Corporation, the Division of Natural Heritage is currently conducting an inventory of Westvaco's Virginia land holdings. The inventory is a result of a five-year cooperative agreement between TNC and Westvaco. Survey sites in the Virginia Piedmont and Mountains have been selected using Westvaco's comprehensive GIS information. The inventory will focus on ecologically significant communities, along with botanical and zoological work. Highlights of the 2000 field season included two new populations of the federally endangered smooth coneflower (*Echinacea laevigata*) in Amherst County, thanks to the assistance of a local naturalist. Smooth coneflower is known from Virginia, North Carolina, South Carolina, and Georgia. Surveys during the winter of 2000-2001 have documented new community occurrences including an Ultramafic Woodland, a Basic- Oak Hickory Forest, a Piedmont Hardpan Forest, and an Eastern Hemlock Forest. Inventory work is now focused on the mountain holdings of Westvaco.

MELICA NITENS FOUND AT PATTERSON CREEK

A specimen of three-flower melic (*Melica nitens*) (G5/S1) was collected at the Little Patterson Creek Shale Barren, Botetourt County on US Forest Service land. The specimen was collected in flower during late May and was just recently keyed out. It more commonly occurs on limestone but has been collected on at least one other shale barren in Virginia.

REGAL FRITILLARY (*SPEYERIA IDALIA*) POPULATION MONITORED IN VIRGINIA

Natural Heritage field zoologists reported the results of a study of Virginia's only known population of the regal fritillary (*Speyeria idalia*), one of only two populations documented east of Illinois. During a mark-recapture survey in the summer of 2000, 109 butterflies were captured and released at the site in western Virginia. This study has been part of a multi-year effort to learn more about the regal fritillary's life history and habitat needs. The

zoologists are in communication with the site managers to promote habitat management and monitoring of the butterfly population.



Regal fritillary (*Speyeria idalia*) (G3/S1)

BLACK SKIMMER NESTING SUCCESS ON THE BARRIER ISLANDS

The Black skimmer (G5S2) colony on Wreck Island Natural Area Preserve, Northampton County produced over 200 chicks and fledging birds during the summer of 2000. The colony peaked late with over 500 adults but many of those were failed pairs from both Ship Shoal and Little Cobb Islands. The colony of 800 skimmers on north Cedar Island produced over 300 fledglings. This is the first significant Black skimmer productivity on the barrier island beaches in over a decade!

NEW SPECIES OF GROUNDWATER AMPHIPOD IDENTIFIED FROM RAPPAHANNOCK RIVER DRAINAGE

During the 2000 field season, Natural Heritage zoologists collected the first specimens of a previously undescribed species of *Stygobromus* from Westmoreland and Caroline counties. The collections were made during field surveys for a U.S. Fish and Wildlife Service-funded project to determine the status and distribution of *Stygobromus* species in eastern Virginia. J. R. Holsinger of Old Dominion University determined that the specimens were representative of a new species based on comparisons with other species known from the region. Three other rare species (*Stygobromus indentatus* G2/S2, *Stygobromus araeus* G2G3/S2, *Caecidotea pricei* G2/S2) were also collected during these field surveys. The report summarizing these findings as well as reviewing the status of eight species of *Stygobromus* in eastern Virginia was completed and submitted to the U.S. Fish and Wildlife Service.

NATIONAL FOREST SPRING AMPHIPOD REPORT COMPLETED

The Natural Heritage staff zoologist prepared a report for the George Washington and Jefferson National

Forests summarizing current knowledge of the spring and seepage-dwelling amphipod crustacean fauna of the forests. The report was based on a review of historical collections, which proved to be mostly limited to samples obtained by Natural Heritage zoologists during the past decade, plus field sampling conducted between March 1999 and March 2000. Three genera and ten species of amphipods have been documented on national forest lands in Virginia, including eight species monitored by the Division of Natural Heritage. The fauna is dominated by the blind, pigmentless subterranean genus *Stygobromus*, including four named species and four additional species provisionally recognized as new to science. Two of the new species are known only from the George Washington National Forest, including one that was collected for the first time during this study from a single locality.

