

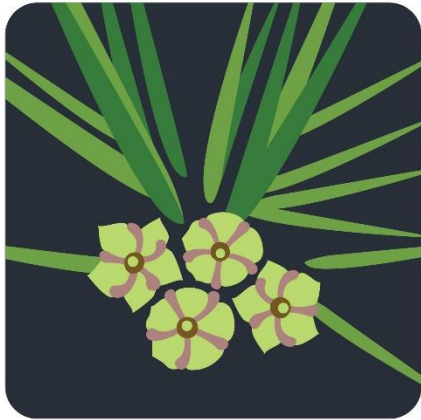
# Revegetation: *Focus on Plants for Pollinators*

Riparian Restoration Workshop  
October 23, 2019  
Palm Desert, CA

Carianne Campbell



**Strategic  
Habitat  
Enhancements**



# Strategic Habitat Enhancements

# Why Conserve Pollinators?

- **\$9 billion/year in ecological services**
- **Over 75% of flowering plants rely on pollinators for reproduction**
- **Food for other wildlife species**
- **Insects are the most important pollinators, and they are in massive decline**

**The Insect Apocalypse is Coming, New York Times Nov 2018**

Photo illustrations by Matt Dorfman. Source photographs: Bridgeman Images.



# **Every Project Can Support Native Insect Pollinators**

- 1. You are probably already doing it**
- 2. Small efforts can make a big difference**

<https://www.nature.com/articles/s41559-018-0769-y>

“Eat food. Not too much. Mostly plants.”  
— Michael Pollan, [In Defense of Food: An Eater's Manifesto](#)

**“Plant native. As many species as possible. No pesticides. Have fun.”**

— Carianne Campbell’s  
**Pollinator Manifesto**



Photo by Carina Barrera



# Systemic Insecticides: Neonicotinoids

- Very common in garden use
  - Used for sap-sucking and leaf-chewing pests
- Insect neurotoxins, effects on bees well-established
  - body of evidence is forming regarding impacts to other species
- **SYSTEMIC**: absorbed throughout the plant tissues **INCLUDING POLLEN AND NECTAR**
- Moves through soil to other plants

## How Neonicotinoids Can Kill Bees

The Science Behind the Role These Insecticides Play in Harming Bees

2nd Edition, Revised & Expanded

Jennifer Hopwood, Almee Code, Marc Vaughan, David Biddinger, Matthew Shepherd, Scott Hoffman Black, Eric Lee-Mäder, and Celeste Mazzacano



# Neonics in Container Plants??

- Be sure your plants were also grown without them
  - Commonly used to treat aphids on milkweed plants
  - Most big box stores and nurseries are phasing out plants grown with them, but this is voluntary, not mandatory
    - Public pressure made this happen
- Did your plant materials cross a state line?
- Talk to your nurseries all the time; better yet, **KNOW** your growers!



# Aphids are Annoying!



Photo from:  
<https://extension.umd.edu/hgr/topics/aphids-got-your-milkweeds>

- If you have aphids, **CONGRATULATIONS!** Your plants were not treated with systemic pesticides!

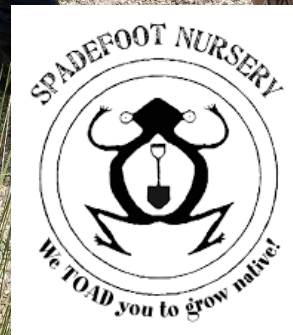
- **Tips:**

<https://monarchjointventure.org/resources/faq/aphids-on-milkweed>

[https://commons.wikimedia.org/wiki/File:Aphid\\_May\\_2010-5.jpg](https://commons.wikimedia.org/wiki/File:Aphid_May_2010-5.jpg)




# Know your growers!



**NIGHTHAWK NATIVES**



A photograph of a field of wildflowers. In the foreground, a large yellow flower with a dark brown center is in focus. To its right, a smaller purple flower is visible. Other yellow flowers are scattered throughout the scene, some in the background. The background shows a blurred landscape with a blue sky and some distant structures.

# How to source plant materials

- **Is there time in the schedule for seed collection and contract grow-out?**
- **Are the species available from local suppliers?**

# Project Goals and Constraints Drive Plant Selection



- General Pollinator Support, or Particular Species Focus?
- Public or Private Space
- Urban or Wildland?
  - Cultivated versus Natural
- Interpretation / Education
- Disturbance Limits
- Maintenance
  - Water
  - Weeds and Pests

# Pollination Syndromes









Type of Pollinator								
Trait	Bat	Bee	Beetle	Bird	Butterfly	Fly	Moth	Wind
<b>Color</b>	White, green or purple	Bright white, yellow, blue, or UV	White or green	Scarlet, orange, red or white	Bright red and purple	Pale, or dark brown, purple	Pale red, purple, pink or white	Pale green, brown, or colorless
<b>Nectar guides</b>	None	Present	None	None	Present	None	None	None
<b>Odor</b>	Strong and musty; emitted at night	Fresh, mild, pleasant	None to strongly fruity or foul	None	Faint but fresh	Putrid	Strong sweet; emitted at night	None
<b>Nectar</b>	Abundant; somewhat hidden	Usually present	Sometimes present	Ample; deeply hidden	Ample; deeply hidden	Usually absent	Ample; deeply hidden	None
<b>Pollen</b>	Ample	Limited; often sticky, scented	Ample	Limited	Limited	Limited	Limited	Abundant; small, smooth
<b>Flower Shape</b>	Bowl shaped; closed during day	Shallow; with landing platform; tubular	Large and bowl-shaped	Large, funnel-like; strong perch support	Narrow tube with spur; wide landing pad	Shallow; funnel-like or complex with trap	Regular; tubular without a lip	Regular and small
								

