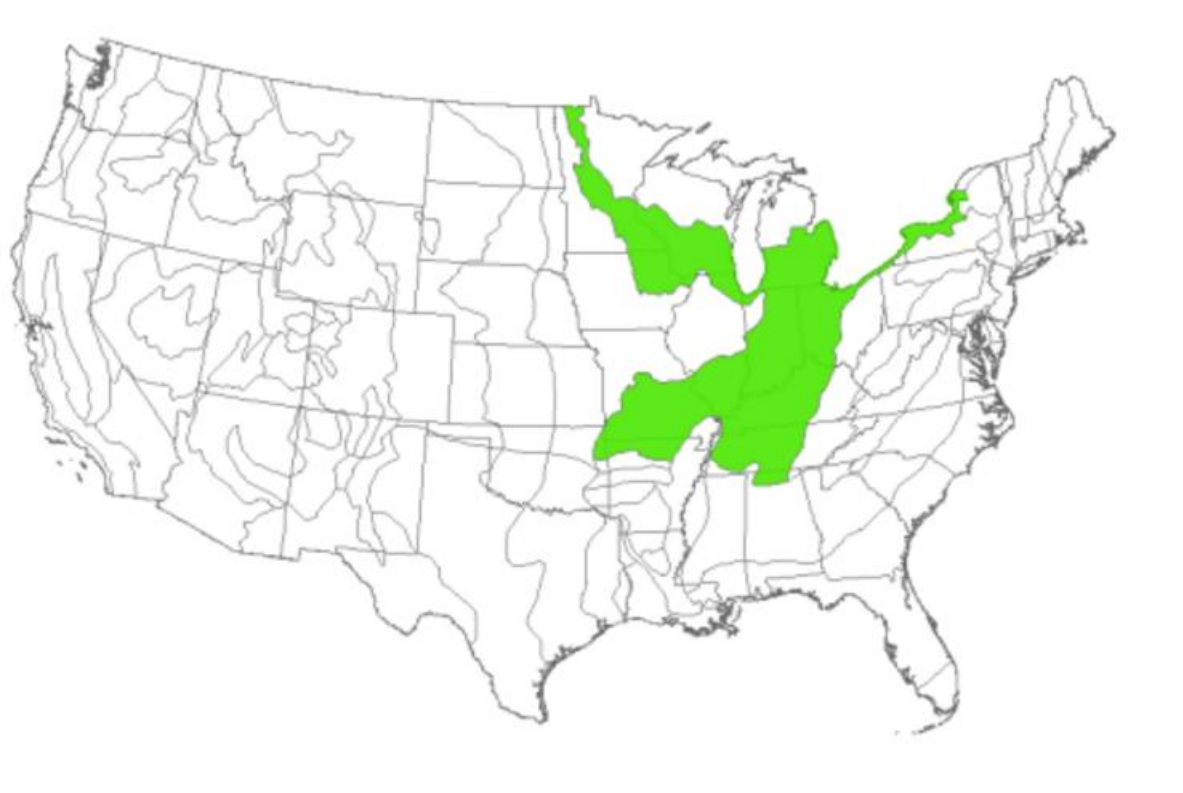
Monarch Wings Across the Eastern Broadleaf Forest Initiative

Tips for Plant ID and Seed Collection and Storage

A presentation by
Amber Barnes & the Indiana
Fish and Wildlife Service

Establish ecoregional seed collecting program



Provide technical assistance and training for seed collection

Training and Communication

- Team Leads need to be well versed in plant ID
- Volunteers can collect alongside Team Leads if they are unfamiliar with plants
- Team Leads can mark plants for Collection Volunteers who may be inconsistent in plant ID

POLLINATOR PARTNERSHIP

Pollinator Partnership
www.pollinator.org
415-362-1137
info@pollinator.org

What kinds of landscapes work best?

- ROWs (utilities, roadsides, etc.)
- Public/community gardens
- Botanical gardens
- State/federal parks and lands
- Farms
- Tribal
- Private Lands
- Corporate Lands
- Rail Lines

How to approach landscapes?

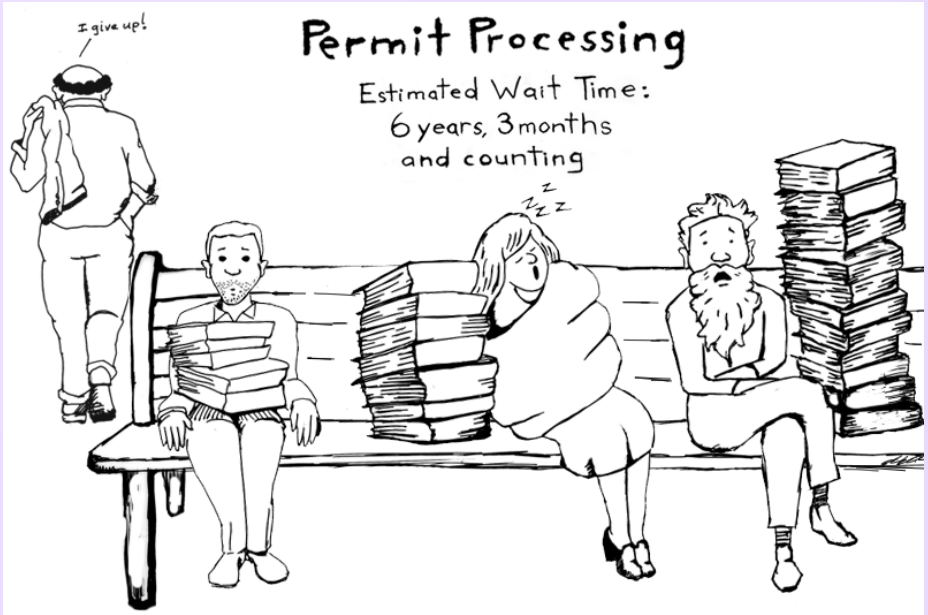
- Send emails to groups like
  - National Association of Conservation Districts
  - American Farm Bureau Federation
  - Master Naturalists groups
  - Farm Cooperatives

Obtain permission to access property

- Property Entry Formal Permission Form
- Property Entry Oral Permission Form
- Volunteer Waiver / Hold Harmless Form

Preliminary Site Visits and Permission to Collect

- Scout potential sites
- Assess target population
- Plan ahead for Permits
- Hold Harmless Documents



What makes a population?

- A group of individuals living within the same collection site, continuous in range, and generally uniform in appearance; one collection.
- Consider plants of the same species within a 3 mile radius around the main collection site to be the same population.
- To gain the most representatively balanced sample of seeds, collecting should be conducted in an even and random method from at least 50 plants.
- Separate collections of the same species by at least 1/4 mile to ensure separate populations are collected.

How to assess a population:

- Scout the site while plants are flowering and confirm the target plants are there.
- Only collect from sites with 50+ individuals in the population (can be spread out).
- Check with the land owner and see if it is okay to mark the populations (flagging tape, pin flags, or yarn).
- Scout again during seed set to estimate when the collection should be scheduled.
- Perform a cut test on the seed to determine seed maturity and amount of bug damage.

Is the seed ready? Visually Assessing the Seed

- Look for changes in fruit and seed color
- Fruits should be splitting or breaking open
- Seeds will rattle
- Seeds will be hard and dry
- Some seeds have already dispersed

Cut Tests

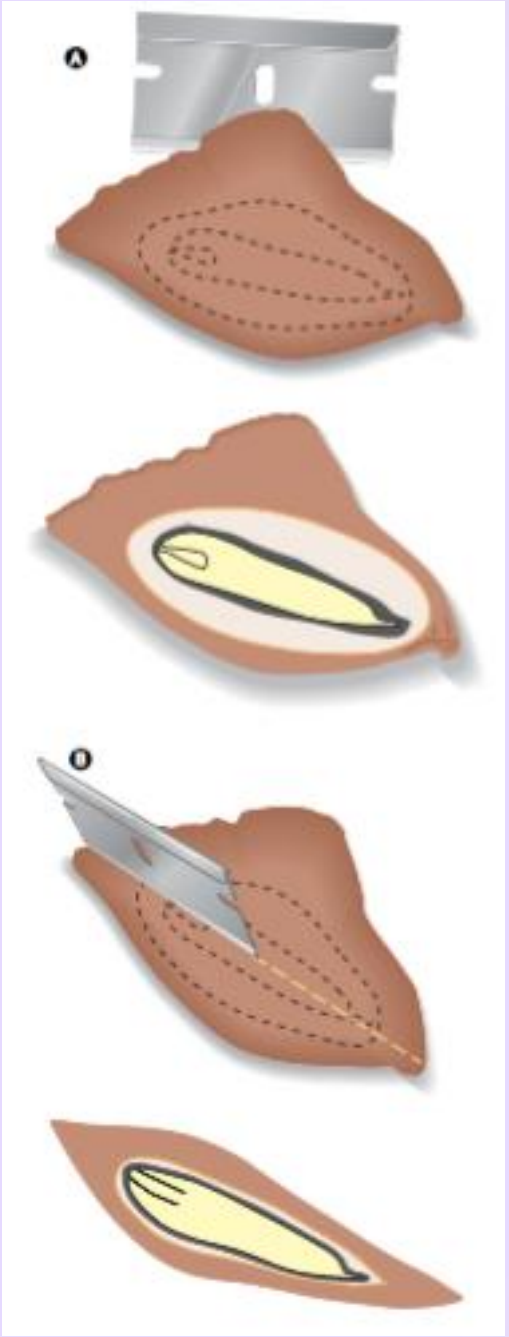
How do we know if the seed is viable?

- What is it?
  - A method of testing seeds by cutting them open to see if their internal tissues are fully developed and undamaged.

- Tells the collector:
  - If the seeds are mature enough
  - If seeds have been damaged (aids in determining the amount of seed needed)

How to perform a cut test:

- Cut seed longitudinally on a firm surface
- Use a clean, sharp razor blade & push downwards through the middle of the seed with constant pressure.
- Examine the seed contents



USDA Forest Service and Southern Regional Extension Forestry

Seeds reach their maximum viability and peak maturity at the time of natural seed shed.

Mature Seed:

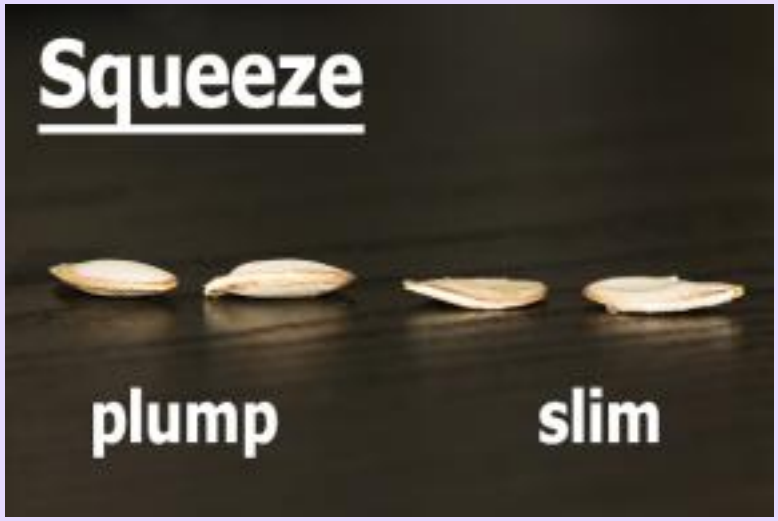
- Seed maturity is usually based on the presence of a fully developed embryo.

Immature Seed:

- Have a softer outer seed coat and an inner tissue that can be milky, and generally not as firm as that found in mature seed.

Empty Seed:

- Likely the result of insect damage or failure to mature.



https://ssaw.org.au/2016/07/01/testing-seed-viability/

What to collect

What goes in the bag?

- Seed heads
- Seed pods
- Fruits

What does not go in the bag?

- Weeds
- Woody materials
- Stems/branches
- Leaves
- Insects
- Rocks
- Clippers
- Sunglasses

Beware of Weeds

- Attention to weeds is crucial!
- Do not accidentally collect weed seeds along with the desired species. It is difficult, and in many cases impossible, to eliminate weed seed contamination once it is in a collection.

University of Minnesota Extension - Source: Lisa Behnken

Collecting Techniques

How to collect randomly and not exceed 20%:

- Collect widely throughout the whole site.
  - Do not stay in one small area, as the plants might be related.

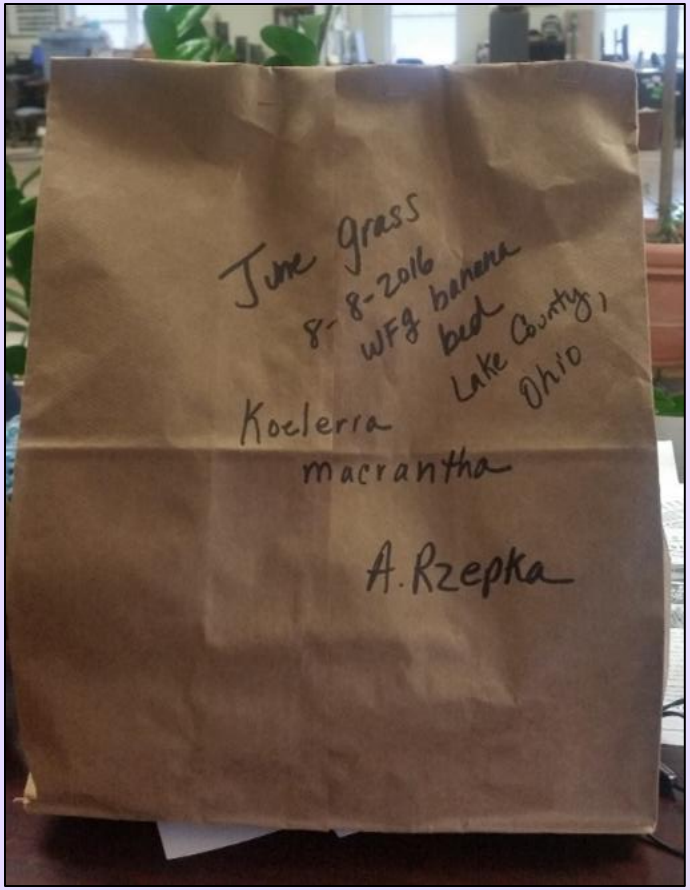
- Make sure to include plants that are in different microhabitats throughout the site (wetter, drier, steeper areas).

- Do not avoid plants that look different or are smaller than the others of the same species.

- Only collect from every 5th plant or 20% of the seed pods present on each individual.

