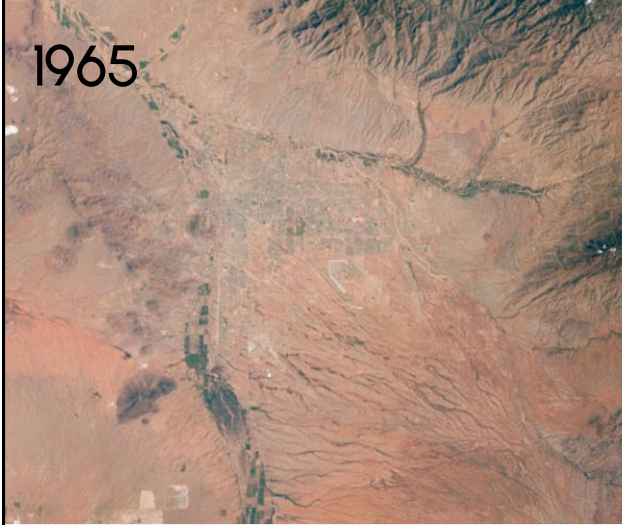




“MORE CITY, LESS GREEN IN TUCSON, AZ”

NASA Landsat Imagery

1965



2011

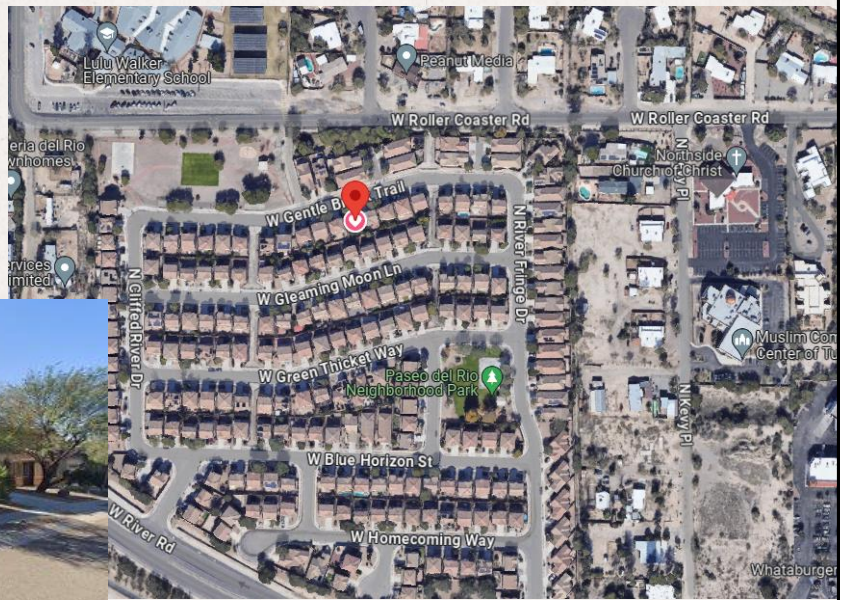


LOW WATER USE GARDEN MISCONCEPTION

- barren habitat • boring!
- increased temperatures



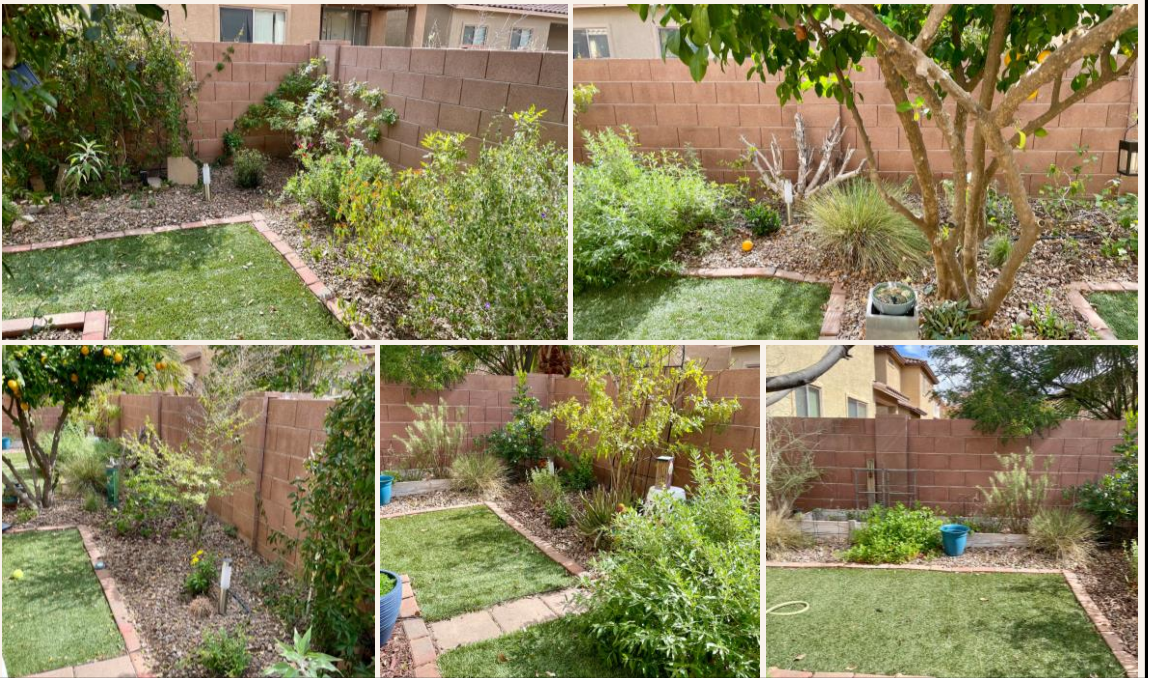
CASE
my house!
STUDY



2020



2023



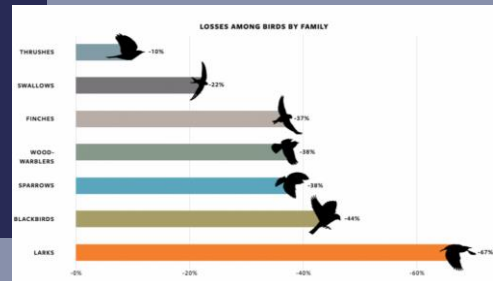
Sabino Springs

The map displays the Sabino Springs area with various colored overlays representing different land management zones. A yellow star marks the location of Sabino Canyon. Roads shown include E Sunrise Dr, N Grant Rd, E Pima St, Broadway Bl, N Wilcox Rd, N Pantano Rd, N Kolb Rd, N Saguaro Canyon Rd, N Cholla Rd, N Bear Canyon Rd, E Snyder Rd, N Harrison Rd, E Catalina Hwy, E Fort Lowell Rd, E Tanque Verde Rd, E Redington Rd, N Freeman Rd, N Mingo Blvd, N Leija Rd, N Soldier