

Vegetation Inventory and Monitoring Workshop for Shenandoah National Park:

Setting objectives and priorities

Summary Report of Workshop Outcomes

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of the program can be periodically measured and modified if necessary. Without clarifying objectives *a priori*, apply inefficient and incorrect data collection methods (Gibbs, 1998). Finally, selecting specific and appropriate objectives will reduce the cost and increase the effectiveness of the LTEMs program.

plants within SHEN and monitoring and limiting the extent of invasion and status of

Table 1. Participants at Vegetation Monitoring Workshop, Shenandoah National Park, Luray, Virginia, March 21, 2000. (continued)

Name	Area/Title	Affiliation	Email	Phone
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exotic plants, animals, and diseases. Furthermore, maintaining forest health involves limiting other anthropogenic effects to the forest such as visitor trampling, air pollution, and overabundant numbers of white-tailed deer.

3. Inventory and monitoring of special and unique ecosystems and species located within the park.

This includes determining what unique ecosystems, communities, and species are present at SHEN and inventorying and monitoring changes in their status.

To further focus management and sampling objectives in each of these three areas, workshop participants were asked to specify the trend or change of forest characteristics in some measured variable that must be detectable, identify high priority sites for conservation at SHEN (e.g., unique or rare ecosystems), and identify forest health issues of importance at SHEN.

- . Woody vegetation composition (species richness of all woody plants)

- . Woody vegetation structure

Dbh, basal area, and height (m) of all dominant and co-dominant overstory trees

Dbh on all woody plants greater than 0.5 m in height

- . Crown health

*Secondary data:*

- . Presence/absence and number of stems and/or percent coverage of non-woody exotic plants

- . Species richness of non-woody native plants

- . Age of overstory trees

2. Site (physical variables):

- . Soil type, soil moisture, soil pH, soil nutrients, etc.

- . Aspect

- . Elevation

- . Topography

3. Broad-scale mapping of landform and forest cover types within the park.

- . Map the park into areas that are characterized by specific landform types (in addition to the forest cover type maps currently used at SHEN). Landform involves classifying park into areas based upon the elevation, aspect, and slope of the land.

- . Stratify site based on landform categories. Landform categories will not change as rapidly over time and can be correlated with vegetation changes.

recruitment. The amount of regeneration is based on the number of stems per acre and how the density of different species of dominant and codominant trees change over time within a forest cover type. Variation in the number of stems per acre is usually high and dependent on stand dynamics. In addition, when focusing on a particular species within a cover type, the investigator must keep in mind that the density of one species is not independent of the density of another.

Management Objective: We want to be able to detect a 50% change in the density of any one species of tree (dominant or codominant) within any one forest cover type at SHEN over a five year period.

Sampling Objective: We want to be 90% sure of detecting a 50% change in the density of any one species of tree (dominant or codominant) within any one forest cover type at SHEN over a five year period and are willing to accept a two in 10 chance that a change took place when it really did not.

Management and Sampling Objective 3: These objectives relate to the accuracy with which we would like the mapping of forest cover types to represent the actual spatial coverage of a forest cover type at SHEN.

Management Objective: We want the forest cover type maps of SHEN to accurately reflect the true forest coverage at the time the aerial photographs were taken.

## Inventory and Monitoring Area of Interest 2:

### Forest Health

Participants in this group (for affiliation and contact information, see table 1): James Akerson, Bill Burkman, Duane Diefenbach, John Karish.

This group identified the following threats as potential items to inventory and monitor to assess forest health. Specific data to be collected are listed under each threat.

#### 1. Air pollution

##### a. Ozone

Number of sensitive species present or absent

Number of leaves affected by ozone injury

Severity of damage on affected leaves

Focus monitoring on species that are easy to detect injury from ozone (e.g., low growing)

##### b. Sulfur/nitrogen pollution

Species composition of lichen communities

Number of sensitive lichen species present or absent

Bioanalysis of collected lichen specimens

After much discussion, the entire group of participants recommended that direct measures of air quality are better indicators of the threat of air pollution to forest health than indirect measures of plant or lichen health.

## Management and Sampling Objectives for Forest Health

This group identified one management and sampling objective that could be used to assess forest health at SHEN.

Management and Sampling Objective 1: These objectives relate to the control of exotics at SHEN. Resource managers are particularly interested if they are successful in reducing the acreage of particular species of exotic plants at SHEN or in particular treated areas at SHEN over a set time period.

Management Objective: We want to see a 20% decrease in the acreage of a specific exotic plant species (e.g., Ailanthus) parkwide over a five year period.

Sampling Objective: We want to be 80% sure of detecting a 20% change in the coverage of a particular exotic species parkwide over a five year period and we are willing to accept a two in 10 chance that we will say a change took place when it really did not.

rare communities and species. Forty unique, rare communities already have been identified at SHEN. This group recommended ranking these 40 communities from highest to lowest management priority. The number of park occurrences for global and state rare plant species should be documented, threats to these species should be identified, and the size of the population for each species should be determined.

#### Management and Sampling Objectives for Special and Unique Ecosystems and Species

This group developed a table that outlines the management and sampling objectives for selected rare communities or species (Table 2).

Table 2. Unique community or species, threat or issue related to the community or species, management objectives, appropriate management activities, and sampling objective.

(continued)

Community or Species	Threats/Issue	Management Objective	Management Action	Sampling Objective
Mafic Fens at Big Meadows	<p>8 species of concern are found in this community type.</p> <p>Fire suppression and over abundance of deer threaten community.</p>	<p>Reduce shrub cover 40% in 5 years from a 2000 baseline and maintain that level at <math>\pm</math> 20%.</p> <p>Increase cover of <i>Carex buxbaunii</i> by 10% in 5 years from a 2000 baseline and maintain that level at <math>\pm</math> 20%.</p>	Controlled burning Exclude deer with exclosures	<p>We want to be 95% sure of detecting a 40% reduction in shrub coverage at Big Meadow from 2000-2005 and are willing to accept a 1.5 in 10 chance that we will say a change took place when it really did not.</p> <p>We want to be able to be 95% sure of detecting a 10% increase in <i>Carex buxbaunii</i> at Big Meadows from 2000 until 2005 and are willing to accept a 1.5 chance in 10 that we will say a change took place when it really did not.</p>

## Conclusions

Each of the three working groups developed at least one specific management and sampling objective for the vegetation LTEMs program at SHEN. These specific objectives now can be linked to sound sampling methodology and appropriate statistical analyses. In addition, current data collection techniques can be evaluated and modified, if necessary, so that if the specific objectives can be realized.