

Introduction

Once abundant, all species of native Florida orchids are in serious decline across the state². Urban development and a long history of poaching have reduced populations to numbers where natural propagation is no longer possible.

This project focuses on introducing plant science to PreK-12th grade students in a novel and engaging format. Students participate in the program both inside and outside of the classroom, and follow the propagation process from seed to establishment.

The goals of the project are :

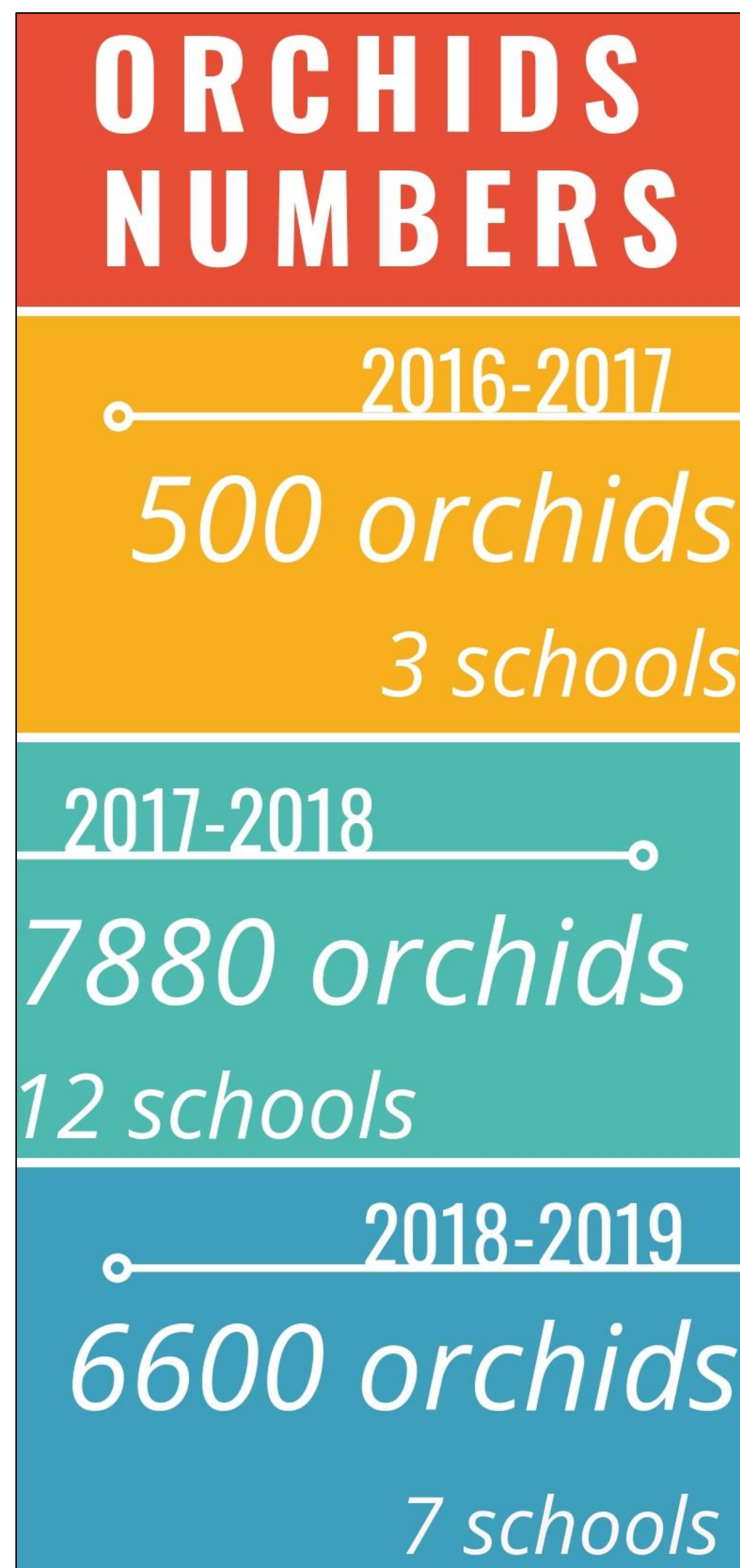
1. To **optimize** propagation techniques for native orchids
2. To **assess** restoration efforts for effectiveness
3. To **explore** the benefits of urban integration
4. To **teach** about the complexity and fragility of Florida's natural landscapes
5. To **inspire** a sense of stewardship over natural habitats among PreK-12th grade students



Recently deflasked orchids in a classroom.