General Seed Collection Information

- Examine a small representative sample of seeds before you collect
- Seed should be dry, dark, and loose in it's shell
- Do not collect empty or damaged seeds
- Estimate the number plants you collect from
- Take care of what you have collected
- Email or call State Lead after collection has been made



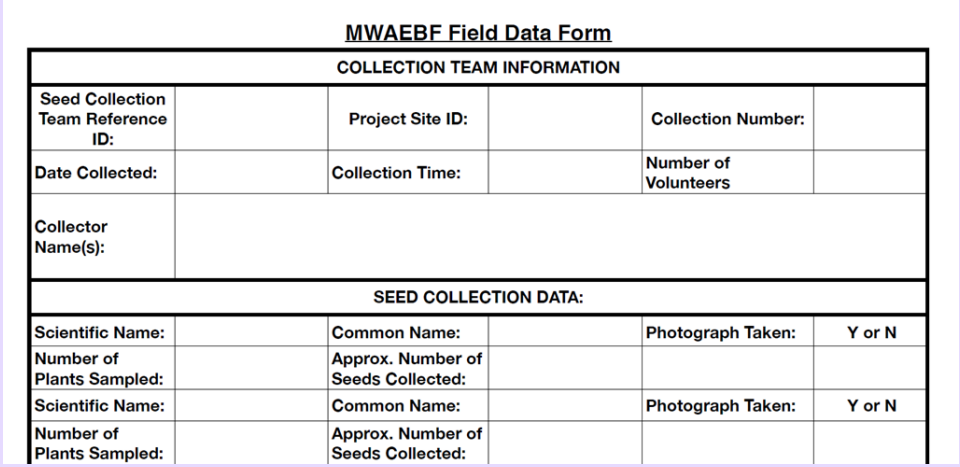
Labeling your seeds

Labeling your seed collection

- Plant name in Latin
- Common name
- Site location name
- County, State
- Collection date
- Collector(s) names
- Unique Seed Collection Reference ID Number

Field Documentation and Data Forms

- Record data in the field
- Fill out a separate data form for each species collected, even if the collection occurs at the same location
- Do not forget your Seed Collection Reference ID Number



MWAEBF Field Data Form

COLLECTION TEAM INFORMATION					
Seed Collection Team Reference ID:		Project Site ID:		Collection Number:	
Date Collected:		Collection Time:		Number of Volunteers	
Collector Name(s):					
SEED COLLECTION DATA:					
Scientific Name:		Common Name:		Photograph Taken:	Y or N
Number of Plants Sampled:		Approx. Number of Seeds Collected:			
Scientific Name:		Common Name:		Photograph Taken:	Y or N
Number of Plants Sampled:		Approx. Number of Seeds Collected:			

Seed Collection Reference ID Number Format

Examples:

Ohio collection team 1 collects their first collection of the season, *Asclepias incarnata*, at a local park. The seed collection reference number would be as follows:

OH.CT1.A-1

Ohio collection team 1 goes to the same site and their next collection is a new species (*Rudbeckia hirta*). The seed collection reference number would be as follows:

OH.CT1.A-2

- *If revisiting a site to collect a new species, utilize the same project site ID, but assign a unique collection number.*

Ohio collection team 1 now goes to a new site and collects from *Asclepias incarnata*. The seed collection reference number would be as follows:

OH.CT1.B-3

- *Even though it is the same species that was sampled at project site A, it is a different population (it is found at site B) with unique genetics, so it is recorded using a new collection number.*

MWAEBF Field Data Form

COLLECTION TEAM INFORMATION					
Seed Collection Team Reference ID:		Project Site ID:		Collection Number:	
Date(s) Collected:		Collection Time:		Number of Volunteers:	
Collector Names (*Circle data collector):*					

SEED COLLECTION DATA:			
Scientific Name:		Common Name:	
Number of Plants Sampled:		Photograph Taken:	Y or N

LOCATION DATA:					
State:		County:		Land Owner:	
Permission Filed:	Y or N	GPS Data Recorded:	Y or N	Managed Area Name:	
Latitude:		Longitude:			
Directions: Provide detailed directions to the collection site. Refer to nearby landmarks, roads, and towns. Include parking information and directions from parking area to collection site.					

HABITAT DATA					
Current Temperature:		Current Humidity:		Land Use Type:	
Non-Target Associated Species:					
SCOUTING INFORMATION: Target plant species in bloom but not ready for collection					
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
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Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Notes:					

Mock Collection

- Seed collection team OH.CT1 made their first collection of the season at 12:30 pm on April 24, 2017 at project site A.
- The collection team was comprised of 4 volunteers: Jane Doe (the data collector), Ravi Patel, Tyrone Jones, and Cindy Lee.
- They collected from about 57 plants of the species *Asclepias incarnata* (swamp milkweed).
- Site A is a park called Acacia, which is owned by Cleveland Metroparks, and it is located in Cuyahoga County, Ohio.
- Permission was filed in advance and the volunteers used their GIS App to record the GPS location of the site. The coordinates are: 41.50442, -81.49128.
- Using their phones, they also determined that the temperature was 65º F with 20% humidity.
- While at the site, they noticed that there were other target species present, but not ready for collection since they were currently in bloom. These were *Monarda fistulosa* (wild bergamot ~35 plants) and *Coreopsis tripteris* (tall coreopsis ~58 plants)
- The team also identified a few non-target associated species at the site: unknown grasses, red clover, Queen Ann's lace, goldenrod, and multiflora rose.

MWAEBF Field Data Form

COLLECTION TEAM INFORMATION					
Seed Collection Team Reference ID:	OH.CT1	**Project Site ID:**	A	**Collection Number:**	1
Date(s) Collected:	4-24-17	**Collection Time:**	12:30 pm	**Number of Volunteers:**	4
Collector Names (*Circle data collector*):	Jane Doe, Ravi Patel, Tyrone Jones, Cindy Lee				

SEED COLLECTION DATA:			
Scientific Name:	*Asclepias incarnata*	**Common Name:**	Swamp milkweed
Number of Plants Sampled:	57	**Photograph Taken:**	Y or N

LOCATION DATA:					
State:	Ohio	**County:**	Cuyahoga	**Land Owner:**	Cleveland Metroparks
Permission Filed:	Y or N	**GPS Data Recorded:**	Y or N	**Managed Area Name:**	Acacia
Latitude:	41.504442	**Longitude:**	-81.491285		

Directions: Provide detailed directions to the collection site. Refer to nearby landmarks, roads, and towns. Include parking information and directions from parking area to collection site.

Headed north on I-271 toward Lyndhurst, took Brainard Rd exit. Turned right onto Cedar Rd. Turned right, into the Acacia Reservation parking lot. Found the marked trail and walked about 50 meters to the collection field, located on the left side of the trail.

HABITAT DATA					
Current Temperature:	65°	**Current Humidity:**	20%	**Land Use Type:**	Urban, Rural, Park, ROW
Non-Target Associated Species:	Unknown grasses, red clover, queen ann's lace, goldenrod, and multiflora rose.				

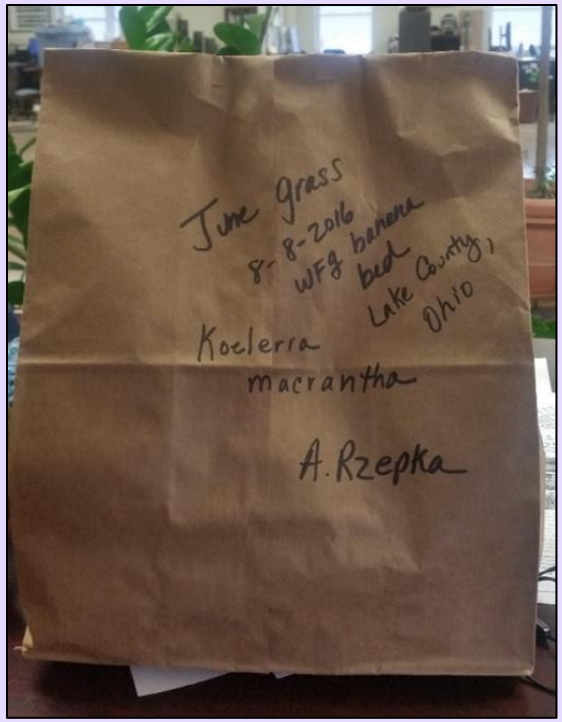
SCOUTING INFORMATION: Target plant species in bloom but not ready for collection					
Scientific Name:	*Monarda fistulosa*	**Common Name:**	wild bergamot	**Approx. Number of Plants Present:**	35
Scientific Name:	*Coreopsis tripteris*	**Common Name:**	tall coreopsis	**Approx. Number of Plants Present:**	58
Scientific Name:		**Common Name:**		**Approx. Number of Plants Present:**	
Scientific Name:		**Common Name:**		**Approx. Number of Plants Present:**	
Scientific Name:		**Common Name:**		**Approx. Number of Plants Present:**	
Scientific Name:		**Common Name:**		**Approx. Number of Plants Present:**	
Scientific Name:		**Common Name:**		**Approx. Number of Plants Present:**	

Notes:

Drying Your Seeds

- Seed should be dried for 3 days prior to shipping in a dry, dark room with low humidity.
- If you have space:
  - Lay out newspaper and spread the collection out – 1 layer thick.
  - A fan on its lowest setting, gently blowing over the seed can expedite the drying process.
- If you don't have space:
  - Leave the seed in the bag, but leave the bag open and stir the seeds at least once a day.
  - A fan on its lowest setting, gently blowing over the bag can expedite the drying process.

Big paper grocery bag



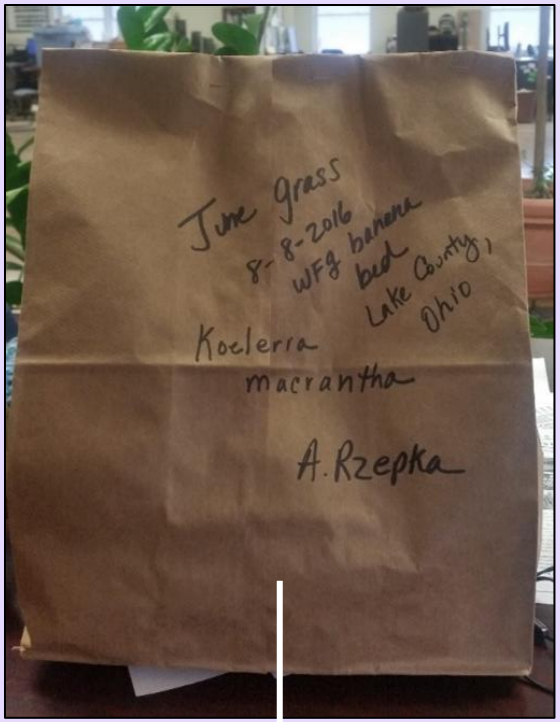

Source: Agriculture Magazine

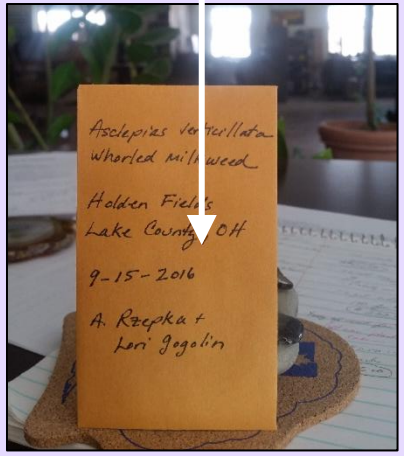
Storing Your Seeds

Only if unable to ship seed immediately after drying to Mason State Nursery

- Clean seed – remove all chaff
- Put seed into a paper bag
- Put seed in a dry, dark room with low humidity until they can be mailed
- If the collection bag is different from the storage bag, transfer the label information

Big paper grocery bag

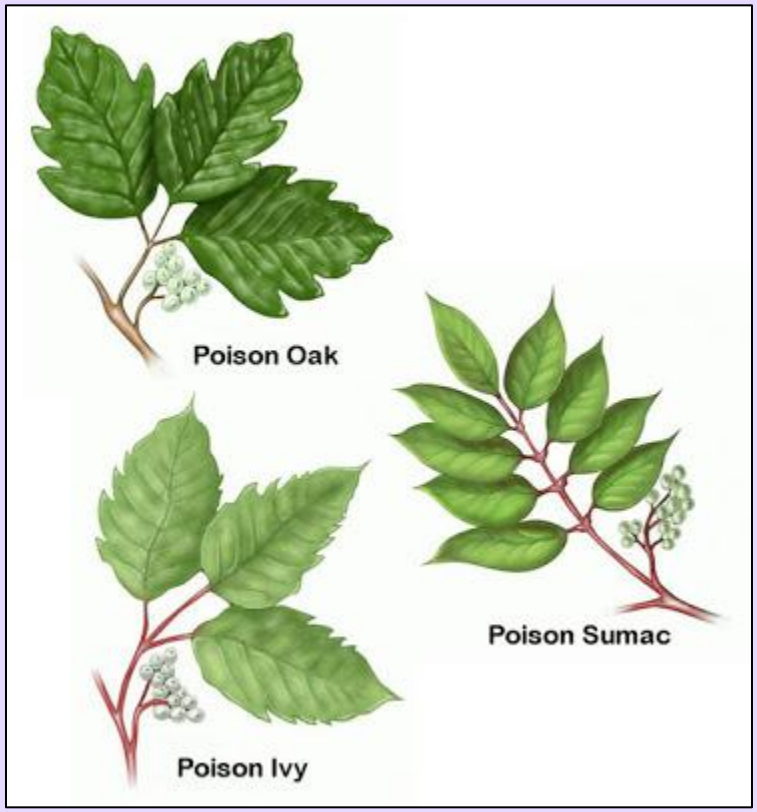




Tiny coin envelope

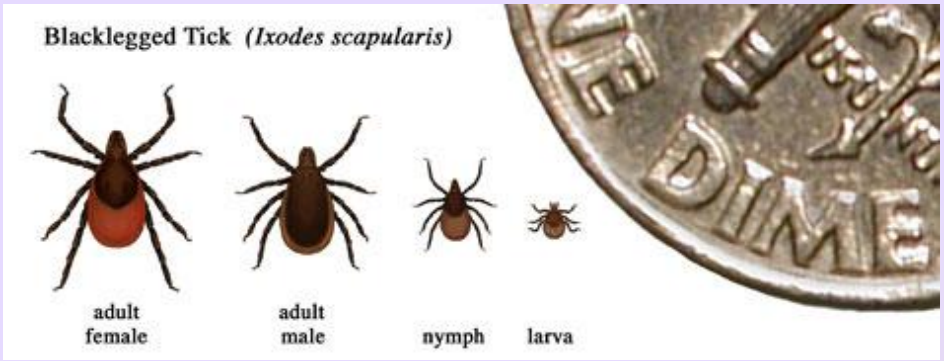
Other things to keep in mind

- Safety Concerns
- Controlling the spread of noxious weeds
- Photo Documentation
- GIS App



