

# The Endless Forms TCN



*Matthew Pace &  
Barbara Thiers*

*The New York  
Botanical Garden*

[mpace@nybg.org](mailto:mpace@nybg.org)

[bthiers@nybg.org](mailto:bthiers@nybg.org)



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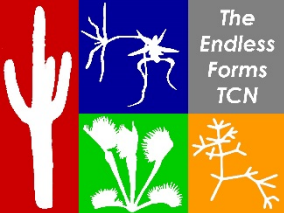


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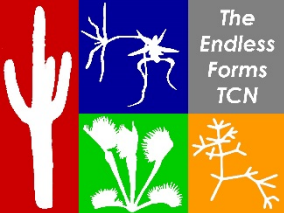




# Project Introduction

- Collaborative grant between 15 herbaria, botanical gardens, museums, and universities
- The New York Botanical Garden is the lead institution
- Digitize 2,000,000 herbarium specimens of carnivorous, epiphytic, and succulent plants in 15 families from all global regions
- Host a Ethical Data Sharing Workshop
- Focus appreciation on EF plants and the role of collections in conservation in a general audience, especially youth in underrepresented groups

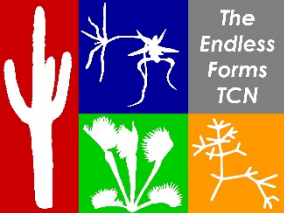




# Synopsis of Year Two

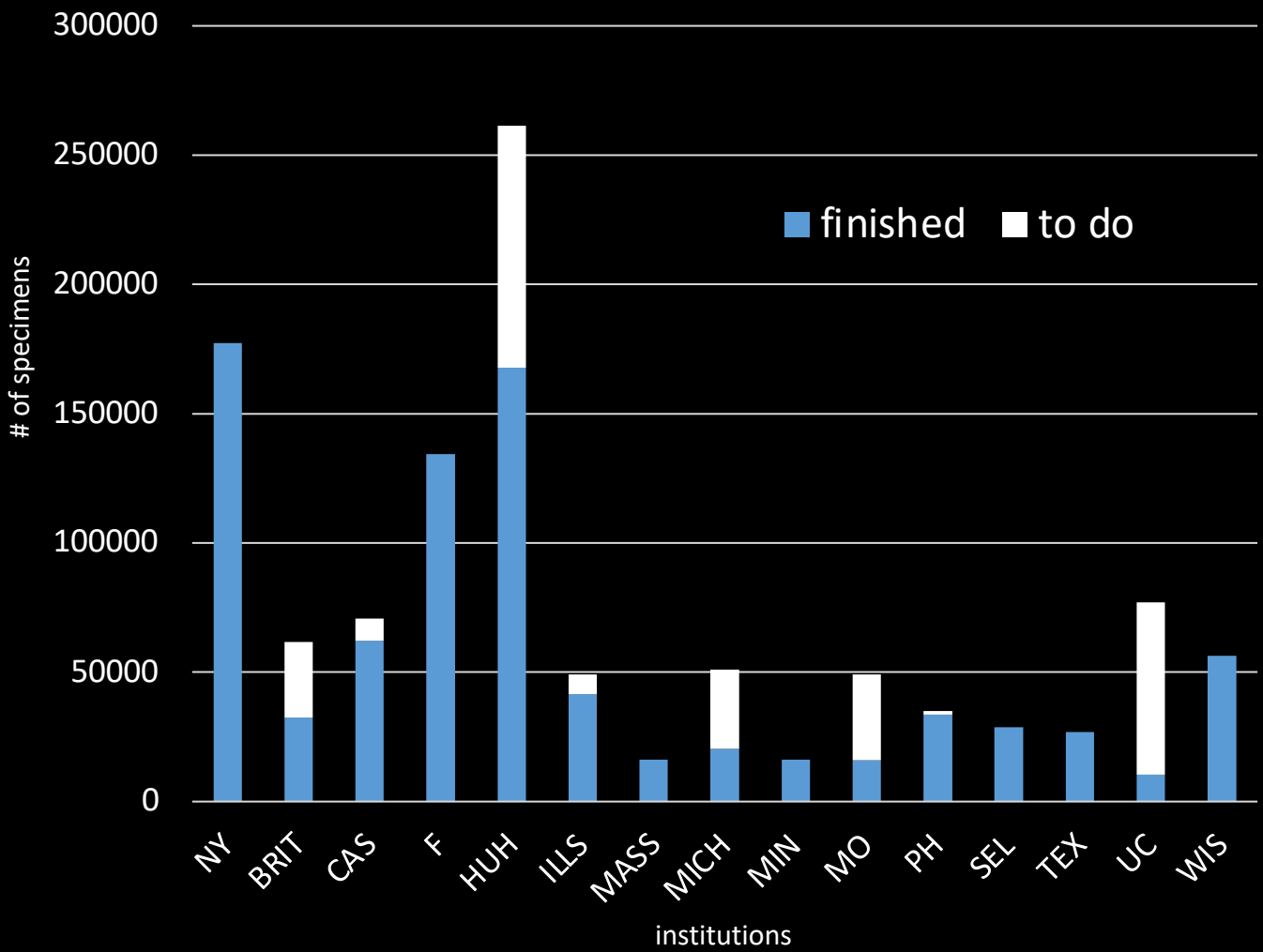
- 52% of the promised specimens were digitized within the first two years of this project across all institutions
- 32 tours or open houses across the included institutions discussed or otherwise highlighted this TCN (before March 2020)
- 546 online volunteers / citizen scientists helped transcribe specimen records in FY 2019
- COVID-19 related shutdowns significantly disrupted progress; pivot to georeferencing and online transcription