Tr, N Pecos Valley Ck, N San Juan Mt, N Swan Rd, E Grant Rd, E Pima St, Broadway Bl, N Wilcox Rd, N Pantano Rd, N Kolb Rd, N Saguaro Canyon Rd, N Cholla Rd, N Bear Canyon Rd, E Snyder Rd, N Harrison Rd, E Catalina Hwy, E Fort Lowell Rd, E Tanque Verde Rd, E Redington Rd, N Freeman Rd, N Mingo Blvd, N Leija Rd, N Soldier Tr, N Pecos Valley Ck, N San Juan Mt, N Swan Rd.

- SABINO SPRINGS HOA
- PUSCH RIDGE WILDERNESS AREA
- AZGFD WILDLIFE MOVEMENT AREAS - RIPARIAN
- MAJOR WASHES
- AREAS OF HIGH BIOLOGICAL SIGNIFICANCE
- FEDERALLY DESIGNATED WILDERNESS AREA

pimamaps.gov

YARDS NEED TO DO MORE



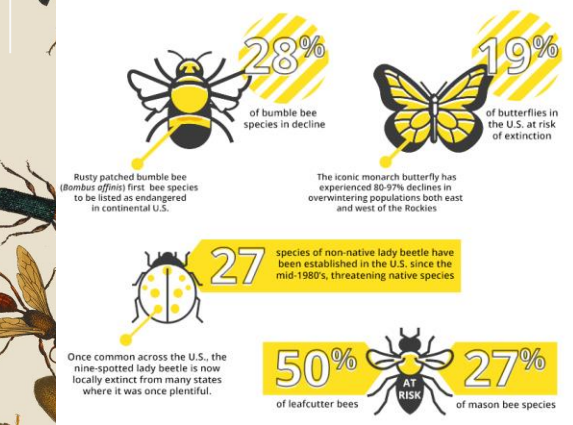
BIRD POPULATION DECLINE

- From 1970 to 2017 North America has lost 2.9 BILLION breeding adults
- 419 of the 529 species studied suffered population declines
- Not only threatened species suffered, common birds were hit hardest