Sacoila lanceolata



Laboratory & Classroom Propagation

Lab: Students work with orchids in the lab:

- Using asymbiotic propagation techniques¹ to grow orchids from seed
- Experimenting with propagation procedures to increase germination rates and improve propagation timelines

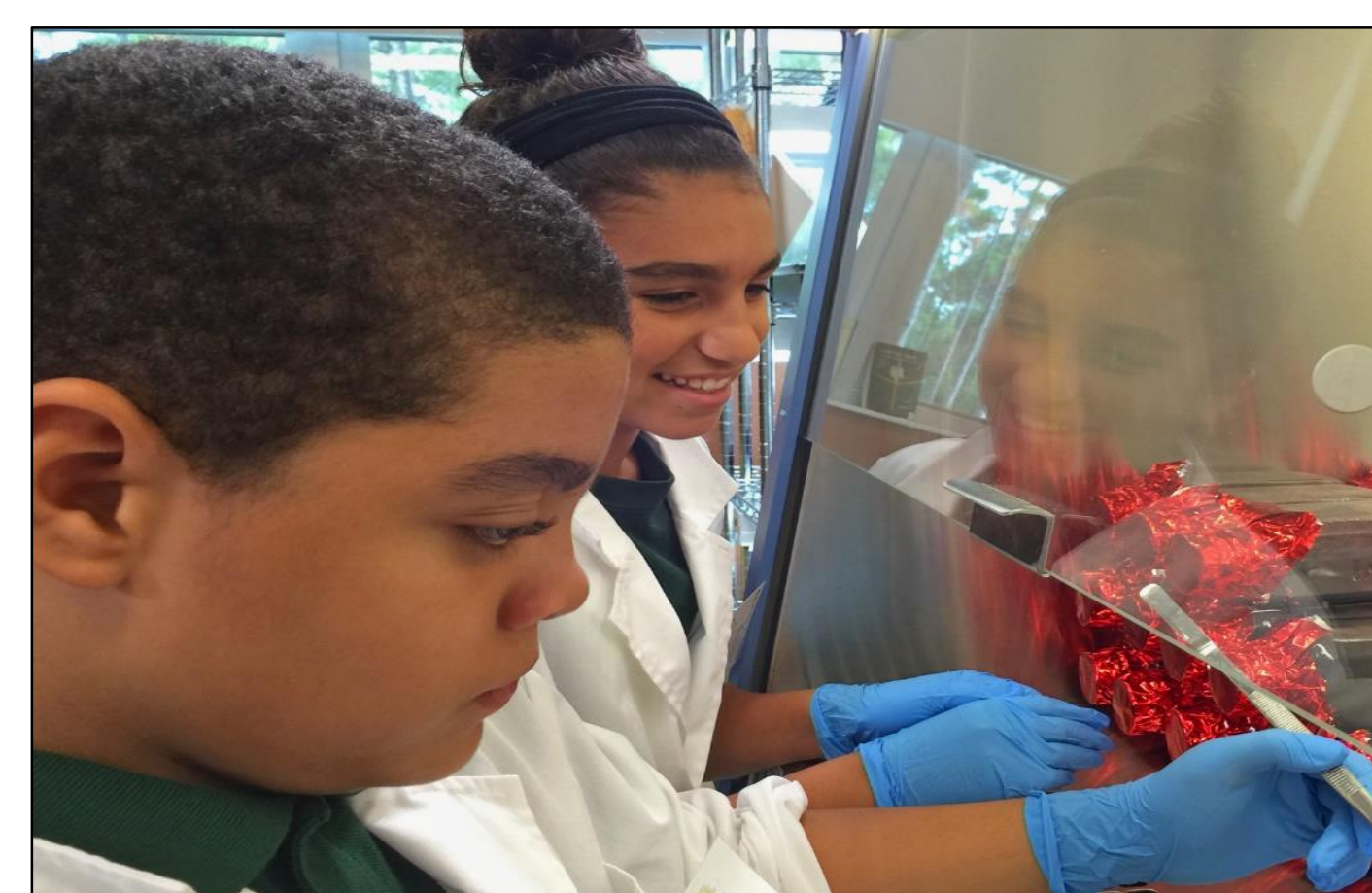
Classroom: Students work with orchids in their classroom:

