

Saratoga Horticultural Research Endowment

Mid-Year Report

Project Title: Native Chaparral Ferns for California Landscapes

Principal Investigator: Peter Evans, Director of Horticulture, Rancho Santa Ana Botanic Garden

Co-Principal Investigator: Ashlee Armstrong, Grounds Manager, Rancho Santa Ana Botanic Garden

1. List accomplishments year-to-date versus proposal project plan and timeline:

Collection of ferns: Garden staff successfully collected 6 different species of chaparral ferns in the San Gabriel and San Bernardino Mountains: *Dryopteris arguta*, *Pellaea andromedifolia*, *Pellaea mucronata*, *Pentagramma triangularis*, *Myriopteris covillei*, and *Selaginella bigelovii* (fern ally). *Notholaena californica* was the only species listed on the proposal that was not collected due to insufficient population sizes. The collections were divided into over 20 plants of each species to over-summer in the nursery. The *P. andromedifolia*, *P. mucronata*, *P. triangularis*, and *S. bigelovii* performed very well in the nursery over the summer. The *Myriopteris covillei* and some of the *Dryopteris arguta* were collected rather late in the season, and may have been stressed at the time of collection. They were generally less vigorous in the nursery, and some were not well-rooted at the time of planting.

Horticulture Trials: Two locations in the Garden were chosen for the horticultural trials in October. Both locations have filtered light in the winter, and both will receive morning sun in the summer. The *Dryopteris arguta* and *Pentagramma triangularis* were found deep in the understories of larger chaparral shrubs on our collection trips, and so were planted in heavier shade, but still very close to the rest of the ferns in each location, maintaining the soil type. The first location is a very flat area with quickly draining sandy loam. The second location has a higher clay content, and is located on an east facing slope.

Ten individuals of each species were planted in each location, save for *Myriopteris covillei* – only 17 of those survived over the summer in the nursery - and 9 and 8 were planted at each location, respectively. The planting took place in early November, which was one month later than expected but weather conditions remained quite warm through October (in the 90's), and we chose to delay until the weather cooled slightly. The growth index of each plant has been recorded once per month. Photos of the ferns can be found below.

A brief survey, rating the characteristics of the ferns from 1 to 5 has been developed, and administered to staff and volunteers.

Communication: A website was created for the project, and will be updated more frequently now that the plants are in the ground. The website can be found at <https://www.rsabg.org/collections/chaparral-fern-project>. The project has been featured on the Garden's social media pages, generating several comments and "likes".

Signage was drafted in October for the two horticultural trial locations, but we have experienced delays with the manufacturer, and it is now expected to arrive by February 15.

2. Discuss any obstacles to your current or future progress and your steps to address these obstacles.

Propagation: Fern spores have been collected as they become available; thus far, we have collected spore from *D. arguta*, *P. triangularis*, *P. mucronata*, and *M. covillei*. There has been significant contamination in spores that have been sown thus far, however, additional sanitation protocols have been researched and will be implemented in the second half of the grant period. We have not been able to make as much progress on the propagation of the fern spores as hoped at this point, due to some time constraints of the propagation staff. Additional time will be allocated in the second half of the grant period.

The only other additional obstacle we have encountered is minor; the delay in signage for the horticultural trial areas. That has been addressed to the best of our ability and will be completed, without significant impact on the project's completion.

Photos of the ferns in the trial plots taken in January 2020:



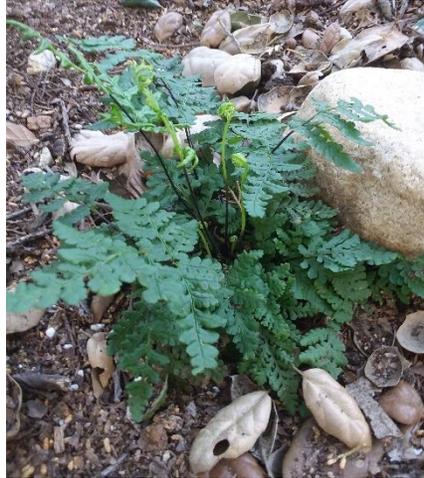
Dryopteris arguta



Pellaea andromedifolia



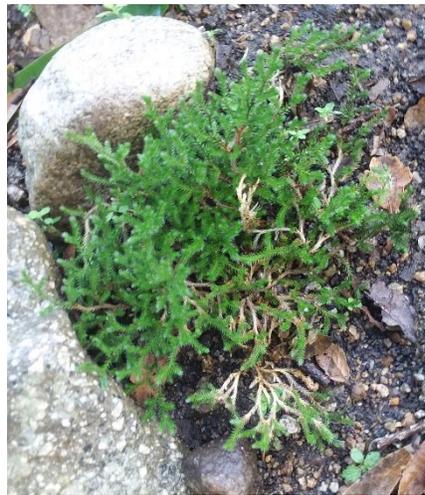
Pellaea mucronata



Pentagramma triangularis



Myriopteris covillei



Sellaginella bigelovii