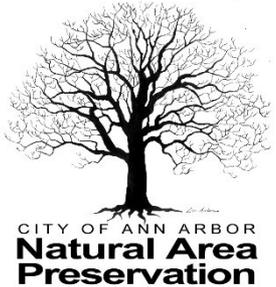




# Creating a Biological Inventory App with Survey123



*Becky Gajewski, Stewardship Specialist  
City of Ann Arbor Natural Area Preservation*

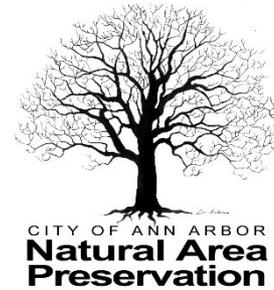


# Outline

- ▶ What/who is Natural Area Preservation?
- ▶ NAP's Inventory Programs
  - ▶ Reptile/Amphibian Surveys
- ▶ The Paper Problem
- ▶ Solving the Problem with Survey123
- ▶ Survey Building Demonstration
- ▶ Data Submission Demonstration
- ▶ Data Visualization Demonstration



# What is Natural Area Preservation?



- ▶ NAP is part of the City of Ann Arbor's Parks and Recreation Department and is funded by the voter-approved Parks Maintenance and Capital Improvements Millage.
- ▶ Created in 1993, NAP's mission is to protect and restore Ann Arbor's natural areas and to foster an environmental ethic among its citizens.
- ▶ NAP is divided into three main areas that all contribute to ecological restoration efforts in Ann Arbor's parks.
  - ▶ Outreach team
  - ▶ Field crew
  - ▶ Inventory team

# Inventory Program

## ▶ What exactly are we inventorying?

- ▶ Plants
- ▶ Birds
- ▶ Frogs, toads, salamanders, turtles, snakes
- ▶ Butterflies
- ▶ Change over time through photo monitoring



## ▶ Who completes the inventories?

- ▶ NAP Staff
  - ▶ Field Biologists
  - ▶ Stewardship Specialists
- ▶ Contractors
- ▶ Volunteers



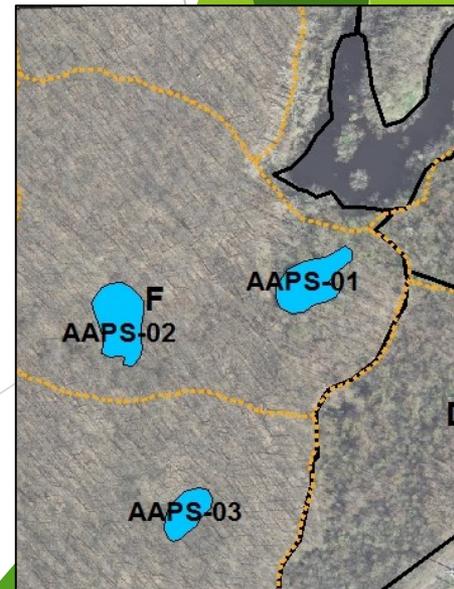
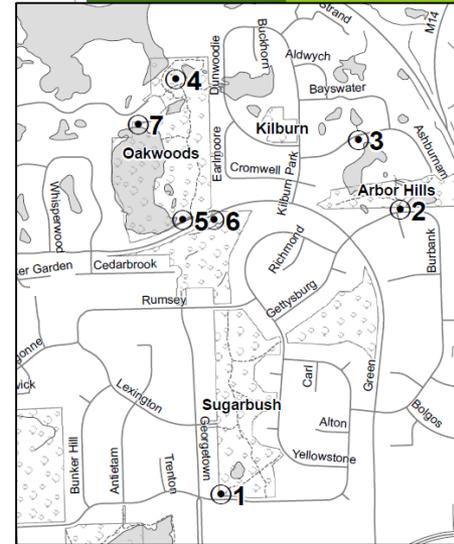
# Why Are We Inventorying?

- ▶ To get baseline conditions in new sites.
- ▶ To characterize the quality of the habitats we have.
- ▶ To look for rare species populations to protect and enhance.
- ▶ To document the impacts of our restoration work.
- ▶ To inform future land management actions.



# Reptile/Amphibian Surveys

- ▶ Frog and Toad Survey
  - ▶ Volunteers visit established monitoring points and listen for calls, recording the species and level of calling.
- ▶ Salamander Survey
  - ▶ Volunteers walk meandering routes around vernal pools, watching for salamander migration. They also look within the pools for evidence of breeding. Outside of the breeding season, they turn cover throughout habitat areas looking for juveniles & adults.
- ▶ Turtle Stewards
  - ▶ Volunteers are assigned to specific parks or stretches of river. They search for basking turtles from the shore or by boat, watching for nesting activity. They also maintain artificial nesting mounds.
- ▶ A Little of Everything
  - ▶ All volunteers are encouraged to report sightings of any reptile/amphibian, no matter what survey they are volunteering for.