- Participating in daily orchid care and data collection
- Using study procedures designed by FAU researchers to conduct research on the growing orchids
- Designing and implementing orchid research projects of their own creation

All orchids grown in the classroom are planted on the school campus where research is continued and the plants demonstrate a successful urban/native plant integration.



Middle school students deflask orchids in their classroom.



Middle school students work replating orchid seedlings in the Pine Jog propagation lab.



The In-class propagation lab.

Reintroduction

Students and FAU researchers reintroduce native orchids into natural landscapes where native orchid populations are either threatened, or can no longer be found despite historical vouchering. These student-led restoration events occur in spring and fall, and consist of population counts, outplanting of new orchids, and survivorship assessment.

Orchids Reintroduced by PreK-12 Students by Academic Year, Site, and Species

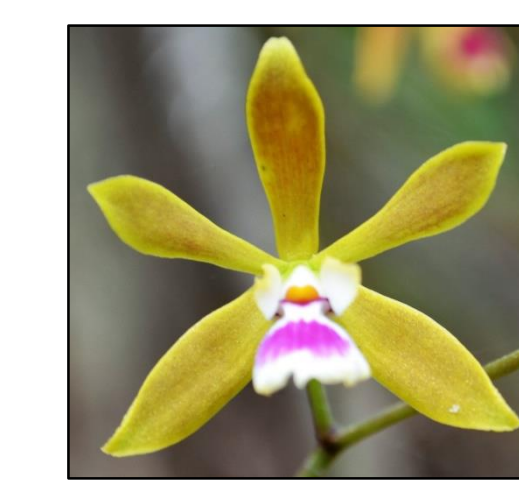
Academic Year	Species	Location	Planted
2016-2017	<i>Encyclia tampensis</i>	Palm Beach County Schools	500
2017-2018	<i>Encyclia tampensis</i>	Palm Beach County Schools	2009
2017-2018	<i>Encyclia tampensis</i>	Palm Beach County Natural Areas	4822
2017-2018	<i>Tolumnia bahamensis</i>	Palm Beach County Natural Areas	1049

ERM Restoration Site 3A 2018



Students work with FAU researchers to:

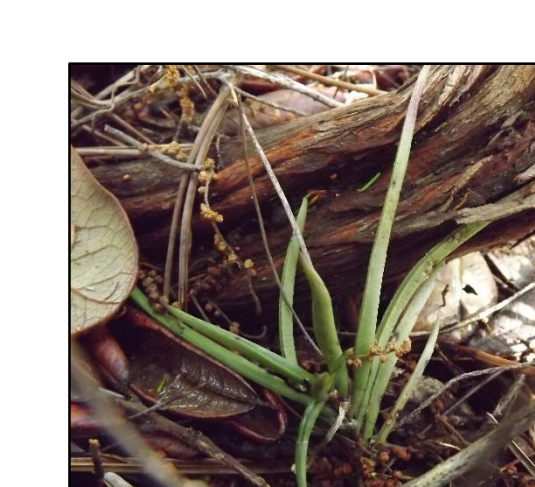
- **Identify** locations for new populations based on research conducted on historical ecosystems
- **Plant**, tag, and GPS mark each plant
- **Locate** established populations and record data on survivorship and establishment
- **Remove** invasive plants