PETERS MOUNTAIN CONSERVATION PROJECT COMPLETED

Natural Heritage ecology staff submitted a final report to the U.S. Forest Service detailing the ecological landscape units of an 11,000 acre area on Peters Mountain in Alleghany County. Twenty landtype phases, based on repeating associations of vegetation, soils, and topography were classified and mapped in the study area. In addition, the report provides formal documentation of 4,700 acres of never-cut, old-growth forest, which are among the largest patches of old growth that has been documented on the George Washington and Jefferson National Forests. The Peters Mountain study area is a significant site for biodiversity conservation because of its old-growth forests and the occurrence of outstanding shale barrens, mountain ponds, and two federally listed plant species.

ECOLOGICAL COMMUNITY CLASSIFICATION OF FORT BELVOIR COMPLETED

Natural Heritage field ecologists completed a community inventory report of Fort Belvoir. The technical report presents a formal classification of the ecological communities of the base. The goals of the study were to describe and map these units, to investigate relationships among biotic and abiotic components, and to inform ecosystem-based management in compliance with the Department of Defense Biodiversity Conservation Initiative and the Department of the Army policy for ecosystem management. Analysis of data from 68 sample plots was used to generate a classification of three ecological groups and seventeen community types.

Several potentially significant community types were identified through the inventory.

VEGETATION MAPPING PROJECT FOR SHENANDOAH NATIONAL PARK

Natural Heritage, in cooperation with the US Geological Survey and National Park Service, has initiated a cooperative multi-year vegetation-mapping project in Shenandoah National Park. The goal of the project is to describe and delineate plant communities within the 196,000-acre park using state-of-the-art technology.

BACK BAY NATIONAL WILDLIFE REFUGE STUDY COMPLETED

A biological inventory report of the Back Bay National Wildlife Refuge was completed this winter for the U.S. Fish and Wildlife Service. Staff zoologists documented three state rare invertebrates: one tiger beetle (*Cicindela trifasciata*) (G5S1) and two live oak feeding moths (*Metria amella* and *Heterocampa astarte*). Botanists updated a list of known rare plant species for the refuge and discovered new locations or sub-populations of 10 state rare species. In addition, staff ecologists placed thirty-six sample vegetation plots across the refuge management area to record the variation in plant communities. From these plots, 17 natural community types were attributed to the Back Bay National Wildlife Refuge.

DRAGON RUN WATERSHED INVENTORY REPORT COMPLETED



The second edition of *A Natural Heritage Inventory of the Dragon Run Watershed* was completed. This report covers rare species and significant community finds from Phase 2 of the inventory, which was conducted during the 2000 field season, and also incorporates the findings of Phase 1, which was conducted in 1999. Dragon Run is located within the Middle Peninsula and forms the headwaters of the Piankatank River. New finds for the 2000 field season include cuckooflower (*Cardamine pratensis*), the blackwater bluet damselfly (*Enallagma*

weewa)(3rd Virginia occurrence), and the southern pitcher-plant mosquito (*Wyeomyia haynei*)(3rd Virginia occurrence). The Browning-Ferris Industries (BFI) Dragon Run Environmental Fund funded phase 2 of the inventory.

NORTHWEST RIVER ECOLOGICAL COMMUNITIES MAP COMPLETED

The GIS Projects Manager/Conservation Biologist completed a draft map of ecological communities of the Northwest River in southeastern VA. The map was derived from remotely sensed imagery using photo-interpretation, field samples referenced by GPS, and spectral analysis. The mapped communities, such as Common Reed (*Phragmites australis*) Marsh, Spikerush (*Eleocharis* spp.) Marsh, and Pond Pine (*Pinus serotina*) Woodland, correspond to the communities identified in an ecology study completed by NH Community Ecologists in 1998. This fine-scale map will be provided to NH Stewardship staff and the Hampton Roads PDC as a valuable tool for management of the important wetlands of the Northwest River.

MATTAPONI RIVER VEGETATION STUDY COMPLETED

The Natural Areas Vegetation Ecologist, Information Manager, and Field Ecologist completed sections of a final report to The Nature Conservancy on a vegetation study of tidal freshwater marshes of the Mattaponi River. The project, entitled "Critical Components of Hydrologic Variability in Tidal Freshwater Wetlands: Hydrogeomorphology and Vegetation of the Mattaponi River," represented a collaborative effort between Natural Heritage and investigators from George Mason University, the Smithsonian Institution's Conservation and Research Center, and Old Dominion University. Natural Heritage was responsible for conducting vegetation inventory in tidal freshwater marshes, shrub swamps, and swamp forests on the Mattaponi and generating a classification of wetland plant communities. Data from 128 plots in this study were combined with 286 other samples representing tidally influenced vegetation in the state (including a large number from the Pamunkey River, where Natural Heritage is currently conducting another inventory project) to produce a second-iteration classification of tidal freshwater and brackish marshes in Virginia. Other components of this investigation included sediment dynamics of marshes and land cover mapping using remote imagery. The Nature Conservancy's Ecosystem Research Program funded the project, with matching funds from Natural Heritage.