# The Paper Problem

- ▶ To report sightings, volunteers fill out paper forms and draw the locations of their sightings on maps.
- ▶ They mail/scan/photograph the forms and maps.
- ▶ Staff translate data on the forms into an Access database.
- ▶ Data from Access is exported to GIS and observation points are mapped by hand.
- ▶ Volunteer hours are calculated and recorded in a different Access database.
- ▶ Very time consuming, and the data forms can be confusing.

# Salamander Survey Form



**Herp Inventory: Data Entry Form**  
 3875 E. Huron River Dr., Ann Arbor, MI 48104  
 (734) 794-6627 / napherps@a2gov.org



Date: \_\_\_\_\_

Run: \_\_\_\_\_

Temperature: \_\_\_\_\_ °F

Start Time: \_\_\_\_\_

End Time: \_\_\_\_\_

Observer(s): \_\_\_\_\_

Site: \_\_\_\_\_

Weather:  clear  cloudy  light rain  raining

Survey Technique  meander entire park  walk trail corridor  visit mapped points only

other: \_\_\_\_\_

**INSTRUCTIONS**  
 Indicate the location of a sighted salamander by placing a circled number on the map. Map data points separately if >50ft apart or if substantially different. Record number of adults (ad), juveniles (juv), and/or egg masses (egg); mark the "none found" box if nothing found at a point using traps or dip nets.

Map Point	None found	survey method			Spotted	Blue Spotted	Red-Backed	Tiger	Red-spotted newt	Four-toed	Small-mouthed*	office use only Site ID for GIS
		Turning Cover	Dip Net	Funnel Trap								
<input type="checkbox"/>	ad	ad	ad	ad	ad	ad	ad					
					juv	juv	juv	juv	juv	juv	juv	
					egg	egg	egg	egg	egg	egg	egg	
<input type="checkbox"/>	ad	ad	ad	ad	ad	ad	ad					
					juv	juv	juv	juv	juv	juv	juv	
					egg	egg	egg	egg	egg	egg	egg	
<input type="checkbox"/>	ad	ad	ad	ad	ad	ad	ad					
					juv	juv	juv	juv	juv	juv	juv	
					egg	egg	egg	egg	egg	egg	egg	
<input type="checkbox"/>	ad	ad	ad	ad	ad	ad	ad					
					juv	juv	juv	juv	juv	juv	juv	
					egg	egg	egg	egg	egg	egg	egg	

Have photos? Please share them with us- via email if you can!

notes

\* Very rare. Please contact NAP immediately if you see a Small-mouthed salamander.

# Frog/Toad/General Survey Form



**Herp Inventory: Data Entry Form**  
**3875 E. Huron River Dr., Ann Arbor, MI 48104**  
**(734) 794-6627/napherps@a2gov.org**

Observer(s): \_\_\_\_\_

Date: \_\_\_\_\_

Site: \_\_\_\_\_

Run: \_\_\_\_\_

Weather:  clear  cloudy  light rain  rain

Temp: \_\_\_\_\_

meander entire park  walk trail corridor  visit mapped points only  canoe

Start/End Time: \_\_\_\_\_



Map Point	survey method					frogs & toads								snakes			turtles							
	Turned Cover	Dip netted	Funnel trapped	Saw basking	Heard calling	Wood Frog	Chorus Frog	Spring Peeper	Leopard Frog	American Toad	Gray Treefrog	Green Frog	Bullfrog	Brown (DeKay's)	Eastern Garter	Northern Water	Map	Snapping	Musk	Painted	Red-eared Slider	Softshell	Blanding's	Other:
	<input type="checkbox"/>	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad				
	<input type="checkbox"/>	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad				
	<input type="checkbox"/>	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad				
	<input type="checkbox"/>	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad	egg juv ad				

Please mark whether a count (number of egg masses, individual juveniles, or individual adults) with a "#," or a calling level (1= few, 2= some, 3= full chorus) with a "C."

**Notes:**

Have extra notes or photos? Please share them on an attached sheet, or send us an email!

