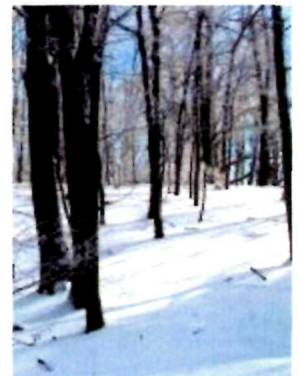
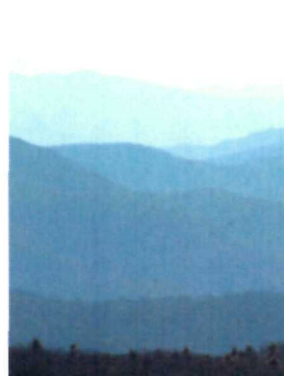




## Annual Work Plan (FY2010) for Inventories and Vital Signs Monitoring

Natural Resources Branch  
Division of Natural and Cultural Resources  
Shenandoah National Park



**ANNUAL WORK PLAN (FY 2010)  
FOR INVENTORIES AND VITAL SIGNS MONITORING**

**FY2010**

**Shenandoah National Park (SHEN)**

Shenandoah National Park Approval Signatures

/s/ Martha Bogle	2/2/2010
Martha Bogle	Date
Superintendent	
Shenandoah National Park	
/s/ Gordon Olson	2/2/2010
Gordon Olson	Date
Division Chief of Natural and Cultural Resources and	
I&M Program Coordinator	
Shenandoah National Park	
/s/ John Karish	2/2/2010
John Karish	Date
Inventory and Monitoring Program Manager	
Northeast Region	
/s/ Jim Comiskey	2/2/2010
James Comiskey	Date
Mid-Atlantic Network Program Manager	

## Shenandoah National Park FY 2010 – Annual Work Plan

Shenandoah National Park in the northern Blue Ridge Mountains of Virginia is the largest fully-protected area in the mid-Atlantic region at 79,889 ha (197,411 ac) including 32,172 ha (79,500 ac) of congressionally designated Wilderness. The park ranges in elevation from 163 to 1249 m (530 to 4,050 ft) above sea level and contains a diverse community of plants and animals. Forested montane communities, cold water high-gradient streams, and rocky outcrops along the ridge tops are prominent features of the landscape. A number of rare plant species and communities occur in the park along with the federally endangered Shenandoah salamander (*Plethodon shenandoah*), which is not found anywhere else in the world. Protection of the resources in a long narrowly-shaped park in the Eastern US presents many challenges. High ozone levels and sulfate deposition (acid rain); invasions by exotic forest insects, diseases, and plants; and destruction of habitats from development on adjacent lands are just some of the threats to the natural resources in the park.

The long-term ecological monitoring program at Shenandoah National Park is one of the original prototype programs established by the agency in 1992. Having completed most aspects of program research and development prior to that year, the program became fully operational in 1992. During the subsequent seventeen years, much of the program has gone through a variety of adjustments while some elements maintained continuity for decades. Concurrently, new issues have emerged and demanded attention including hemlock woolly adelgid, sudden oak death, and chronic wasting disease. Some research and protocol development efforts have continued specifically related to the forest monitoring protocol, amphibian monitoring, and stream water monitoring techniques. Due to funding constraints, some aspects of the program have never been implemented or have been suspended. Other areas, such as stream water chemistry have datasets extending to three decades.

### I. Planned Activities and Anticipated Products

#### Inventories

##### FAUNA

- Coordinated parkwide opportunistic surveillance efforts for Chronic Wasting Disease (CWD) in white-tailed deer will continue to aid in documenting the presence of exotic diseases in the park and to support management efforts.
- Park staff will continue to explore options for completing small mammal inventory work.
- Twenty-four crayfish samples (collected in 1990's by a former park employee) will be assessed and identified to add to the understanding of biodiversity in the park.
- Qualitative data documenting rattlesnake dens and animal presence will be collected by an independent cooperator.

##### FLORA

- New vascular plant and lichen specimens will be added to the park's herbarium collection as opportunities allow.



