

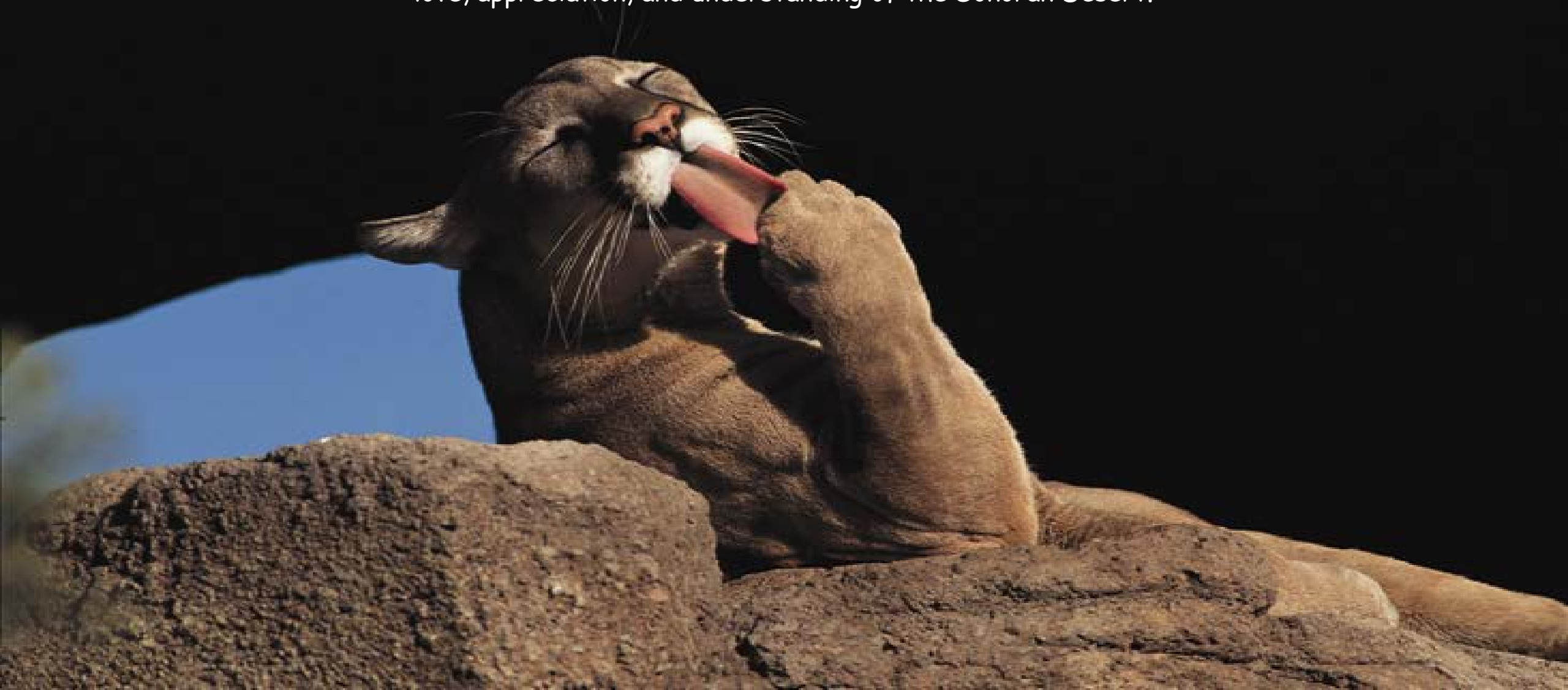
The background of the slide is a close-up photograph of two dragon fruit flowers in full bloom. The flowers are a vibrant orange-yellow color with many layers of petals. They are set against a blurred background of green foliage and the spiky stems of the dragon fruit cactus.

Evolving Roles of Botanical Gardens: Interpretation & Exhibits on a Budget- 3 Unique Perspectives

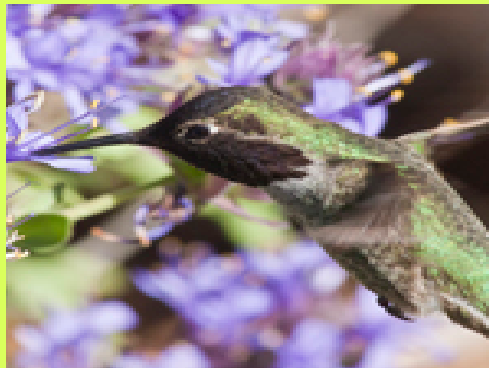
**Marie Long
Associate Director of Conservation
Education & Science**

Arizona-Sonora Desert Museum

The mission of the Arizona-Sonora Desert Museum is to inspire people to live in harmony with the natural world by fostering love, appreciation, and understanding of the Sonoran Desert.