Photo credits © Merlin Tuttle, Tom Eisner, Edward Ross, Arla Altman, Chris Carvalho, Paul Growald

# Nativars and Hybrids

Avoid double blooms and flower color changes

Nativars may be cloned from a single plant

- Lower genetic diversity lowers potential resilience to climate change
- Examples
  - Desert Museum paloverde – clone of a hybrid
  - Desert willow – seedless, deep ruby coloration



# From the Xerces Society....

**Blogpost: Picking Plants for Pollinators, the Cultivar Conundrum  
by Justin Wheeler**

“So how are you to know if a cultivar is “good” or “bad”? Unfortunately, it’s hard to tell and there isn’t a ton of research out there. You’d have to do your due diligence and try to figure out what the plant was bred for. If it has double blooms it’s an absolute no-no as they prohibit pollinators from accessing the pollen or nectar, and are almost always sterile. If they’ve been cultivated to change the flower color, they are almost certainly going to be less attractive than the straight species. If however their cultivated trait is just a larger flower or shorter habit, they may be ok.

**The bottom line is that, when you can get your hands on the straight species, you’re always going to have the best possible plant for pollinators.”**

# Non-Natives in Natural Areas May Be Providing Critical Resources

- Consider phased approach for treatment/removal
  - Example – *Marrubium vulgare* at Ash Spring
- Tolerate it?
  - Example – *Caesalpinia gillesii* in Patagonia

Yellow bird of paradise (*Caesalpinia gillesii*)

<https://www.fireflyforest.com/flowers/2774/caesalpinia-gilliesii-bird-of-paradise-shrub/>

# Bees

A close-up photograph of two bees on a white flower. The bee in the foreground is a honeybee with a black and orange striped abdomen and a fuzzy thorax. The bee in the background is a darker, more fuzzy bee, possibly a native species. Both bees are surrounded by yellow pollen on the flower's surface.

- **HONEYBEES ARE NOT NATIVE BEES!**
- **Native bees are generally solitary, don't sting, and nest in holes in the ground or in tunnels**



# Native Bees

Are more the **MOST** excellent pollinators

- ❖ Hairs that pollen sticks to
- ❖ Enthusiastic feeding style
- ❖ Extensive daily foraging
- ❖ Buzz pollination

***BUT REMEMBER – they have to meet all of their life needs within a small area – your project is probably a great scale!***

**FORAGE/FLOWERS \* NESTING  
SITES**



# Tunnel nesters mason bees, leaf-cutter bees, carpenter bees



- **Dead trees and stalks of vegetation**
- **Rock walls**
- **Need mud**
- **Bee houses**



# Excellent Resources Available at [www.xerces.org](http://www.xerces.org)

INVERTEBRATE CONSERVATION FACT SHEET

## Tunnel Nests for Native Bees Nest Construction and Management

There are many simple and successful ways to make artificial nests for native bees.

However, keeping the nests clean is important to limit disease build-up and maintain healthy bee populations.



Artificial nest sites like bamboo tubes in a plastic bucket are effective, but need maintenance. *Photograph by Eric Mader*

About 30 percent of the four thousand species of bees native to North America nest in small tunnels such as hollow plant stems, abandoned borer-beetle holes in snags, and similar locations. This includes some of our best known native bees, the blue orchard bees and leafcutters. The absence of these features in intensively farmed landscapes can limit nesting opportunities for these important crop pollinators.

Artificial nests consisting of wood blocks drilled with a large number of dead-end tunnels have been promoted as a way to attract bees and boost their local populations. This can be an effective way to enhance bee populations but these nests do need some tending to maintain the benefits. This fact sheet provides an overview of tunnel-nesting bee biology, and guidance on how to make and manage nests.

### TUNNEL-NESTING BEE BIOLOGY

The vast majority of native bee species, including tunnel-nesting bees, lead solitary lives. While they may have gregarious tendencies, preferring to nest near other members of their species, each female individually constructs her own nest and provisions it with food for her offspring.

To make a nest, a female bee builds partitions to divide the tunnel into a linear row of brood cells. Depending on the species, the partitioning walls may be constructed of mud, plant resins, leaf pieces, flower petals, and even cellophane-like glandular secretions.

The female provisions each brood cell with a mixture of pollen and nectar, onto which she lays a

Pollinators are a vital part of a healthy environment.

Native bees are North America's most important group of pollinators.

Nest sites are simple to make, and can be added to any area of greenspace, large or small.

INVERTEBRATE CONSERVATION FACT SHEET

## Nests for Native Bees



A selection of home-made bee nests: (clockwise from left) wooden block, bamboo bundle, and bumble bee box.