- Version 2.0 of the park's vegetation map will be warehoused and web material related to the map production will be posted.
- Lichen inventory work will continue on overlook rock walls and roadside banks.

#### **FOREST HEALTH**

- During Hemlock Woolly Adelgid treatment efforts, staff will search for previously unidentified hemlock stands and document those.
- Inventory and mapping of exotic plants will continue, with an emphasis on rare plant communities and rare species habitats.
- The Shenandoah Invasive Exotic Vascular Plant Watchlist for Shenandoah National Park will be updated as needed and posted to the park website.
- New invasive plant fact sheets will be developed and posted to the park website.
- Park staff members will visit a number of the 111 surveillance points that were established last year to conduct early detection surveys for exotic plants.
- Emerald Ash Borer (EAB) surveillance traps will be deployed in park developed areas and targeted white ash areas to determine the presence of EAB in the park.

#### **GEOLOGY**

- The new bedrock/surficial geology map will be warehoused and material related to the map and related products posted on the park's website.

#### **SOILS**

- Park staff will continue to explore options for updating soils maps for the park.

#### **DATA MANAGEMENT**

- Data management support for all NPS cooperators for inventory data entry and retrieval into and out of park databases including NPSpecies and NatureBib will be provided.

### **Vital Signs Monitoring**

#### **AIR QUALITY**

- Park staff will revise the Shenandoah air quality station operator's Standard Operating Procedure (SOP).
- Park staff members will operate National Air Quality Monitoring Programs including NADP (including mercury deposition), IMPROVE, CASTNET, GPMP, TEOM (particulate matter) and contaminants including CFC's at the Big Meadows Monitoring Site.
- National air program data will be validated and reports will be completed.
- A draft annual report for the park's air quality will be completed.

#### **WEATHER AND CLIMATE**

- Weather data associated with various programs (Gaseous Pollutant Monitoring, RAWS – fire weather, Department of Transportation) will be collected and compiled.
- Cooperators at Pennsylvania State University will complete the Shenandoah 2007 and

#### 2008 Climate Summaries.

- Park staff members will seek opportunities to implement water temperature monitoring in response to a changing climate.
- Develop a resource brief on climate change and monitoring in the Mid-Atlantic Network.
- As funds allow, work with University of Virginia to support pilot testing water temperature monitoring as it relates to climate change.

### GEOMORPHOLOGY

- Park staff will collect stream channel characteristics and hill slope features data in association with fisheries, aquatic macroinvertebrate, and forest vegetation monitoring. Data will be collected, entered into a database, and checked for accuracy according to monitoring procedures.

### HYDROLOGY

- Stream flow and velocity data will be collected in association with the Shenandoah Watershed Assessment Study, fisheries monitoring, and aquatic macroinvertebrate monitoring. Data will be collected, entered into a database, and checked for accuracy according to monitoring procedures.

### WATER QUALITY

- Cooperators from Virginia Tech and park staff will revise the aquatic macroinvertebrate protocol in concert with protocol development for the Mid-Atlantic I&M Network and bring it in line with National NPS I&M standards and guidelines.
- Aquatic macroinvertebrate sampling will continue during FY 2010. Data will be collected, entered into a database, and checked for accuracy according to monitoring procedures.
- The SWAS monitoring protocol is being re-drafted to National NPS I&M standards and guidelines. The protocol will be completed and ready for peer review during FY2010.
- The Shenandoah Watershed Assessment Study (SWAS) monitoring will be implemented and water resource data collected, entered into a database, and checked for accuracy according to monitoring procedures.
- A multi-year study of “Biological significance of headwater streams and springs in Shenandoah National Park” by USGS is using (and expanding on) data collected by the park’s stream monitoring program. This project is ongoing and on schedule for completion during 2010.
- Through USGS cooperators, an approved (funded) proposal to conduct a compilation of data from the SWAS, fisheries and macroinvertebrate monitoring, and headwaters streams project to examine useful aggregations, data gaps, and monitoring program efficiencies will be developed.

### INVASIVE SPECIES

- Invasive vascular plant species will be monitored via the park’s Forest Vegetation Monitoring Program.

