# Methods

This survey was conducted in the Center for Tropical Forest Science-Forest Global Earth Observatory’s (CTFS-ForestGEO) dynamic forest plot. The plot, itself, is located at the Smithsonian Conservation Biology Institute in Front Royal, Virginia, USA. SCBI is 3.1 miles (5 kilometers) from the Shenandoah National Park and roughly 80 miles (~130 kilometers) from the Smithsonian National Zoological Park.

The research was conducted by a team of interns under the labs of William McShea, Ph.D and Kristina Anderson-Teixeira, Ph.D. On average, 3.3 people/day participated in the census with 3.7 field days/week. A single person logged an average of 29 hours/week, resulting in 97 hours/week being done. Roughly 3,200 total amount of work hours - including data collection, review, entry, and analysis - was completed.

The survey team utilized methods set by the Center for Tropical Forest Science - Forest Global Earth Observatory, also known as CTFS-ForestGEO (Condit 1998 and Gonzalez-Akre et al. 2016). Measurements of old, new multi-, and new plant stems are either measured or recruited at greater than or equal to 1 cm DBH (Bourg et al. 2013). “Old stems” are considered to be stems that existed in the previous census. These measurements also include old multistemed species. “New multi stems” are new stems that have grown on the same woody species as the old stem. Once their information is recorded, each stem is given a different colored wire/combination of colored wires to signify which stem it is. “New plant stems” are the new growth of species that have not been tagged in the plot yet. “Tagging” is when a woody species is marked with a specific identification number. These numbers are compiled within a spread sheet and logged into the global CTFS database.

With the recruitment of new growth comes the acknowledgement of stem death. According to Gonzalez-Akre et al. 2016, dead stems are considered to be dead due to the following criteria: (1) stems that are broken below DBH; (2) loosened or detached bark; (3) lack of development in regards to flower or leaf buds and; (4) signs of pests or pathogens such as fungus and insects.

Ramage et al. 2017: - 4 hectares of the plot is fenced in to keep out \*Odocoileus virginianus (white-tailed deer) - area will further be refered to as the deer exclosure