#### Summit Metro Parks

Utilizing Natural Area Parks to Promote & Perform Conservation Research

> Robert Curtis, Ecological Supervisor Sarah Culliton, Student/Seasonal Biologist Charlotte Gintert, Cultural Resource Specialist

> > February 3, 2025

#### Introduction

- Background
- Types of Research
- Case Studies

Sarah Culliton – Permit Recipient/Seasonal Employee/Research Student
 Charlotte Gintert – Staff Cultural Resource Specialist

Coordinates University Field School

#### Summit Metro Parks' Mission

We conserve, sustainably manage and value natural resources for the health and enjoyment of our community, and inspire people to connect with nature through clean and safe parks.

#### Background



#### 16 Parks

**3** Nature Centers



Est. 1921

+ 400 volunteers



150+ Trail Miles 15,000 Acres



73% Voter Approval



# Types of Conservation Research

- I. Special-Use Permits
- 2. Seasonal/Intern Support
- 3. Partnerships

#### **Special-Use Permits**

- •760+ Permits in 2024
- ~22 Research Permits Per Year
- Thoroughly Screened
- Primary Categories
  - Agency Research
  - o Student Research
  - O University/Consultant Training
  - Personal Interests (eg Birds, Mushrooms, Trees)
  - $\circ$  Collections

SPECIAL-USE PE	ro Parks <sup>®</sup>		
SPECIAL-USE PE			
	RMIT INFORMATION		
975 Treaty Line F	Rd., Akron, OH, 44313-5837		
phone 330-867-5511 • fax 330-8	67-4711 • email csr@summitmetroparks.org		
Completed permits must be to be a sequiring the closure of roadways, lodges or shelters must if your application is approved, a copy will be sent to you any Summit Metro Parks employee who inquires can ver IETRO PARK	e received four (4) weeks in advance. Lb submitted no later than seven (7) months in advance of the intended use. a. It must be retained with proper signatures and kept with you so that iffy you have received permission to use the park as described below. FACILITY		
ay & Date of Event Start Time	End Time Estimated Attendance		
ame/Type of Activity			
xplanation			
Name of Photographer	Name of Caterer Name of Disc Jockey		
OUR INFORMATION (Person in charge and respo	onsible)		
AME	PHONE (day/evening)		
DDRESS	EMAIL		
ITY, COUNTY, STATE & ZIP			
rganization's and/or Sponsor's Name (if different from al	bove)		
ddress City	County State Zip Code		
SURANCE INFORMATION - IF REQUIRED (See	e information page)		
surance Company	Amount of liability coverage		
nereby make this application for special use and age etro Parks and its lodges and shelters.	ee to abide by all rules and regulations in effect for Summit		
Signature of Applicant	nt Date		
Metro Parks U	se Only Below This Line		
PERMIT APPLICATION:	OVED REJECTED with reason, see below		
Permit Fee: INSURANG			
Security required	Additional toilet facilities required		
Additional assistance needed	led Additional clean-up needed		
Emergency medical service required (active use	e or groups of 50 or more)		
Summit Metro Parks restrictions and/or r	equirements for use:		

# Special-Use Permits – 2024 Examples

Biological	Geological	Cultural
Ant Collection/Survey	Water Quality Sampling	County Home Cemetery Survey
Breeding Bird Census	Geologic Features Survey (x2)	
Fungi Collection/Survey	Geosciences Class	
Invasive Bee Collection/Survey	Glacial Lacustrine Deltaic Deposits Class	
Plant & Fungi Collection/Survey	Paleontological Resource Inventory	
Redback/Ravine Salamander Research	Sedimentology Class	
Seed Collections (x3)	Soil Sampling/Spectroscopic Measurements	
Tick Collection/Survey (x2)	Soil Stability Class	
Wetland Delineation Course (x3)	Stream Processes Class (x2)	

## Seasonal/Intern Support – SMP Workload

## Ecological/Wildlife

Full Park Inventories – Natural Resource Protection
Restoration & Invasive Species Management
Citizen Science Surveys (Stream, FrogWatch, iNaturalist, etc)
Special Projects (Herps, Coyotes, Bats, etc)

#### • Employ ~I0-20 Seasonals/Interns Annually

## Seasonal/Intern Support – SMP Workload

# • Full Park Inventories



Figure 2: Survey Point Layout Illustrating Each Step and its Respective Survey Area.