- US Forest Service and Shenandoah staff will conduct gypsy moth egg mass surveys if needed. Data will be collected, entered into a database, and checked for accuracy according to monitoring procedures.
- The Virginia Division of Forestry will conduct aerial surveillance and collect imagery to document defoliation by forest pests including gypsy moths.

#### **INFESTATIONS & DISEASE**

- Beech Bark Disease early detection surveys will be completed and data will be collected, entered, and checked for accuracy.
- Surveys (via stream baiting) for the presence of the pathogen *Phytophthora ramorum* that causes Sudden Oak Death will be completed and data will be collected, entered, and checked for accuracy (contingent on funding from the Forest Service).

#### **FOCAL SPECIES & COMMUNITIES**

- Forest monitoring plots will be sampled and field data will be collected, entered into a database, and checked for accuracy.
- The Forest Vegetation Monitoring Protocol will be completed in accordance with National NPS I&M standards and guidelines and will be ready for peer review.
- Fisheries monitoring will occur and data will be collected, entered into a database, and checked for accuracy.
- A prototype of a Fisheries Monitoring Annual Report will be completed.
- The Breeding Bird Survey (BBS) program will be implemented and data will be collected, entered into a database, and checked for accuracy.
- Landbird Point Count Surveys in disturbed hemlock forests (Limberlost and Camp Rapidan) will be conducted and data will be collected, entered into a database, and checked for accuracy.
- High Priority Bird Species Surveys (e.g. cerulean warbler, Canada warbler) will be conducted and data will be collected, entered into a database, and checked for accuracy.
- Spring Cliff Nesting Bird Surveys in high priority cliff habitats (e.g. peregrine falcon, common raven) will be conducted and data will be collected, entered into a database, and checked for accuracy.
- White-tailed Deer Spotlight Surveys at Big Meadows Area will be conducted in the fall and spring and data will be collected, entered into a database, and checked for accuracy.
- Rare Plant Community monitoring will be conducted at Big Meadows and field data will be collected, entered into a database, and checked for accuracy.

#### **AT-RISK BIOTA**

- The USGS and George Mason University will continue with data analysis in association with development of a monitoring program for the federally endangered Shenandoah salamander (*Plethodon shenandoah*). A draft protocol that meets National NPS I&M standards will be prepared in 2010.
- Rare plant monitoring plots will be installed and sampled, and field data will be collected, entered, and checked for accuracy. Additional rare plant populations will be monitored for presence and negative impacts, including invasion by exotic plants.
- Rare plant populations will be monitored for species abundance, vigor, and the presence of

invasive plants. Data will be collected, entered into a database, and checked for accuracy according to monitoring procedures.

#### **VISITOR AND RECREATION USE**

- Resource Management staff members will work Revenue Management and Interpretation and Education staff to understand park visitor use data collection procedures and records management aimed at blending this information into the Vital Signs program.

#### **FIRE AND FUEL DYNAMICS**

- Natural Resource staff members will work with the park's Fire Ecologist to assure that fire and fuels dynamics data are as secure as Vital Signs data and to embrace reporting on those monitoring efforts in the FY10 Annual Accomplishments Report.

#### **OTHER MONITORING EFFORTS**

- The Annual Christmas Bird Count program sponsored by the Audubon Society will be implemented by park staff and community volunteers.
- The Annual Butterfly Count sponsored by the North American Butterfly Association will be completed by park staff and community volunteers.
- Legacy monitoring protocols and links to inter-organizational protocols and procedures will be posted on the Servicewide Protocol Database.
- The Annual Administrative Report for FY2009 and this document (Work Plan for FY2010) will be prepared.
- A booklet explaining the Conceptual Design of the park's Long Term Ecological Monitoring (Vital Signs) Program will be completed and distributed.
- Park staff members will work with the University of Maryland to develop and implement a template for preparing annual Vital Signs monitoring results. See Fisheries Monitoring Annual Report task above.
- Park staff members will serve on the Steering Committee of the National Science Foundation NEON program (Domain 2).