Pollinators are a diverse and fascinating group of animals. In addition to their beauty, pollinators provide an important link in our environment by moving pollen between flowers and ensuring the growth of seeds and fruits. The work of pollinators touches our lives every day through the food we eat. Even our seasons are marked by their work: the bloom of springtime meadows, summer berry picking, pumpkins in the fall.

There are 4,000 species of native bees in North America. Together they form the most important group of pollinators. Like all wildlife they are affected by changes in our landscapes, especially the loss of nesting sites. Bees make nests in which they create and provision brood cells for their offspring. In many modern landscapes, a desire for neatness has usually resulted in the removal of bare ground, dead trees, and untidy corners of rough grass—all important nesting sites for bees.

This fact sheet gives information on how to provide nest sites for native bees, including nest blocks and bare ground for solitary-nesting bees, and nesting boxes for bumble bees.

For more information, visit our web site, [www.xerces.org](http://www.xerces.org), where you will find other fact sheets and more detailed guidelines on how to enhance habitat for pollinators. You'll also find information about *Attracting Native Pollinators*, *Protecting North America's Bees and Butterflies*.

Written by  
Eric Mader, Matthew  
Shepherd, Mace  
Vaughan, and Jessa  
Guise



The Xerces Society  
for Invertebrate  
Conservation

[www.xerces.org](http://www.xerces.org)

Written by  
Matthew Shepherd



The Xerces Society  
for Invertebrate  
Conservation  
(855) 232-6639  
[www.xerces.org](http://www.xerces.org)

# Ground Nesters



- Majority of native bees, including bumblebees
- Need bare soil *not* covered with gravel or lawn

*Photos this slide by Eric Sophiea, used with permission*

# Forage

- Purple, blue, yellow, white non-tubular flowers
- Cactus, mallows, asters, milkweeds, verbena



This photo courtesy of Caroline Paiano

**Male carpenter bee on *Penstemon parryi***

(photo courtesy of Gita Bodner)



**Female carpenter bee on *Passiflora arida***

# Monarchs



# Monarch Caterpillars Need Milkweeds



Host plant: *Asclepias angustifolia* (Aug 2018)



Host plant: *Asclepias erosa* (Aug 2018)



# Asclepias of California ♂ Games

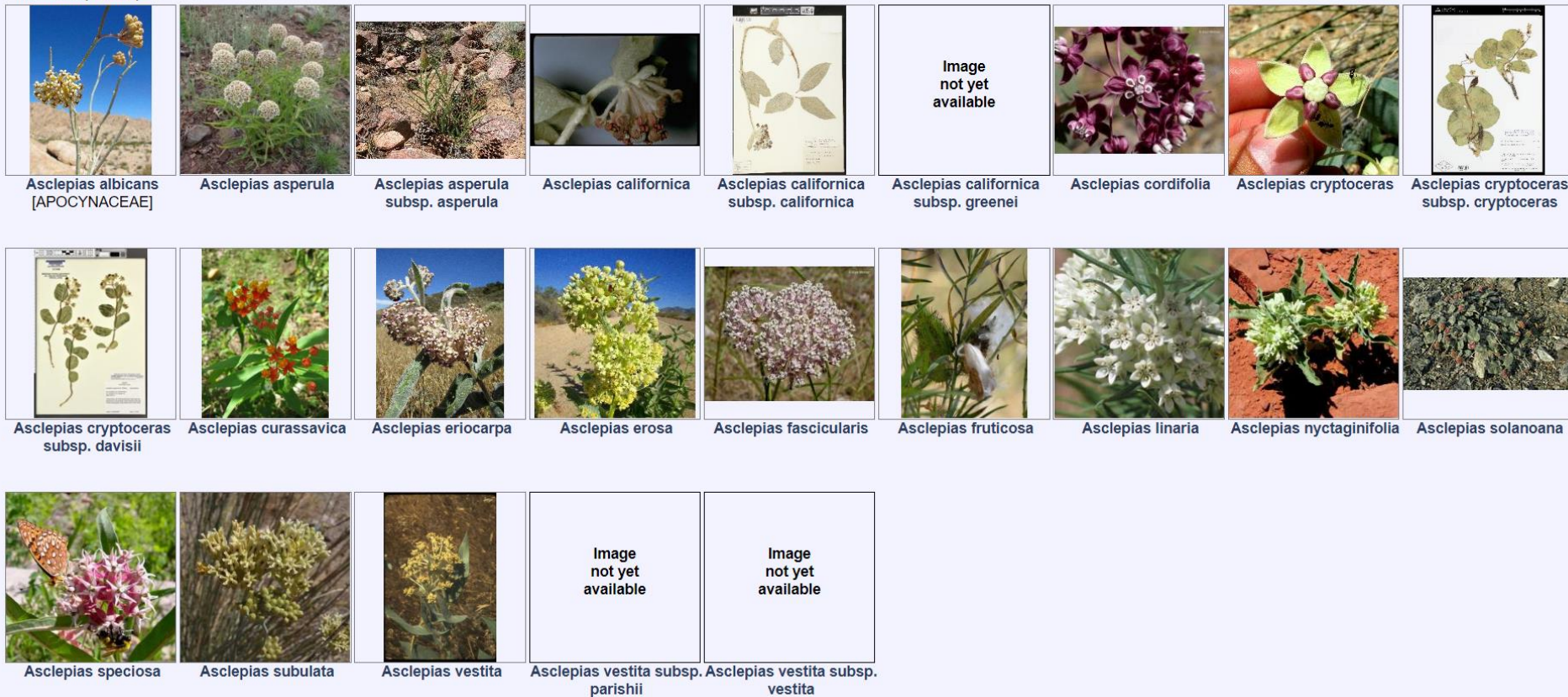
Authors: Nabhan, Buckley, and Fishbein

Families: 1

Genera: 1

Species: 16

Total Taxa (details): 19



- 16 species in CA
- Wide elevation range and habitat types
- Several widely available, and supply is increasing