Regional Museum





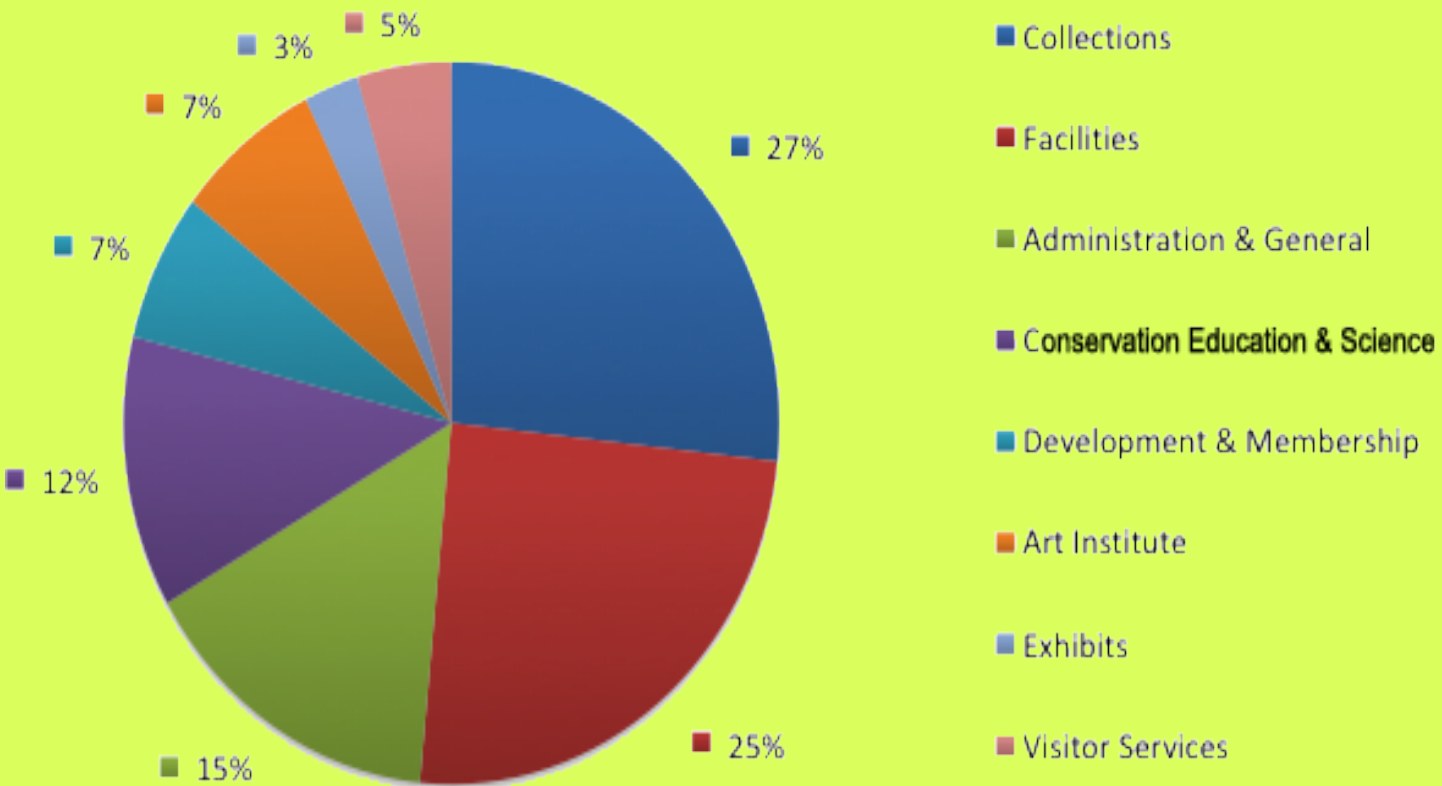


350,000 visitors tour the Museum annually, from all parts of the world.

- **Name #3 zoo in the US in USA Today Poll in 2017**
- **#9 Museum in the US by TripAdvisor in 2014**
- **#5 Public Garden in the US by TripAdvisor in 2013**
- **21,032 household members**
- **713 volunteers (242 docents) 71,985 hours contributed=\$3 million**
- **120 staff**

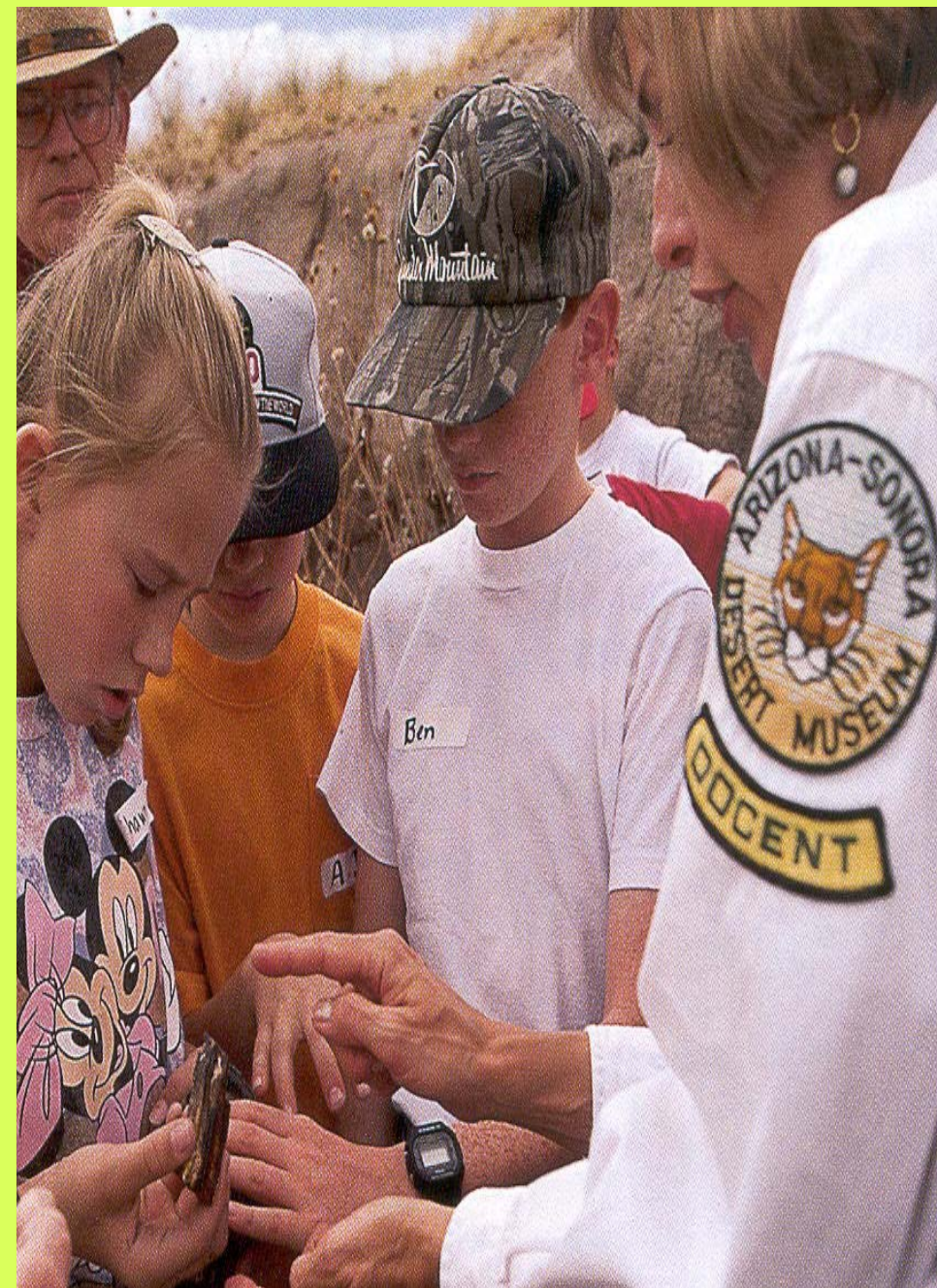
Unlike most museums, about 85% of the experience is outdoors and alive!