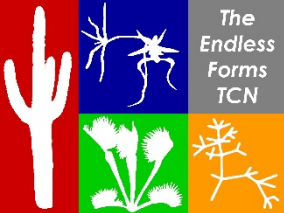
# Digitization

## Barcoding (as of July 2020)



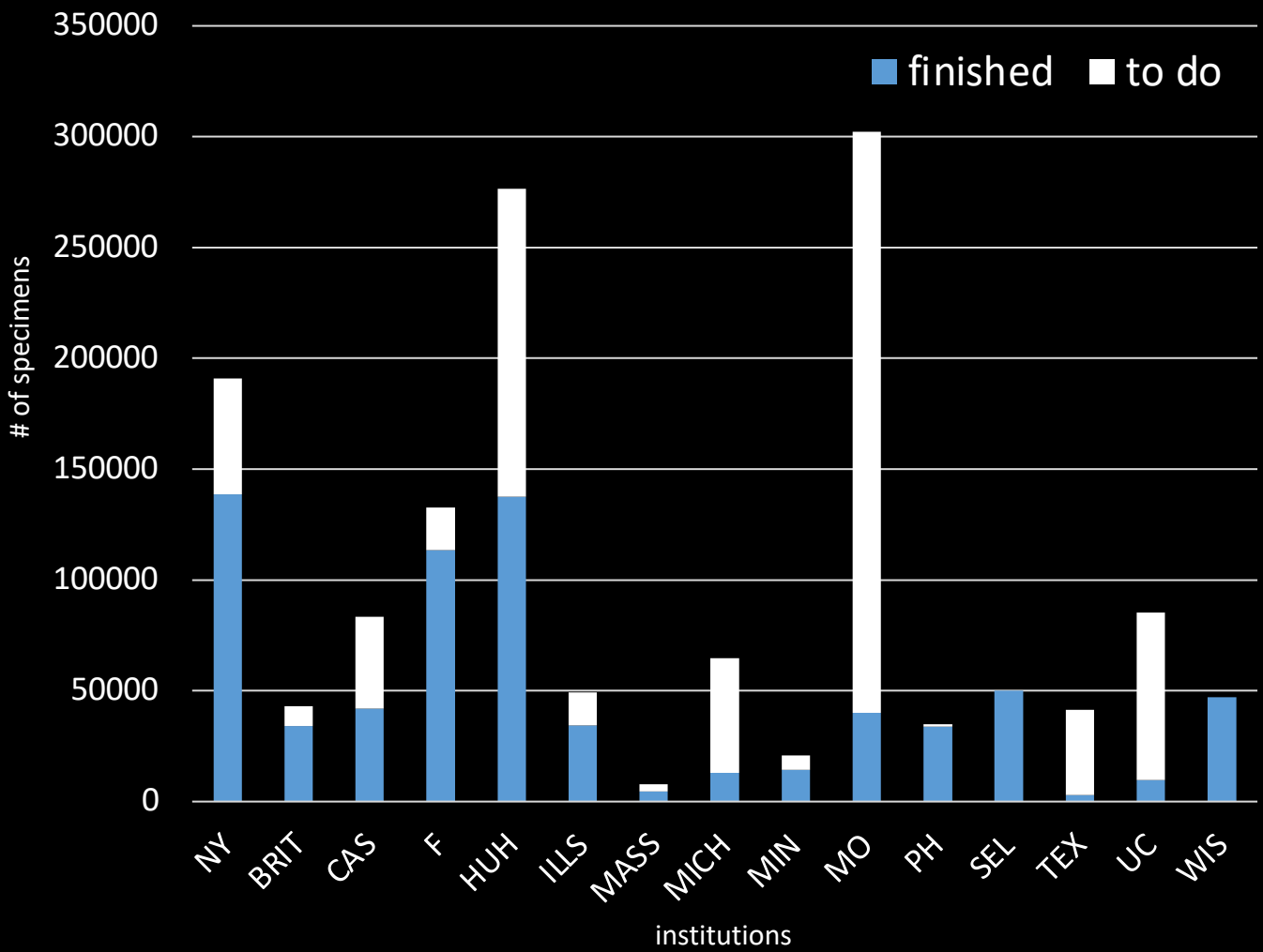
840,790 specimens barcoded (76% of total)

