

H) Research project 22523-1801. Lesser Long-nosed bat (*Leptonycteris yerbabuena*) forage phenology monitoring protocol. Refuge Staff, SBNWR Complex.

As an important migratory pollinator species in the Sonoran desert, the Lesser Long-nosed bat (*Leptonycteris yerbabuena*) relies on columnar cacti and several agave species for nectar. The lesser long-nose bat is migratory in Southeastern Arizona occurring spring to fall to give birth after mating in its winter range. The lesser long-nosed bat is considered one population, which includes both the migrating and non-migrating sub-populations; impacting management considerations.

The migratory sub-population of lesser long-nosed bats requires a “nectar trail” to provide energy for the bats along migration routes. This food source as well as adequate roosting sites are the two factors driving the future viability of this bat species. One specific concern is the effect of climate change on temporal availability of resources and the potential impacts on synchronicity of nectar availability during migration times. To help assess this, the USFWS partnered with the USA National Phenology Network in 2018, to monitor forage species phenology at multiple monitoring sites (within 40 miles of known roosting sites). The monitoring approach is to better understand resource availability in the face of climate change to determine if/when forage resources are no longer available for migrating lesser long-nosed bats. Forage plants that are currently being monitored are: saguaro (*Carnegiea gigantea*), organ pipe cactus (*Stenocereus thurberi*), Cardon (*Pachycereus pringlei*), Palmer’s agave (*Agave palmeri*), desert agave (*Agave deserti*), Parry’s agave (*Agave perryi*), and century plant (*Agave americana*).

Leslie Canyon NWR was identified as a forage phenology monitoring site for Palmer’s agave, and refuge staff utilize Nature’s Notebook to record phenology characteristics to inform the lesser long-nosed bat research team. Each year, on a weekly basis, refuge staff enter data about flowering and fruiting status of five century plants on Leslie Canyon NWR. In general, monitoring should occur April through September, although Palmer’s agave starts to flower in May typically.

Figure 1 shows the phenology of Palmer’s Agave on LCNWR from 2018 to 2022. Two trends were unique to this year. One was that phenology classes were slightly delayed when compared to previous years, by about 2 weeks. An additional trend not shown in figure 1 was that a majority of flowers failed prior to fruiting this year, with around 70% of flowers failing this year. In 2022, flower failure rates were much lower at around 20%. A much drier monsoon is likely the cause for this large change in flower viability

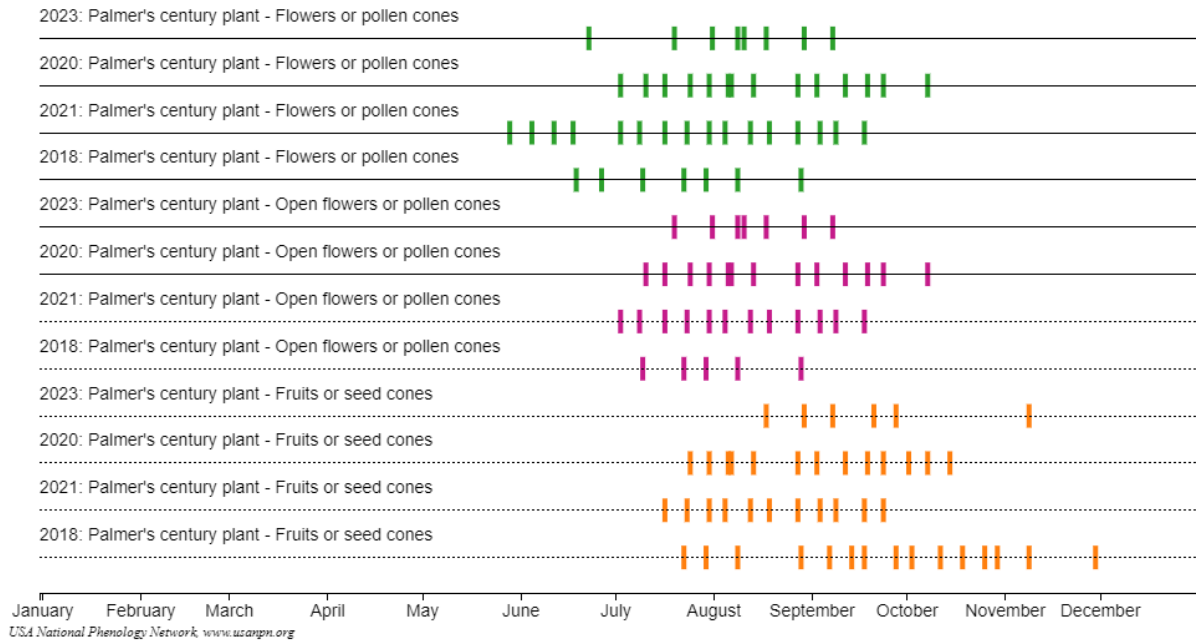


Figure D5H1. Phenophases of *Agave palmeri* on LCNWR from 2018, 2020, 2021 and 2023. Gray represents an absence of that phenophase on that day of survey whereas a color represents presence of that phenophase in that survey. Phenophases in this graph are broken into flowers, open flowers or fruits.