Safety Concerns

- Be careful when handling milkweed pods
- Remember to hydrate
- Wear bright clothes near roads
- Check for ticks and chiggers
- Keep an eye out for poison ivy, poison oak, and poison sumac



Controlling the Spread of Noxious Weeds

- Educate yourself before you visit the site
- Come clean
- Pay attention to your surroundings
- Leave clean

Photo Documentation and GIS App

At least three photos should be taken for each collection:

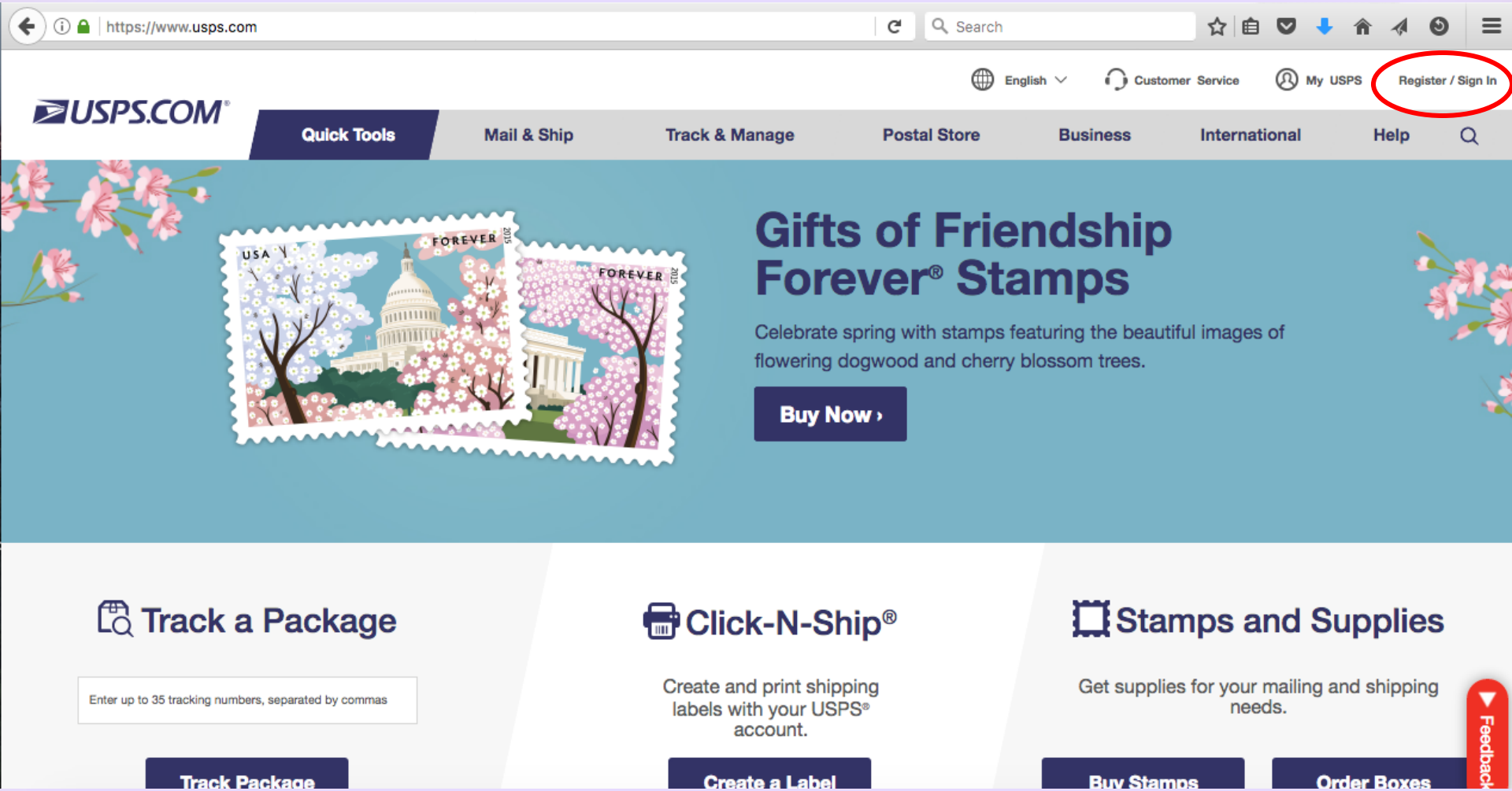
- Landscape level / population
- Individual plants
- Material collected (seed)
- When possible, close up of flower and leaf structure

Sending Your Seeds

- Ship your seeds via USPS.
- Unless directed otherwise, ship your seeds directly to Mason State Nursery.
- Do not mail your seeds out on Thursday or Friday.

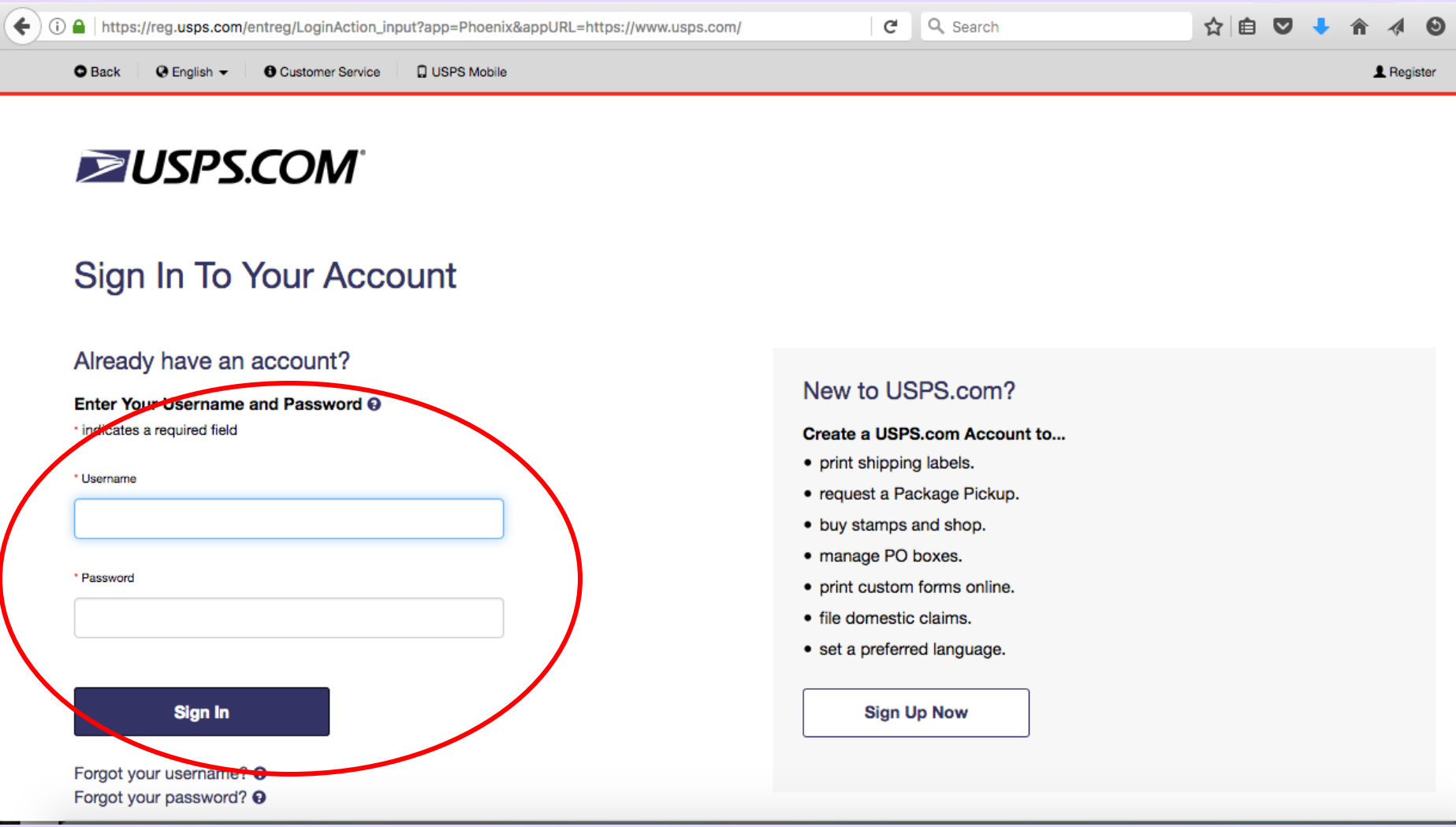
- Always check the estimated delivery before mailing to ensure seed arrives before the weekend.
- **Send a copy of the field data form with each collection and make sure the bag is also labeled.**
- Use a free USPS priority mail flat rate box.

How to ship via USPS:



- Visit www.usps.com
- Click the Register/Log in option to access the project USPS account

How to ship via USPS:

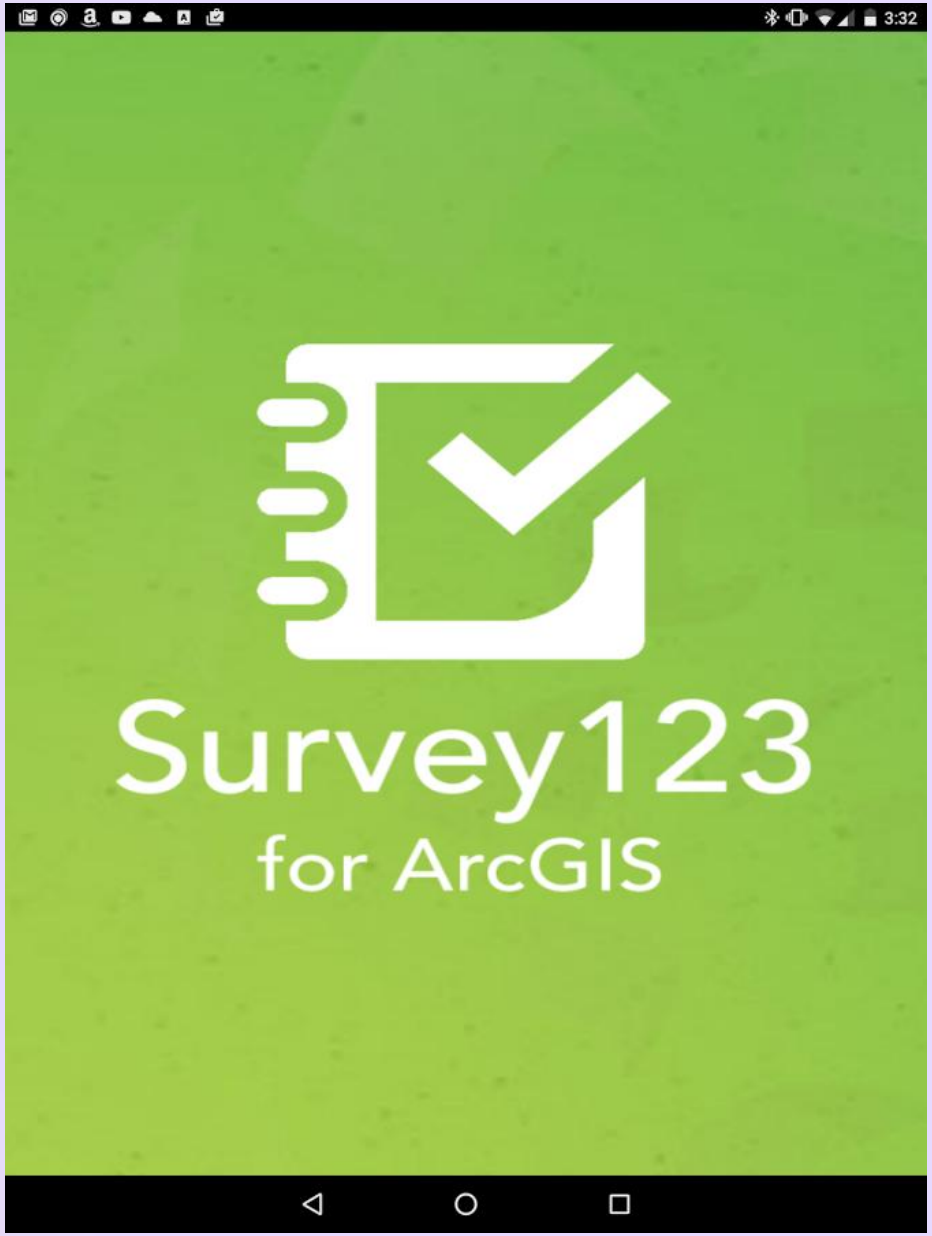


- Log in to the project USPS account
  -If you are responsible for the shipment of the seeds, contact your State Lead or Pollinator Partnership for login credentials.

How to ship via USPS:

- Once you've processed the payment for the postage, you can print the label and securely tape it to the top of the box

- You can either:
  - Hand deliver the package to any USPS Post Office
  - Schedule a pickup with your daily mail pickup
- Make sure:
  - The package is received by a postal worker on the same day
  - The package is never left in an uncontrolled, hot, or humid environment
- Contact your State Lead or info@pollinator.org to confirm seed has been shipped.
- See Seed Collection Protocol – provided by your state lead - for detailed instructions.

