1.       **Vegetation Community Dynamics on Round Bald**

2.      **Description of Research**

Round bald is an upper montane treeless meadow and the first bald along Carver’s Gap on Roan Mountain of the Roan Mountain Massif. True balds only occur in the Blue Ridge Physiographic region above 1,400 meters in elevation, while apparent can balds occur on rock outcrops above 1,200 meters in elevation. The bald itself is an open meadow below the climatic timber line – meaning, it should be populated with trees, but it has an open canopy. Such areas are called balds and can be divided into two categories: grass bald and heath bald. The former, a grass bald, is dominated by grasses and sedge species, while the latter is dominated by woody vegetation such as *Rubus* and *Vaccinium* species. In the 1920s when the United Stated Forest Service acquired some of the bald lands, management and activity ceased and nature started to transform Round bald from a grass bald to a heath bald. Shrub succession began in the 1930s, and became a management concern in the 1950s, then in the 1980s a survey of the balds of Carver’s Gap was conducted. In 2020 a repeat survey was conducted by Stokes and Horton following the 30-year mowing management protocol. In 2022 a low-intensity fire broke out on the bald and burned almost 10 hectares. Prescribed fire is speculated to be a managing tool of balds along with mowing and grazing, but data suggest that post-burn vegetation community is not indicative of characteristic grass bald vegetation. Furthermore, prescribed fire is hard to control at such high elevations, soil moisture levels, and understudied effects on rare and endemic floral species.

To examine the effects of the fire on the seed bank, seed bank samples were collected in July 2022 and January 2023. At those times, approximately 200 grams of soil was obtained from the top 5 cm of soil at six random sites in 2022 in one of four treatments; over 50% Rubus/burned, over 50% Rubus/unburned, under 25% Rubus/burned, under 25% Rubus/unburned. The first - over 50% Rubus/burned - describes plots with greater than 50% cover of blackberry and burned from the February 2020 fire, followed by greater than 50% blackberry and unburned, less than 25% blackberry and burned, lastly, less than 25% blackberry and unburned. Two measurements of the seed bank were collected in July of 2022 and January of 2023. In July 2022, I took 24 samples of the seed bank following the February 2022 ground fire that occurred on Round Bald. In January 2023, the second soil seed bank sample was collected at three spots, on three separate sites, along all four transects, in both burned and unburned areas of Round Bald. A total of 72 seed bank samples were collected and set in the fridge until March 2023.

3.       **Intended Goal/Outcome**

The objectives of this study are;

1. Quantify vegetation composition and the soil seed bank over the first and second growing seasons following the low intensity ground fire on Round Bald, and

2. Propose methods to improve management for conservation of these rare ecosystem subtypes.

The general question is, how has the low-intensity ground fire affected vegetation dynamics and are there management practices that could be gleaned from this disturbance? I expect that there is little to no decrease in the cover of *Rubus* spp., likely there will be a slight increase in blackberry cover following slight scarification from the February 2022 ground fire.

4.       **Work Plan**

Initial vegetation surveys following Stokes and Horton were conducted in the summer of 2022. In early summer of 2023, a second survey following the February 2022 fire will be conducted. In the Summer of 2022, a one-by-one meter quadrat divided into 100 equal squares was used to quantify vegetation composition to 100%. Each square was visually assigned a vegetation genus (i.e. Rubus, Grass, Sedge, etc.) and annotated as being in the February fire borders or unburned. A total of 97 plots were measured in the summer of 2022.

5.       **Timeline**

March – continue seed bank sample from summer of 2022. Begin second seed bank germination trial

May/June – Repeat vegetation composition surveys following protocol from 2020 and 2022

July – analyze data and develop thesis

6.       **Location of Research**

Round bald is in the Roan Mountain Massif of the Unaka Mountain range of the Southern Appalachian Mountains, between Carver’s gap and Engine gap. The Appalachian Trail (AT) bisects the study site into North of the trail and South of the trail. The site itself is spread across Pisgah National Forest in North Carolina and Cherokee National Forest in Tennessee, at approximately 36° 06’N and 82° 60’W.

7.       **Faculty Research Advisor/Mentor’s Role** (Explain your plan to work with and communicate with your advisor/mentor and the role that your advisor/mentor and the role that your advisor/mentor will play in the project.)

Professors Collins, Hyman, and Jonathan Horton of University of North Carolina Asheville, all act as my advisors through the thesis drafting process. They have been tremendously helpful in guiding me through and their help is much obliged.