#### **DATA MANAGEMENT**

- Regular maintenance (server test), software upgrades, and provision of natural resource information over the Shenandoah intranet will be handled.
- Requests for monitoring data will be filled.
- Park staff members will be assisted with routine database tasks for the major monitoring project databases maintained in the park.

## **II. Staffing**

### **Shenandoah National Park Staff**

Cass, Wendy – Botanist  
Demarest, David – Biological Science Technician  
Forder, Melissa – Fire Ecologist  
Garcia, Liz – Physical Science Technician  
Gubler, Rolf – Biologist  
Hochstedler, Wendy – Biological Science Technician  
Hughes, Jake – Biological Science Technician  
Meyerhoeffer, Dale – Biological Science Technician  
Olson, Gordon – Chief, Division of Natural and Cultural Resources and I&M Program Coordinator  
Schaberl, Jim – Ecologist (Air and Water Resources)  
Williams, Alan – Data Manager  
Wofford, Jeb - Fish and Wildlife Biologist

### **Natural Resource Inventory Cooperators**

Fleming, Gary – Ecologist, Virginia Department of Conservation and Recreation, Natural Heritage Program  
Flenniken, Don- Independent Lichenologist  
Ihrman, Phyllis – Independent Lichenologist  
King, Tim – Geneticist, Leetown Science Center, USGS-BRD  
Snyder, Craig – Aquatic Ecologist, Leetown Science Center Hydrologist, USGS-BRD  
Southworth, C. Scott – Geologist, USGS  
Young, John – Ecologist, Leetown Science Center, USGS-BRD

### **Long Term Ecological (Vital Signs) Monitoring Cooperators**

Comiskey, Jim, Mid-Atlantic Network Inventory and Monitoring Program Manager, National Park Service  
Grant, Evan, Wildlife Biologist, Patuxent Wildlife Research Center, USGS-BRD)  
Sevin, Jennifer– Biodiversity Conservation Specialist, Smithsonian Institution – National Zoological Park  
Voshell, Reese – Aquatic Invertebrate Specialist, Virginia Polytechnic Institute and University  
Webb, Rick – Shenandoah Watershed Study Program Coordinator, University of Virginia

## **III. Reports, Publications and Presentations**

A Conceptual Design document that explains the justifications behind the selection of Vital Signs for Shenandoah will be completed. This document tiers off of the Vital Signs Monitoring Plan, prepared by the Mid-Atlantic I&M Network.



A prototype Vital Signs Report will be completed for the Fisheries Monitoring Program. That prototype will be applied to other monitoring components as circumstances allow.

Park staff members will give public and employee presentations on various aspects of the park's Long Term Ecological (Vital Signs) Monitoring Program.

#### **IV. Connect the Dots – Resource Condition Summary Table**

Park staff will continue to work on development of the Connect the Dots – Resource Condition Summary Table with emphasis on identifying resource standards and thresholds and on identifying specific metrics that will be reported on.

#### **V. Budget**

##### **Natural Resources Inventory**

Although some inventory tasks are identified in this Work Plan, no significant funding is available for this work. The most significant inventory voids that Shenandoah has are as follows. Funding is needed to support these efforts.

- Small mammals inventory
- Soils inventory and mapping
- Terrestrial invertebrate inventory
- Non-vascular plant inventory

##### **Vital Signs Monitoring**

In FY2010, park staff will use available monitoring funding to implement a robust program and to move the park program in the direction of meeting National NPS I&M standards and guidelines. The drop in funding levels between FY2009 and FY2010 is accounted for in that two projects, under development jointly with the USGS and others, are coming to closure. One project has focused on developing monitoring procedures for Shenandoah Salamander. The other has documented resource conditions at park headwater streams and springs to help us analyze the park's water quality monitoring program.

We will continue to coordinate planning and development efforts with the Mid-Atlantic I&M Network.