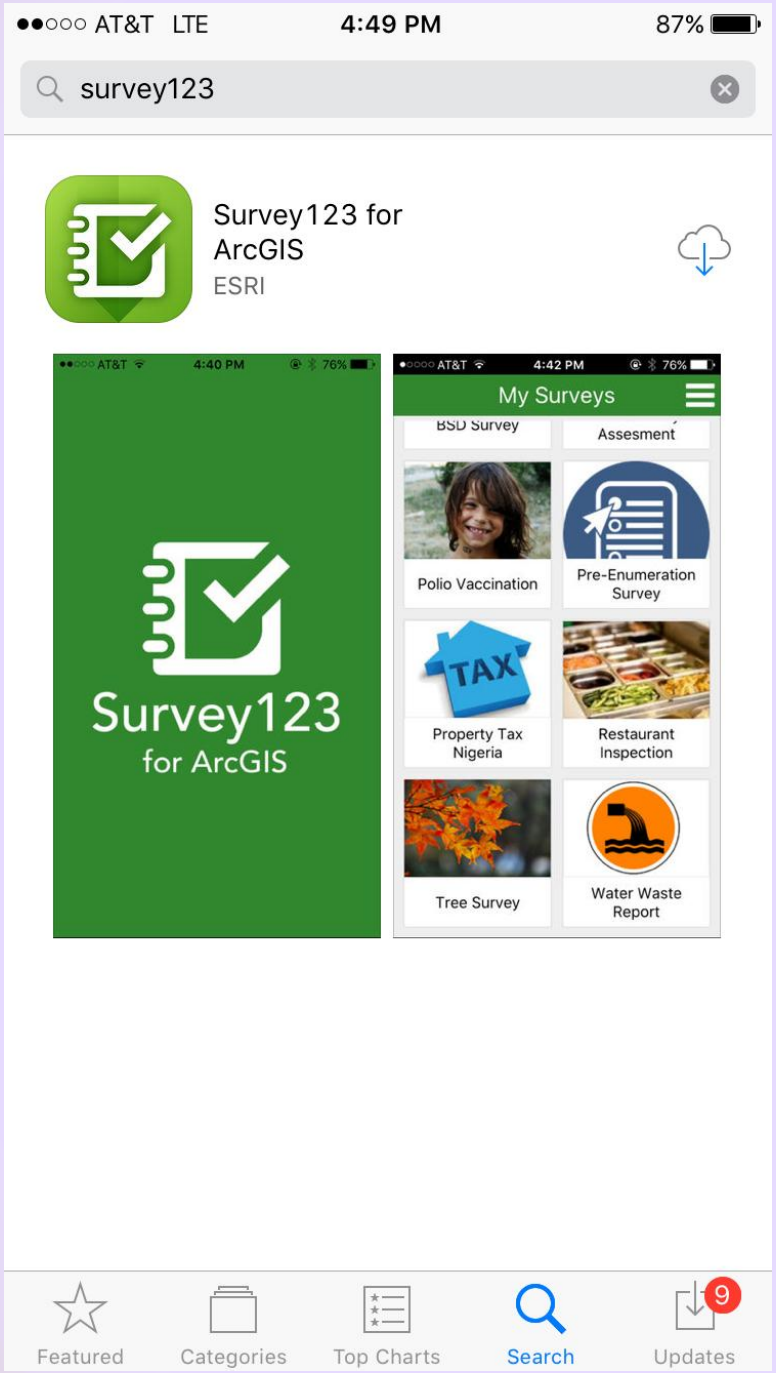


- **Completed using:**
- Web browser OR Free mobile app called "Survey123 for ArcGIS“
  - Apple, Windows Mobile or Android devices.

- If you don’t have a smart phone, no worries! Look at your neighbor’s.

- 1-2 designated data collectors per team.

- The paper ‘field work’ forms also need to be completed



1.) To download the Survey123 app on your smart phone, first navigate to the App Store.

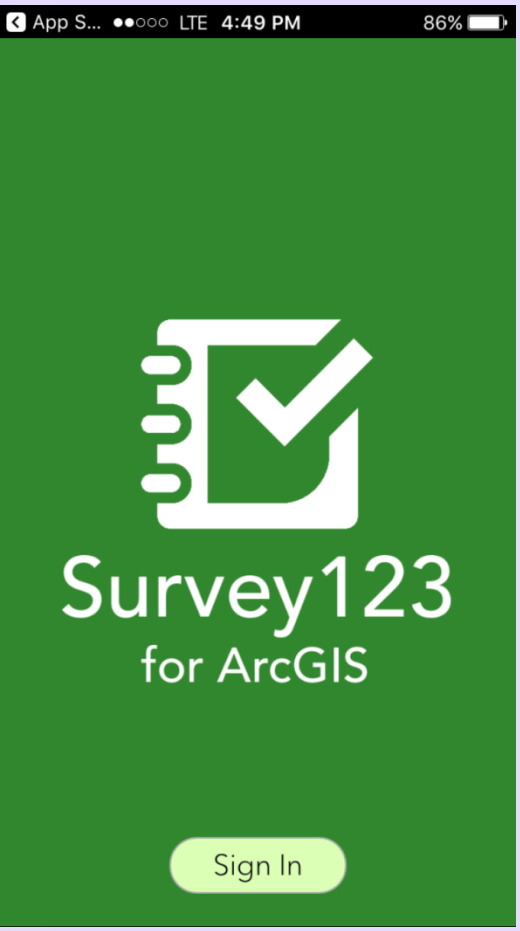
2.) Search for "Survey123"

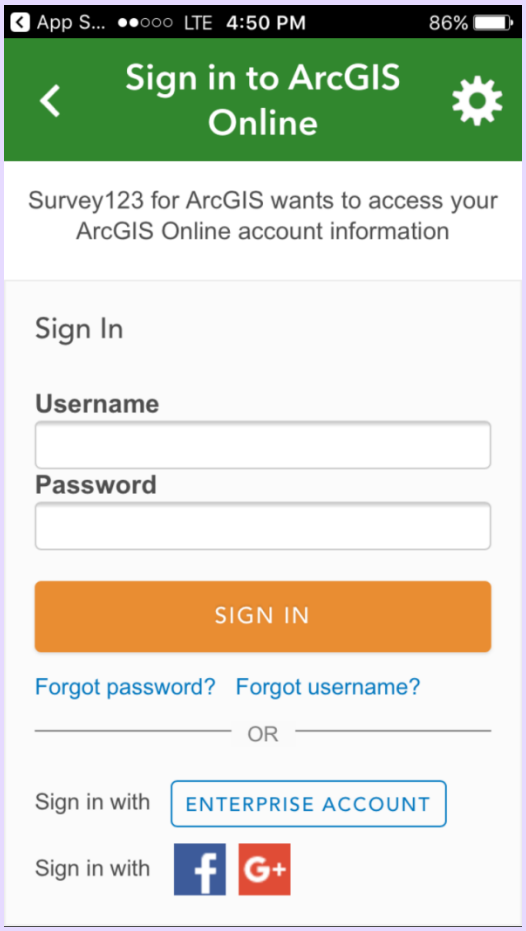
- Locate and install

Depending upon the type of mobile phone you're using, here's where to download the app online:

iTunes download (Apple):
https://itunes.apple.com/us/app/survey123-for-arcgis/id993015031?mt=8

Google Play download (Android):
https://play.google.com/store/apps/details?id=com.esri.survey123&hl=en





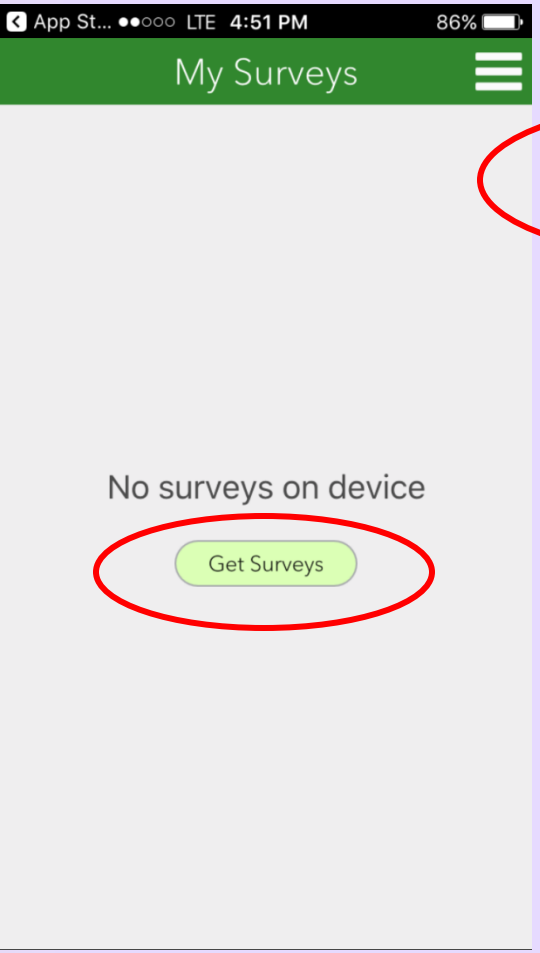
3.) After install, use your credentials to sign-in to the Survey123 app.

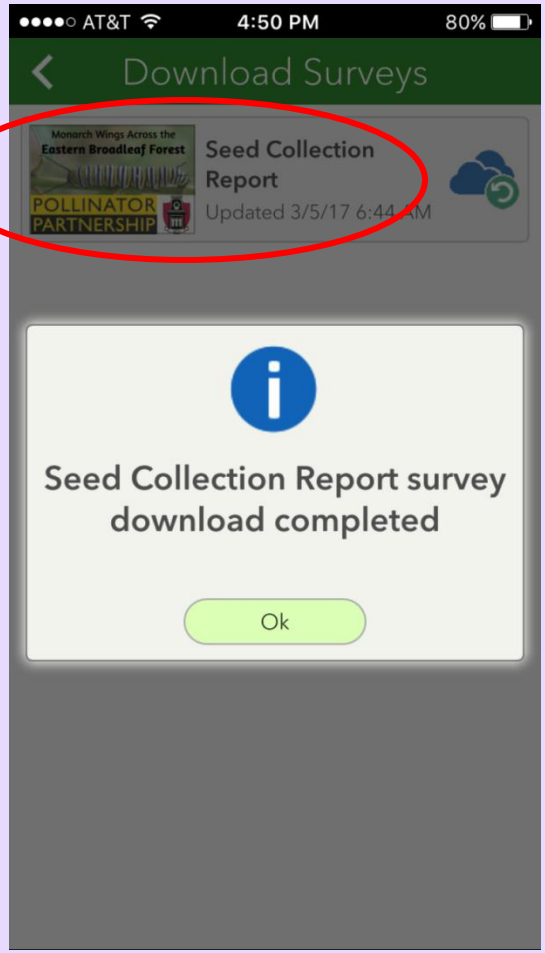
Normally you will use the credentials provided to you by the state lead and Brian Culpepper.

Today, we're using a set of credentials <u>made specifically for this training</u>.

username	**password**
p2ohuser	p2seed17

This practice log-in information will not be used for seed collections outside of today's training.

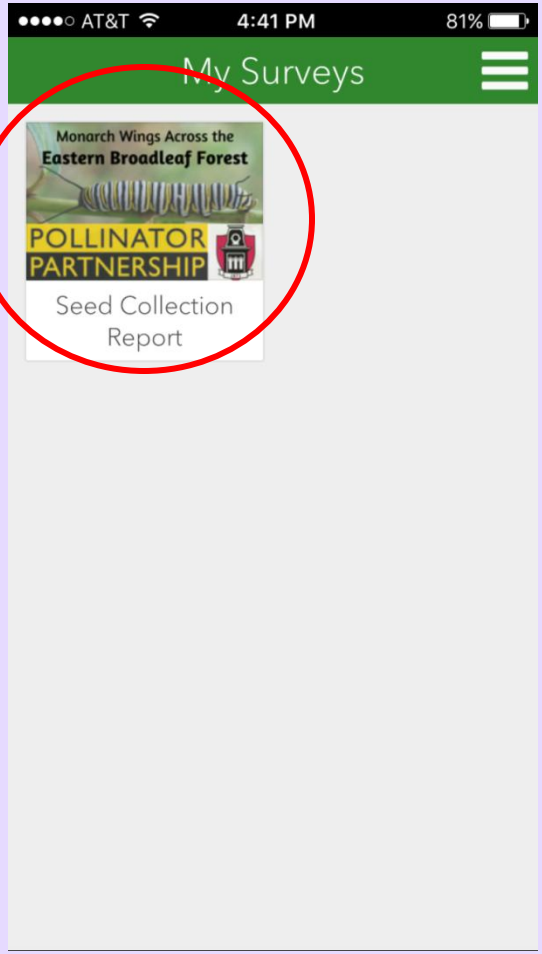




4.) Next, you will need to download the Seed Collector Report survey.

- Click "Get Surveys"
- To download: select "Seed Collection Report"
- It should now display in the "My Surveys" home screen.

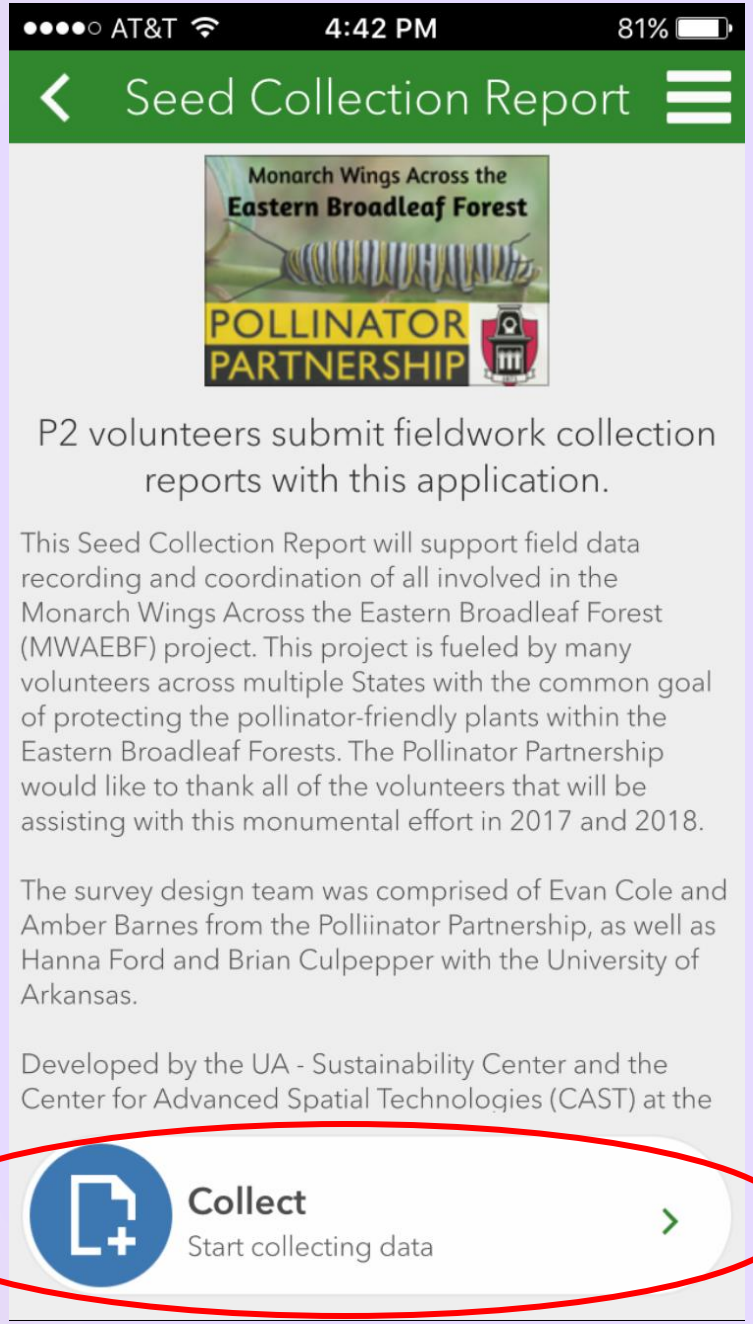
Using the App in the field:



