Executive Summary

The Southern Blue Ridge (SBR) ecoregion is a nationally recognized biodiversity hotspot that contains 9.4 million acres of forested landscape stretching across five states (Georgia, North Carolina, South Carolina, Tennessee, and Virginia). This landscape is well known for its intact temperate forest stratified across a large elevation and climate gradient which produces unique and diverse landforms, plant communities, as well as bedrock geologies. These variations in SBR support the highest salamander diversity worldwide, high densities of forest breeding birds, 400 rare plant species, and 120 endemic terrestrial communities (Anderson et al. 2013, Hunter et al. 1999). The urgency to understand where and how to best protect this vital region has increased with the encroachment of human development, climate change, and disturbances (natural and human) that are occurring throughout this valuable landscape.

Recently, SBR priority conservation areas were identified by The Nature Conservancy through an analysis of matrix forests which identified 83 large blocks that are relatively unfragmented forest (Anderson et al. 2013). In this analysis a matrix forest was defined as a large area (greater than or equal to 15,000 acres) of heterogeneous, relatively undeveloped forested areas (i.e. areas containing at least 80% deciduous forest, evergreen forest, or forest scrub). These forests are considered to be large enough to be resistant to the effects of catastrophic events (i.e. hurricanes, tornadoes, ice storms) and resilient enough to return to a positive state of ecological productivity and species composition following disturbances (Anderson and Bernstein 2003). The boundary of each block was delineated by any major fragmenting feature (interstates, railroads, large lakes, etc.). These blocks were then prioritized across the SBR to identify which matrix forest blocks best represented a range of ecological land units (ELU). These ELUs contain combinations of elevation, bedrock geology, and land forms that make them each unique, however some matrix forests are more similar to some than to others. These characteristics create a wide range of environmental conditions often correlated with high biodiversity. Thus through conservation of a wide array of large forest blocks, a wide range of biodiversity will be supported, and it will maintain or improve ecosystem function as changes within the environment occur, including climate disruption.

While these matrix forest blocks are relatively undeveloped, they do contain elements of multiple-use landscapes. The concern with multiple-use landscapes in these areas is that these blocks could contain minor fragmenting features or be managed in such a way that might not support biodiversity (i.e. extraction). These minor fragmenting features are defined as features such as minor roads (county, Forest Service, logging etc.), motorized recreation trails or other landscape features that could impede movement of organisms across the matrix block or downsize habitat. To meet the habitat needs of SBR organisms it is necessary to identify and evaluate unfragmented core forests that will reside within priority matrix forests to be managed for biodiversity.

The goal of this report is to build upon previous analysis of SBR matrix forest blocks using aerial photography and geospatial analysis to identify **core forests** within each of these blocks. A **core forest** is defined as a heterogeneous landscape with minimal (i.e. hiking trails) or no fragmenting features that contain at least 5,000 acre **interior forest** surrounded by a 100m buffer. The **buffer** is a part of the core forest which surrounds and protects the 5,000 acre (or larger) interior forest from any multiple-use disturbances (such as off road vehicle trails) that may take place in the matrix forest block. Core forests are a key component in the long-term SBR conservation strategy as they “provide the opportunity for

relatively natural processes to occur or be mimicked through management, resulting in a healthy range of structural and compositional forest attributes" (Anderson et al. 2013).[1]

The accompanying report summarizes the **five step delineation of core forests** involving:

1. Identify minor (or multiple use) fragmenting features in forest matrix blocks.
2. Delineate core forests that do not contain minor fragmenting features.
3. Document current land owner and management of core forests.
4. Calculate and evaluate core forests based on density of minimally fragmenting features, shape index values, and biodiversity potential.
5. Use aerial photographs to review core forests identified by GIS software to look for any mistakes made in land cover classification.

This study identified 200 potential core forests within the SBR intended to be used by TNC and its partners to further refine the ecoregion's conservation strategies. It is estimated that these 200 core forests account for 2,875,373 acres of land. More specifically 57% of the total land within matrix forest blocks was identified as core forest. Additionally, all but five of the 83 matrix forest blocks contained at least one core forest. These promising results are meant to guide TNC and its partners in conserving a diverse forest network for long-term biodiversity protection through informing land acquisition, forest management, and monitoring. More specifically, within the SBR, Nantahala and Pisgah National Forests are currently undergoing Land & Resource Management Plan revision which could incorporate protection of significant core forests in the new plan. The identification of a forest matrix network with embedded core forests is a key component in long term preservation of ecosystem processes within Nantahala and Pisgah National Forests and throughout the SBR (Anderson 2008).

[1] It is important to note at this stage, all sites identified in this report as a core forest are considered potential sites which should be further evaluated with input from local experts.