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Say Cheese! Candid Cameras Reveal the A.T.'s Importance to Wildlife

The A.T. Corridor Provides a Sanctuary for Hikers and Wildlife Alike.

The Appalachian National Scenic Trail (A.T.) is enjoyed by millions of hikers every year, but people are not the only animals that utilize this wilderness footpath. Many critters rely on the protected, albeit quite narrow in some places, forested land around the trail. Though the A.T. corridor itself is mostly forested and the upland Appalachian oak forest has experienced significant expansion in the past 100 years, at lower elevations it is surrounded by a patchwork of agricultural, residential, and industrial land where there has been significant habitat loss. Fragmentation and habitat loss can cause a variety of ecological impacts that trigger various responses in different mammal species. Many large mammals have experienced dramatic range contractions, while others have expanded following natural reforestation. Recent studies have shown that mammalian carnivore species presence and abundance are best predicted by forest fragment size and isolation. Although fragmentation is frequently detrimental to large carnivore populations, ungulates (hoofed animals - like white-tailed deer) and some medium-sized predators (raccoons, skunks, foxes, etc.) thrive on the “edge habitat” created by fragmentation.

People Power & Hi-tech Tools

Large-scale studies can often be limited by monetary restrictions and a lack of appropriate personnel, but these limitations can sometimes be overcome by using new cost-effective, non-invasive techniques and by utilizing reliable volunteers. This is just what William McShea of the Smithsonian Conservation Biology Institute (in collaboration with the University of Colorado and volunteers

Motion sensitive cameras similar to this one were used to log over 18,000 days of image capture along more than 600 miles of the Appalachian Trail.



Study results suggested that bobcats are a species that prefer more heavily forested and relatively undisturbed habitat areas. Smithsonian Conservation Biology Institute photo.

from Appalachian Trail clubs) did by pairing together automatic trail cameras and the dense human population near the A.T. corridor and utilizing them as “citizen scientists”. McShea realized that so-called “camera traps” monitored by dozens of volunteers could provide greater amounts of objective data and cover a larger survey area than could any one team of scientists. Also, being able to draw from the large group of 2 to 4 million people who use the A.T. every year helped to make the forests of the Appalachian Mountains in the Eastern United States an ideal testing ground for these new techniques.

Large-scale studies looking at eastern mammal communities are rare, but are important in understanding the ecology of the region and the interplay between mammals with large home ranges and human development. Although secondary forests have reclaimed parts of the Appalachian region, many of these forests have been fragmented by roads and development. Being able to model this fragmentation and its effects on mammal distributions is a critical need for federal and state agencies. Developing a predictive GIS model that effectively incorporates human impacts in its designation of suitable habitat could be an effective tool for wildlife managers. This study also contributes to the knowledge of remote camera technology and its effectiveness in conducting



accurate wildlife surveys. Camera-traps are an attractive research option because they can provide information on otherwise elusive and data-deficient species.

Volunteers..., Cameras..., Action!

Between 2007 and 2009, from May through November (when animals are most active), cameras were placed at 447 sites along 636 miles of trail that traversed from southern Pennsylvania to Tennessee. Using the A.T. as a kind-of “mega-transect”, the three-year study looked at how forest cover, hunting, trail use and the presence of roads affected eight mammal species (white-tailed deer, raccoons, American black bears, Virginia opossum, coyotes, bobcats and red and gray foxes). The sites were surveyed by 50 volunteers recruited from hiking and nature clubs, and over 18,800 “camera days” were racked up during the study. The citizen scientist volunteers handled camera placement and maintenance, file management, and recorded their own data that was then entered into a National Park Service website where pictures could also be uploaded. Hundreds of the photographs they collected can be viewed on the Smithsonian’s *SI Wild* website, see the link on the right).

A Picture Speaks a Thousand Words. The Results:

Overall, 19 medium and large mammal species were detected and identified, along with five small mammal species. The study revealed the importance of available forest to six of the eight target species (opossums and coyotes were the two outliers). Hunting on adjoining lands was the second strongest predictor of occupancy for three mammal species, negatively influencing black bears and bobcats, while positively influencing raccoons. Study results also indicated an avoidance of high trail use areas by bears and a natural inclination towards high use areas by red fox. Roads had the lowest predictive power on species occupancy within the corridor and were only significant for deer. The occupancy models stress the importance of compounding direct and indirect anthropogenic (human) influences operating at the regional level. Study organizers feel that protecting current forest habitat and encouraging continued reforestation and land acquisition would be extremely beneficial to a number of mammal species. For certain target species, hunting should be monitored closely and regulations should be adaptable in areas where occupancy might otherwise be low due to the effects of recreation and/or roads. Scientists and managers should consider these human impacts and their potential combined influence on wildlife persistence when assessing optimal habitat or considering management actions.

More Information

Northeast Temperate Network

<http://science.nature.nps.gov/im/units/netn/>

Scientific article published in PLOS One:

Anthropogenic Influences on Macro-Level Mammal Occupancy in the Appalachian Trail Corridor
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0042574>

To see more camera trap photos:

The Smithsonian’s *SI Wild* website

<http://siwild.si.edu/index.cfm?region=at08>

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Eastern coyotes were one of the few species that seemed to be unaffected by the nearby availability of forested habitat according to the study. Smithsonian Conservation Biology Institute photo.



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