**Cat Canyon, opened
1973**



Approximately 9 million in operational

Botany 525,030 (9 full time staff)



The Desert Museum's gardens showcase this vibrant ecosystem and represent a variety of biotic communities found within the Sonoran Desert region.



Arizona-Sonora
Desert Museum

Living plant collection contains 56,000 specimens, of ~1200 species - including 213 types of cacti

Cultural & Demonstration Gardens

Hohokam Agave Field
Labyrinth
People & Pollinator
Desert Garden
Pollination Gardens
Yucca & Saguaro Ramada

Taxonomic Collections

Palo Verde
Agave
Cactus
Ocotillo
Cholla

Biotic Communities

Desert
Mountain Woodland
Desert Grasslands
Tropical Deciduous Forest
Thornscrub
Riparian Corridor (habitat)
Life Zone Transects & Walk
In Aviaries
Mojave Desert





Interpretation & Exhibit's on a Budget

Butterfly & Pollination Garden

Yucca Ramada

People & Pollinator Garden

Cactus Garden

Agave Garden

Labyrinth

Butterfly & Pollination Garden



Butterfly Interpretation

Monarch Waystation

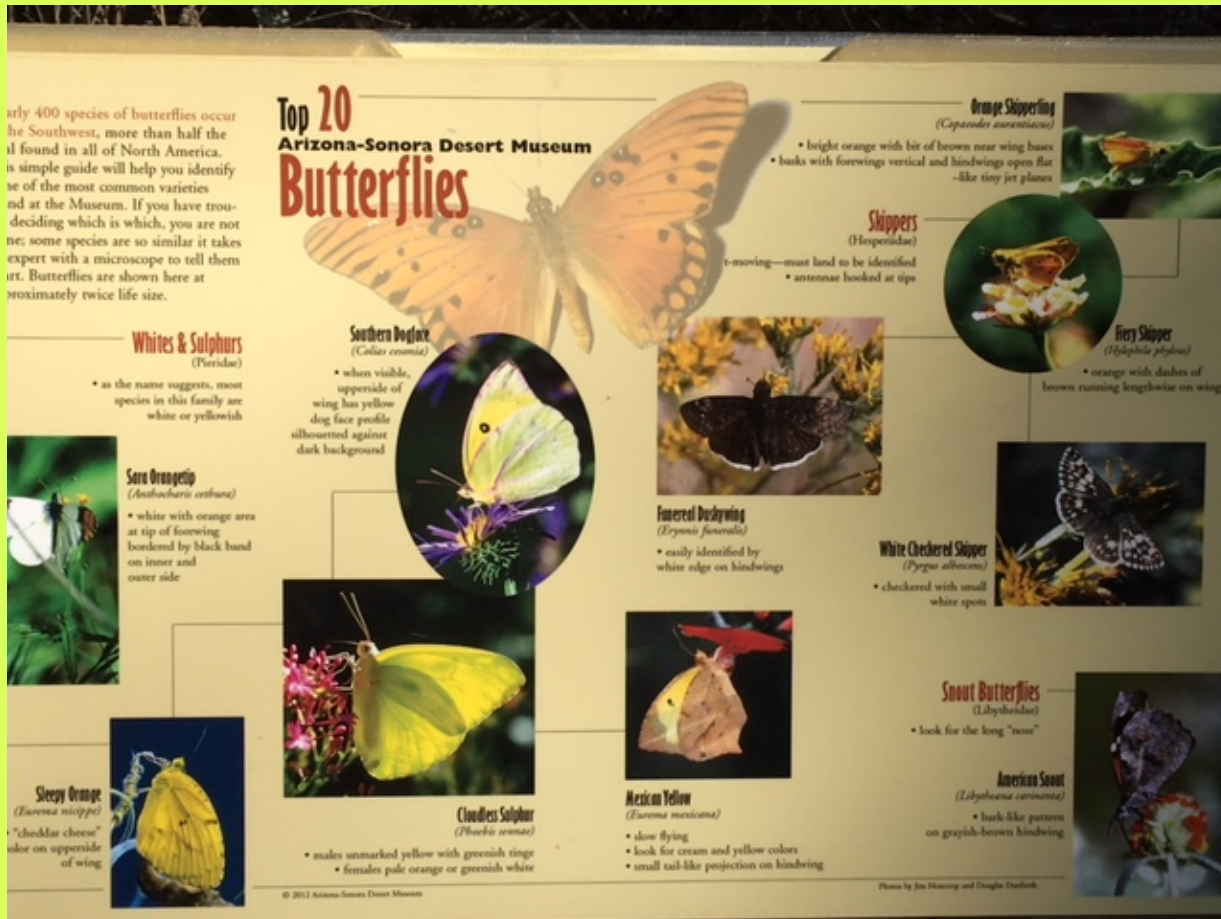


Butterfly Walks

Citizen Science-Monarch Tagging

Plant with a Purpose-Plant Sale

\$33,000 Revenue





ARIZONA-SONORA
DESERT
MUSEUM

#protectingpollinators





University of Arizona-Insect Festival

Milkweed Propagation



4500 milkweeds propagated-Monarch Way Station-School Yards-expanded operations, 8 species