# white-stem milkweed (*Asclepias albicans*)

- <2,500 ft
- North-facing rock outcrops, granitic ranges
- Upright form, sculptural
- Low water use, great in xeriscape; FULL SUN
- Harder to find

Photo by Frankie Coburn

<http://swbiodiversity.org/seinet/taxa/index.php?taxon=Asclepias+albicans&formsubmit=Search+Terms>

# rush milkweed (*Asclepias subulata*)



- <3,000 ft
- Upright form, sculptural
- Low water use, great in xeriscape; **FULL SUN**
- Widely available

# desert milkweed (*Asclepias erosa*)

- 200 – 5,000 ft
- Washes and roadsides in Sonoran and Mohave Desert scrub, especially on sandy plains and hummocks on either side of the Lower Colorado River
- April- October

## Desert Milkweed (*Asclepias erosa*)



- Flowers: Green-white, late spring to summer
- Perennial
- Forb/Herb
- 1-4 ft. tall
- Sun Requirement: Full sun to part shade
- Water Requirement: Low

# Antelope horns / Spider Milkweed

(*Asclepias asperula*)

- 3,000 – 9,000 ft
- Sprawly, taproot, dies back in winter
  - I-gal, not treepot
- Finicky to get established, transplant shock



Photo by Max Licher

<http://swbiodiversity.org/seinet/imagelib/imgdetails.php?imgid=189647>

# pine-leaf milkweed (*Asclepias linaria*)

- 
- 2,800 – 5,800 ft
  - Perennial shrub, low to moderate water, full sun to part shade
  - Not a monarch favorite, but supports a wide array of other insects, including queen butterflies
  - Widely available

# showy milkweed

(*Asclepias speciosa*)

- 5,000 – 8,500 ft
- Meadows, open woodlands, streams, roadsides, disturbed areas



# Milkweeds benefit a wide variety of species

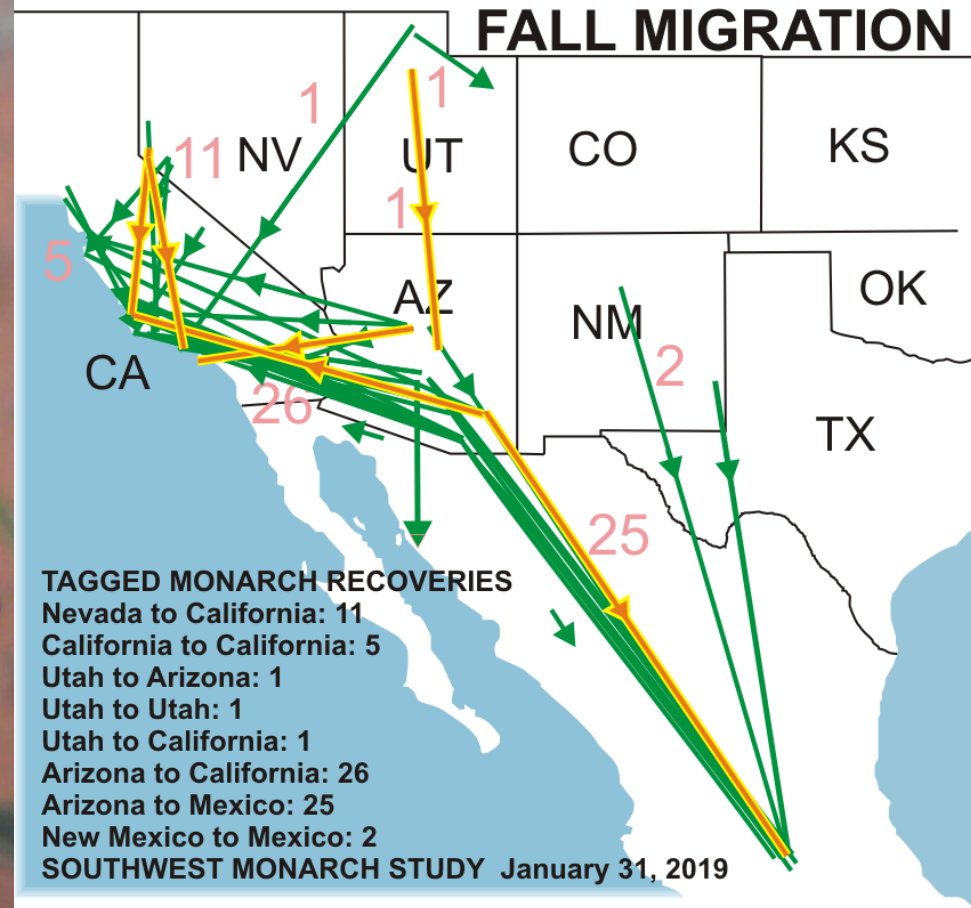
- Other butterflies and moths
- 104 species of bees
- Flies, beetles, wasps and other beneficial species that eat aphids, mealy bugs, mites, white flies...
- **AND PREDATORS OF ALL OF THE ABOVE**





