



NECTAR CONNECTORS: A NATURE'S NOTEBOOK CAMPAIGN



Project Background

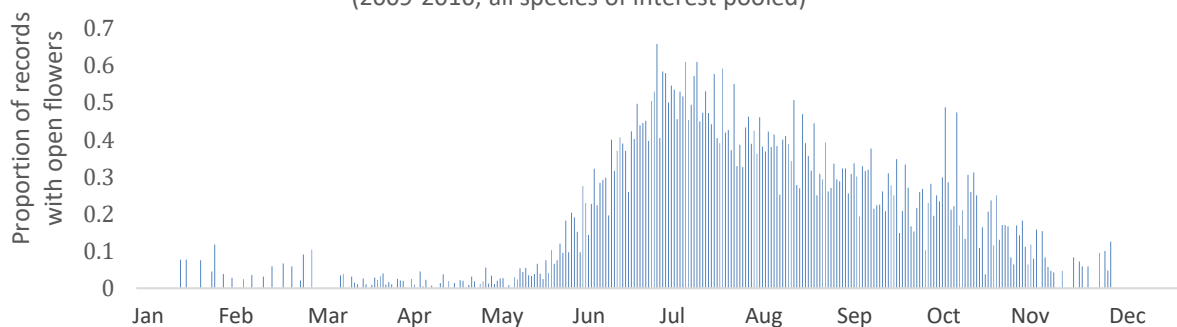
Pollinators are an essential part of our environment. They ensure the reproduction of 85% of the world's flowering plants, and over two-thirds of our crop species.

One of the best-known butterflies in North America is the monarch (*Danaus plexippus*). Monarchs are renowned for their complex life cycle, which takes them on the longest distance migration known for insects. The nectar that they rely on to fuel their flight comes from a diverse suite of flowering species that occur across a large geographic area. Changes to these food sources, through habitat

loss, pesticide use, and/or climate change, can be costly to monarch populations, as well as to the many other pollinators that rely on these same species for their dietary needs.

To meet the needs of the US Fish & Wildlife Service and other natural resource managers concerned about monarchs and other pollinators, the USA National Phenology Network (USA-NPN; www.usanpn.org) is seeking to provide a more accurate picture of the spatial and temporal distribution of nectar resources across the United States. These data will help resource managers evaluate habitat quality and landscape-level connectivity and how this corresponds to the migration and breeding needs of monarchs and other pollinators.

Flowering phenology of key nectar plant species
(2009-2016; all species of interest pooled)



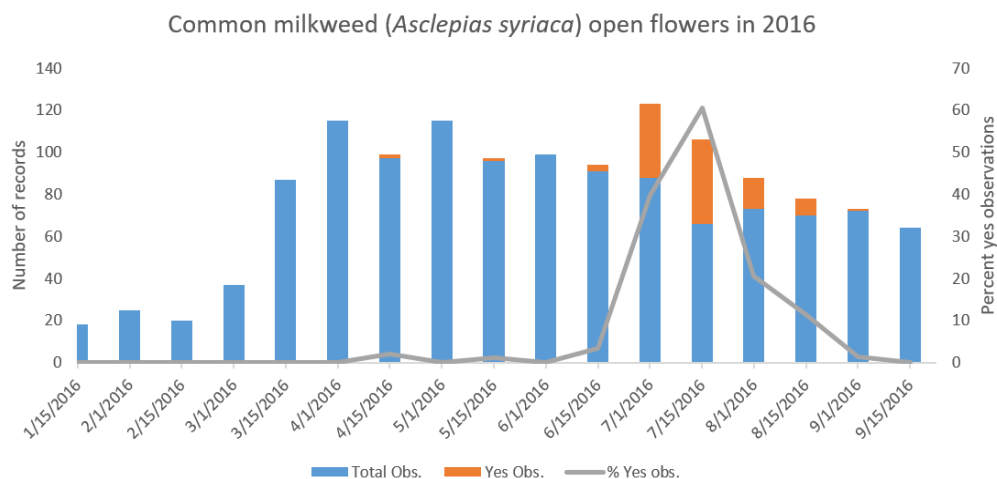
Seasonal pattern in flowering phenology for 20 nectar species in the National Phenology Database pooled, across 2009-2016.

Nectar Connectors Campaign

To help determine where to focus nectar source conservation efforts, the USA-NPN launched Nectar Connectors, a monarch nectar plant monitoring campaign, with the goal of documenting the occurrence of flowering of a suite of species that are important nectar sources for monarchs and other pollinators. The USA-NPN is currently working with Adventure Scientists to complement this campaign with data on the flowering of nectar plants from the backcountry.

Nectar connectors focuses on 52 species of flowering plants in 17 genera. These species have been determined to be important nectar sources for monarchs and other pollinators by the Xerces Society, Monarch Watch, the US Fish and Wildlife Service (USFWS), and the National Audubon Society's Hummingbirds at Home and Plants for Birds programs. The 15 genera include:

- Milkweeds (*Asclepias* spp.)
- Blazing stars (*Liatris* spp.)
- Asters (*Symphyotrichum* spp.)
- Goldenrods (*Solidago* spp.)
- Joe Pye Weed (*Eutrochium fistulosum*)
- Lanceleaf coreopsis (*Coreopsis lanceolata*)
- Lupines (*Lupinus* spp.)
- Bee balm/bergamot (*Monarda* spp.)
- Black-eyed Susan (*Rudbeckia hirta*)
- Coneflowers (*Echinacea* spp.)
- Sunflowers (*Helianthus* spp.)
- Prairie clovers (*Dalea* spp.)
- Thistles (*Cirsium* spp.)
- Cardinal flower (*Lobelia cardinalis*)
- Golden Alexanders (*Zizia aurea*)



Example graphic of how data from *Nature's Notebook* can be summarized for a single species, across sites. This sort of summary can be provided by year or for the entire period for which we have data (2009-2016).

How to participate

Register to monitor the flowering phenology of one or more nectar plant species through the USA-NPN's *Nature's Notebook* program. Participants are encouraged to record observations 2-3 times per week throughout the growing season to capture the onset, duration, and end of flowering. Please sign up to receive campaign messages to receive species identification tips, recommendations for observing, and results from the campaign.

Details on participation can be found at www.naturesnotebook.org/nn/NectarConnectors.