Goals for data collection

The data that you collect as part of the Time to Restore project will help provide better guidance on when nectar plants bloom and seed, and how that timing may be impacted by climate change. Any data that you can collect on the flowering and seed timing of the priority species below will be extremely helpful. We are particularly interested in when flowering and seeds start and ultimately peak. Learn more about the Time to Restore project at www.usanpn.org/TimeToRestore

Texas priority species list

American Basket-flower, *Centaurea americana*	Gregg's Mistflower, *Conoclinium greggii**
American Beautyberry, *Callicarpa americana*	Horseherb, *Calyptocarpus vialis**
Antelope Horns Milkweed, *Asclepias asperula*	Mealy Blue Sage, *Salvia farinacea**
Blackeyed Susan, *Rudbeckia hirta*	Prairie Coneflower, *Ratibida columnifera*
Blue Mistflower, *Conoclinium coelestinum**	Purple Horsemint, *Monarda citriodora**
Butterfly Weed, *Asclepias tuberosa*	Showy Milkweed, *Asclepias speciosa*
Buttonbush, *Caphalanthus occidentalis*	Tall Blazing Star, *Liatris aspera*
Cardinal Flower, *Lobelia cardinalis*	Tall Goldenrod, *Solidago altissima*
Common Sunflower, *Helianthus annuus*	Texas Bluebonnet, *Lupinus texensis*
Cowpen Daisy, *Verbesina encelioides*	Texas Frogfruit, *Phyla nodiflora**
Eastern Purple Coneflower, *Echinacea purpurea*	Texas Lantana, *Lantana urticoides**
Eastern Redbud, *Cercis canadensis*	Texas Thistle, *Cirsium texanum**
Firewheel, *Gaillardia pulchella*	Turk's Cap, *Malvaviscus arboreus**
Frostweed, *Verbesina virginica*	Wild Bergamot, *Monarda fistulosa*
Green Milkweed, *Asclepias viridis*	

**Not yet available for data collection in* Nature's Notebook*. Coming in early 2025.*

Data collection platforms

We invite you to collect data on flowering and seed timing of the above priority species in either of both of the following free and easily accessible data collection platforms:

iNaturalist

- Easy to pick up and use
- Great for species ID, make one-time observations, best for casual visitors, visiting a place you won't regularly return to and/or visit
- Submit data via the app, photos allowed
- Training videos available

nature's notebook
A project of the USA-NPN

- Requires a bit more training and set-up to get started
- Great for repeated observations on the same plants in the same area, capturing timing of start and peak of flowering/seeding
- Submit data via the app or paper datasheets and then online, no photo submissions made
- Training course available

Contact the Time to Restore state lead for help with data collection trainings

Please contact David Gwin, the Texas State Coordinator - TTR at dgwin@ymail.com to schedule a presentation on the Time to Restore project and/or a training session for your chapter or interested group.

Time commitment for this project

We appreciate any data that you are able to collect as part of this project. You may spend a couple minutes taking and submitting photos of nectar plants in flower to iNaturalist or choose to set up a *Nature's Notebook* site with several plants and spend 10 minutes a week doing regular data collection. How much time you spend is up to you! We anticipate that this project will be ongoing for several years.

Nature's Notebook guidelines for sites, plants, and phenophases

Download the *Nature's Notebook* app

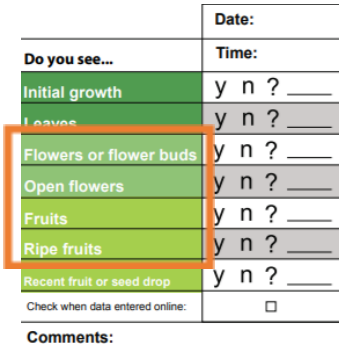
To get started with Nature's Notebook, create an account, set up a site, and add one or more species from our priority list! There is no need to join a Local Phenology Program or Campaign as part of this project, all you need to do is pick one of the priority species from the Texas Priority Species list.

After you register with *Nature's Notebook* and set up your site and species, you will make repeated observations on the same individual plants (or patches of plants for species) at the same established sites.