Creating Monarch Waystations in the Community



**Day of the Dead Celebration
the monarch butterfly and museum animals past & present**



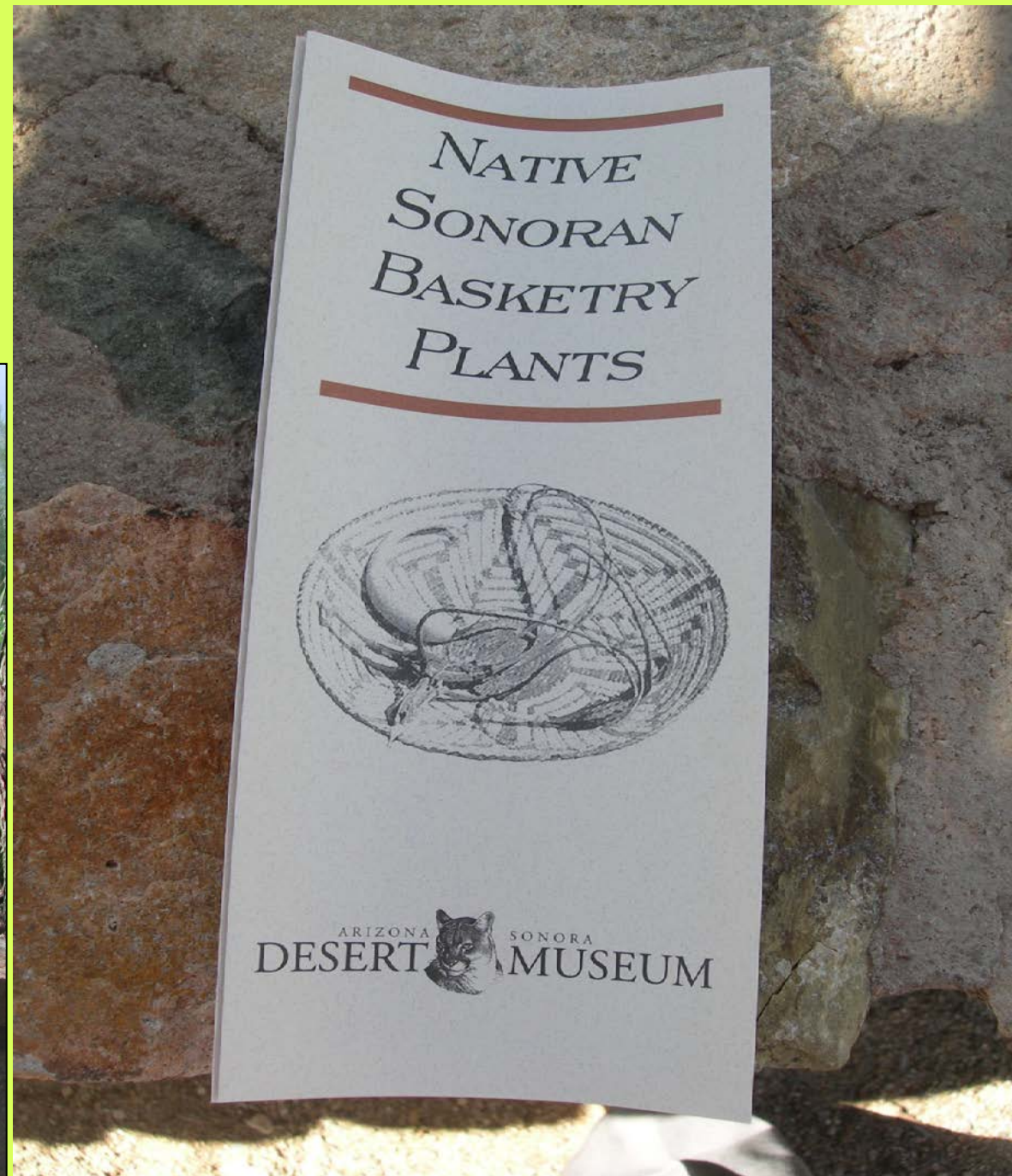




^ Life Underground
Yucca Ramada ^

Yucca Ramada
Revitalization \$1000

Originally this site was called the Weavers Ramada, that's why there are several species of yucca plants around.



In the past this Ramada has been used by Tohono O'odham basket weavers, and as a Native Food cooking demonstration site



A photograph of a rustic, open-air structure made of weathered wood and stone, situated in a desert environment. The structure features a thick, thatched roof made of dried palm fronds or similar natural materials. Several large, gnarled wooden posts support the roof. The walls are constructed from stacked, irregular stones. The ground is sandy and covered with shadows from the structure and surrounding vegetation. In the background, there are various desert plants, including tall grasses and shrubs, under a clear blue sky. The overall atmosphere is one of a traditional, naturalistic building.

Expanding the Interpretive Site

Agave

HERITAGE



Agave Roasting Pit

For centuries, many types of agave have been a source of food for Native Americans in the Southwest, often being roasted in pits like this. The plant was so important that some desert people grew it as a crop instead of just gathering wild agaves.

