

# Flowers for Bats Monitoring Guide



The USA National Phenology Network (USA-NPN) is partnering with the USFWS to implement the forage monitoring portion of the lesser long-nosed bat post-delisting monitoring plan. The data collected will help the USFWS track changes in the phenology of important lesser long-nosed bat forage species and evaluate the potential effects of climate change on forage species.

**Goal:** Through *Nature's Notebook*, observers will help track the status of the forage species for the lesser long-nosed bat by recording onset, peak, and duration of flowering of the nectar species.

**IMPORTANT:** Before you begin making observations for the Flowers for Bats project, you need to be able to identify the species and understand how to observe each species, specifically agaves. This pamphlet is for the use of describing the observing procedure when monitoring these species.

## Flowers for Bats Species:

saguaro (*Carnegieia gigantea*)

organ pipe cactus (*Stenocereus thurberi*)

cardon (*Pachycereus pringlei*)

Palmer's century plant (*Agave palmeri*)

Parry's agave (*Agave parryi*)

desert agave (*Agave deserti*)

American century plant (*Agave americana*)

When a particular Refuge, Park, or other unit is ready to begin monitoring, the designated leader for that site should submit a request ([www.usanpn.org/nn/groups/group-interest](http://www.usanpn.org/nn/groups/group-interest)) to the USA-NPN for their group to be created. Creation of a *Nature's Notebook* account will be required to access the form. Each member of a group should register an individual *Nature's Notebook* account, and join their respective group during registration. Individual accounts allow each data record collected to be tied back to an individual observer. For groups, a site leader is appointed as the group administrator, and is able to set up observation sites, and register plants at those sites. Members can be set up as data entry technicians, to enter data on behalf of other users or edit existing data for the group.

## SPECIES PROTOCOLS

Observations will be made on the same individuals and patches- clusters of individuals- in Southeast Arizona over time. For agaves, we are mainly concerned with the flowering phenophases, although observations can optionally be made on fruiting. For columnar cacti, we are concerned with both flowering and fruiting phenophases. The phenophases you will be observing are “Flowers or flower buds”, “Open Flowers”, “Fruits” and “Ripe Fruits”.

*\*NOTE: “Flowers or flower buds” is an overarching phenophase; when reporting “yes” for “open flowers”, continue to report “yes” for flowers or flower buds until flowering ends.*



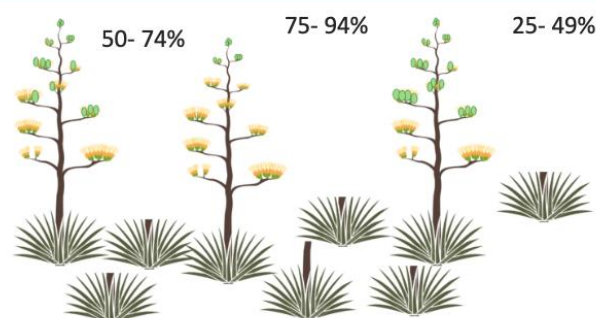
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For each individual plant or patch of plants, observers will document two types of data:

1. **Status:** A “yes” or “no” response to *flower buds and open flowers* on any plant in the patch.
2. **Intensity:** The number of flower stalks/flowers and percent of open flowers for the individual plant or for all plants in the patch.


**IMPORTANT:** The way that we monitor and record agave and columnar cacti flowering is different. Please note that while the question, “How many flowers or flower buds are present” remains the same for all species in *Nature’s Notebook*, for agave we are referring to the stalk as a single “flower”. When observing a patch, the patch is observed as an “individual”.



50- 74%      75- 94%      25- 49%

*How many flowers or flower buds are present?*  
**3 for the patch**

*What percentage of all fresh flowers (buds & unopened & open) on the plant are open?*  
**Average for the patch: 50-74%**



*How many flowers and flower buds are present?*  
**11-100 for the individual**

*What percentage of all fresh flowers (buds & unopened & open) on the plant are open?*  
**50-74%**

### Recommended Monitoring Frequency

	April	May-June	July	August	September
<b>Columnar Cacti</b>	Begin monitoring weekly	When flowers appear, monitor 1-2 times a week	Fruit may optionally be recorded 1-2 times per week	No monitoring anticipated	Fall flowering may optionally be recorded
<b>Agave</b>	Begin monitoring monthly	When flower stalks appear, monitor once per week			