INTERNATIONAL PAPER AND NATURAL HERITAGE PRESCRIBED BURN AGREEMENT

Under a new agreement Natural Heritage led a prescribed burn at Cherry Orchard Bog in Sussex County. This site is owned by International Paper and is on the Virginia Registry of Natural Areas. In addition to DCR and TNC staff at the burn a DOF crew with a tractor plow was on hand in case of an escape into adjacent young pine plantations. The burn went well and was completed without incident. Initial assessments indicate that the objective to reduce woody growth in the wetland communities was met, helping to restore habitat for the site's eight rare plants. The rare purple pitcher plant (*Sarracenia purpurea*) which had not been seen at the site for six years, was relocated by a member of the burn crew.

DCR CO-HOSTS PHRAGMITES SYMPOSIUM

On December 14, DCR and The Chesapeake Bay Commission co-hosted "Phragmites in Virginia: A Management Symposium," held at the Library of Virginia in Richmond. Nearly 150 attendees at the one-day conference listened to scientists and Phragmites management specialists from throughout the Atlantic States discuss control strategies and techniques for this invasive wetland grass. Several Heritage staff members were involved in the program either as speakers, moderators, or registration assistants. Abstracts from the conference can be viewed and printed from the Natural Heritage web site: <http://www.dcr.state.va.us/dnh/phragsymp.pdf>. To learn more about Phragmites or other invasive plants visit the Natural Heritage Website at <http://www.dcr.state.va.us/dnh/invinfo.htm>.

PHRAGMITES MONITORING COMPLETED AT DAMERON MARSH

Natural Heritage staff have completed year 2000 monitoring efforts for eight stands of the invasive wetland grass, *Phragmites australis* at Dameron Marsh Natural Area Preserve. Each stand was sampled to quantify abundance and density of *Phragmites*, as well as native herbaceous and woody species. This data collection is a vital component of a joint wetland restoration effort between the US Army Corps of Engineers and DNH, and will help to measure the success rate for herbicide treatment applied to some of the stands in the Fall of 2000.



Phragmites

INVASIVE SPECIES CONTROL AT NORTH LANDING RIVER NAP

In September Natural Heritage stewardship staff helped coordinate an aerial spraying project to control the invasive wetland grass *Phragmites australis* at North Landing River Natural Area Preserve in Virginia Beach. This work is part of a cooperative control project between DCR, The Nature Conservancy, City of Virginia Beach, and Back Bay National Wildlife Refuge. This is a two-year project funded in part by a grant from the National Fish and Wildlife Foundation and involves the use of prescribed fire in combination with herbicide applications to maintain and enhance native plant diversity in SE Virginia marsh ecosystems.

Natural Heritage in partnership with The Nature Conservancy, Back Bay National Wildlife Refuge, City of Virginia Beach, Hampton Roads Planning District Commission, and Back Bay Restoration Foundation are working to promote a shared-resource approach to the control of the invasive grass *Phragmites australis* in southeast Virginia. NH Stewardship staff have completed surveys and mapping at Northwest River and North Landing River Natural Area Preserves for the extent of *Phragmites australis*. Individual patches of common reed were located and mapped using GPS receivers, along with attribute information such as patch size, density, and burn complexity. The patches were treated in the fall of 2000 and then burned during February 2001.

COOPERATIVE INVASIVE SPECIES CONTROL PROJECT AT COWBANE PRAIRIE NAP

In September Natural Heritage staff joined with staff and volunteers from The Nature Conservancy at Cowbane Prairie Natural Area Preserve and the adjoining South River Preserve (owned by TNC) in Augusta County to complete a cooperative project focusing on control of two invasive species. Multiflora rose and autumn-olive were removed by a

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combination of herbicide and mechanical means at both preserves. This project was registered as a Fall River Renaissance riparian corridor improvement event, and should result in decreased threat to, and increased habitat for, rare wet prairie species and natural communities along the South River.