# Southwest Monarch Study

[HTTPS://WWW.SWMONARCHS.ORG/](https://www.swmonarchs.org/)



- 10 years of citizen science data
- Importance of riparian areas as migration corridors

Photo by Steve Plath



**Monarch Butterflies Need Nectar!**

# Milkweed Not the Limiting Factor?

- Cornell study analyzed 22 years of citizen science data and monarch phenology to determine at when declines are happening
- Key finding: monarch populations decline with the fall migration
- Restoration implication
  - Late season nectar sources
  - Other habitat resources – water, roosting trees, etc.

Inamine, H. , Ellner, S. P., Springer, J. P. and Agrawal, A.A. (2016), Linking the continental migratory cycle of the monarch butterfly to understand its population decline. *Oikos*, 125: 1081-1091. doi:[10.1111/oik.03196](https://doi.org/10.1111/oik.03196)



**Photo by Frankie Coburn**

<http://swbiodiversity.org/seinet/imagelib/imgdetails.php?imgid=654452>

**sweetbush**  
(*Bebbia juncea*)

Photo by Fankie Coburn

<http://swbiodiversity.org/seinet/imagelib/imgdetails.php?imgid=1366207>



**Eumeda checkerspot**



**Mexican fritillary**



**Erichson's white skipper**



**Laviana white skipper**

# Under-appreciated Over-achievers: Thistles



## Native Thistles

A Conservation Practitioner's Guide

*Plant Ecology, Seed Production Methods,  
and Habitat Restoration Opportunities*

James Eckberg, Eric Lee-Mäder, Jennifer Hopwood,  
Sarah Foltz Jordan, and Brianna Borders



- Lovely, but maligned
- Large flower heads encourage lots of visitation
- High flower and patch density
- 200 pollinator species have been documented visiting native thistles in North America
- Seeds eaten by finches and sparrows, nectar with high sugar content for hummingbirds
- **PLANT SEEDS IN THE FALL**

- *Cirsium neomexicanum*
- *C. undulatum*
- *C. arizonicum*



*Chrysothamnus nauseosus*  
Photo by Max Licher



**Under-appreciated  
Over-achievers:  
LATE SEASON bloomers!**



*Solidago missouriensis*  
Photo by Max Licher



**desert broom  
(*Baccharis sarothroides*)**



Photo by Max Licher

# One day in Madera Canyon

<http://arizonabeetlesbugsbirdsandmore.blogspot.com>

Photos by Marguerite Brummermann



# Steps to Create Your Own Site-Specific Pollinator Plant Palette

1. Inventory
2. Map Floral Resources
3. Identify Species to Add to Palette
4. Install Plant Materials
5. Monitor, Refine, Adapt!



**SEINet** Arizona - New Mexico Chapter

Home | Specimen Search | Images | Flora Projects | Agency Floras | Dynamic Floras | Additional Websites | Resources | Log In | New Account | Sitemap

Welcome to SEINet

The SEINet data portal was created to serve as a gateway to distributed data resources of interest to the environmental research community within Arizona and New Mexico. Through a common web interface, we offer tools to locate, access and work with a variety of data. SEINet is more than just a web site - it is a suite of data access technologies and a distributed network of collections, museums and agencies that provide environmental information.

To learn more about the features and capabilities available through this site, visit the Symbiota Help Pages. Join SEINet as a regular visitor and please send your feedback to [seinetAdmin@asu.edu](mailto:seinetAdmin@asu.edu). Visit the Data Usage Policy page for information on how to cite data obtained from this web resource.

Visit some of the other regional data portals that are fellow members of the SEINet Network.

- Consortium of Midwest Herbaria
- Consortium of Southern Rocky Mountain Herbaria
- Intermountain Regional Herbarium Network
- Madrean Discovery Expeditions (MDE)
- Mid-Atlantic Herbaria Consortium
- North American Network of Small Herbaria
- North Great Plains Herbaria
- Red de Herbarios del Noroeste de México (northern Mexico)
- SERNEC (Southeast USA)
- Texas Oklahoma Regional Consortium of Herbaria (TORCH)

Development of SEINet, Symbiota, and several of the specimen databases have been supported by National Science Foundation Grants (DBI 9983132, BRC 0237418, DBI 0743827, DBI 0847966)

**Plant of the Day**

What is this plant?  
Click here to test your knowledge

**SEINet is your new best friend!**  
<http://swbiodiversity.org>

# #1: Inventory

- What is already growing onsite?
  - Casual list or detailed inventory
  - Consider spring and fall flora
  - Are there invasive species that should be addressed?
- Put your list into an Excel spreadsheet





# Use SEINet (<http://swbiodiversity.org/seinet/index.php>) to fill in information



## *Dicliptera resupinata* (Vahl) Juss. ↗

Go To Encyclopedia of Life...