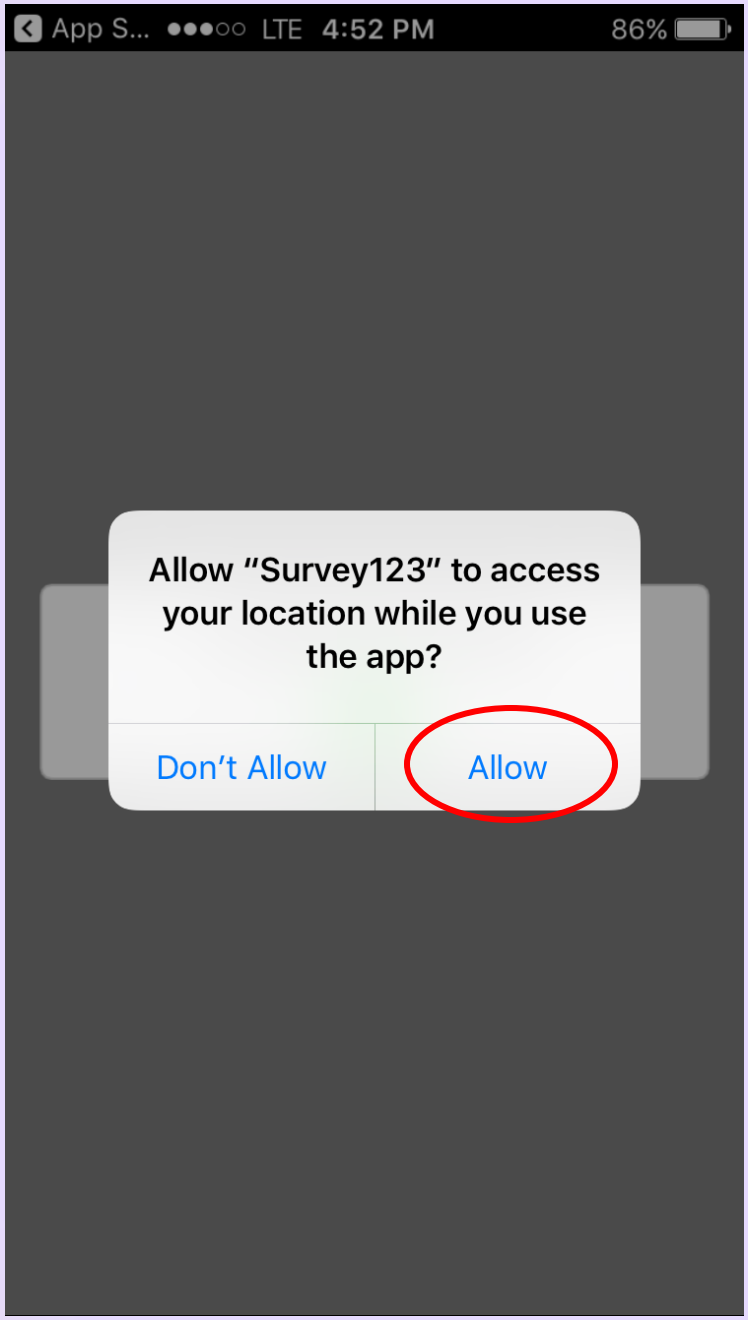
1.) Now that you've installed the app and downloaded the survey, you are all set to begin collecting data!

- This survey app can be used when 'off-line' and should work whether you have wi-fi / cell service or not.
- *However*, once you return to cell service or wi-fi, you must remember to submit those 'draft' survey responses so that they are sent to the database.

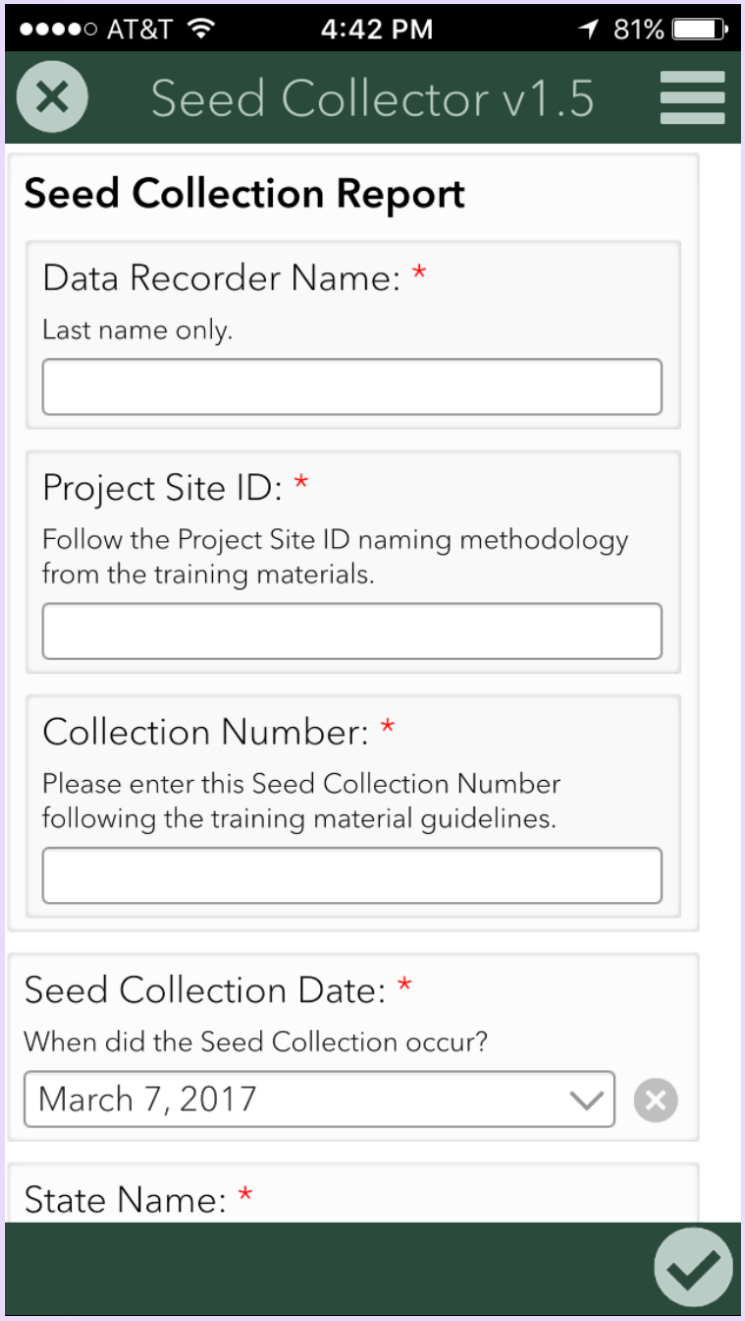
2.) Select Seed Collection Report on the "My Surveys" home page to be directed to the survey's home page.



3.) To begin collecting data, select the "Collect" button at the bottom of the Seed Collection Report home page.



4.) Select "Allow" so that the app can auto-locate your point based on your phone's GPS coordinates.



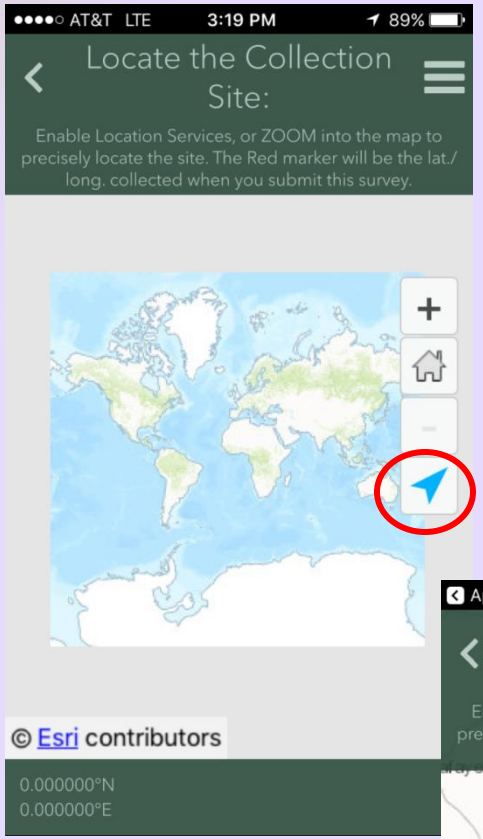
5.) Fill out the form starting with "Data Recorder Name."

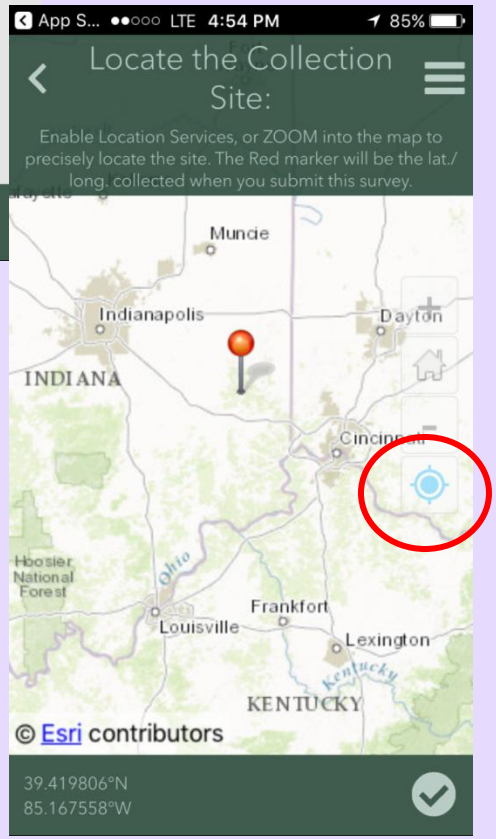
- **TODAY ONLY - enter TEST as the name**

- Note that **fields marked with asterisks are required** in order to submit the survey.

6.) Refer to the training manual for the appropriate Project Site ID and Collection Number formats.

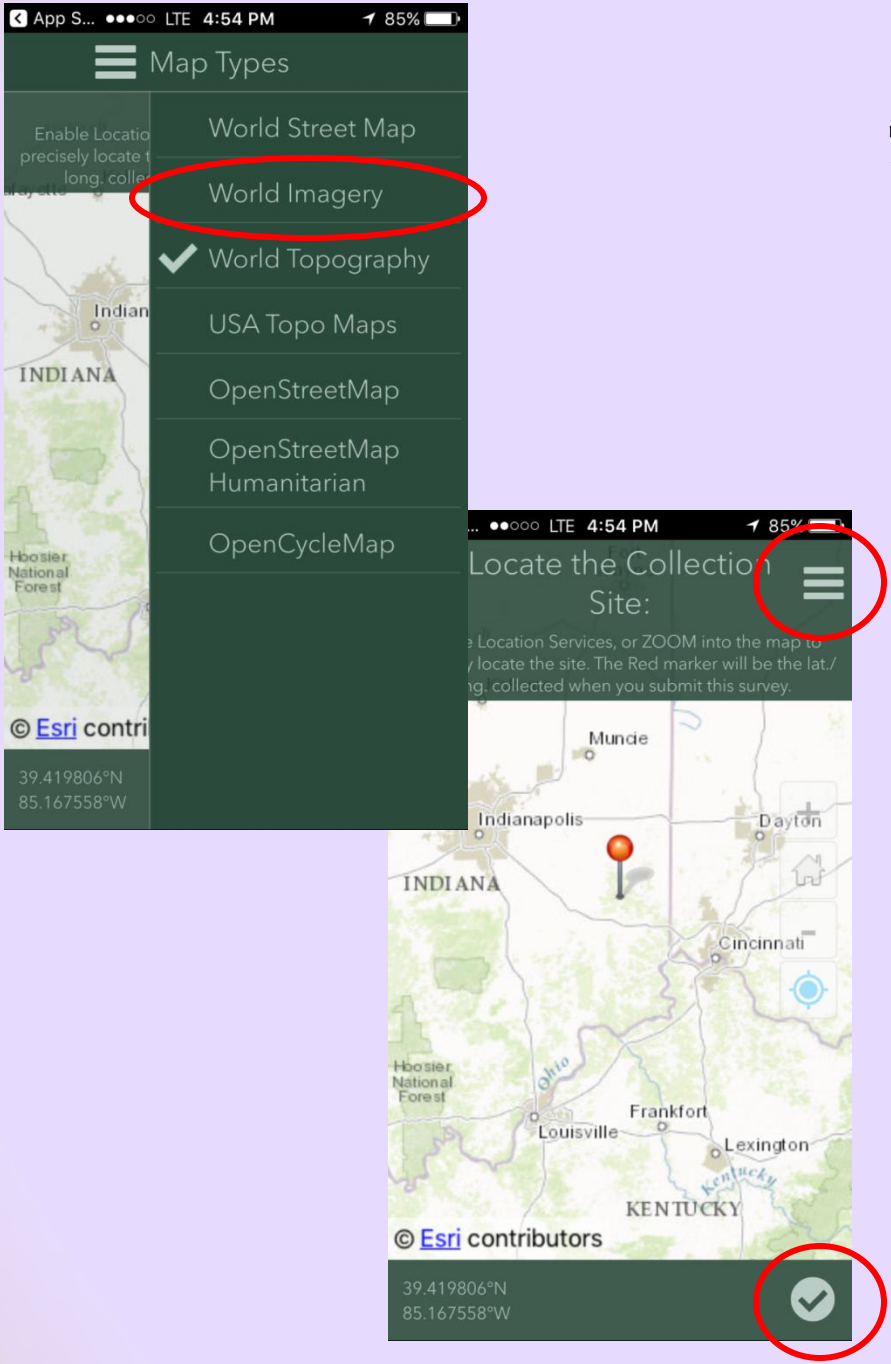
- Your State Lead will assign each team an unique Collection Team ID





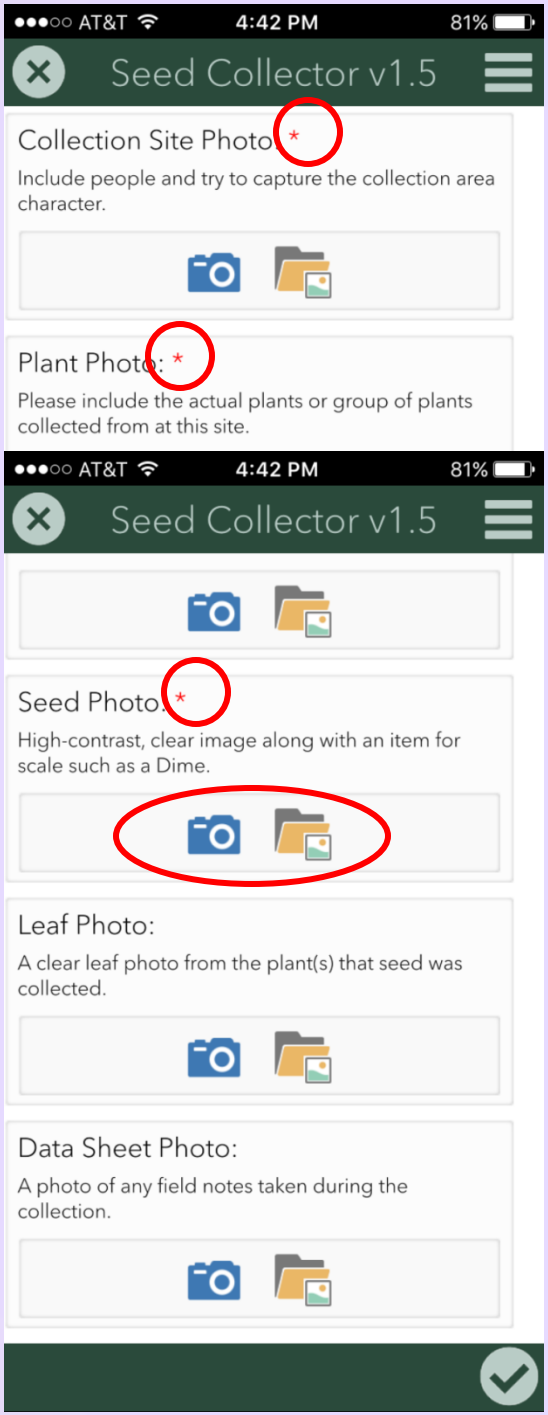
7.) Locating the collection site:

- To auto-locate: select the bullseye on the map.
- You need to allow the app to access your location for this feature to work.
- You can toggle between the blue arrow and bullseye buttons to switch between auto-locate and manual-locate.