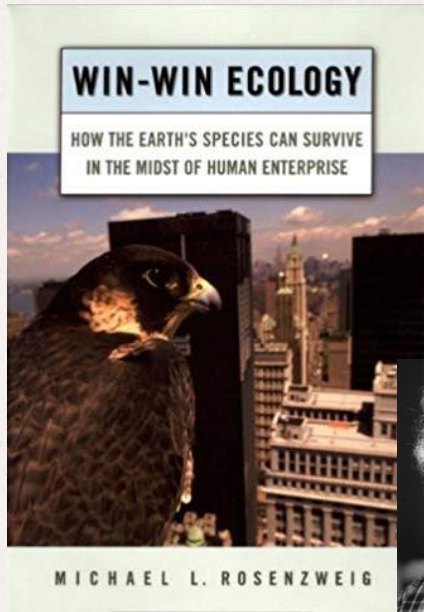
INSECT POPULATION DECLINE

"The magnitude of the decline could significantly affect the continent's food webs and ecosystems."

"we can be pretty sure that other parts of the ecosystem are also in decline and degradation."



HOW TO CREATE YARDS THAT DO MORE



RECONCILIATION ECOLOGY

MICHAEL ROSENZWEIG

The science of inventing, establishing, and maintaining new habitats to conserve species diversity in places where people live, work, and play.



HABITAT COMPONENTS

FOOD



WATER



HOME



REDUCING
HAZARDS



NATIVE PLANTS

main component of habitat

FOOD



WATER



HOME



REDUCING
HAZARDS



PLANNING YOUR HABITAT

- THE SIZE OF YOUR YARD
- WHICH PLANTS WILL STAY? WHICH WILL GO?
- WHICH NEED TO GO?
- WHERE ARE THE AREAS OF SUN AND SHADE AND WHEN DO THEY OCCUR?
- WHAT WILDLIFE DO YOU WANT TO ATTRACT?
- ARE THERE RESTRAINTS TO WHAT YOU CAN AND CANNOT PLANT?



WHAT TO CONSIDER WHEN SELECTING PLANTS

- IS IT NATIVE?
- HAS IT BEEN TREATED WITH SYSTEMIC INSECTICIDES?
- THE PLANTS SIZE AND SHAPE AT MATURITY
- WHAT ARE ITS SUN/SHADE REQUIREMENTS?
- WHAT ARE ITS WATER REQUIREMENTS?
- WHAT PURPOSE DOES IT SERVE TO THE HABITAT?



SEINet Arizona - New Mexico Chapter

Home Specimen Search Images Flora Projects Agency Floras Dynamic Floras Additional Websites Resources

***Aloysia gratissima* (Gillies & Hook.) Troncoso**

Family: Verbenaceae
Whitebrush

[*Aloysia floribunda* M. Martens & Galeotti

SW Field Guide Resources

Kearney and Peebles 1969, Shreve and Wiggins 1964, Allred and Ivey 1971

Common Name: whitebrush **Duration:** Perennial **Nativity:** Native **Lifeform:** Shrub **General:** Slender fragrant shrub 2-3 m tall; bark is pale and wood is yellow; stem is slender, gray, 4-angled, ciliate. **Leaves:** Opposite, often with fascicle of smaller leaves in the axils, on short petioles 1-3 mm long; blades oblong to elliptic, 5-25 mm long, bases attenuate into the petioles, margins entire to denticulate, surfaces scabrous-strigose and dull-green above, strigillose beneath. **Flowers:** Small, whitish or bluish, and vanilla-scented. In open, leafy panicles composed of many slender elongate spikes or spike-like racemes; corollas bilabiate and somewhat irregular; calyces 2 mm long, regular-campanulate, deeply 4-lobed, and conspicuously villous. **Fruits:** Schizocarp of 2-4 nutlets. **Ecology:** Found in rocky or gravelly hills, sandy or limestone soils, and arroyos, around 3,000-4,000 ft. (1,219 m). **Flowers:** April-September. **Distribution:** ± AZ to W TX; south through MEX to S. Amer. **Notes:** This vanilla-scented shrub is uncommon in the hitting its northern limit in the extreme southern part of Arizona near the Ruby Road, in Dona Ana County on the southern border of New Mexico; and neighboring Texas. It is similar to the more common *Aloysia wrightii* with its slender graceful stems, small oval leaves, and many racemes of small flowers with hairy calyces; however, *A. wrightii* has gray-green leaves which are distinctly white-tomentose underneath and have regularly and obviously toothed margins. *A. gratissima* has olive-green leaves which can be a bit hairy underneath but are not densely white-tomentose, with mostly smooth margins which can have small, irregular teeth. **Ethnobotany:** Used topically to treat wounds in South America. **Etymology:** *Aloysia* is named in honor of Maria Louisa Teresa, 1751-1815, Princess Parma and wife of King Carlos IV of Spain; *gratissima* means very pleasing. **Synonyms:** *Aloysia lycioides*, *Veronica gratissima*, *Lippia lycioides* **Editor:** LCrumbacher2012, AHazelton 2015

NATIVITY

- indicates if the plant is native to Arizona

LIFEFORM

- Indicates the plants form (tree, shrub, etc.)

