

Shenandoah National Park – U.S. National Park Service
Long Term Ecological Monitoring Program
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Shenandoah National Park in the northern Blue Ridge Mountains of Virginia is the largest protected area in the mid-Atlantic region (79,380 ha; 196,000 A). The park ranges in elevation from 530 to 4,050 feet above sea level and contains 60 peaks that exceed 3,000 feet in elevation. Because of its vicinity to Washington, D.C. and other large eastern metropolitan areas, the park is a popular visitor destination.

The park has a diverse flora of northern and southern plants whose showy display of blooms in the spring and the brilliant fall colors are renown nationwide. Many neotropical birds migrate through and nest in the park, and the large mixed mesophytic forest provides important habitat for many species of wildlife. The park also contains the federally endangered Shenandoah salamander (*Plethodon shenandoah*), which is not found anywhere else in the world.

High ozone levels and sulfate deposition; invasions by exotic forest insects, diseases and plants; and destruction of habitats from development on adjacent lands threaten the natural resources in the park. Protection of the resources is challenging because of the long narrow shape of the park.

In order to improve the quality of management of park natural resources, park staff began efforts to inventory park resources in the 1970s. Inventories included things such as species lists, voucher specimens, and photographic and cartographic documentation. Those inventory efforts continue today.

In response to legal mandates and recognized threats, Shenandoah National Park began long-term ecological monitoring of water quality, air quality, brook trout and black bears in the 1980s. In 1992, prototype ecological monitoring of the park's forested landscape was continued through the National Park Service (NPS) Inventory and Monitoring (I&M) Program and is fully integrated into the resource management program of the park.

Since 1992, monitoring has been expanded to include rare plants, forest health, aquatic insects, other fishes, and neotropical birds. Beginning in 2005, closer coordination between the natural resource monitoring program and the fire effects monitoring program started. NPS natural resource funding has been critical for the establishment of the I&M program at Shenandoah; however, additional studies and funding by cooperating agencies such as the U.S. Geological Survey, U.S. Forest Service, U.S. Fish and Wildlife Service, state agencies, universities, and others play an important part in understanding and protecting park resources.

Significant funding difficulties in the form of insufficient appropriations to cover employee pay raises have forced changes in the monitoring program. In 2005, the

neotropical bird monitoring program continued to be suspended and park staff members moved major portions of the monitoring program into an every other year rotation.