7.) Locating the collection site:

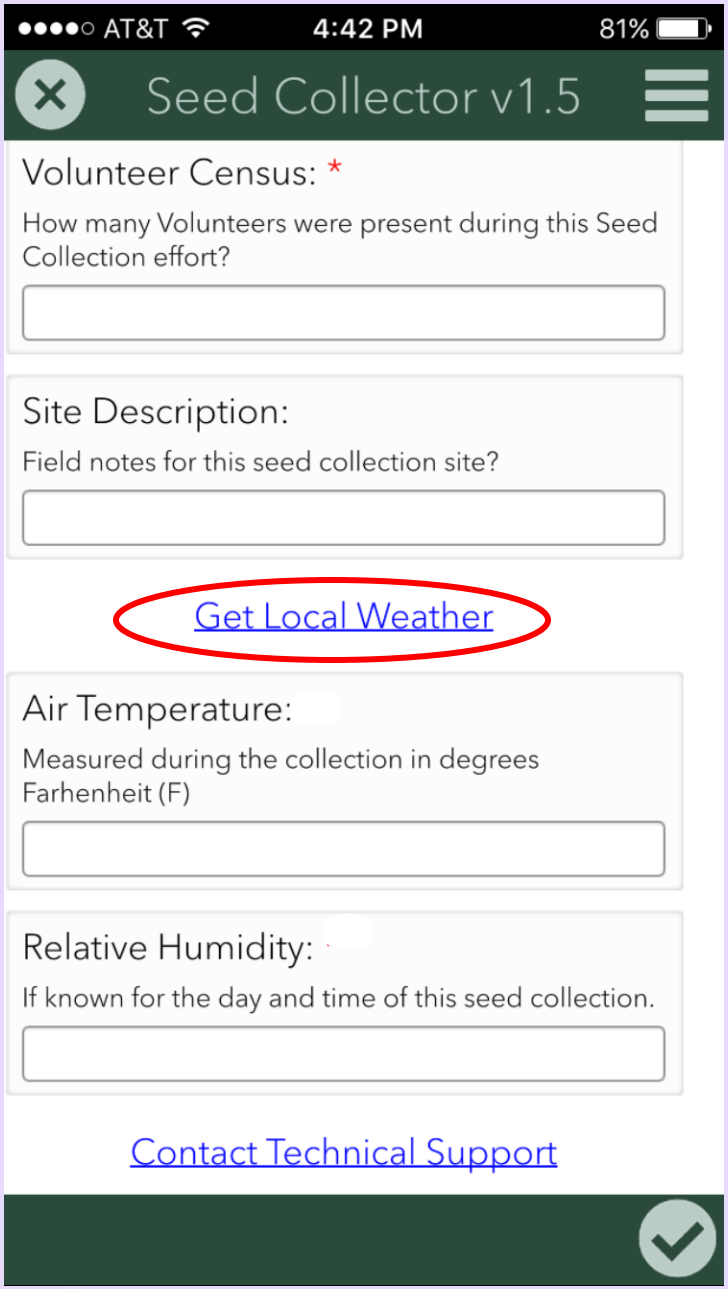
- Switching to "World Imagery" may help you determine your exact location based on nearby features.
- To manually locate the collection site, select the map and drag the pin to the appropriate location.
- Pinch to zoom or use the "+" or "-" buttons.
- When satisfied with the position of your point, select the green check mark at the bottom-right of the screen to confirm your location.



8.) Photos can be submitted in two ways:

- Click the camera icon to take a photo directly through the app
- Click the folder icon to select a photo from your saved pictures.

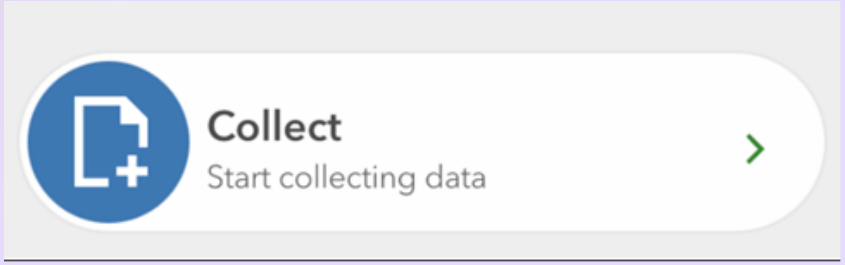
- **Note**:
- The **first three** photo fields **are required** (indicated by *).
  - Collection Site
  - Plant
  - Seed
- The last two are optional.
  - Leaf
  - Data Sheet

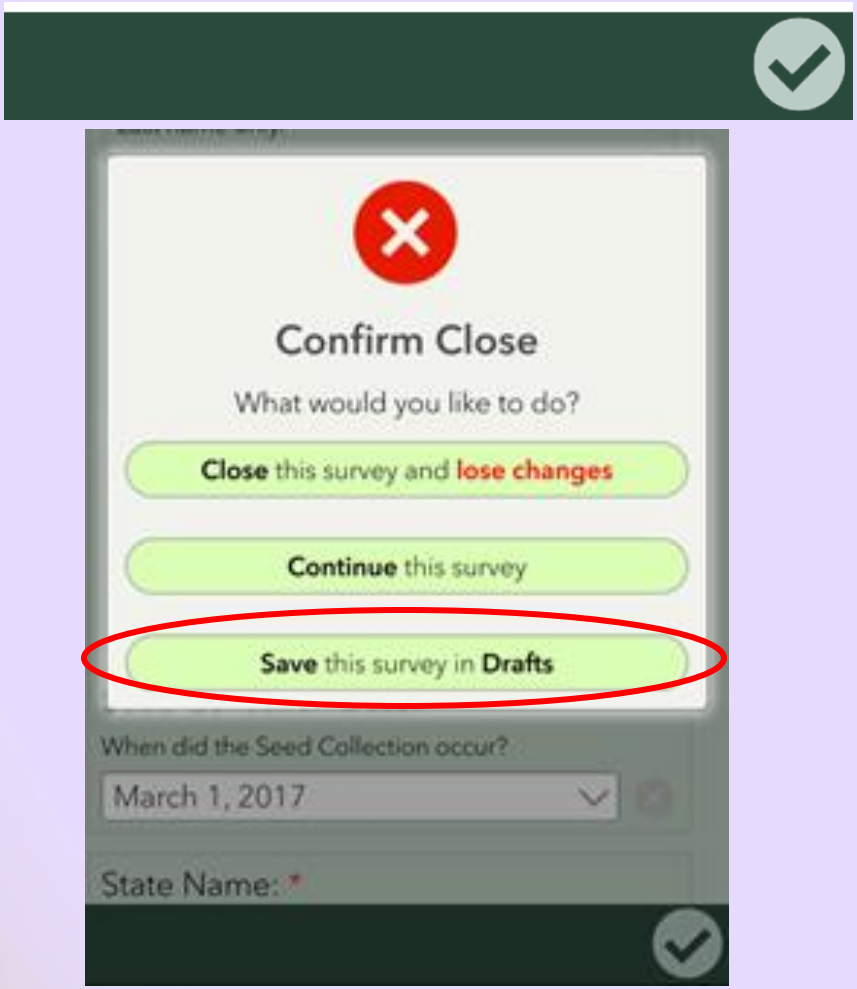


9.) Click the "Get Local Weather"

- Directs you out of the app to your browser.
- Enter zip code to get weather data.
  - -Air Temperature and Relative Humidity

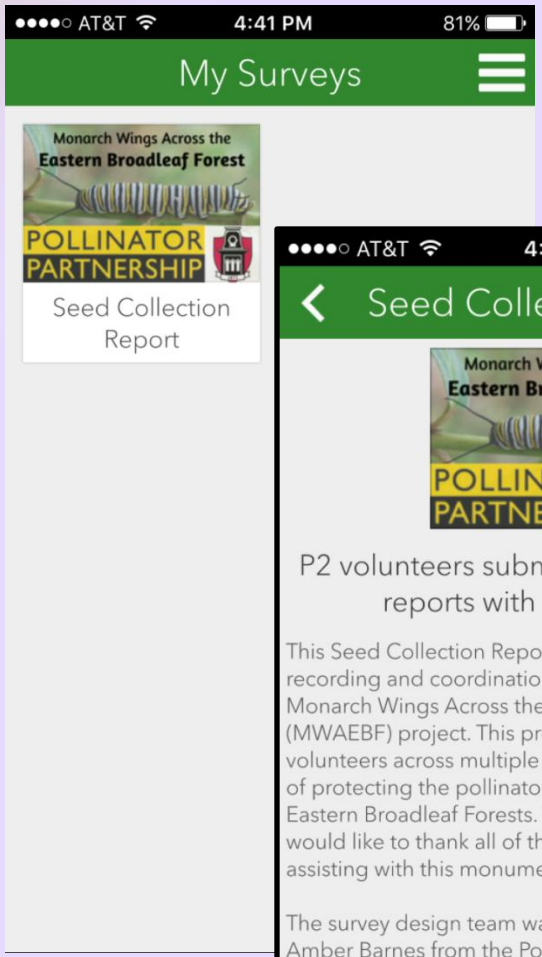
- Return to the app to enter in the information in the final two fields of the survey form.

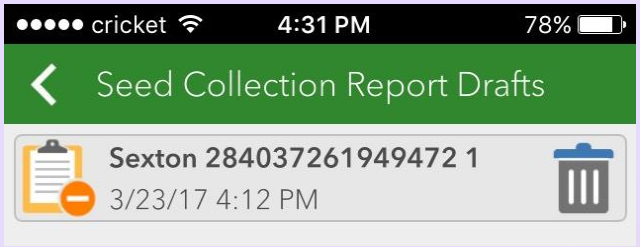




Summary of Survey Workflow:

- Start collecting
- Fill out the form
- Set location
- Take photos
- Double check that all data is correct
- Close the App to save draft or hit checkmark to submit survey



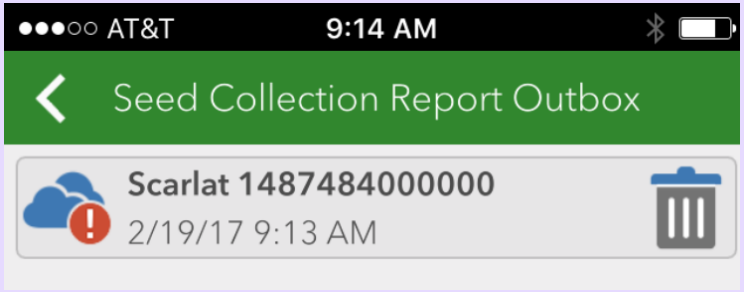


Accessing and completing drafts:

- You can see active drafts when you open up the survey.
- If you select drafts, it will bring you to a list of drafts that need to be completed.
- Select the draft to open and complete the survey.

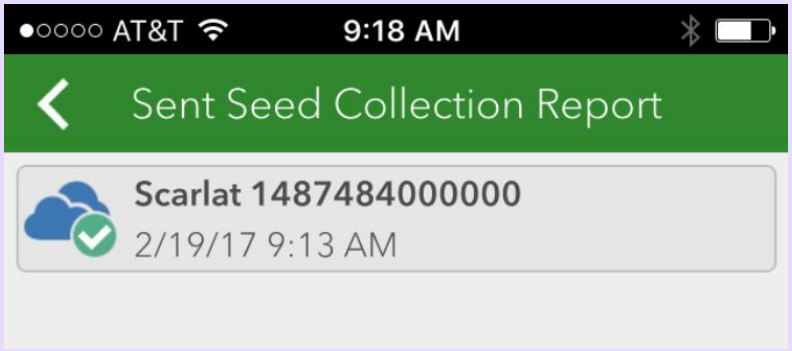
- **Completed unsent surveys:**
  - Outbox folder
  - Number will be **red**
  - Retry until survey is successfully submitted