C= Calling Level # = Number of Individuals Seen

Last modified April 2012

# Salamander Survey Map



**Oakwoods Survey Area 1**  
Green Rd., Kilburn Park  
Circle and Whisperwood Dr.  
Ann Arbor, MI 48105

Observers: \_\_\_\_\_

Date: \_\_\_\_\_ Run #: \_\_\_\_\_



Return to NAP @ 3875 E. Huron River Dr., Ann Arbor, MI 48104 / [NAPherps@a2gov.org](mailto:NAPherps@a2gov.org)



# Can We Utilize Technology?

- ▶ Free apps are already out there.
  - ▶ Bird survey volunteers enter data into eBird.
  - ▶ Park Stewards and other park visitors report sightings with iNaturalist.
  - ▶ Michigan Herp Atlas, HerpMapper
- ▶ Online databases too!
  - ▶ Butterfly survey volunteers submit data through PollardBase.
  - ▶ Universal FQA Calculator
- ▶ Many benefits: Easier for volunteers to submit data immediately from the field, less time-consuming for staff, automatic report generation, data goes into globally-accessible databases, anyone can contribute
- ▶ Unfortunately, none of the currently available apps capture the level of detail we'd like to record for reptiles and amphibians.

# Exploring Survey123



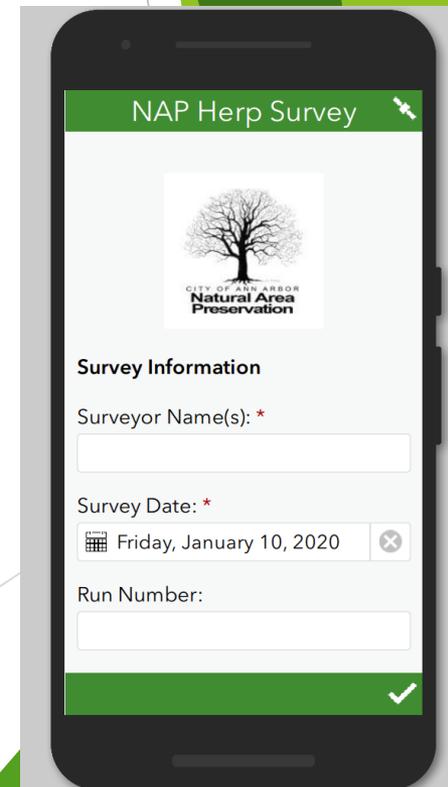
- ▶ The spatial part of our data is the most important - can we just track all of our information in GIS?
- ▶ Can we figure out a way for volunteers to submit their own data from their phones or computers?
- ▶ Could Survey123 be the solution?
  - ▶ Part of the ArcGIS software suite.
  - ▶ A tool for building smart data collection forms, which are stored in ArcGIS Online. Forms have the ability to record geopoints.
  - ▶ If your organization has an ArcGIS Online account, you also have Survey123.
  - ▶ Free 21-day trial with options to buy a subscription after the trial.
  - ▶ The app is free to download, users have to log in with an ArcGIS Online account to submit data.

# Building A Survey

- ▶ Two methods: Web builder, or Survey123 Connect
  - ▶ Web builder is the simplest
  - ▶ Survey123 Connect offers much more customization

	A	B	C	D
1	type	name	label	hint
2	note			
3	note		<b>Survey Information</b>	
4	text	Name	Surveyor Name(s):	
5	date	Date_	Survey Date:	
6	integer	Run_	Run Number:	
7	time	StartTime	Start Time:	
8	integer	Temp	Temperature (*F):	
9	select_one weather	Sky	Weather:	Choose the wettest you encountered
10	select_one survey_type	SurvType	Survey Type:	Choose the survey for a majority of the time
11	select_one no_obs	NoObs	Survey Type:	<font color= red >if you completed your survey without observing any
12	begin repeat	StartRepeat	Individual Observations	
13	geopoint	Location	Location	
14	select_one certainty	Certainty	Location Certainty:	
15	select_one survey_method	SurvMethod	Survey Method:	
16	select_one calling_code	CallingCode	Calling Level:	
17	select_one organism	OrganismType	Animal Type:	
18	select_one species	Species	Species:	Note: Bianchnard's Cricket Frog and Pickersel Frog are extremely rare
19	text	OtherSpecies	Other Species not Listed:	

**Hint**  
This will act as extra information that can help to answer the survey question (e.g., Distances should be entered in miles).



# Survey Building, Data Submission, and Data Visualization Demonstrations

<https://survey123.arcgis.com/>  
<https://arcg.is/05CXPW>  
<https://a2-mi.maps.arcgis.com/>

# What's Next?

- ▶ Working on a custom basemap for the app.
- ▶ Auto-calculating hours based on start and end times.
- ▶ Automatically adding park names to data points.
- ▶ Data submitted through Survey123 can be accessed directly from ArcGIS Desktop/Pro, no need to export.
- ▶ Frog calling survey app!



# Questions?

*Thank you!*

Becky Gajewski, [bgajewski@a2gov.org](mailto:bgajewski@a2gov.org)



CITY OF ANN ARBOR  
**Natural Area  
Preservation**