Family: Acanthaceae

alfalfilla, more...

[*Diapedium resupinatum* (Vahl) Kuntze, more]



Anthony Mendoza

Field Guide

Field Guide

Web Links

Wiggins 1964, Daniel 1984, Kearney and Peebles 1969, Felger et al 2014

**Duration:** Perennial **Nativity:** Native **Lifeform:** Forb/Herb **General:** Herbaceous perennial, ascending to erect and often bushy, to 80 cm tall; stems branching, glabrous or sparingly puberulous around nodes, hairs curved. **Leaves:** Opposite and petiolate; petioles to 2 cm long; blades lanceolate to lance-oblong or ovate, to 8 cm long with a blunt tip, narrowed at base, glabrous or nearly so, inconspicuously ciliolate at margins. **Flowers:** Umbels in leaf axils; peduncles short or elongate, branching into 3-5 pedicels, each topped with a single purple flower; involucre bracts cordate to round-obovate, to 7 mm long and 8 mm wide, very flat, veiny, glabrous or nearly so; corolla bilabiate, purple with darker purple dots, about 1.5 cm long, lips obovate. **Fruits:** Capsules about 5 mm long, glabrous, flat, obovoid, with 4 seeds. **Ecology:** Found on dry wooded slopes or flats from 3,000-6,000 ft (914-1829 m); flowers September-May. **Distribution:** sw US through w and wc Mexico to the state of Guerrero. **Notes:** Uncommon in the US; range extends into Mexico. Distinct due to showy, purple, 2-lipped flowers in the leaf axils, each flower subtended by a pair of heart-shaped bracts. With age the plants are usually leafless and the bracts cling to the plant, becoming papery, white and conspicuous. **Ethnobotany:** Unknown, but other species in the genus have uses. **Etymology:** Dicliptera is from Greek referring to two folded wings, while resupinata means upside down due to twisting of the pedicel. **Synonyms:** *Diapedium resupinatum*, *Diapedium torreyi*, *Dicliptera pseudoverticillaris*, *Dicliptera torreyi*, *Justicia resupinata* **Editor:** SBuckley 2010, FSCoburn 2015, AHazelton 2015

## Master Plant and Bloom List

Family	Latin name	Common name	Growth Form	Elevation range	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Acanthaceae	<i>Anisacanthus thurberi</i>	desert honeysuckle	shrub	2000-5000 ft												
Acanthaceae	<i>Dicliptera resupinata</i>	Arizona foldwing	shrub	3000-6000 ft												
Acanthaceae	<i>Justicia californica</i>	chuparosa	shrub	<2500 ft												
Acanthaceae	<i>Justicia candicans</i>	jacobina	shrub	<2500 ft												
Adoxaceae	<i>Sambucus cerulea</i>	Mexican elderberry	tree	2500-5000 ft												
Amaranthaceae	<i>Atriplex canescens</i>	four-wing saltbush	shrub	300-6500 ft												
Amaranthaceae	<i>Salsola tragus</i>	Russian thistle	annual	0-8000 ft												
Apiaceae	<i>Conium maculatum</i>	poison hemlock	annual	5000-7500 ft												
Apocynaceae	<i>Asclepias angustifolia</i>	Arizona milkweed	herbaceous perenn	3500-5700 ft												
Apocynaceae	<i>Haplophyton crooksii</i>	cockroach plant	shrub	2500-5200 ft												
Apocynaceae	<i>Asclepias albicans</i>	whitestem milkweed	shrub	<2500 ft												
Apocynaceae	<i>Asclepias albicans</i>	white-stem milkweed	shrub	500-2500 ft												
Apocynaceae	<i>Asclepias asperula</i>	antelope horns milkweed	herbaceous perenn	3000-9000 ft												
Apocynaceae	<i>Asclepias erosa</i>	desert milkweed	herbaceous perenn	200-5000 ft												
Apocynaceae	<i>Asclepias linaria</i>	pine leaf milkweed	shrub	2600-5800 ft												
Apocynaceae	<i>Asclepias subulata</i>	rush milkweed	shrub	<3000 ft												
Apocynaceae	<i>Asclepias tuberosa</i>	butterfly milkweed	herbaceous perenn	3000-8000 ft												
Apocynaceae	<i>Funastrum cynanchoides</i>	twining milkweed	perennial vine	500-5500 ft												
Apocynaceae	<i>Vinca major</i>	vinca	perennial vine	4500-6000 ft												
Asparagaceae	<i>Agave palmeri</i>	Palmer's agave	agave	3000-6000 ft												
Asparagaceae	<i>Agave parryi</i>	Parry's agave	agave	5000-7000 ft												
Asparagaceae	<i>Dasyllirion wheeleri</i>	desert spoon, sotol	shrub	3000-6000 ft												
Asparagaceae	<i>Yucca elata</i>	soaptree yucca	shrub	1500-6000 ft												

You can sort by family, flower color, phenology, or elevation - according to your project goals