## Budget Summary

FY10 Work Plan

Network: Shenandoah Prototype

### Category: 1\_Income

<b>Description</b>	<b>\$ Amount</b>	<b>\$\$ Source</b>	<b>Where \$ Went</b>	<b>Comments</b>
Air Resources Monitoring	\$40,000.00	Other Partners		Dominion Donors to Contractors
Air Resources Monitoring	\$125,000.00	Park or Regional \$\$		ARD to Contractors
Air Resources Monitoring	\$26,235.00	Park or Regional \$\$		ARD to SHEN AQ Tech
Air Resources Monitoring	\$36,923.00	Park or Regional \$\$		4846-1000-NZO
Chronic Wasting Disease (CWD)	\$500.00	Other Partners		Wildlife center sample testing (estimate)
Chronic Wasting Disease (CWD)	\$2,000.00	Park or Regional \$\$		Park CWD surveillance (4846-2000-NZC) (estimate)
Fire Effects Monitoring	\$54,000.00	Fire Program/FirePro		Fire Monitoring
Forest Health Monitoring	\$11,000.00	Other Partners		USFS FHM Funds (33% of total HWA allocation)
Forest Health Monitoring	\$8,000.00	Other Partners		USDA-FHP SOD monitoring
Forest Health Monitoring	\$1,900.00	Prototype \$\$ - Park Base		4846-2000-NZC SHEN EAB monitoring
Monitor Animals Special Concern	\$31,898.00	Prototype \$\$ - Park Base		4846-1000-NZC
Monitor Aquatic Biota	\$207,682.00	Prototype \$\$ - Park Base		4846-4000-NZI
Monitor Birds	\$12,400.00	Prototype \$\$ - Park Base		4846-5000-NZI
Monitor Exotic Animals	\$10,995.00	Prototype \$\$ - Park Base		4846-1000-NZA
Monitor Exotic Animals	\$7,000.00	Prototype \$\$ - Park Base		4846-4000-NZI (fish)
Monitor Exotic Plants	\$70,024.00	Prototype \$\$ - Park Base		4846-1000-NZP
Monitor Plants Special Concern	\$15,387.00	Prototype \$\$ - Park Base		4846-3000-NZC
Monitor Program Oversight	\$3,919.00	Prototype \$\$ - Park Base		4846-1000-NZI
Monitor T&E Animal Species	\$3,150.00	Prototype \$\$ - Park Base		4846-1000-NZE and Housing contribution
Monitor Vascular Plants	\$170,551.00	Prototype \$\$ - Park Base		4846-3000-NZI
Monitor Water Quality	\$52,500.00	Park or Regional \$\$		4846-1000-NZW - UVA SWAS
Monitoring Data Mgmt	\$85,995.00	Prototype \$\$ - Park Base		4846-2000-NZI
Shenandoah Salamander	\$20,000.00	USGS-BRD		USGS-NRPP
				USGS - Sevin
Springs and Headwater Streams	\$30,000.00	USGS-BRD		USGS NRPP - Craig Snyder
<b>Subtotal</b>	<b>\$1,027,059.00</b>			