By year 2, seven institutions (47%) have met or surpassed their committed specimen totals



# Digitization

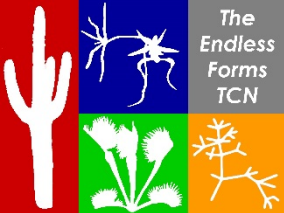
## Imaging (as of July 2020)



715,348 specimens imaged

Imaging has been significantly disrupted by COVID-19

Imaging could not take place for 40% of FY 2109



# *Lessons Learned*

## ***Workflows matter***

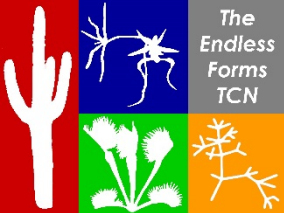
-barcoding and imaging should occur in tandem: e.g., as you finish barcoding Family A and start barcoding Family B, start imaging Family A

## ***Transcription***

- transcription should happen after imaging
- always transcribe from an image, not the physical specimen

## ***The limits of student interns***

-including student interns is a critical component of TCNs, however they have limits compared to FTEs (such as lead digitizers): e.g., many universities lost 1-2 months of digitization time, as collections/campuses closed to students earlier than FTEs, due to COVID-19



# Outreach

## Realizing the full potential of DIGIVOL & Notes from Nature

- 546 online volunteers / citizen scientists helped transcribe specimen records in FY 2019.
- New volunteer opportunities for institutions to engage previously on-site, in person volunteers, during shutdowns.

**NYBG**

### The Milkweed Family: Monarch butterflies to carrion flowers

The Milkweed family, Apocynaceae, contains some of the most spectacular flowers of any plant group. Many species also have interesting relationships with pollinators. For example, the North American Butterflyweed, *Asclepias tuberosa*, is a critical host plant for the Monarch Butterfly; the butterfly pollinates this species and lays its eggs on the milkweed, which contains a toxic latex sap. Monarch caterpillars have evolved to eat the milkweed leaves and use the toxic chemicals in the sap as part of their own chemical defense system, making them unpalatable to birds and other predators. Other members of Apocynaceae, like *Stapelia*, have large red and brown flowers that smell... [Read more](#)

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0% Validated    44% Transcribed    2000 Tasks