GENERAL

- Physical description of plant

ECOLOGY

- Where the plant is naturally found
- Elevation is key

FINDING APPROPRIATE PLANTS

SEINET

SWBIODIVERSITY.ORG

SABINO SPRINGS ELEVATION:

2725'- 2850'

PLANT HARDINESS ZONE: 9a

(20 to 25 °F/-6.7 to -3.9 °C)



RESOURCES



SPADEFoot NURSERY

Native plants and resources

DESERT SURVIVORS

Native plant nursery and resources

TUCSON CACTUS AND SUCCULENT SOCIETY

cactus rescue, prickly park,
volunteerism, information

ARIZONA NATIVE PLANT SOCIETY

Resources and meetings

ECOSENSE

All things soil

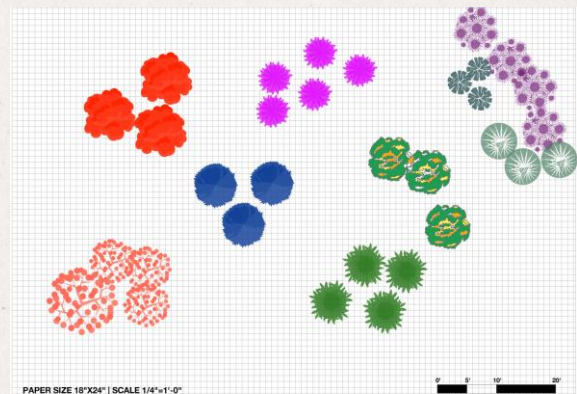
BIRD AND POLLINATOR HABITAT - BEST PRACTICES

PLANT IN PATCHES

Patches are groupings of plants of the same species that improve habitat quality by making it more readily located and usable. These splashes of color act as an 'open' sign to your garden.

CREATE A DIVERSITY OF PATCHES

To obtain a bio-rich habitat full of nectar, fruits, seeds, insects, nesting sites, and cover for a variety of birds and wildlife, include a diverse array of complementary patches that each offer something different.



BIRD AND POLLINATOR HABITAT - BEST PRACTICES

DIVERSE LAYERS OF VEGETATION

The structure of plants is often divided into three categories: understory, midstory, and canopy. Here, we are differentiating categories by height, but categories may also include textures and colors.



BIRD AND POLLINATOR HABITAT - BEST PRACTICES

PLANT FOR YEAR-ROUND BLOOMS

A diverse garden with native plants blooming throughout the year will provide food resources for birds and pollinators through the seasons which is especially important in times like winter and late summer when blooms can be sparse.

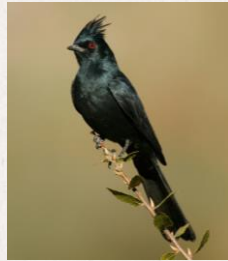
	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
Anderson's wolfberry												
Desert marigold												
Firecracker penstemon												
Apache plume												
Gregg's mistflower												
Arizona milkweed												
Slimpod senna												
Brittlebush												
Blue mistflower												
Wright's goldenrod												

ADDING PLANTS - CANOPY

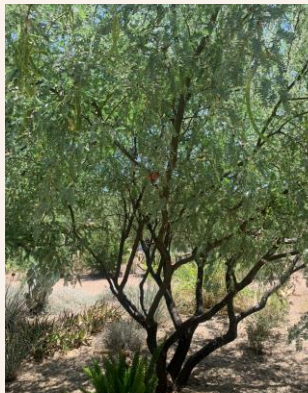
The canopy is the uppermost layer, formed by the crowns of trees. The canopy provides shade to the plants and soil below, which can greatly reduce evaporation in warm months.