## Category: 2\_Personnel

<b>Description</b>	<b>\$ Amount</b>	<b>\$\$ Source</b>	<b>Where \$ Went</b>	<b>Comments</b>
Air Resources Monitoring	\$26,235.00	Park or Regional \$\$	NPS	ARD to SHEN AQ Tech
Air Resources Monitoring	\$29,423.00	Park or Regional \$\$	NPS	AQ Tech
Chronic Wasting Disease (CWD)	\$2,000.00	Park or Regional \$\$	NPS	Park CWD surveillance personnel (estimate)
Fire Effects Monitoring	\$46,000.00	Fire Program/FirePro	NPS	
Forest Health Monitoring	\$18,300.00	Other Partners	NPS	Hemlock and SOD Detection Surveys
Forest Health Monitoring	\$1,900.00	Prototype \$\$ - Park Base	NPS	
Monitor Animals Special Concern	\$31,898.00	Prototype \$\$ - Park Base	NPS	Animals Special Concern (1000-NZC)
Monitor Aquatic Biota	\$171,182.00	Prototype \$\$ - Park Base	NPS	Wildlife/Fisheries (4000-NZI)
Monitor Birds	\$11,900.00	Prototype \$\$ - Park Base	NPS	Birds (5000-NZA)
Monitor Exotic Animals	\$7,000.00	Prototype \$\$ - Park Base	NPS	Exotic Animals (fish)
Monitor Exotic Animals	\$10,995.00	Prototype \$\$ - Park Base	NPS	Exotic Animals (1000-NZA)
Monitor Exotic Plants	\$68,824.00	Prototype \$\$ - Park Base	NPS	Exotic Plants (1000-NZP)
Monitor Plants Special Concern	\$14,987.00	Prototype \$\$ - Park Base	NPS	Plants Special Concern (3000-NZC)
Monitor T&E Animal Species	\$3,150.00	Prototype \$\$ - Park Base	NPS	T&E Animals (1000-NZE)
Monitor Vascular Plants	\$163,051.00	Prototype \$\$ - Park Base	NPS	Vascular Plants (3000-NZI)
Monitoring Data Mgmt	\$81,895.00	Prototype \$\$ - Park Base	NPS	Data Management (2000-NZI)
Shenandoah Salamander	\$15,000.00	USGS-BRD	USGS	Salaries: Sevin, Temps
Springs and Headwater Streams	\$20,000.00	USGS-BRD	USGS	Contributed Salaries
<b>Subtotal</b>	<b>\$723,740.00</b>			

## Category: 3\_Coop. Agreements

<b>Description</b>	<b>\$ Amount</b>	<b>\$\$ Source</b>	<b>Where \$ Went</b>	<b>Comments</b>
Monitor Aquatic Biota	\$25,000.00	Prototype \$\$ - Park Base	Univ_Non-CESU	Wildlife/Fisheries (4000-NZI) - Voshell
Monitor Water Quality	\$50,000.00	Park or Regional \$\$	Univ_Non-CESU	UVA SWAS
<b>Subtotal</b>	<b>\$75,000.00</b>			

## Category: 4\_Contracts

<b>Description</b>	<b>\$ Amount</b>	<b>\$\$ Source</b>	<b>Where \$ Went</b>	<b>Comments</b>
Air Resources Monitoring	\$40,000.00	Other Partners	Univ_Non-CESU	Dominion Donors to Contractors
Air Resources Monitoring	\$125,000.00	Park or Regional \$\$	NPS	ARD to Contractors
<b>Subtotal</b>	<b>\$165,000.00</b>			

### Category: 5\_Operations/Equipment

<b>Description</b>	<b>\$ Amount</b>	<b>\$\$ Source</b>	<b>Where \$ Went</b>	<b>Comments</b>
Air Resources Monitoring	\$1,000.00	Park or Regional \$\$	NPS	Supplies
Fire Effects Monitoring	\$2,000.00	Fire Program/FirePro	NPS	Supplies
Fire Effects Monitoring	\$3,000.00	Fire Program/FirePro	NPS	Misc. support
Monitor Aquatic Biota	\$2,500.00	Prototype \$\$ - Park Base	NPS	Wildlife/Fisheries - Supplies (4000-NZI)
Monitor Birds	\$500.00	Prototype \$\$ - Park Base	NPS	Birds - Supplies (5000-NZI)
Monitor Exotic Plants	\$1,200.00	Prototype \$\$ - Park Base	NPS	Exotic Plants - Supplies (1000-NZP)
Monitor Plants Special Concern	\$400.00	Prototype \$\$ - Park Base	NPS	Plants Special Concern - Supplies (3000-NZC)
Monitor Program Oversight	\$3,919.00	Prototype \$\$ - Park Base	NPS	
Monitor Vascular Plants	\$4,500.00	Prototype \$\$ - Park Base	NPS	Vascular Plants - Supplies (3000-NZI)
Monitor Water Quality	\$500.00	Park or Regional \$\$	NPS	Water Supplies
Monitoring Data Mgmt	\$2,100.00	Prototype \$\$ - Park Base	NPS	Data Management - Supplies (2000-NZI)
Monitoring Data Management				
Springs and Headwater Streams	\$9,000.00	USGS-BRD	Univ_Non-CESU	Invertebrate ID / processing
<b>Subtotal</b>	<b>\$30,619.00</b>			

