Introducing a Natural Resource Condition Assessment of the Appalachian National Scenic Trail

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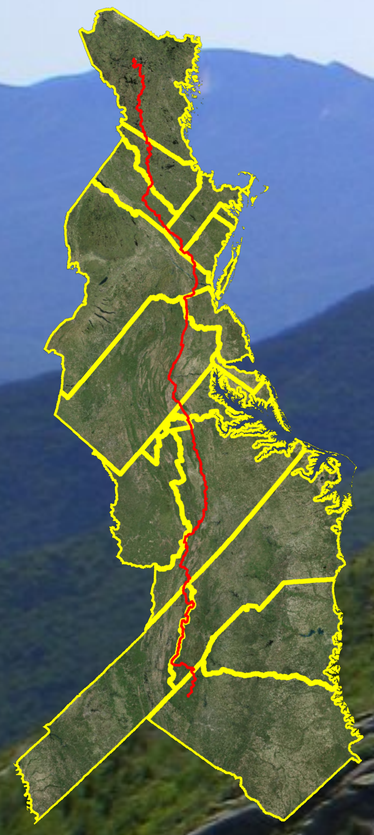
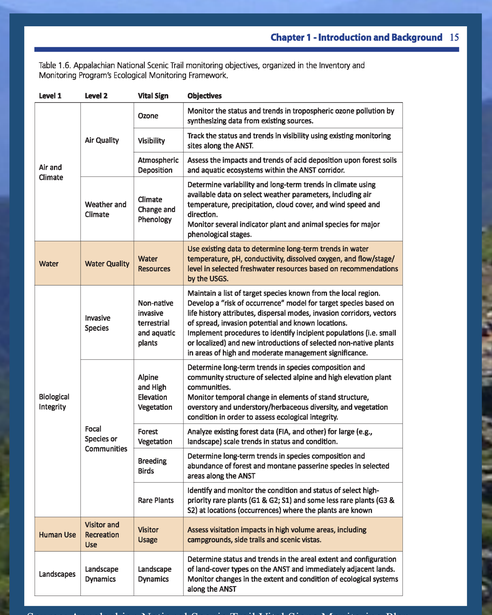
The Appalachian National Scenic Trail

The Appalachian National Scenic Trail (APPA) is approximately 2,200 miles long stretching from Maine to Georgia. The APPA was one of the first two federally recognized National Scenic Trails (NST), acquiring that designation with the promulgation of the National Trails System Act of 1968. The trail passes through numerous different landscapes, ecosystems, and properties. The purpose of the NST designation is to "promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation."





Chapter 1 - Introduction and Background 15

Table 1.6. Appalachian National Scenic Trail monitoring objectives, organized in the Inventory and Monitoring Program's Ecological Monitoring Framework.

Level 1	Level 2	Vital Sign	Objectives
Air and Climate	Air Quality	Ozone	Monitor the status and trends in tropospheric ozone pollution by synthesizing data from existing sources.
		Visibility	Track the status and trends in visibility using existing monitoring sites along the ANST.
		Atmospheric Deposition	Assess the impacts and trends of acid deposition upon forest soils and aquatic ecosystems within the ANST corridor.
	Weather and Climate	Climate Change and Phenology	Determine variability and long-term trends in climate using available data on select weather parameters, including air temperature, precipitation, cloud cover, and wind speed and direction. Monitor several indicator plant and animal species for major phenological stages.
Water	Water Quality	Water Resources	Use existing data to determine long-term trends in water temperature, pH, conductivity, dissolved oxygen, and flow/stage/level in selected freshwater resources based on recommendations by the USGS.
Biological Integrity	Invasive Species	Non-native invasive terrestrial and aquatic plants	Maintain a list of target species known from the local region. Develop a "risk of occurrence" model for target species based on life history attributes, dispersal modes, invasion corridors, vectors of spread, invasion potential and known locations. Implement procedures to identify incipient populations (i.e. small or localized) and new introductions of selected non-native plants in areas of high and moderate management significance.
	Focal Species or Communities	Alpine and High Elevation Vegetation	Determine long-term trends in species composition and community structure of selected alpine and high elevation plant communities. Monitor temporal change in elements of stand structure, overstory and understory/herbaceous diversity, and vegetation condition in order to assess ecological integrity.
		Forest Vegetation	Analyze existing forest data (FIA, and other) for large (e.g., landscape) scale trends in status and condition.
		Breeding Birds	Determine long-term trends in species composition and abundance of forest and montane passerine species in selected areas along the ANST
		Rare Plants	Identify and monitor the condition and status of select high-priority rare plants (G1 & G2; S1) and some less rare plants (G3 & S2) at locations (occurrences) where the plants are known
Human Use	Visitor and Recreation Use	Visitor Usage	Assess visitation impacts in high volume areas, including campgrounds, side trails and scenic vistas.
Landscapes	Landscape Dynamics	Landscape Dynamics	Determine status and trends in the areal extent and configuration of land-cover types on the ANST and immediately adjacent lands. Monitor changes in the extent and condition of ecological systems along the ANST

Source: Appalachian National Scenic Trail Vital Signs Monitoring Plan, National Park Service

Natural Resource Condition Assessment

A National Scenic Trail (NST) requires management and monitoring to fulfill its purpose laid out by the National Park Service (NPS) and the NST Act of 1968. The NPS monitors the "vital signs", or natural resources, of their park sites to gauge overall park health. This is achieved through Natural Resource Condition Assessments (NRCA). More than 140 parks have NRCAs. The Center for Land Use and Sustainability is working with the NPS and partners to create an NRCA for the APPA.