It takes one to four days to cook agaves in a roasting pit. To prepare the, people remove the leaves from the plant's short thick stem, until they expose the heart. Agave "hearts" are then sandwiched between layers of moist vegetation in the rock-lined pit and covered with dirt to bake. Fresh baked agave is extremely sweet and low in calories.

Agave is also a major source of fiber. The plant's long fibers can be used to make thread, cord, nets, clothing and baskets. Agave leaves are steamed in roasting pits for a short period of time, after which the leaf pulp is scraped leaving the fibers, which are twisted and spliced together to make balls of twine.



Pozo para Asar el Maguey

Por siglos, muchos tipos del Maguey han sido fuente de comida para los Americanos Nativos en el Suroeste que seguido se asan en pozos como este. La planta era tan importante que algunos habitantes del desierto lo sembraban como parte de su cosecha en lugar de pizar el Maguey silvestre.

Se toma de uno a cuatro días para cocinar el Maguey en el pozo para asar. Para prepararlos, uno tiene que remover las hojas de los brazos cortos y gruesos, hasta que se vea el "corazón." El "corazón" del Maguey es envuelto en tapas de vegetación húmeda en el pozo forrado de rocas y cubierto de tierra para asarse. El Maguey acabado se asar es extremadamente dulce y bajo en calorías.

El Maguey es también la mayor fuente de fibra. Las fibras largas de la planta se pueden usar para hacer hilo, cuerda, redes, ropa y canastas. Las hojas del Maguey se cocinan al vapor dentro del pozo por un corto tiempo, luego se raspa la pulpa dejando solo la fibra, la cual es entretejida y unida para hacer bolas de hilo.







People & Pollinator Garden

\$10,000 Donation



Opening Day



e & Pollinators
ibit opening!
ay & Sunday

What is a pollinator?
Any animal that helps plants reproduce by transporting pollen.
To reproduce, most plants exchange pollen—carrying sperm cells. Plants are made from...





LET'S GO FOR A DRIVE!
CHEVROLET
CAVALIER
CAMARO
MALIBU
MONTE CARLO
IMPALA
Orlery
www.ory.com

EXP





Tohono O'odham Community College

Traditional Ecological Knowledge & Interpretation





Heritage Fruit Tree Project



Shade structure to propagate heritage fruit trees









Cactus Garden Revitalization

The Revitalization of the Cactus Garden introduced more plant groupings, increased density and provided needed shade. A hard frost in 2011 and following years of drought damaged many plants in the collection. Fall of 2014 \$15,000-Single donor funding





Volunteers

Thanks to the United Way of Tucson's Days of Caring for participating.





Haag Cactus Garden 50th Birthday

May 2015-Free with Museum admission, refreshments, tours of the garden and history
Jason reconnected the local cactus society through talks, renovation and they provided plants



Docent Led Cactus Tours



Flying Saucer



Trichocereus hybrid

Photo Credit-Marie Long

Close to 10,000 likes, Mark Dimmitt, former curator, he was a leader of the beginning of hybridizing trichocereus and is still well known for it.



Photo credit-Jason Wiley

Amazon Donation –Fall 2017





Agave Garden Revitalization

\$35,000-Donor funded



Rock work created by starting a concreted incomplete mold and then a horticultural mix soil fill. Irrigation incorporated into the rock along with additional irrigation upon completion. Results in a rich mix, water absorbing and open bottom for roots.



Agave Interpretations

“Watching stalks grow”

Science Studies

Tequila Tasting

Agave Tours

Labyrinth Garden







Exhibit Opening & Blessing



Native American Cultural Night

*June 28th, 2014, Free Admission for Native American community members
attendees-2,252, with 668 Native American community members*



Questions?



Idaho Botanical Garden



Simple Plant Stakes

Engraved plant labels on a stake may cost \$20 or more each.

Simple signs may be appropriate in certain locations



Blackboards

Metal coated with blackboard paint creates signs that can be changed frequently or used for an extended period. Use chalk or chalk pens.



ACTIVE

What goes in here?

Fresh greens & food waste.

• No weeds, no meat, no trash!



CURING

This bin allows for the compost to neutralize in pH, and break down into humus.



FINISHED

Ready for the garden!

Compost increases the soil's quality, and the availability of nutrients to our growing plants



WHAT'S BLOOMING!