34 Volunteers

**NYBG**

### Gesundheit! The spicy world of the Piperaceae

The true peppers (family Piperaceae, distinct from chili peppers in the tomato family, Solanaceae), are some of the most important plants to human history and cuisine. The black pepper spice on your dinner table comes from the dried fruit and seed of *Piper nigrum*. It has formed a foundational component of Indian cooking for the last 4000 years, and was a delicacy to the ancient Romans. Peppercorns were even stuffed into the nose of Ramesse II as part of the mummification process. The trade in black pepper and other species between India, southeast Asia, China, The Middle East, and Europe helped to form links between cultures for the past 2000 years. Black pepper continues to be... [Read more](#)

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11% Validated    100% Transcribed    3026 Tasks

47 Volunteers

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### Cacti: Dangerous Beauty

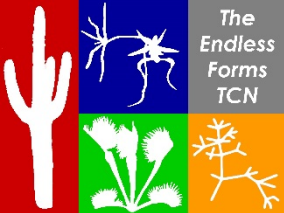
Cacti are remarkable plants: their leaves have evolved into sharp defensive spines, they grow in arid deserts where water is always in short supply, and they produce large, gorgeous flowers that are pollinated by bees and bats! Cacti are important members of their ecosystems, providing nectar for pollinators, fruits for tortoises and other animals, and nesting sites for myriad species of birds, from woodpeckers to eagles. From the iconic Saguaro to the diminutive hedgehog cactus, these amazing plants dominate the arid habitats of the North and South America. Yet these spectacular species are also under threat from poachers, mining, and other forms of habitat destruction. Herbarium specimens provide the baseline data used to describe biodiversity, document where these species... [Read more](#)

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73% Validated    100% Transcribed    2739 Tasks

57 Volunteers



The  
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# Relevance

**Rare, endangered species continue to be targeted. We need to find a balance between data access and protection.**

## 'Unfathomable destruction': thousands of rare wildflowers wiped out in Nevada

**About 40% of the Tiehm's buckwheat population destroyed, amid fierce dispute over proposed lithium and boron mine nearby**



▲ Tiehm's buckwheat in the Silver Peak Range. Conservations have been working to protect the unique flowering plant from the proposed mining operation. Photograph: Patrick Donnelly/AP



National Park Service  
U.S. Department of the Interior

Big South Fork National  
River & Recreation Area  
4564 Leatherwood Road  
Oneida, TN 37841

423-569-9778 phone  
[www.nps.gov/biso](http://www.nps.gov/biso)

## Big South Fork NRRRA News Release

Release Date: Immediate, June 25, 2020

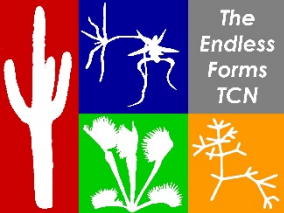
Contact: Chris Derman, [christopher.derman@nps.gov](mailto:christopher.derman@nps.gov), 423-569-9778

### National Park Service Seeks Information on Theft of Pink Lady Slipper Plants

[Oneida, Tennessee] – Park rangers are seeking information related to the theft of approximately 30 pink lady slipper plants (*Cypripedium acaule*) along Leatherwood Loop Trail, on or about June 8-9, 2020. On June 11, park staff discovered holes where the plants were known to be present. Flowering and vegetative individuals at the site had been counted by park staff two weeks earlier, on May 28, so an accurate count of how many plants were dug was possible.





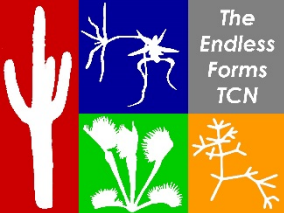


# New Endless Forms PEN

*Welcome to Endless Forms new PEN: Mare Nazaire at the Herbarium at California Botanic Garden!*

“This partnership fills an important gap by adding 70,000 herbarium specimens representing all EF families, some of which are especially diverse (cacti, agave, spurge) in California, a world biodiversity hotspot.”





# *The Endless Forms TCN*

*Thank you!*

Melissa Tulig

Kim Watson

Charlie Zimmerman

Lin Li

Elizabeth Rivas



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