KANKAKEE MALLOW PROJECT COMPLETED

The Natural Heritage Stewardship Biologist has completed a final report ending a 2-year project, "Conservation of Kankakee Mallow in Virginia", funded by the U.S. Geological Survey-Biological Resources Division. Kankakee mallow is an extremely rare plant, occurring globally only at 11 sites: 9 in Virginia and 1 each in Illinois and Indiana. Project goals were to describe current status of the Virginia populations, to inform landowners of occurrences, to seek permission to apply management treatments to improve population health, and to assess results of management. The greatest success was achieved at Piney Island in the James River, owned by the City of Bedford, where a prescribed burn in April 1999 resulted in improved habitat conditions, stimulation of flowering, and seedling recruitment for Kankakee mallow. A management agreement and natural area registry with Bedford are currently being pursued to foster long-term stewardship of this significant conservation site.

ATLANTIC WHITE-CEDAR INVENTORY COMPLETED

The DCR State Natural Area Steward, the Southeast Regional Steward, and the Stewardship Assistant recently completed an inventory of the only state-owned Atlantic white-cedar (*Chamaecyparis thuyoides*) stand in Virginia. The 40-acre stand is located in a remote shrub swamp on the North Landing River Natural Area Preserve. Navigation to and from the area was facilitated by the use of newly acquired GPS units. Data collection included stand age and growth rate, regeneration potential, forest structure and composition, and herbaceous and shrub species abundance.

VEGETATION MANAGEMENT AT BIG SPRING BOG NAP

In September Natural Heritage staff completed a vegetation control project at Big Spring Bog Natural Area Preserve in Grayson County to restore open conditions in a seepage bog harboring numerous rare plants. Encroaching woody vegetation (small trees and shrubs) was mechanically removed from two small openings (each less than 0.10 acre), allowing

increased sunlight to reach the forest floor. These openings support at least 10 rare herbaceous species and will be maintained using prescribed fire in the future.

DRAFT OF VIRGINIA SNEEZEWEED RECOVERY PLAN DISTRIBUTED FOR REVIEW

The technical/agency draft of the Virginia Sneezeweed (*Helenium virginicum*) Recovery Plan, written by Natural Heritage and finalized by the US Fish and Wildlife Service, has been distributed for review. This draft is being sent to government agencies, conservation groups, representatives of academia, and others concerned with protection of this federally listed (threatened) plant species. Virginia sneezeweed, a member of the Aster family limited to sinkhole pond habitats, has been found in fewer than 30 sites in Augusta and Rockingham Counties in the Shenandoah Valley of Virginia and one disjunct occurrence in southern Missouri.



Virginia sneezeweed (*Helenium virginicum*)
(G2S2/LTSE)

SEASONAL SURVEYS COMPLETED FOR NORTHEASTERN BEACH TIGER BEETLES

NH Stewardship staff (Chesapeake Bay Region Steward, Stewardship Assistant) have completed adult surveys for the federally threatened Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis*) (G4T2/S2). Status of populations at five DCR Natural Area Preserves (Savage Neck Dunes, Dameron Marsh, Hughlett Point, William B. Trower Bayshore, Bethel Beach) as well as the City of Hampton's Grandview Beach Nature Preserve was assessed. Training in tiger beetle monitoring methodology was also provided to staff of Kiptopeke State Park.

MONITORING AND INVENTORY PROJECT AT POOR MOUNTAIN NAP, ROANOKE COUNTY

An intensive monitoring and inventory project has been initiated at Poor Mountain Natural Area Preserve. This effort consists of the installation of permanent sampling plots in the eastern section of the Preserve. The project will provide quantification of

the distribution and abundance of the rare parasitic shrub piratebush (*Buckleya distichophylla*) (GS/S2), as well as document the ongoing mortality of eastern hemlock (*Tsuga canadensis*) from the hemlock woolly adelgid. Another intended outcome of the project is the delineation of management units for future stewardship efforts.