HABITAT VALUE:

- SHADE
- food
- shelter



CANOPY PLANTS



VELVET MESQUITE

Neltuma velutina

Size/Shape: 25 x 25', multi-trunk, loose spreading crown

Water: low

Sun/Shade: Full sun/Part shade

Bloom time/Color: Apr - Jun, Yellow

Habitat Value: 

DESERT WILLOW

Chilopsis linearis

Size/Shape: 25 x 20', deciduous, multi-trunk

Water: Low-Med

Sun/Shade: Full sun/Part shade

Bloom time/Color: Mar - Apr, pink - purple - white

Habitat Value: 



CANYON HACKBERRY

Celtis reticulata

Size/Shape: 30 X 30', deciduous, excellent shade tree

Water: Low-Med

Sun/Shade: Full sun/Part shade

Bloom time/Color: Mar - Apr, inconspicuous flowers followed by bright red berries

Habitat Value:   



FOOTHILLS PALO VERDE

Parkinsonia microphylla

Size/Shape: 20 x 20', multi-trunk, slow growing, ideal size for yards

Water: Low

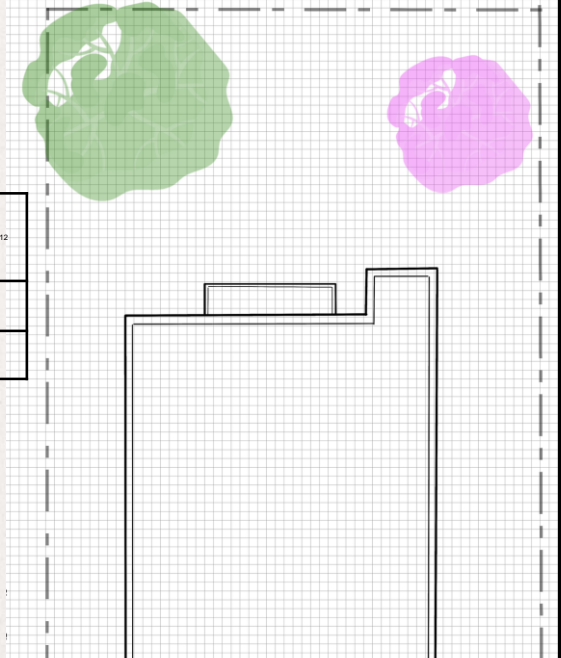
Sun/Shade: Full sun

Bloom time/Color: Apr - May, Showy yellow flowers

Habitat Value:   

PLACE CANOPY

BLOOM TIME CALENDAR	1	2	3	4	5	6	7	8	9	10	11	12
velvet mesquite												
desert willow												



ADDING PLANTS - MIDSTORY

The mid-story can consist of tall shrubs, young trees, and vines climbing up the taller plants.

HABITAT VALUE:

- NESTING
- food
- shelter/cover



MID STORY PLANTS



BUCKHORN CHOLLA


Cylindropuntia acanthocarpa

Size/Shape: 3 x 7'

Water: low

Sun/Shade: Full sun

Bloom time/Color: May - Jun, Yellow

Habitat Value: 

FREMONT'S WOLFBERRY


Lycium fremontii

Size/Shape: 6 x 8'

Water: low-med

Sun/Shade: Full sun/Part shade

Bloom time/Color: Jan - Apr, purple flowers followed by orange-red berries

Habitat Value: 






CHUPAROSA*Justicia californica*

Size/Shape: 5 x 5'

Water: low

Sun/Shade: Full sun/Part shade

Bloomtime/Color: Mar - Sep, red



Habitat Value:   **BUSH DALEA***Dalea pulchra*

Size/Shape: 5 x 5'

Water: low

Sun/Shade: Full sun/Part shade

Bloomtime/Color: Apr - Jun, Yellow




Habitat Value:  **INDIAN MALLOW***Abutilon palmeri*

Size/Shape: 6 x 4'