1 CHOKECHERRY
throughout the garden

2 TULIPS
throughout the garden

3 HELLEBORES
throughout the garden

4 SIBERIAN BUGLOSS
Meditation Garden

5 EASTERN REDBUD
throughout the garden

6 KOREAN SPICE VIBURNUM
English Garden

7 CRABAPPLE
throughout the garden

8 OAKLEAF SUMAC
Lewis & Clark Native Plant Garden

9 OREGON GRAPE
throughout the garden

10 SIBERIAN PEA SHRUB
throughout the garden

11 LILAC
throughout the garden

12 SERVICEBERRY
throughout the garden



Coroplast Signs

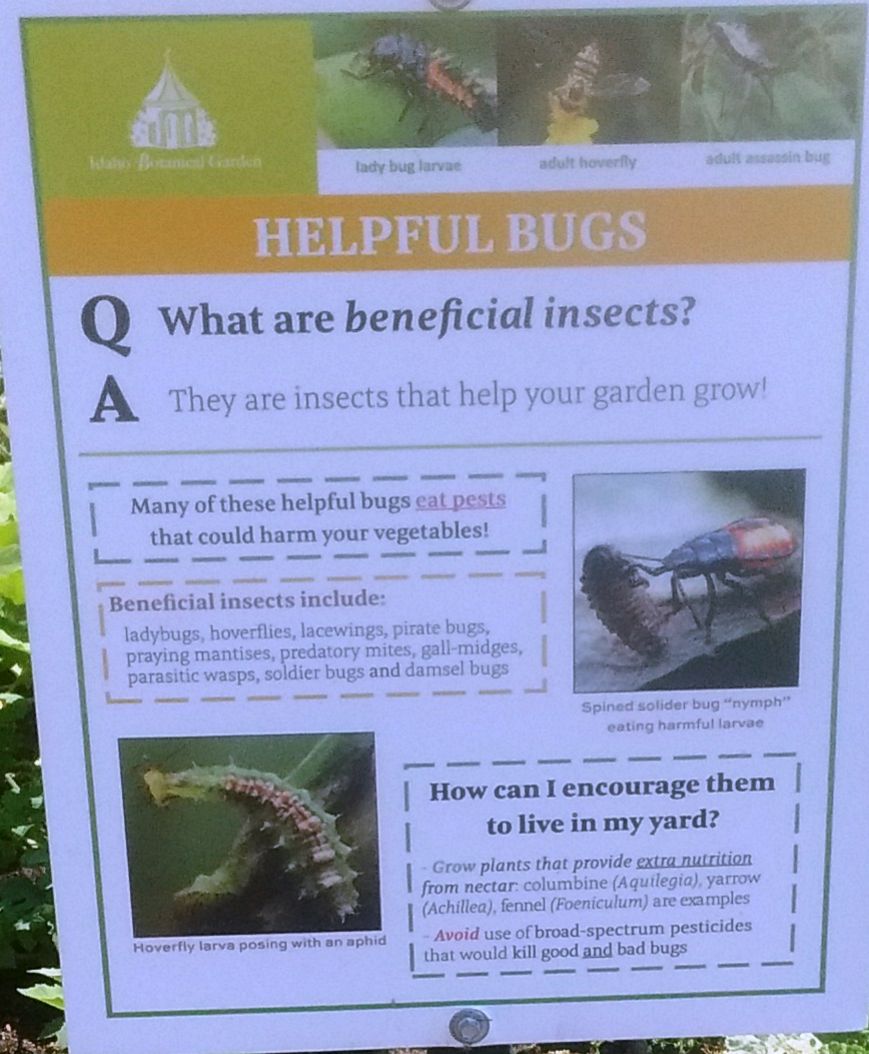
Corrugated plastic can be used to make inexpensive signs that will last a season or more.

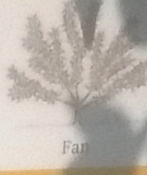
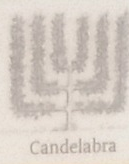
Reusing a template saves on design costs.



Small Metal Signs

Like the coroplast signs, reusing a template for aluminum signs saves on design costs.





ESPALIER TRAINING

Q How can you grow a fruit tree in a small space?

A Train the tree to be an espalier!

Benefits of espalier (es-PA-lee-ay) training:

- maximize fruit production
- easier to reach the fruit



By planting crops **next to a wall** that reflects **heat** and **sunlight**, the **growing season** may be extended.

Espalier trees can be shaped into *decorative patterns*, or turned into a *formal hedge or wall*.



Inexpensive Art Exhibit- Scarecrow Stroll

For a small fee,
community members,
schools and
businesses are invited
to display a scarecrow
in October.