# #3: Identify New Species to Add to Your Palette

## SEINet Again

Agency Lists

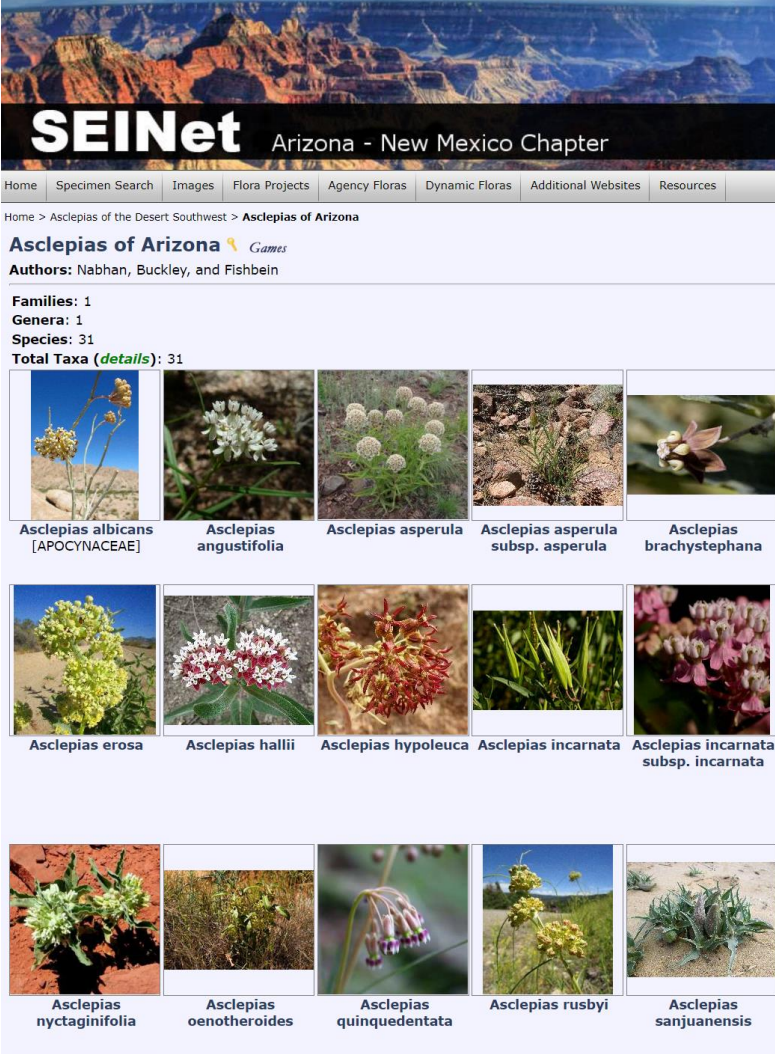
<http://swbiodiversity.org/seinet/projects/index.php?pid=5>

Dynamic Flora Checklist

<http://swbiodiversity.org/seinet/checklist/s/dynamicmap.php?interface=checklist>

Map Search (allows custom polygons)

<http://swbiodiversity.org/seinet/checklist/s/dynamicmap.php?interface=checklist>



The screenshot shows the SEINet Arizona - New Mexico Chapter website. The header features a landscape image and the text "SEINet Arizona - New Mexico Chapter". Below the header is a navigation menu with links: Home, Specimen Search, Images, Flora Projects, Agency Floras, Dynamic Floras, Additional Websites, and Resources. The main content area displays "Asclepias of Arizona" with authors Nabhan, Buckley, and Fishbein. It lists 1 family, 1 genus, and 31 species. A grid of 15 small images shows various Asclepias species, each with a caption below it: *Asclepias albicans* [APOCYNACEAE], *Asclepias angustifolia*, *Asclepias asperula*, *Asclepias asperula* subsp. *asperula*, *Asclepias brachystephana*, *Asclepias erosa*, *Asclepias hallii*, *Asclepias hypoleuca*, *Asclepias incarnata*, *Asclepias incarnata* subsp. *incarnata*, *Asclepias nyctaginifolia*, *Asclepias oenotheroides*, *Asclepias quinquedentata*, *Asclepias rusbyi*, and *Asclepias sanjuanensis*.



# Which Species to Consider?

## Look for species that:

- Will help to provide year-round, overlapping blooms
- Support species that you are interested in helping to conserve
- Lower elevation / broad elevation species that are likely to be successful now AND IN THE FUTURE



# #4: Install Plants!



# #5: Monitor, Refine, Adapt

- Update with your phenology observations
  - Improve accuracy regarding bloom periods and flower color
  - What is actually happening at your site versus what is in the literature
- The spreadsheet can be used as a monitoring tool
  - Plant replacements and additions
  - Survival
  - Pollinator species observed on plants



# Clark County Wetlands Plant List – Existing Species

Common name	Elevation range	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
salt heliotrope	<5000 ft												
wolfberry	800-5600 ft												
seep willow	<5000 ft												
yerba mansa	1000-6000 ft												
sacred datura	1000-6500 ft												
white sweet-clover	unk												
catclaw acacia	<5000 ft												
willow baccharis	500-5000 ft												
broad-leaved pepperw	0-2500 ft												
horsetail milkweed	?												
desert broom	1000-5500 ft												
Fremont cottonwood	<6500 ft												
velvet ash	3000-7000 ft												
narrow-leaved willow	1000-8500 ft												
narrow-leaved dock	unk												
water speedwell	1500-7000 ft												
salt cedar	<5000 ft												
desert willow	<5500 ft												
marsh fleabane	0-5215 ft												
brittlebush	<3000 ft												
sunflower	1000-7000 ft												
Goodding's willow	<7500 ft												
honey mesquite	<5000 ft												
quailbush	<3500 ft												
screwbean mesquite	<4000 ft												
prickly lettuce	<9000 ft												
globemallow	<3500 ft												