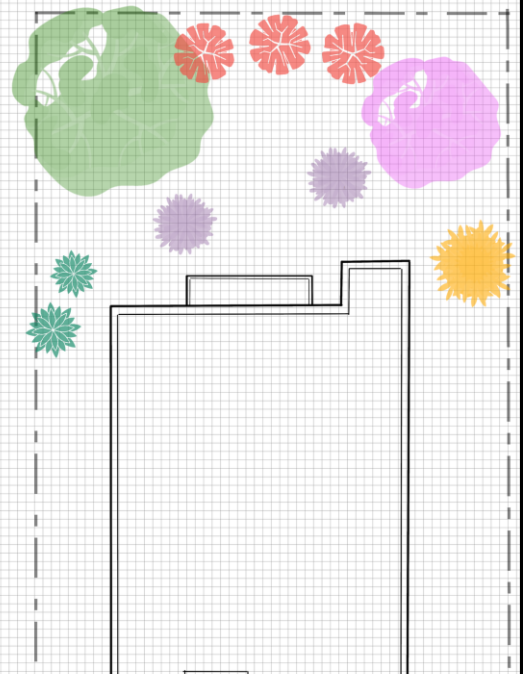
Water: low

Sun/Shade: Full sun/Part shade

Bloomtime/Color: Mar - May, Orange-yellow

Habitat Value:   **PLACE MIDSTORY**

BLOOM, TIME CALENDAR	1	2	3	4	5	6	7	8	9	10	11	12
VELVET MESQUITE				Yellow	Yellow	Yellow						
DESERT WILLOW				Pink	Pink	Pink	Pink	Pink	Pink	Pink	Pink	
INDIAN MALLOW			Orange	Orange	Orange							
CHUPAROSA			Red	Red	Red	Red	Red	Red	Red	Red		
BUSH DALEA				Blue	Blue	Blue						
MEXICAN HONEYSUCKLE	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange



UNDERSTORY

The understory includes the grasses, wild flowers, and small shrubs.

Add last

Plant in Patches
groups of 3 or more

Create a Diversity of patches
color; food type, textures, etc.

HABITAT VALUE

- blooms for pollinators
- seeds for birds
- cover & shelter for birds, lizards
- Nesting sties for ground nesting birds



UNDERSTORY




FLAT-TOP BUCKWHEAT
Eriogonum fasciculatum

Size/Shape: 3 x 3'

Water: low

Sun/Shade: Full sun/Part shade

Bloom time/Color: Mar - Jun, white

Habitat Value: 




FAIRY DUSTER
Calliandra eriophylla

Size/Shape: 3 x 3'

Water: low

Sun/Shade: Full sun/Part shade

Bloom time/Color: Feb - May, pink

Habitat Value: 




BRITTLEBUSH
Encelia farinosa

Size/Shape: 4 x 4'

Water: low

Sun/Shade: Full sun

Bloom time/Color: Feb- May, Aug- Sep, yellow

Habitat Value: 

UNDERSTORY



GOODDING'S VERBENA
Glandulari gooddingii

Size/Shape: 1 x 2'
Water: low - med
Sun/Shade: Full sun/Part shade
Bloom time/Color: Mar - Oct, lavender
Habitat Value:



MEXICAN HONEYSUCKLE
Justicia spicigera

Size/Shape: 2 x 3'
Water: low - med
Sun/Shade: Full sun/Part shade
Bloom time/Color: year-round, bright orange
Habitat Value:



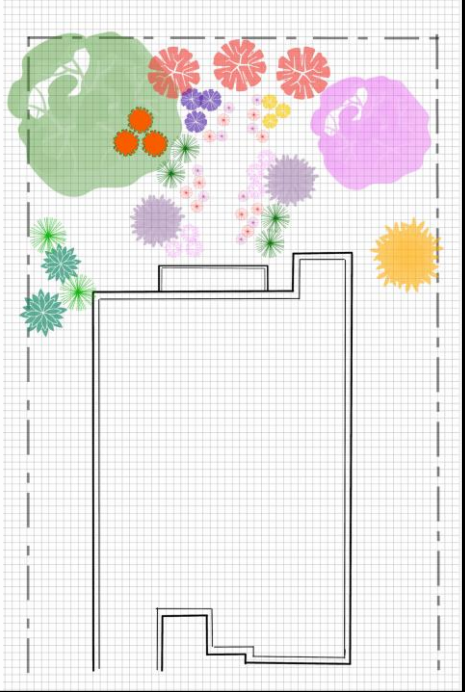
SONORAN HONEYSUCKLE
Justicia sonora

Size/Shape: 2 x 2'
Water: low-med
Sun/Shade: Full sun/Part shade
Bloom time/Color: anytime with supplemental water or after rains, brilliant violet
Habitat Value:



Place Understory

BLOOM TIME CALENDAR	1	2	3	4	5	6	7	8	9	10	11	12
VELVET MESQUITE				Yellow	Yellow	Yellow						
DESERT WILLOW				Pink	Pink	Pink	Pink	Pink	Pink	Pink	Pink	
INDIAN MALLOW			Orange	Orange	Orange							
CHUPAROSA			Red	Red	Red	Red	Red	Red	Red			
BUSH DALEA				Blue	Blue	Blue						
DESERT MARIGOLD			Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow			
GOODDING'S VERBENA	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple
SONORAN HONEYSUCKLE	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple	Purple
BRITTLEBUSH		Yellow	Yellow	Yellow	Yellow			Yellow	Yellow			
FLAT-TOP BUCKWHEAT			Pink	Pink	Pink	Pink						
PENSTEMON			Pink	Pink	Pink							
MEXICAN HONEYSUCKLE	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
GLOBEMALLOW			Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	