Vital Signs and Scale

Only several of the nineteen vital signs will be ranked in the core analysis. These core resources best represent the trail's health. The others will be included as contextual resources. Contextual resources are cross-cutting and affect the core resources, but cannot be managed at the scale of the park unit or lack sufficient data to include in the core analysis.

The scale of the analysis will vary for each core resource. Some, like rare, threatened and endangered species will benefit from small scale analysis. Factors like forest health will benefit from larger scales like states or ecoregions. NPS sites along the trail or that are corridor shaped (like APPA) will be used for insight into assessment metrics and scale.

CHAPTER 2 (CONTEXTUAL RESOURCES)	*CHAPTER 4 (CORE RESOURCES)*
NIGHT SKIES / SOUNDSCAPES	LISTED & PRIORITY SPECIES
CLIMATE	BIRDS
PHENOLOGY	FOREST HEALTH
INVASIVE SPECIES	LAND USE / FRAGMENTATION
GEOLOGY	

Analysis

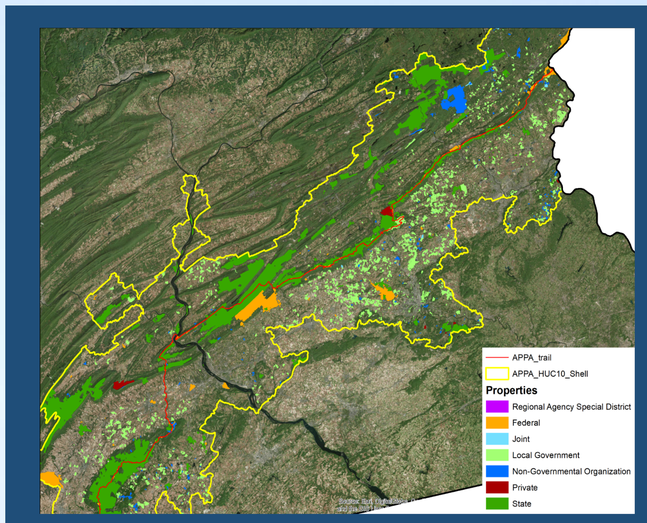
Vital sign assessment is broken down into current conditions, expected trends, and confidence. Confidence refers to the available data and its quality. The NRCA provides an analysis of these factors for each vital sign. The overall condition of each vital sign is summarized at the end of each section.

Status	Trend	Confidence
Significant concern	Condition is improving	High
Moderate concern	Condition is unchanging	Medium
Good condition	Condition is deteriorating	Low

For example, in the Wet Meadows and Fens summary to the right, the first three symbols show the following conditions:

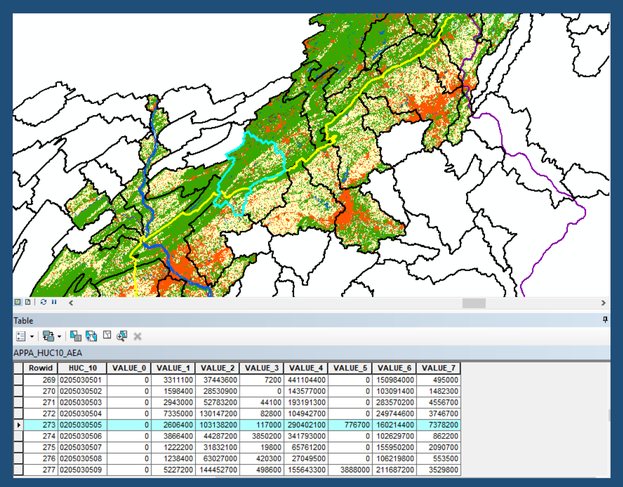
- Total wetland area is in good condition, with a high degree of confidence in this assessment.
- Non-native plants are causing moderate concern, though confidence is low for this assessment.
- Restoring wetlands altered by human actions is a significant concern, but the condition is improving.

Source: Great Smokey Mountains National Park NRCA, National Park Service



Above: The different property types that are present along the Appalachian Trail corridor. The numerous property types provides a unique challenge when constructing this NRCA.

Below: National Land Cover Data for 2001 isolated for the Appalachian Trail corridor. An analysis of land use on the scale of the HUC 10 units that comprise the trail corridor. Analysis of the NLCD for 2006 and 2011 has been done so that changes can be compared over time on a HUC 10 scale.



Table

APPA_HUC10_AEA

Rowid	HUC_10	VALUE_0	VALUE_1	VALUE_2	VALUE_3	VALUE_4	VALUE_5	VALUE_6	VALUE_7
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270	0205030502	0	1598400	28530900	0	143577000	0	103091400	1482300
271	0205030503	0	2943000	52783200	44100	193191300	0	283570200	4556700
272	0205030504	0	7335000	130147200	82800	104942700	0	249744600	3746700
273	0205030505	0	2666400	103138200	117000	290402100	776700	160214400	7378200
274	0205030506	0	3866400	44287200	3850200	341793000	0	102629700	862200
275	0205030507	0	1222200	31832100	19800	65761200	0	155950200	2090700
276	0205030508	0	1238400	63027000	420300	27049500	0	106219800	553500
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Goal

The purpose of this report is to state the vital signs' current conditions, their projected trends, the confidence/quantity of the supporting data, and to provide recommendations on how to proceed with managing the resource.

This report will be what managers of the APPA consult when creating new management plans or altering existing ones.

The deliverables for this project include the NRCA report itself, geodatabases containing any relevant GIS data, tables, and maps, and an ESRI story map.

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APPALACHIAN TRAIL CONSERVANCY