### Category: 6\_Travel

<b>Description</b>	<b>\$ Amount</b>	<b>\$\$ Source</b>	<b>Where \$ Went</b>	<b>Comments</b>
Air Resources Monitoring	\$6,500.00	Park or Regional \$\$	NPS	
Fire Effects Monitoring	\$3,000.00	Fire Program/FirePro	NPS	Travel and Training
Monitor Aquatic Biota	\$9,000.00	Prototype \$\$ - Park Base	NPS	
Monitor Vascular Plants	\$3,000.00	Prototype \$\$ - Park Base	NPS	
Monitor Water Quality	\$2,000.00	Park or Regional \$\$	NPS	Travel
Monitoring Data Management	\$2,000.00	Prototype \$\$ - Park Base	NPS	Travel and Training
Shenandoah Salamander	\$1,000.00	USGS-BRD	USGS	
Springs and Headwater Streams	\$1,000.00	USGS-BRD	USGS	
<b>Subtotal</b>	<b>\$27,500.00</b>			

### Category: 7\_Other

<b>Description</b>	<b>\$ Amount</b>	<b>\$\$ Source</b>	<b>Where \$ Went</b>	<b>Comments</b>
Chronic Wasting Disease (CWD)	\$500.00	Other Partners	NPS	Wildlife center sample testing (estimate)
Forest Health Monitoring	\$700.00	Other Partners	Other non-Federal	EAB monitoring - Virginia Department of Agriculture and Consumer Services

Shenandoah Salamander		\$2,000.00	USGS-BRD	USGS	USGS PWRC Overhead
Shenandoah Salamander		\$2,000.00	USGS-BRD	USGS	Report preparation
	<b>Subtotal</b>	<b>\$5,200.00</b>			



## Budget Analysis

### Analysis of Expenses by Where \$ Went

<i>Funding Source</i>	<i>Total \$\$</i>	<i>NPS</i>	<i>USGS</i>	<i>Other Federal</i>	<i>Univ.-CESU</i>	<i>Univ_Non-CESU</i>	<i>Other non-Federal</i>
Fire Program/FirePro	\$54,000	\$54,000					
Other Partners	\$59,500	\$18,800				\$40,000	\$700
Park or Regional \$\$	\$242,658	\$192,658				\$50,000	
Prototype \$\$ - Park Base	\$620,901	\$595,901				\$25,000	
USGS-BRD	\$50,000		\$41,000			\$9,000	
<b>Totals</b>	<b>\$1,027,059</b>	<b>\$861,359</b>	<b>\$41,000</b>			<b>\$124,000</b>	<b>\$700</b>

### Analysis of Expenses by Category

<i>Funding Source</i>	<i>Total \$\$</i>	<i>Personnel:</i>	<i>Coop Agree.</i>	<i>Contracts</i>	<i>Operations/Equip.</i>	<i>Travel</i>	<i>Other</i>
Fire Program/FirePro	\$54,000	\$46,000			\$5,000	\$3,000	
Other Partners	\$59,500	\$18,300		\$40,000			\$1,200
Park or Regional \$\$	\$242,658	\$57,658	\$50,000	\$125,000	\$1,500	\$8,500	
Prototype \$\$ - Park Base	\$620,901	\$566,782	\$25,000		\$15,119	\$14,000	
USGS-BRD	\$50,000	\$35,000			\$9,000	\$2,000	\$4,000
<b>Totals</b>	<b>\$1,027,059</b>	<b>\$723,740</b>	<b>\$75,000</b>	<b>\$165,000</b>	<b>\$30,619</b>	<b>\$27,500</b>	<b>\$5,200</b>

### Expense Totals By Category

<i>Category</i>	<i>SubTotal</i>	<i>Percent</i>
2_Personnel	\$723,740	70.47%
3_Coop. Agreements	\$75,000	7.30%
4_Contracts	\$165,000	16.07%
5_Operations/Equipmen	\$30,619	2.98%
6_Travel	\$27,500	2.68%
7_Other	\$5,200	0.51%
	<b>\$1,027,059</b>	