Interpretation & Exhibits on a Budget

Tucson Botanical Gardens

Ashley Pedersen, Director of Education

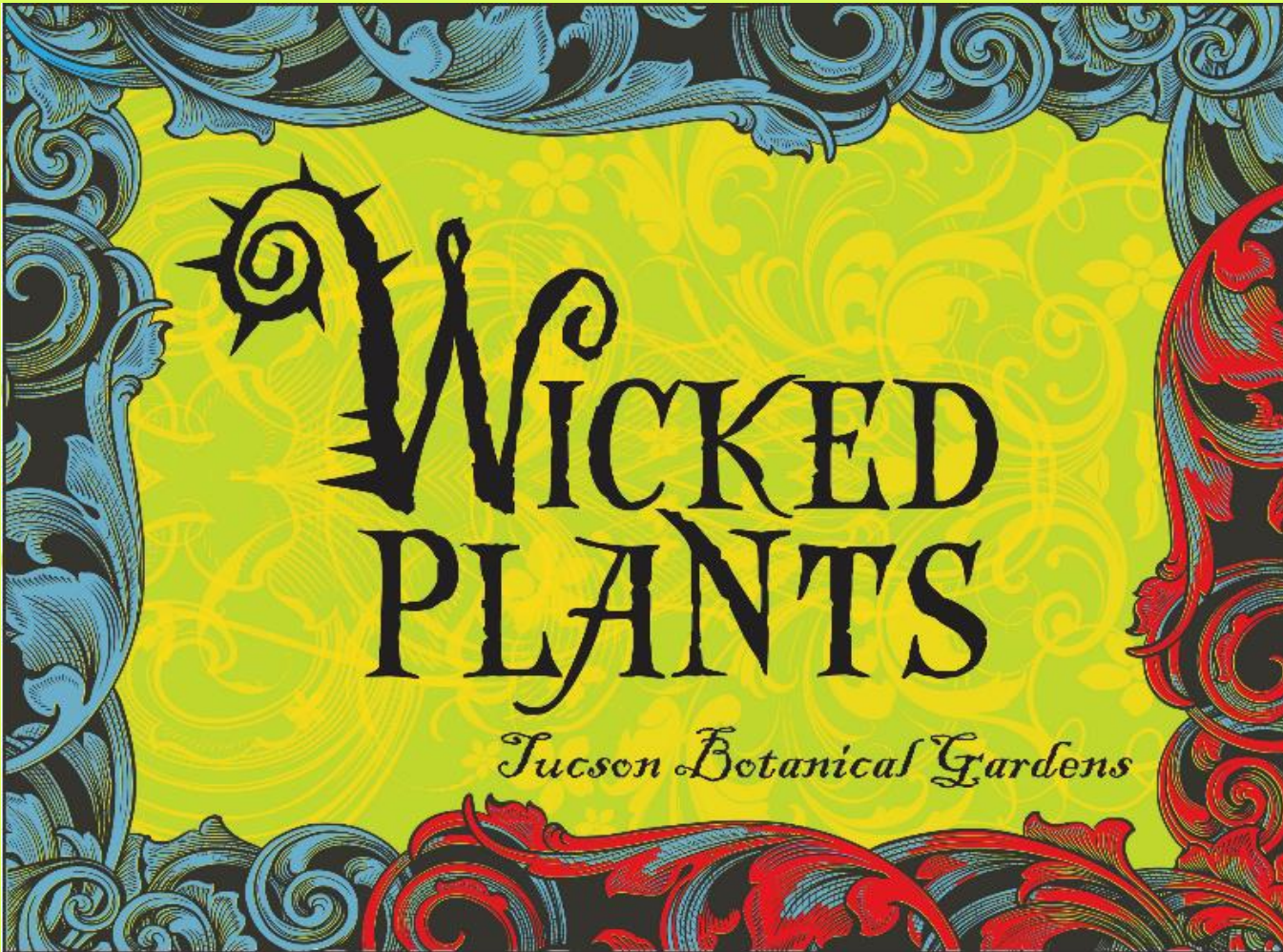
Tucson Botanical Gardens

5.5 acres, 17+ thematic pocket gardens, 100K
annual visitors, 4,800 member households



Small Original Exhibits

Approx. \$12,000 each, created in-house



OLEANDER (*Nerium oleander*)

WICKEDPEDIA: The oleander plant is widely grown as an ornamental in warm climates. It is an evergreen shrub, frequently used as a screen or backdrop planting. In the warm months it produces attractive white, pink, or red flowers.

WICKED WAYS: Oleander is one of the most toxic of all plants. It is poisonous to people and many animals.

WICKED WHYS: All parts of the plant are laced with oleandrin and nerine, potent cardiac glycosides which effect the digestive tract and the heart.



SEGOPALM (*Cycas revoluta*)

WICKEDPEDIA: The sego palm is a cyad – an ancient kind of plant which makes cones rather than flowers. Plants are either male or female.

WICKED WAYS: All parts of the plant are toxic to humans and to pets. Toxins include cycasin, a glycoside. The toxins are most concentrated in the seeds.

WICKED WHYS: Sego palm rarely makes seeds, and then only on female plants. Many plants concentrate poisons in their reproductive parts, especially seeds. These seeds are large and full of nutrition (intended for the developing seedling), so it is advantageous for the plant to protect its seeds with poisons.



VENOMOUS VEGGIES

You mash, chop, steam, dip, munch and enjoy fruits and veggies every day. They're good for you – or are they? Can you guess which of these delicious plants can pose a dangerous threat?

TOXIC

A small amount of amygdalin, found in apple seeds, won't hurt you, but a large enough dose could be fatal.

TASTY

Broccoli is rich in vitamins A, C, and K. Sorry, kids!

Botanically speaking, a vegetable is a non-scientific way to describe the edible part of a plant.

TOXIC

Linamarin is a dangerous cyanogenic glucoside contained in raw lima beans.

Fruit refers to the part of a plant that grows a flower.

TASTY

Oranges aren't known to have any toxic effects. Orange you glad?

TOXIC

Green potatoes have a high concentration of the alkaloid solanine. Ingesting these spuds can bring on vomiting, paralysis or death.

TOXIC

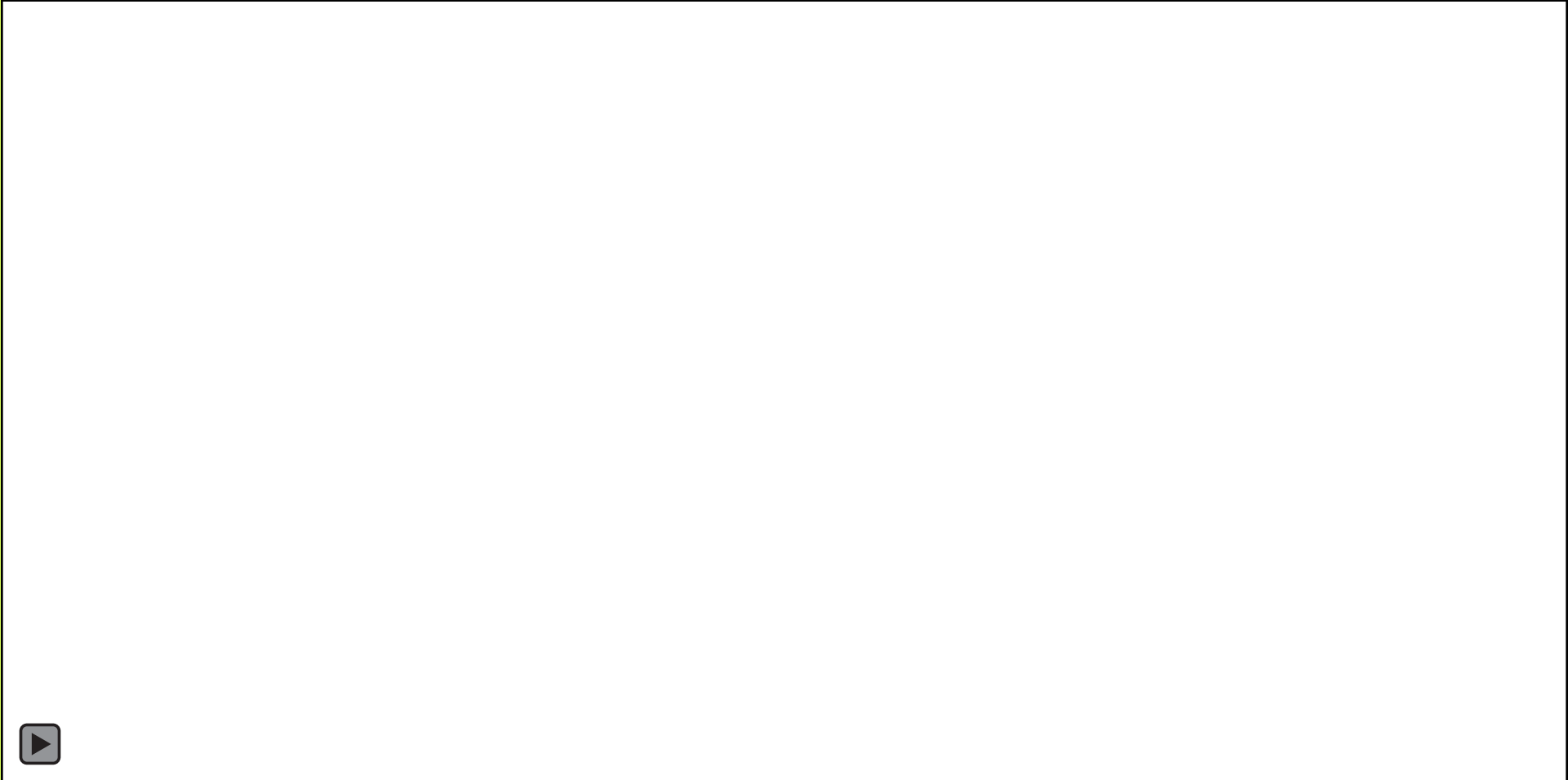
Oxalic acid in the leaves of rhubarb can cause kidney problems and even induce a coma.