CITIZENS FOR A BETTER EASTERN SHORE AND BROADWATER ACADEMY AT SAVAGE NECK DUNES NAP

The CBES and students from Broadwater Academy removed 1240 pounds of trash (weighed at the local landfill) from the beach at Savage Neck Dunes Natural Area Preserve. Most of the trash was plastic. Great photos were taken and John and Ive Chubb submitted items to the local paper and for the CBES newsletter. As an Adopt-A-Stream area, the groups will do similar cleanups twice each year.

ESRI AND ABI (NETWORK OF NATURAL HERITAGE PROGRAMS) FORM STRATEGIC PARTNERSHIP

ESRI, developer of Arc View and Arc Info, and ABI (Natural Heritage Network Association) have formed a strategic partnership with the goal of advancing the next generation of tools and information to help guide conservation decision-making and protect biological diversity. The heart of the partnership is a commitment to work together to develop a GIS-based data management system for conservation comprising the core features and functions required by the conservation and planning community. ESRI, the leading developer of GIS software, will work with ABI and other partners to develop the system.

This proposed spatially-enabled data management system will be the foundation of a cutting-edge, GIS-based decision support system that will include advanced analytical and visualization tools, field mapping and data entry tools, and spatial modeling predictive tools to aid scientific studies and decision-making, and will include a customized, web-based software module to meet the special requirements of ABI and the Natural Heritage Network.

"This alliance will serve as a model to promote other partnering between the business and not-for-profit sectors to meet the environmental challenges we will confront in this century," said Jack Dangermond, President of ESRI. Added Mark Schaefer, ABI's President and CEO, "With this new decision-support system, we hope to bridge the chasm between the traditional planning community and the conservation

sciences, making biodiversity information an integral part of decision-making at all levels."

PUBLICATION ON AMPHIBIAN AND REPTILE FAUNA OF SAVAGE NECK DUNES NATURAL AREA PRESERVE

Members of the zoological staff published an article in *Catesbeiana*, the semiannual journal of the Virginia Herpetological Society, summarizing current knowledge of the amphibian and reptile fauna of Savage Neck Dunes Natural Area Preserve in Northampton County on Virginia's Eastern Shore. A total of 17 species (10 amphibians, 7 reptiles) was recorded on the preserve during 1999 inventories. Although no rare species were documented, a breeding population of the marbled salamander (*Ambystoma opacum*) was confirmed at a series of interdunal ponds, representing a new county record and a southwestward range extension for this species on the Delmarva Peninsula of approximately 44 miles (70 km). Subsequent to the publication of the paper, a ring-necked snake (*Diadophis punctatus*) was observed on the preserve on 1 November 2000, constituting another new county record and a southern range extension on the Delmarva Peninsula of approximately 50 miles (80 km).

CAVE WEEK IN VIRGINIA

Governor Gilmore proclaimed the week of October 16-23 as Cave Week. During this week the Virginia Cave Board, DCR's Project Underground and Karst Program staff, volunteers from local caving organizations and the commercial caves in the state offered special educational opportunities to school groups and others who visit commercial caves in Virginia. The purpose of Cave Week is to recognize caves as special geologic and biologic resources, their uniqueness to the Commonwealth and their educational, scientific and economic value. Visit <http://www.dcr.state.va.us/dnh/cavehome.html> to learn more about karst resources.

CHILDREN'S GROUNDWATER FESTIVAL

Natural Heritage staff helped with the Children's Groundwater Festival, September 22 in Harrisonburg, Virginia. Four hundred kids had a great time while learning about caves, karst, groundwater springs, sinkholes, and nonpoint source pollution.

Natural Heritage Karst Project staff are providing technical assistance to several counties and SWCDs on karst ordinances, stormwater management policies, and cave protection. Project Underground

staff are organizing workshops, working on web page ideas, and a groundwater forum for Page County.



**NEW BOOK PUBLISHED ON THE
NATURAL HISTORY OF THE GREAT
DISMAL SWAMP**

Old Dominion University and the Suffolk-Nansemond Chapter of the Izaak Walton League of America, Inc. have teamed to produce a 300-page book on the natural history of the Great Dismal Swamp. The book is based largely on presentations made at a January 1997 symposium that was held at ODU. Members of the zoological staff of the Division of Natural Heritage coauthored three chapters in the book. These chapters include extensive annotated checklists of the Lepidoptera (106 species of butterflies and skippers) and Odonata (76 species of dragonflies and damselflies) faunas of the swamp, as well as a brief summary of the bats recorded in the area.

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