WATER

WATER



WATER FOR WILDLIFE

STATIC
MOVING

WATER FOR HABITAT

SIMPLE
ADVANCED



STATIC

Mechanism free; require regular maintenance



BIRD WATERER



WATER DISH



BUTTERFLY PUDDLER

MOVING

ADD WATER MOVEMENT

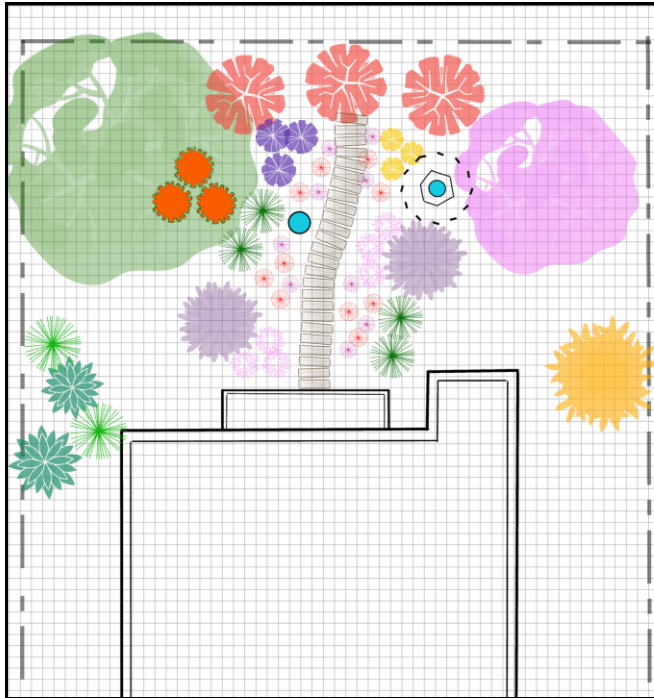
POND

WATER WIGGLER

IRRIGATION DRIP

BOULDER FOUNTAIN

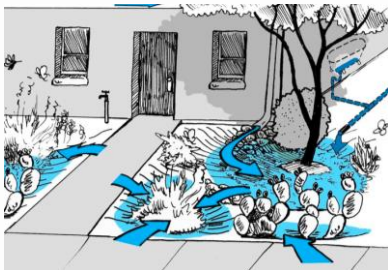




ADD WATER FOR WILDLIFE



WATER FOR HABITAT



SIMPLE

contouring of the land to slow, spread, and direct rainwater into the ground and surrounding plants. It is a simple strategy that captures and “plants” rain and localized runoff.

ADVANCED

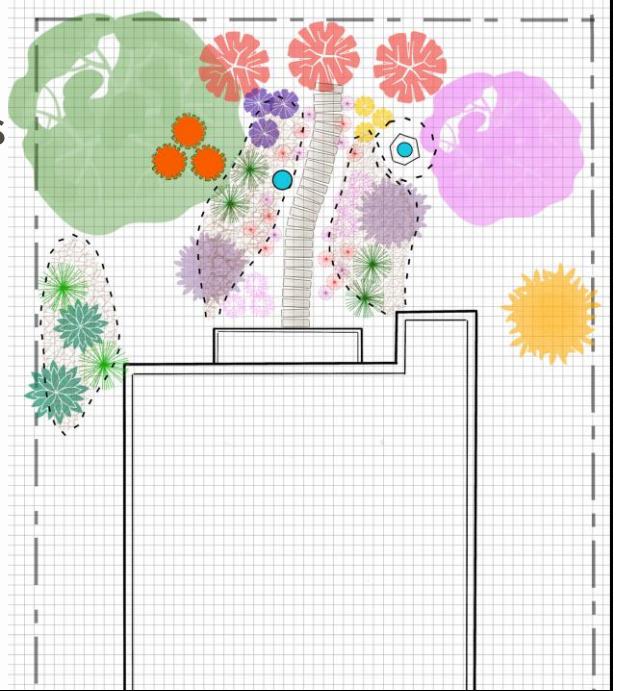
Advanced (or active) water-harvesting utilizes rain barrels, cisterns, and other containers to store rainwater for later distribution. The stored water can be used outdoors to irrigate vegetation. Active water harvesting systems can “extend” the rainfall season— maximizing the use of collected water, and reducing the consumption of municipal water.