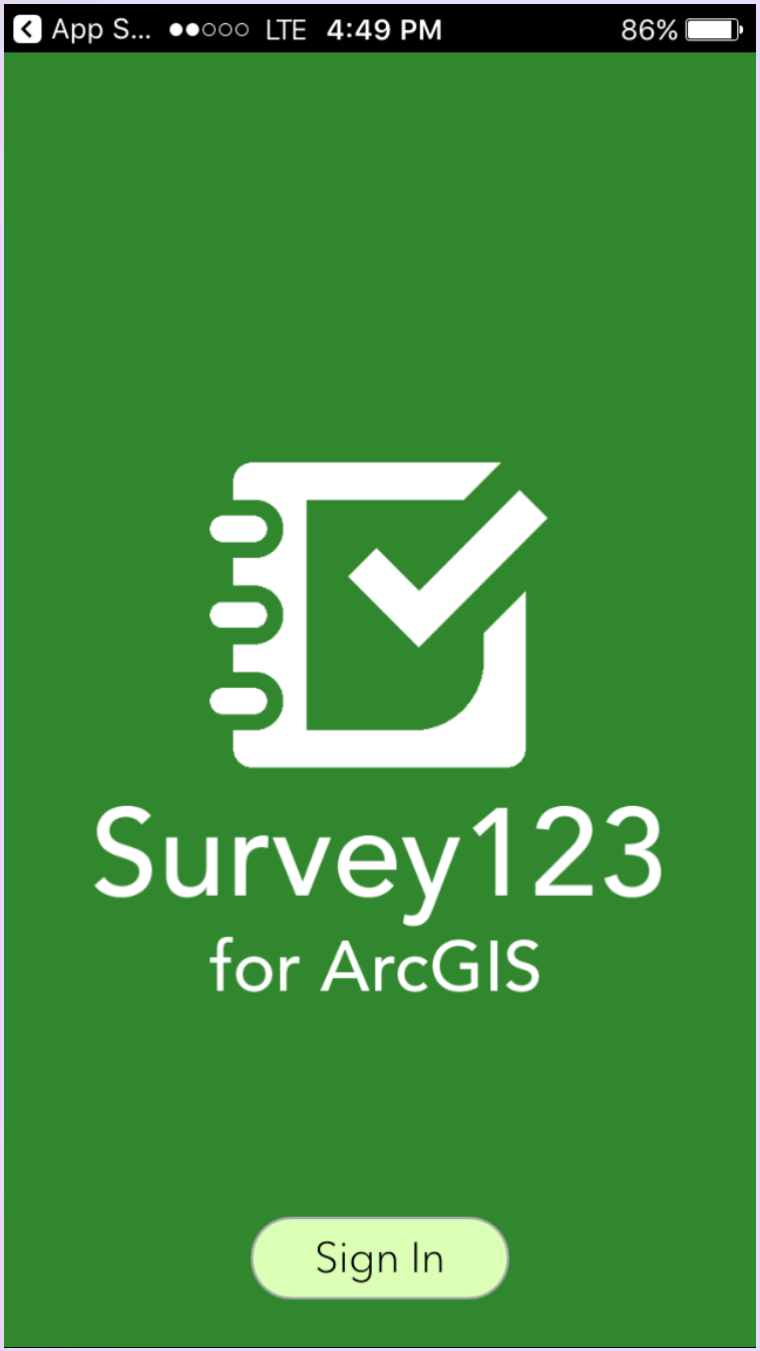
- **What causes this?**
  - Loss of cell signal or wifi interruptions



- **Successfully sent surveys:**
  - Sent Folder
  - Logo and number are **grey**

- If you select the sent box, it will take you to your completed surveys.
  - These surveys will have a **green** checkmark





You are now ready to collect data!

If you have any troubles with the App, please contact the Pollinator Partnership (info@pollinator.org) or Brian Culpepper (brian@cast.uark.edu) at the University of Arkansas, Fayetteville for assistance.

Any questions?















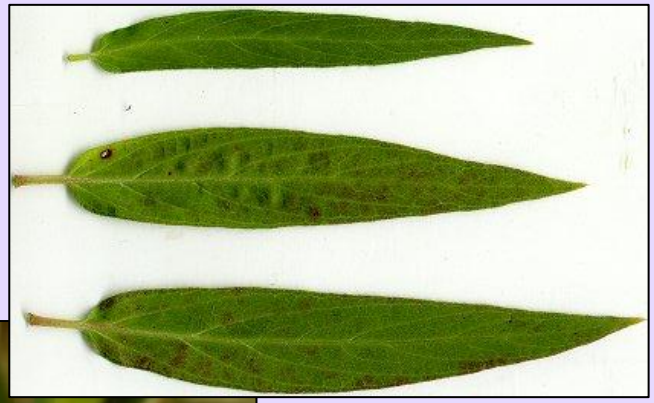
Meet The Species!

Asclepias spp., Milkweeds

Common Milkweed ***Asclepias syriaca***	**Swamp Milkweed** ***Asclepias incarnata***	**Whorled Milkweed** ***Asclepias verticillata***
		

Asclepias syriaca, common milkweed

Asclepias incarnata, swamp milkweed



Asclepias verticillata, whorled milkweed

Don’t be fooled

Collecting Milkweed Seeds

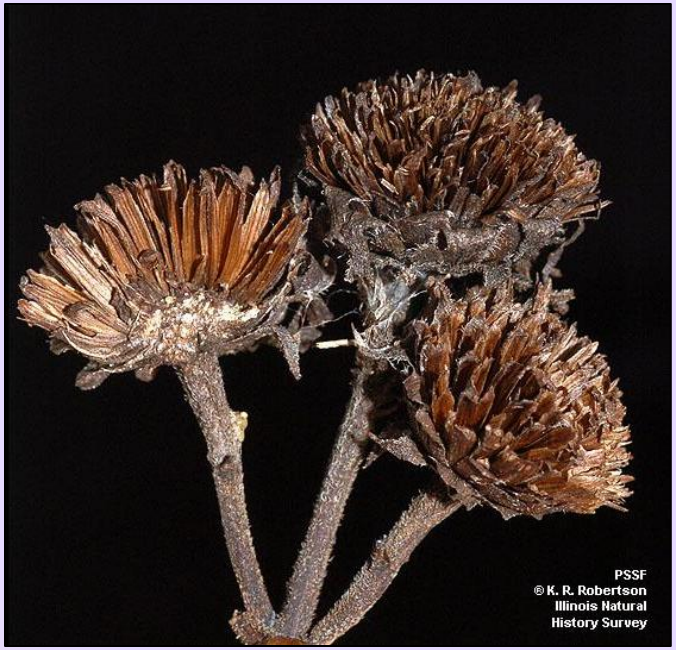
Please do not put these in your collection bag

Composite seeds that can be shaken out or gently mashed

- *Heliopsis helianthoides*
- *Coreopsis tripteris*
- *Ratibida pinnata*
- *Rudbeckia hirta*

Heliopsis helianthoides

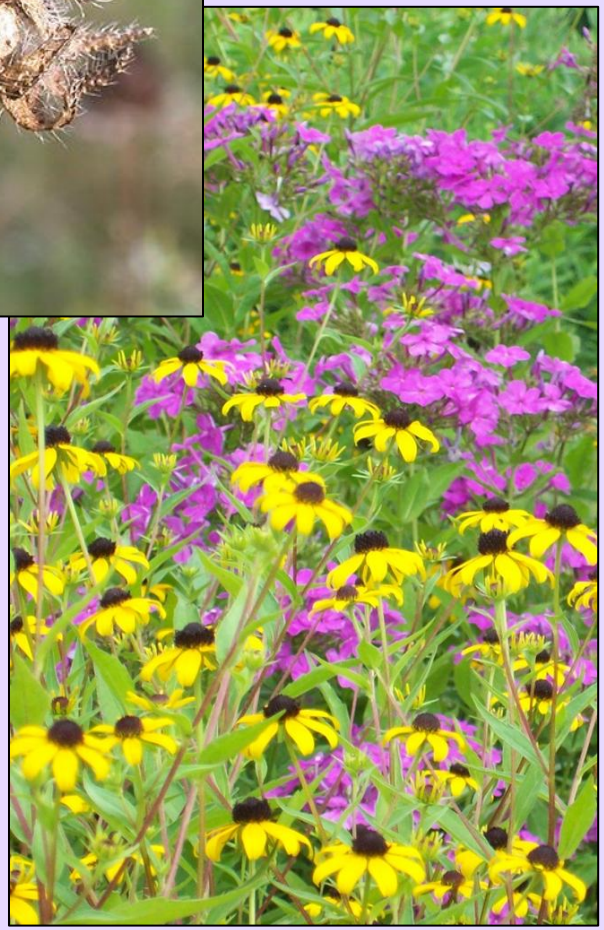
ox-eye sunflower



Coreopsis tripteris
tall coreopsis

Ratibida pinnata
yellow coneflower

Rudbeckia hirta
black – eyed Susan

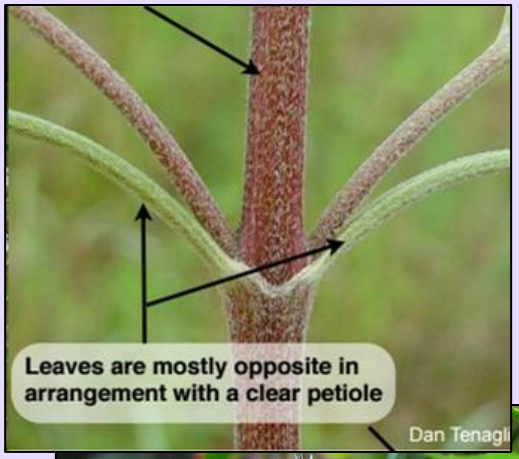


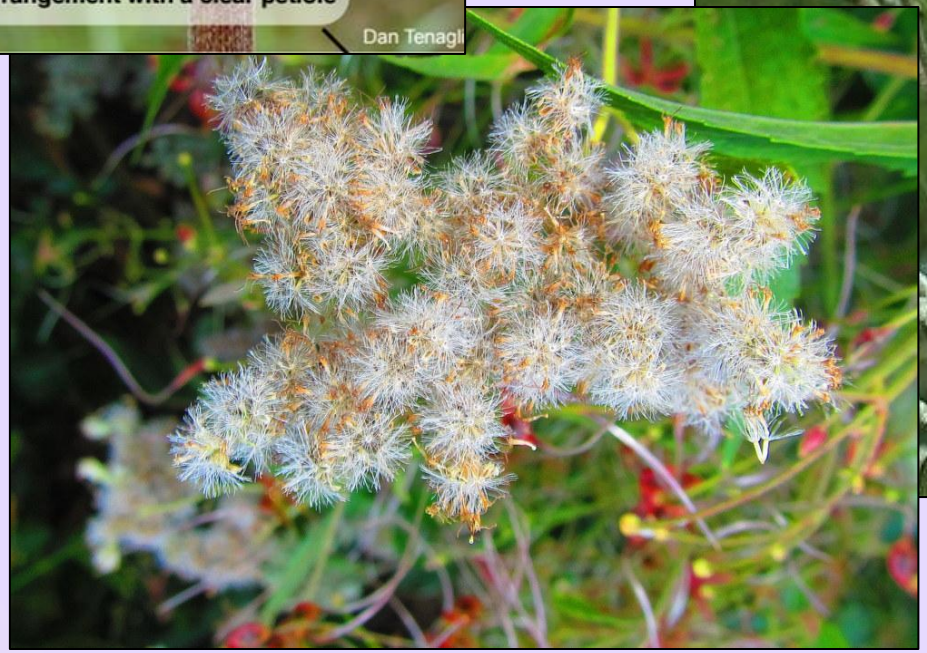
Composite seeds that fly away

- *Eupatorium serotinum*
- *Eupatorium perfoliatum*
- *Symphyotrichum laeve*
- *Symphyotrichum novae-angliae*
- *Symphyotrichum pilosum*
- *Vernonia gigantea*

"Whoa! Watch where that thing lands—we'll probably need it."