## Seasonal/Intern Support – What We Get (2024)

## ~2x Work Volume

#### Surveys

1000 Floristic Plots Surveyed
2 Bioblitzes Supported
7700 iNaturalist Records Made
50 River Miles Monitored

o 180 Rare Species Located

o New Skill Sets

- District Mycological Survey
- District Aquatic Isopod Survey

#### Management

o 2400 Nuts/Seeds Collected

 $\circ$  7100 Nuts/Seeds Potted

 $\circ$  I 30 Trees/Shrubs Outplanted

o 14,200 Planted Trees Monitored

o 3100 Planted Trees Treated

 $\circ \textit{Invasive Species Controlled}$ 

- I600 Acres Cleared
- 700 Trees/Shrubs Treated

# Seasonal/Intern Support – What They Get

Field Exposure









#### Appreciation of Natural World

# Seasonal/Intern Support – What They Get



Jobs!



Collaboration

Professional Contacts



### Partnerships – Public

#### **Research Interest**

- Deer/Coyotes/etc •
- Rare Bats/Birds/Herps
  - Rare/Invasive Fish •
  - Rare/Invasive Plants
    - Mussels •
    - Virgin Soils •
  - Habitat Restoration •
- Watershed Management •

#### Partner Agency

- Neighboring Metro Parks
  - o Cuyahoga
  - $\circ$  Geauga
  - $\circ$  Portage
  - $\circ$  Stark
  - $\circ$  Medina
- Cuyahoga Valley National Park
- Soil & Water Conservation District
- Ohio Department of Natural Resources
- US Fish & Wildlife Service

#### Partnerships - Private





#### Using Drone Imagery to Map Phragmites near Akron, Ohio

Geosciences Service Learning Course, Department of Geosciences, University of Akron

November 3, 2024

Project Goals and Participants Wetland Invasive Plants Study Areas Drone Data Collection Orthomosaic Imagery Imagery Interpretation Results Conclusions Reference -

#### $\rightarrow$

#### **Project Goals and Participants**

During the Fall 2024 semester, the Geosciences Service Learning class at the University of Akron completed an invasive species mapping project with Summit Metro Parks. This project was conducted at two study sites in Northeast Ohio: Long Lake in Portage Lakes and Tinker's Creek State Nature Preserve near Aurora. The specific goal of the project was to identify the locations of the invasive species *Phragmites australis*, or the common reed, for Summit Metro Parks to control and treat in the future. The class completed several field visits to both the Long Lake and Tinker's Creek study areas to collect imagery using Unpiloted Aircraft Systems (UAS), or drones. With this data, the class created a map showing where *Phragmites australis* were present as the final product for Summit Metro Parks.

# of Akron Summites Metro Parks®

At the beginning of the Fall 2024 semester, the class members had a meeting with staff at Summit Metro Parks to define the project goals and study areas. After a brief overview of the structure of the park system, park biologists suggested that the class should look for *Phragmites* 

Long Lake was measured to have a total of 0.52% *Phragmites* that covered 3,540 m<sup>2</sup> of the study area.

## Fungal Diversity Research



#### Sarah Culliton, Undergrad Student/Citizen Mycologist

Summit Metro Parks Seasonal Biologist Ecological Researcher at Hiram College's Field Station

## **DNA Barcoding to Capture Fungal Diversity**

- Ohio Mushroom DNA Lab (OMDL) nonprofit citizen science organization aiming to document fungal diversity in the state and beyond. Funded almost entirely by community donations.
- Over 2,000 specimens sequenced so far.
- Mushroom specimens can be collected and submitted by anyone at any level of experience after reading a brief collection manual.
- Mushrooms receive DNA "barcode" of their ITS region which is compared to reference data in GenBank by OMDL volunteer validators.



## Mushroom Collection



#### Special Use Permit

- In 2023, Sarah obtained a Special Use Permit as a citizen scientist allowing collection of fungi specimens from Summit Metro Parks properties with some limitations.
- Only one park in SMP's district studied in 2023: Liberty Park.
- 90 total specimens were collected in 2023. Some DNA results are still pending, but so far: 13 first state records and one potentially undescribed species.

Cortinarius anthracinus First state record



*Pholiotina "sp-OH01"* Potentially undescribed

#### **Special Use Permit**

- Most specimens from Liberty Park came from the same segment of trail, including almost all the rare specimens found.
  - This segment happened to be the only undisturbed area (no history of agriculture or logging for at least the past 90 years) suggesting past land use has an impact on fungal diversity.



### Seasonal Biologist Opportunities

• In 2024, Sarah and myco-colleague Jessica Williams continued documenting fungal diversity as SMP seasonal biologists.

o Access to off-trail habitat and conservation areas.

 New focus on comparing finds in old growth forest versus finds from regenerative forest with agricultural land use history. Use of historic aerial imagery.

o More properties surveyed.

o Over 500 collections representing at least 400 different species.

