

**Proposer or designated leader of a student group****Name:** Jessica Hong**Academic classification:** Senior**Department:** School of Forestry and Conservation**Graduation Date:** Summer 2017**UF e-mail address:** jessica.hong@ufl.edu**Postal address:** 1505 Fort Clarke Blvd APT 9302, Gainesville, FL 32606**Phone number(s):** (941)720-0850**Experience or training related to proposed project:** Jessica has taken soil cores in a soils lab and has recently conducted germination experiments for an environmental horticultural research internship.**Sponsor (must be a UF faculty member)****Name:** Dr. Héctor Pérez**Department:** Environmental Horticulture**UF e-mail address:** heperez@ufl.edu**Campus-mail address:** P.O. Box 110675**Phone number(s):** 352-273-4503**Title of project:** Soil Seed Bank Composition in NATL: A Preliminary Study

**Project summary-** A preliminary study examining soil seed bank composition within old field successional stages and an upland pine ecosystem managed with prescribed fire, herbicide or mechanical methods will be conducted. Seedlings emerging after exposure to simulated seasonal or constant temperatures will be identified. We expect to deliver: 1) a baseline description of soil seed bank composition; 2) species comparison across management methods; and 3) visual aids for identification of emergent seedlings. This information can inform future management decisions and lays the ground work for more comprehensive seed bank ecology studies within NATL.

**Starting date-** January 9<sup>th</sup>, 2017**Completion date-** May 1<sup>st</sup>, 2017**Description of project:**

Soil seed bank research can provide information regarding likely species composition following a disturbance, predict seed bank impact on the restoration of target plant communities, and offer insight towards local weed population dynamics (Adams & Steigerwalt, 2008). The objectives of this study are 1) to determine baseline soil seed bank composition in the different successional stages of the Old Field plots and 2) compare species composition between different management methods in the Upland Pine ecosystem. The Natural Area Teaching Lab has five Old Field plots that are tilled in 1, 10, and 40 year intervals. Examining the soil seed bank will reinforce the concept of vegetative successional stages by comparing species composition in each plot. In the Upland Pine ecosystem, three management methods to maintain the understory are being conducted: herbicide treatment, prescribed burn, and bush-hog. Comparing species composition between these management methods can lead to insight on which method produces the most desirable outcome (e.g. preventing invasive species, wiregrass recruitment, etc.).

A stratified random sampling method will be conducted with a 100 m baseline and the distance of each point along the transect line will be determined randomly by a random number generator. At each point, an initial vegetation survey with a 1m x 1m quadrat will be conducted. Five soil cores (8.9 x 5 cm) will be retrieved from each successional plot and Upland Pine management treatment. Soil cores will be bulked according to collection site. Trays containing a layer of vermiculite and potting soil will be overlaid with 0.5 to 1 cm of bulked soil samples. Soil samples will then undergo germination experiments using growth chambers and greenhouse screenings. Four chambers will be programmed to one of four simulated seasonal temperatures and soil within trays will be kept moist as needed. Four samples of bulked soil from each site will be randomly assigned to each temperature. Likewise, four samples of bulked soil from each site will be randomly placed on a greenhouse bench (ca. 25 °C). Trays will receive mist for 5 seconds every ten minutes. Mist will run from 8am until 5pm. Seedlings that emerge will be identified using the Guide to the Vascular Plants by Richard Wunderlin, Trees, Shrubs, and Woody Vines of Northern Florida and Adjacent Georgia and Alabama by Robert Godfrey and comparison to specimens within the UF Herbarium. Throughout the project, Jessica will periodically attend the NATL Operation Committee to update how the project is progressing. At the end of the project, a seedling photo library and a visual for overall species composition/distribution for each ecosystem will be provided.

A total of \$399 is requested for the project. Items included in the request are: nursery flats (\$120/case, 11"x22"x2.5") for greenhouse germination experiments; greenhouse fees (\$65/ 100 ft sq); potting soil (\$35/2 cu. ft bag) and vermiculite (\$25/4 cu. ft. bag) for germination experiments; plastic containers (\$22/case, 6"x4"x2") for growth chamber germination experiments; Keson Open Reel Fiberglass Tapes (\$62) for line transects, PVC pipes and PVC elbows (\$20) to construct PVC quadrat, and shipping charges (\$50).

References Cited:

Adams, C. R., & Steigerwalt, N. M. (2008). Methodology for wetland seedbank assays. *Environmental Horticulture Department, Florida Cooperative Extension Service, IFAS, University of Florida, Gainesville, FL. EDIS, ENH1090.*

Student \_\_\_\_\_ Date \_\_\_\_\_

Sponsor \_\_\_\_\_ Date \_\_\_\_\_