Select a site that is:

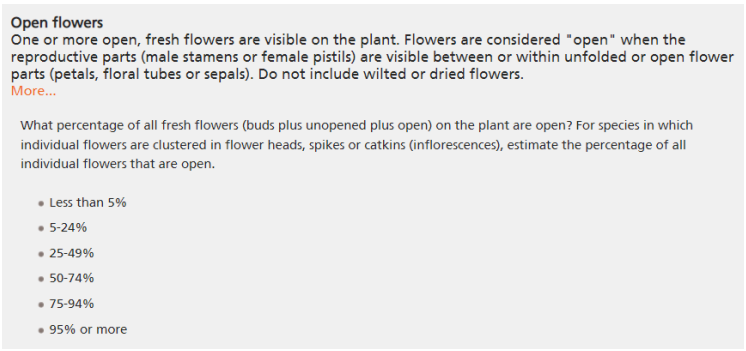
- Convenient – the easier your site is to access, the more likely you are to visit it. Set up a site in your backyard or another place you frequent like a park, native garden or trail.
- Uniform and representative – try to pick a site that generally represents your area with a similar ecosystem. You can create multiple sites if you live in an area that affords different ecosystems.

We are most interested in flowering and fruiting phenophases for this project. There is a detailed definition for each of the questions on the *Nature's Notebook* datasheet.



	Date:
Do you see...	Time:
Initial growth	y n ? ____
Leaves	y n ? ____
Flowers or flower buds	y n ? ____
Open flowers	y n ? ____
Fruits	y n ? ____
Ripe fruits	y n ? ____
Recent fruit or seed drop	y n ? ____
Check when data entered online:	☐

Comments:



Open flowers
One or more open, fresh flowers are visible on the plant. Flowers are considered "open" when the reproductive parts (male stamens or female pistils) are visible between or within unfolded or open flower parts (petals, floral tubes or sepals). Do not include wilted or dried flowers.
More...

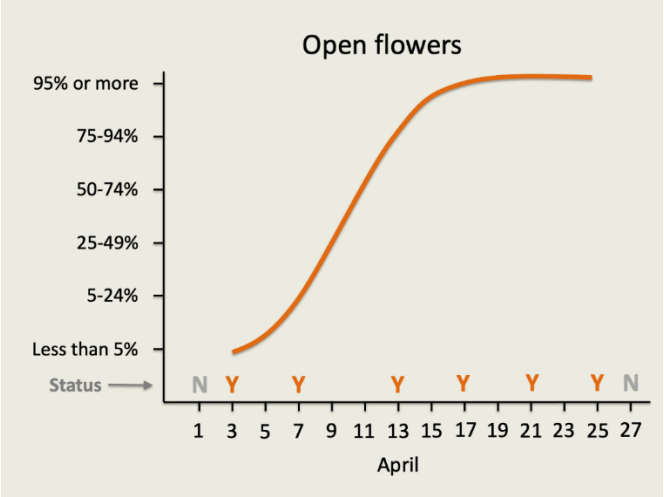
What percentage of all fresh flowers (buds plus unopened plus open) on the plant are open? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), estimate the percentage of all individual flowers that are open.

- Less than 5%
- 5-24%
- 25-49%
- 50-74%
- 75-94%
- 95% or more

Remember, the goal is to capture the **start** of open flowers/ripe seeds and the **peak** occurrence of that activity.

- A precise estimate of the **start** of flowering will depend on making more observations near the beginning of flowering/seeding. The shorter the period between your last "no" and your first "yes", the better

- An estimate of the **peak** will depend on answering questions about "What percent of flowers/fruits are open/ripe?"



Interested in observing with a group of people?

Phenology is better together! Local Phenology Programs (LPPs) are organizations or community groups that connect like-minded people in tracking phenology with *Nature's Notebook*. LPPs have their own goals for phenology including answering science questions, informing management decisions, and engaging others in learning about phenology. Learn more and request a Program at usanpn.org/community/LocalPhenologyPrograms.

September 2024, Time to Restore: Connecting People, Plants, and Pollinators. This work is supported by The Department of the Interior South Central Climate Adaptation Science Center, which is managed by the U.S. Geological Survey National Climate Adaptation Science Center.