Tasty or Toxic?

Wicked Plants, 2009

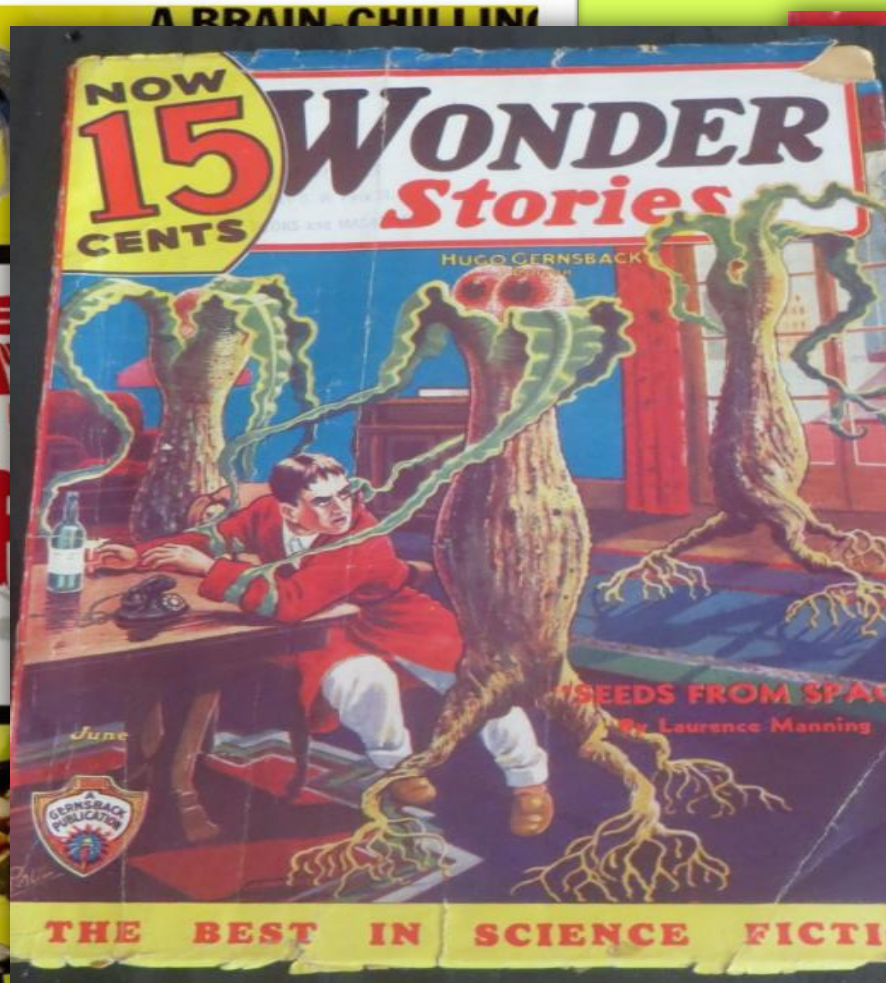
Inspired by book and similar exhibits

Wicked Plants, 2009
“Edutainment”



Alien Invasion of the Plant Kind, 2013

Using pop culture to tell the story of invasive plant species



Alien Invasion of the Plant Kind, 2013

Created by local exhibit designer with basic materials to resemble shipping crates



Alien Invasion of the Plant Kind, 2013

Hands-on activities and live interpretation



Add-ons to Major Exhibits



Nature Connects, 2015

Lego Playroom



Frida Kahlo: Art, Garden, Life, 2016

Play Kitchen and Puppet Theatre



Redesigned and Extended



Origami in the Garden, 2017

Origami Folding Room



Luminaria Nights

Korean Lantern Display



Plant Labels

Pollinator focused areas of the Gardens

Gooding Verbena
Glandularia gooddingii
Verbanaceae



Arizona Foldwing
Dicliptera resupinata
Acanthaceae



Questions?