- First batch of DNA results expected later this year.
- Three Bio Blitz events attended, provided mycology expertise.

## Fungal Microscopy

 Thanks to grant funds, microscopy was made possible in 2024.

 North Spore Mycology Scholarship
 Paul & Maxine Frohring Foundation



Spring beauty rust





## Old Growth Forest Research

- Final species IDs still pending DNA confirmation, but preliminary results show a minor difference in diversity between old growth and selectively logged plots, but noticeably less diversity in plots with history of agricultural use.
- Hiram College field station survey results:
  - Old growth plot: 143 species, 20 of which were rare.
  - Selectively logged plot: 136 species, 18 of which were rare.
  - Formerly tilled plot: 99 species, 5 of which were rare.
- The tilled plot not only had less species diversity, but species found were also more common.
- The same trend was observed in Summit Metro Parks properties surveyed.

## Old Growth Forest Research

- Despite the three Hiram College plot types having varying species diversity, overall species ecological role distribution was remarkably consistent:
  - ~70% saprobic, 20% parasitic, 10%
     mycorrhizal in all three plots.
  - o Is this ratio important in all ecosystems?
- Surveys were based on detection of visible fungal fruiting bodies. Results may be different using other methods, such as eDNA sequencing.





## What's Next?



• 2025 (and beyond) planned research:

- Continue fungal diversity surveys with focus on understudied taxa and habitats.
- Insect community surveys in mushroom specimens.
- eDNA sampling to capture fungi that don't produce visible mushrooms.

#### Cultural Resources Research



#### Charlotte Gintert, MA, RPA

Cultural Resources Specialist

#### Cultural Resources Research

#### Cultural Resources Management at Summit Metro Parks

• Cultural Resources Partnership Research in Park Areas

Ouniversity of Akron Department of Anthropology
 Community Archaeology Summer Program
 Ouniversity of Akron Department of History
 Applied History Graduate Research

#### Cultural Resources at Summit Metro Parks

- SMP stewards cultural resources as well as natural resources.
- Cultural resources include historic standing structures and archaeological sites.
- Cultural Resources division of the Conservation Department started in 2016.
- SMP is the only county level park district in Ohio with full-time cultural resources staff.
- Cultural resources research includes archaeological survey, historical research, collections management, and collaborative research with the public.









#### Foundation: University of Akron's Community Archaeology Program

- Research partnership began under leadership of Dr. Lynn Metzger (UA) c. 1999.
- Linda Whitman becomes UA Community Archaeologist in 2001.
- Student education needs met through SMP research needs.
- Provides practical on the job training, university credit and opportunities to connect with local organizations and leaders.
- Archaeological research conducted by UA staff and students in 10 parks from 1998-2016, identifying approximately 55 previously unidentified archaeological sites.



Hampton Hills Metro Park 2000



Wood Hollow Metro Park 2013

Evolution: SMP & UA Community Archaeology Summer Program (CASP)

#### 2020: SMP & UA host only archaeological field school in Ohio and one of only a few in the US.

- Allows students to graduate on time despite pandemic restrictions.
- Novel scheduling system for CASP is now used by other US field schools.

 Multiple CASP graduates are now permanently employed in CRM positions.





## CASP Research 2021 - Present: Everett Knoll Complex



# 2021 Everett Knoll Complex





# 2021 Everett Knoll Complex



## CASP Research 2022 - Present: Everett Knoll Complex



# CASP Everett Knoll Complex Research Results So Far



#### CASP Everett Knoll Complex Research Results So Far

- Site Extends across entire landform to the west.
- Occupied from Archaic to the Late Precontact archaeological periods (c. 8000 BC – AD 1650).
- Evidence of Eastern Agricultural Complex presence on site.
- Evidence of complex multiple flooding events and historic tributaries.
- Evidence of partially intact features.





#### CASP Everett Knoll Complex Research Results So Far

Unlocking the Paleosols!

Layer I (0-28cmbs)

Layer 2 (28-44cmbs)

Layer 3 (44-58cmbs)

Layer 4 (58-70cmbs)



#### Expanding the View: Magnetic Gradiometry Survey



#### Expanding the View: Magnetic Gradiometry Survey



## CASP Everett Knoll Complex Research for 2025...





#### UA Applied History Graduate Research: Wheelock Cuyahoga Acres

#### Class led research

 Wheelock Cuyahoga Acres Property ownership research

# • Individual thesis research

2025 Wheelock
 Cuyahoga Acres
 Archaeological
 Survey







Partnering in Education and Research = Investing in the Future of Conservation and Cultural Resources Management



# Questions?