Encyclia tampensis



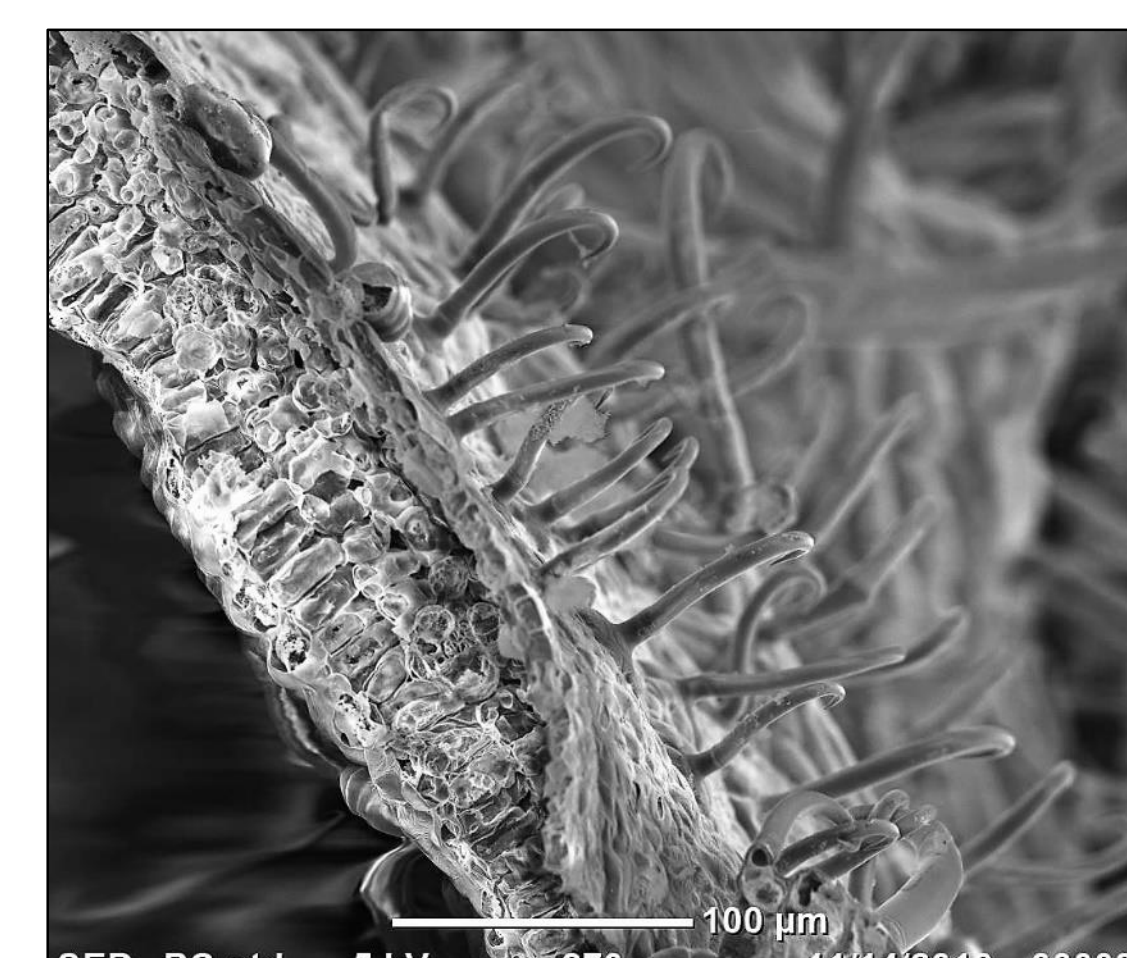
Tolumnia bahamensis inflorescence



Tolumnia bahamensis

Survivorship

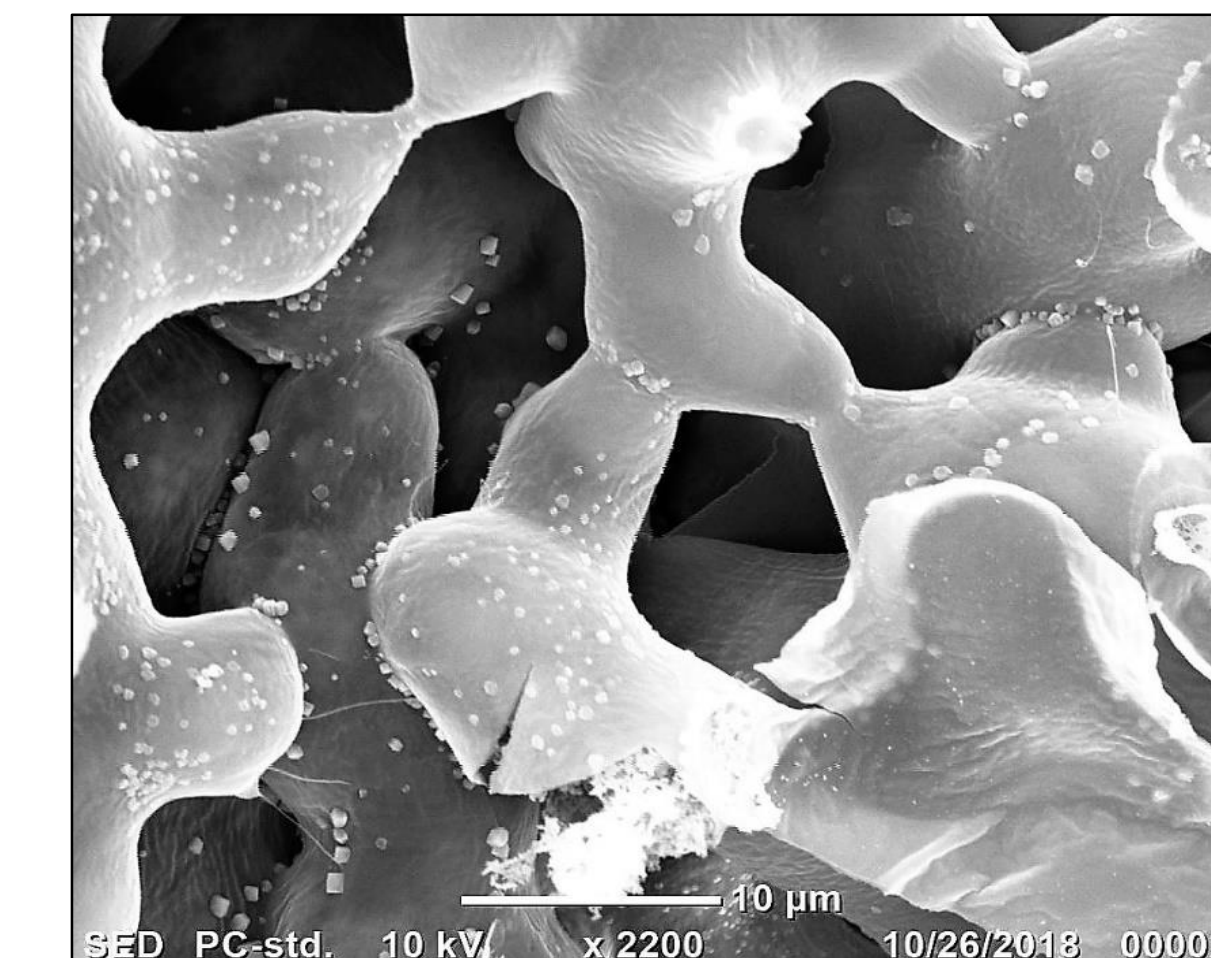
Future research will focus on the fungal associations imperative to orchid success. Students have just begun using Scanning Electron Microscope technology and staining techniques to identify and explore the mycorrhizal fungi populations present in new and established orchid populations across the project.



SEM images of orchid leaves taken by FAU High School students.



Middle school students checking survivorship of *E. tampensis* on their school campus.



Scanning electron microscope images of *E. tampensis* roots taken in the FAU High School Imaging lab.

References and Acknowledgements

1. Fairchild Tropical Botanic Gardens Million Orchid Project (2000). *Million Orchid Project Propagation Procedures*. Miami, FL: Jason Downing.
2. Luer, Carlyle A. 1972. *The Native Orchids of Florida*. New York Botanical Institute. W.S. Cowell Ltd., Ipswich, England

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