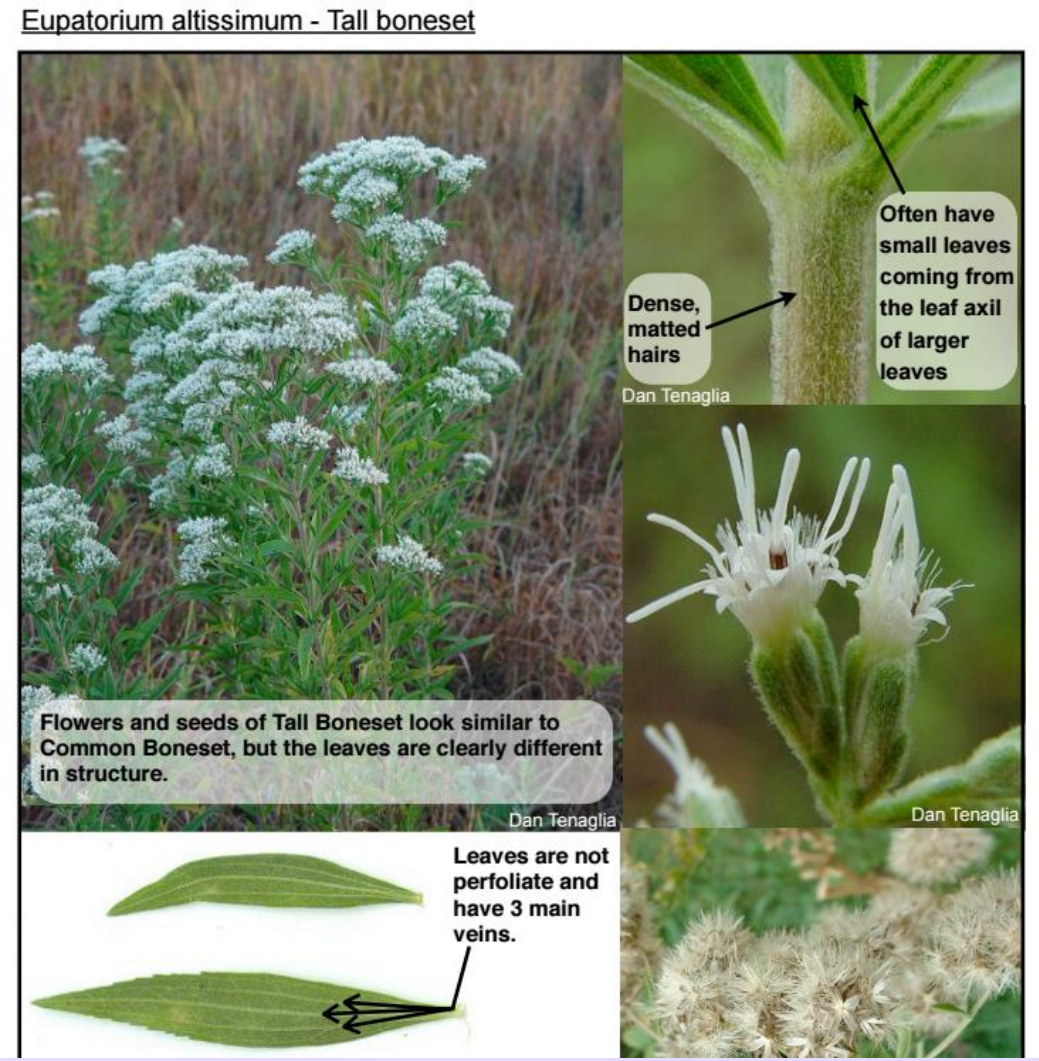
Eupatorium serotinum
late boneset





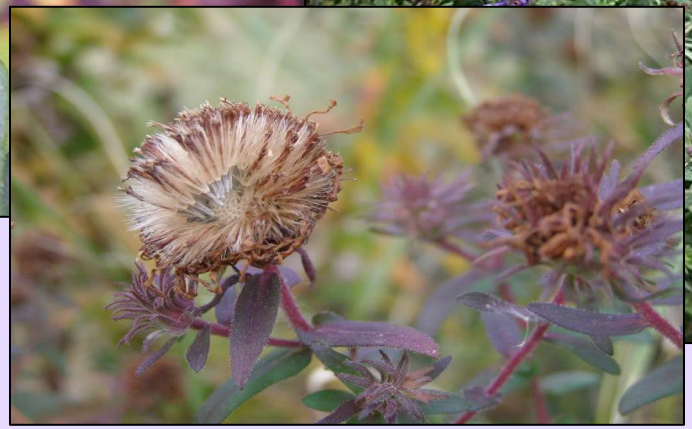
Eupatorium perfoliatum
common boneset

Don’t be fooled



Symphyotrichum laeva
smooth blue aster

Symphyotrichum novae – angliae
New England aster



Symphyotrichum pilosum
frost aster

Vernonia gigantea
giant ironweed

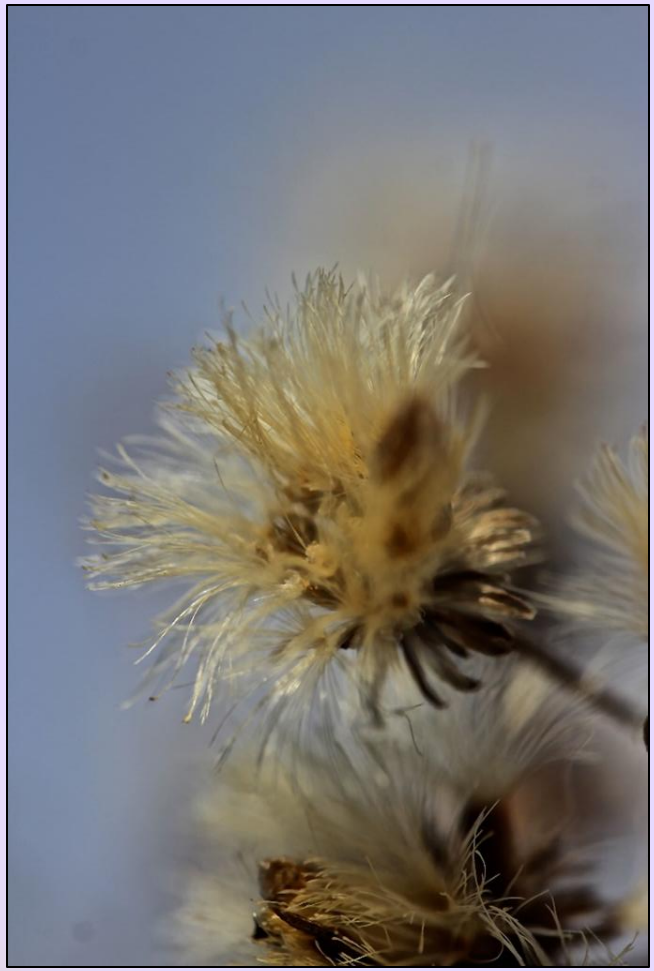
Don’t be fooled

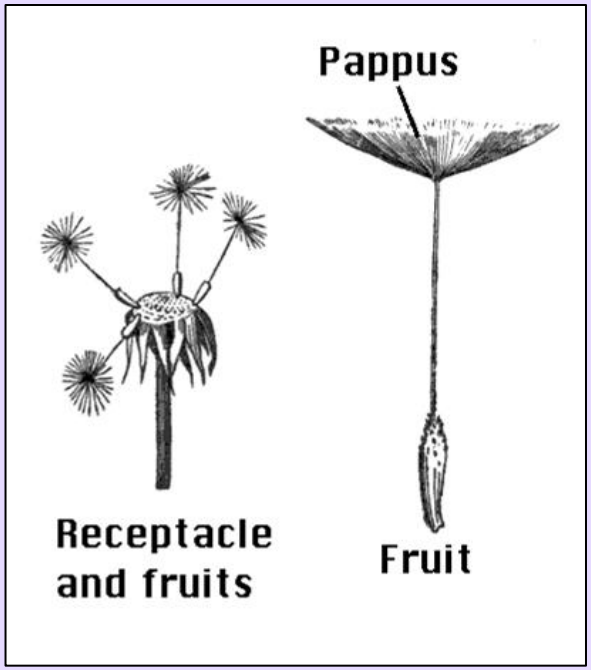
Vernonia fasciculata - Smooth Ironweed

Keys to distinguishing Smooth Ironweed from Giant Ironweed:

- Has hairless leaves and stems
- Will sometimes have black dots on the underside of the leaves.
- Narrower leaves: ½” or less vs. over ½” wide.
- Condensed flowering head vs. spreading.

Collection of seeds from composite flowers that fly away





All the rest

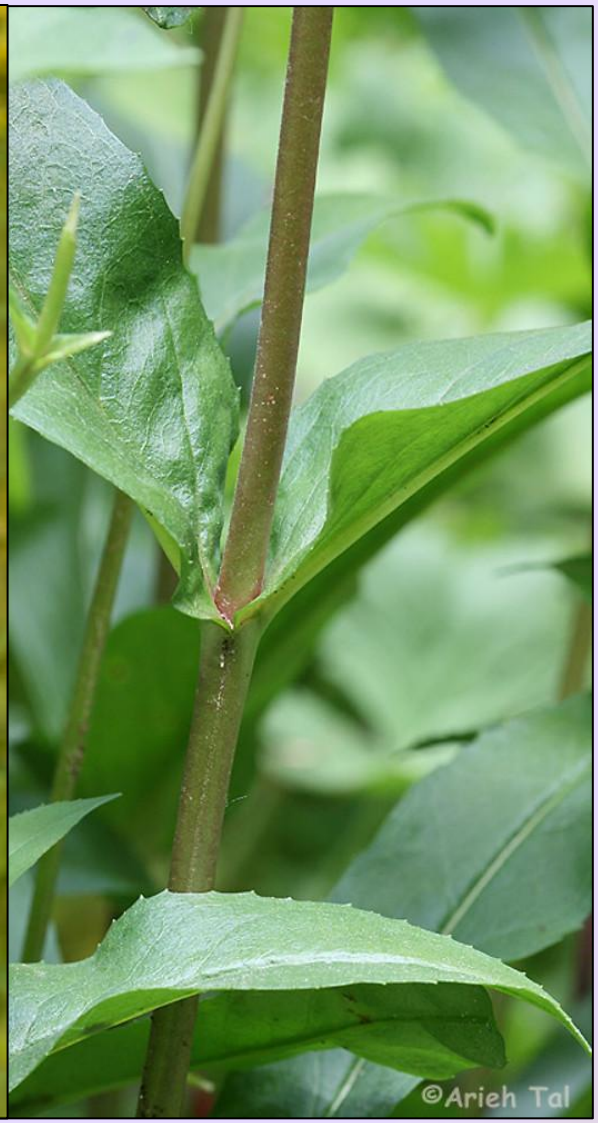
- *Chamaecrista fasciculata*
- *Monarda fistulosa*
- *Pycnanthemum tenuifolium*
- *Penstemon digitalis*
- *Tradescantia ohiensis*
- *Verbena urticifolia*
- *Zizia aurea*

Chamaecrista fasciculata

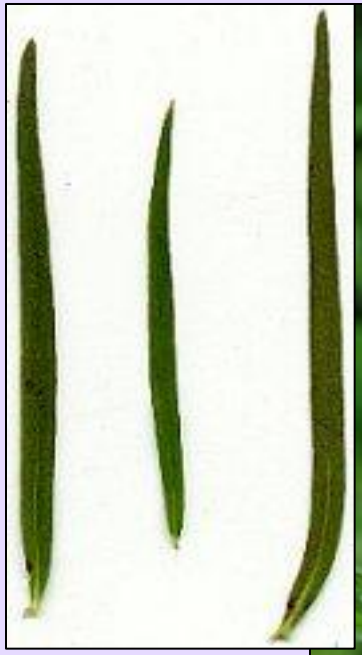
partridge pea

Monarda fistulosa
wild bergamot

Penstemon digitalis
foxglove beardtongue

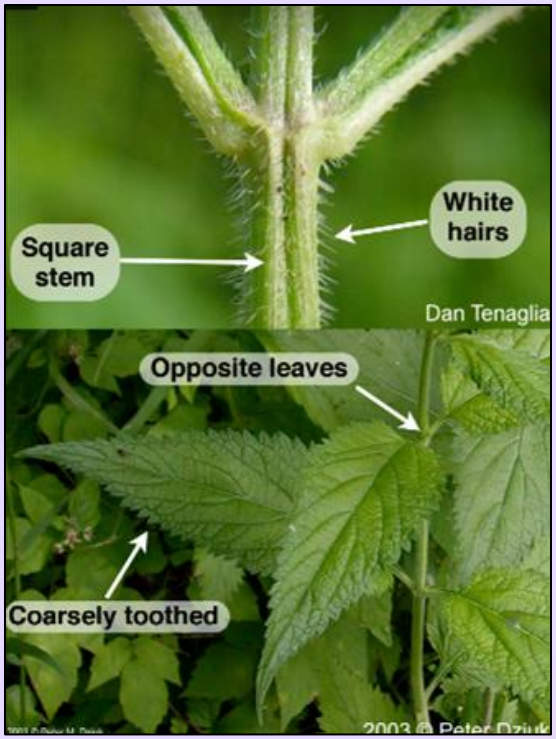


Pycnanthemum tenuifolium
narrowleaf mountainmint

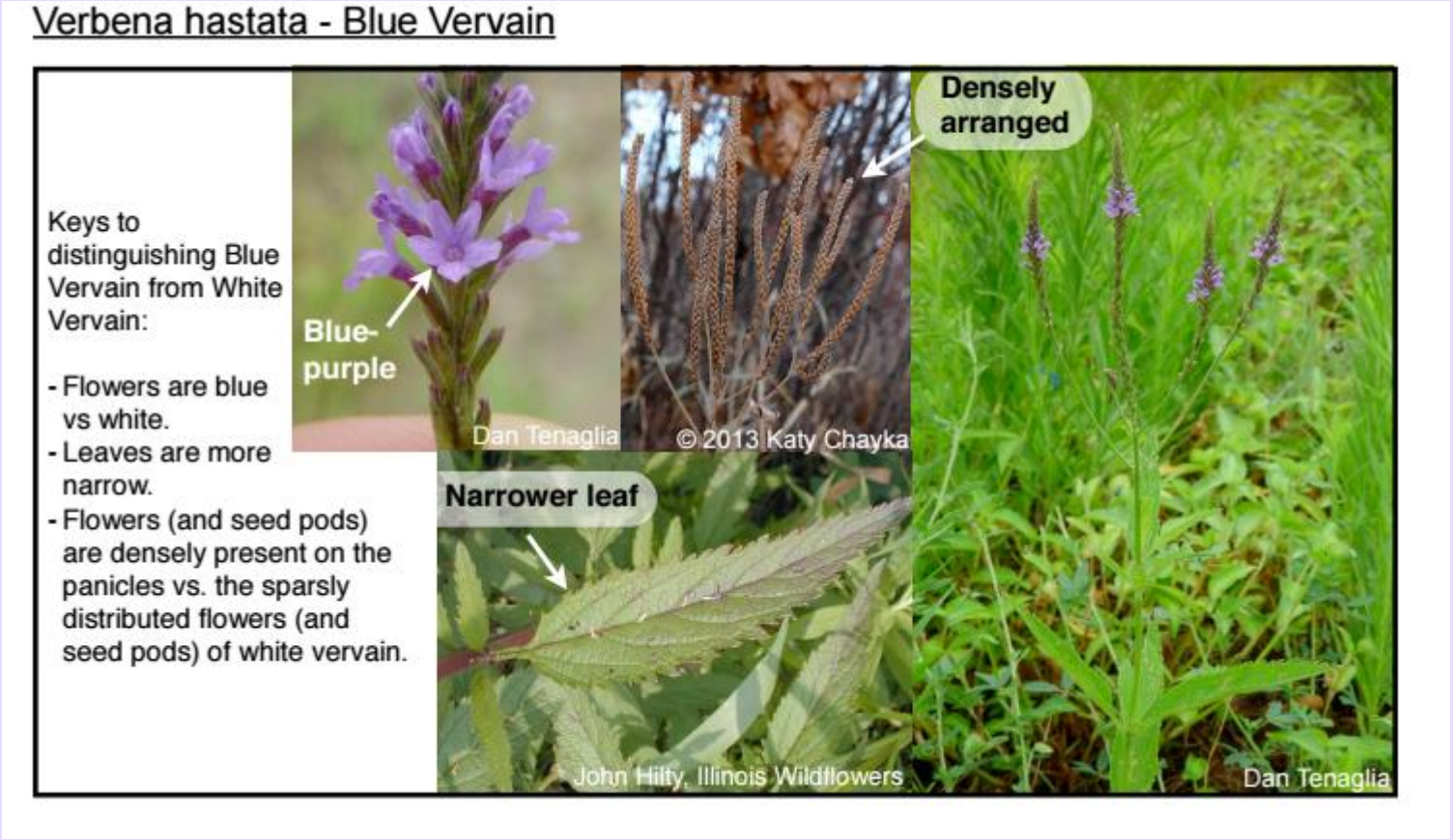


Tradescantia ohiensis
Ohio spiderwort

Verbena urticifolia
white vervain



Don’t be fooled



Zizia aurea
golden Alexander

Thanks for helping the Monarch!!

HOLDEN FORESTS & GARDENS

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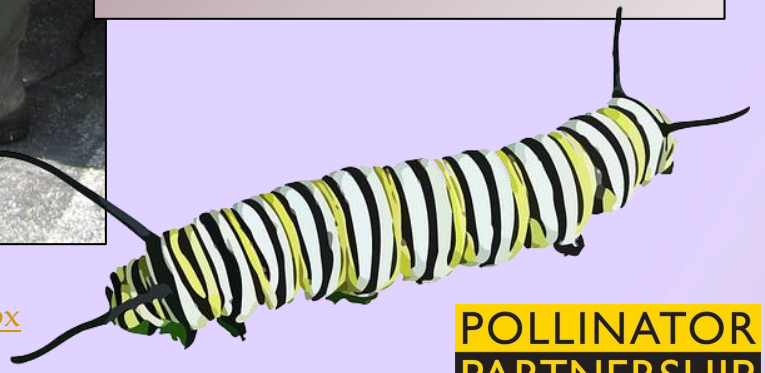

Plant information for this presentation obtained from:
http://www.missouribotanicalgarden.org/plantfinder/plantfindersearch.aspx
http://www.illinoiswildflowers.info/

POLLINATOR PARTNERSHIP