(Includes invasives)

# Conducted SEINet Search

- Dynamic map search within 30 km; 331 species

36\_10127-115.02342 within 30 km

Locality: 36\_10127-115.02342 within 30 km

Families: 47

Genera: 201

Species: 331

Total Taxa: 331





# Key Points

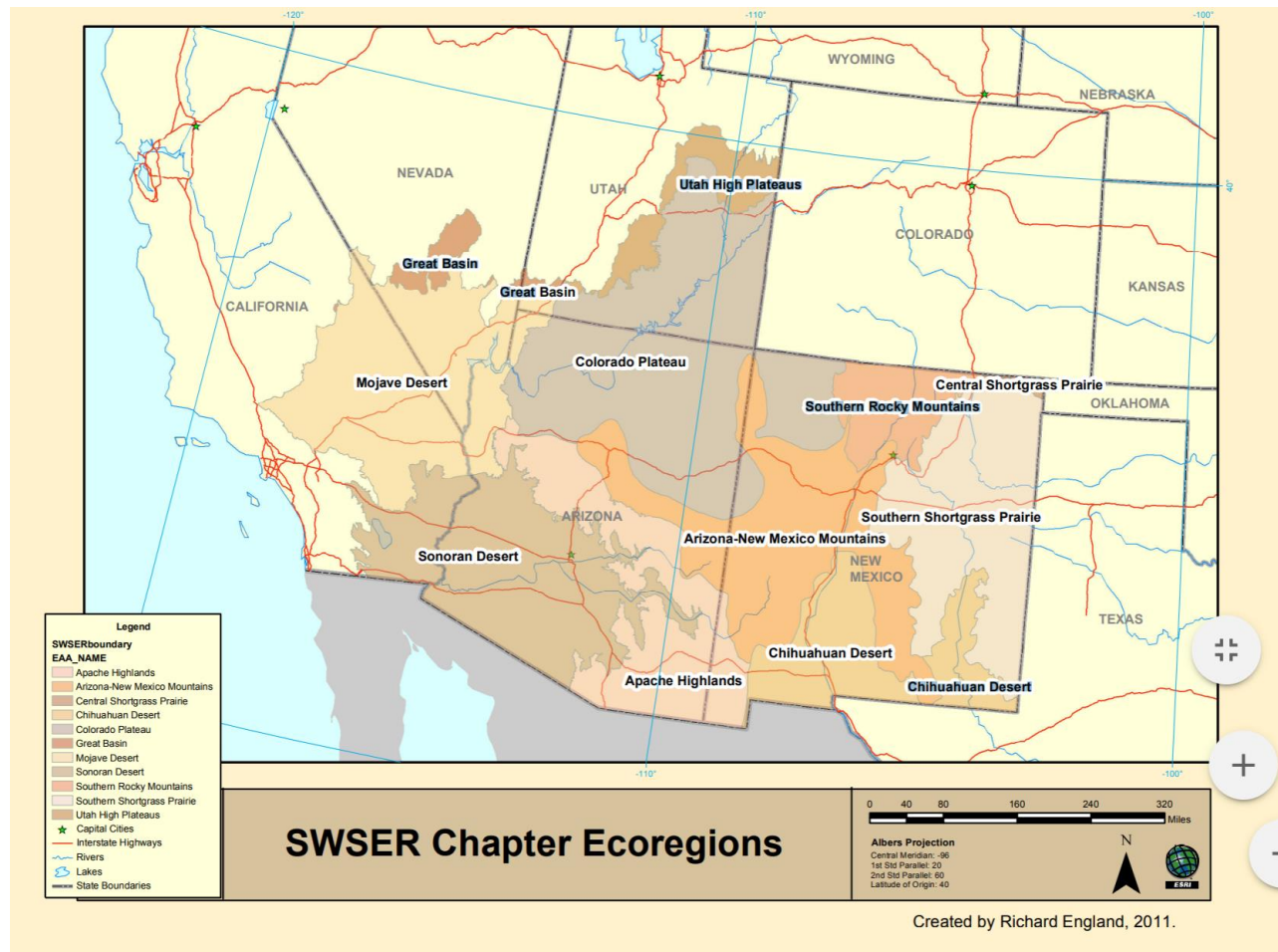
A close-up photograph of a butterfly with black wings featuring white spots and orange markings. The butterfly is perched on a white flower with a green center. The background is a soft-focus green.

- Use as many species as possible
- Look at phenology to ensure overlapping bloom periods
- Prioritize late summer-blooming Asteraceae
- Include appropriate native milkweed species



# Society for Ecological Restoration SW Chapter Annual Conference

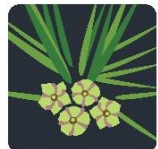
November 8 – 10 \* TUCSON, AZ \* University of Arizona





Questions?

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**Strategic  
Habitat  
Enhancements**