ADD SIMPLE WATER HARVESTING COMPONENTS

MULCH

- Easy way to keep moisture in the soil
 - reduces water evaporation limits water runoff
- Enhances the soil's fertility and structure
- In basins, we recommend very coarse rough-cut wooden mulch that is 3-6"
- On other surfaces, we recommend using medium coarse rough-cut wooden mulch that is 1-3"
- Avoid finely shredded mulch and dyed mulch



SHELTER

Piles

Piles - shelter, forage, nesting

Brush Pile

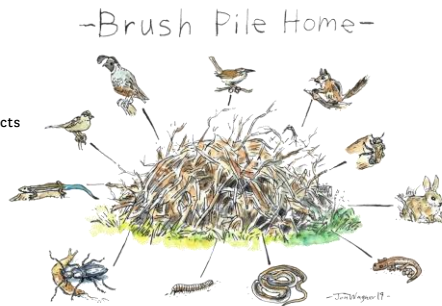
For birds

Rock Piles

Shelter for lizards

Leaf Litter

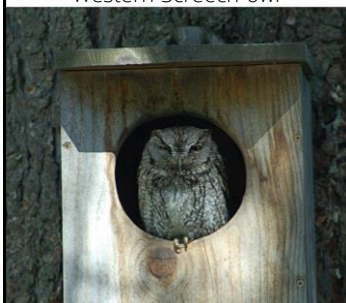
mulch, nesting for insects



Lucy's Warbler



Flycatcher



Western Screech-owl



American Kestrel

Nestboxes

Nest boxes are becoming increasingly important as natural cavities are lost

Bats



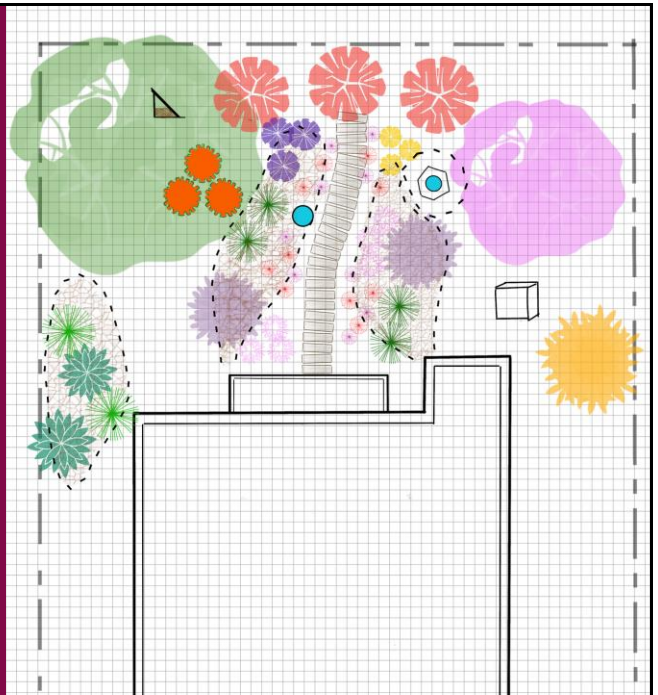
Nestboxes

Nest boxes aren't only for birds.
Bats and Native bees rely on
artificial nesting sites

Native bees



ADD NESTBOXES



HABITAT COMPONENTS

FOOD



WATER



HOME



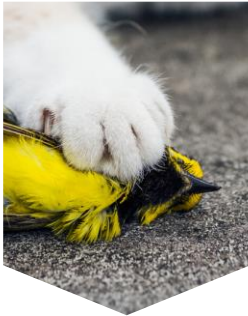
REDUCING
HAZARDS



HAZARDS

REDUCING ANTHROPOGENIC THREATS

THREATS TO BIRDS



CATS

2.4 billion
birds/year in
the US



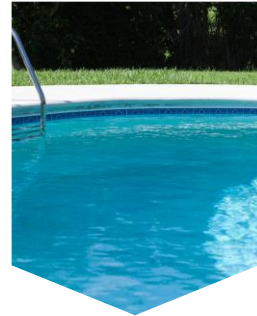
WINDOWS

365 million - 1
billion/year in the
US



PESTICIDES

contaminate and
eliminated food
sources



DROWNING

A number of animals from
ground squirrels and
lizards to bees and bats
can drown in large bodies
of water

EASY FIXES

Keep cats indoors

Make windows visible

- Buy plants that have not been treated with pesticides
- Put an owl or kestrel box up

Add an escape ramp
to your swimming
pool



OUTDOOR CATS



WINDOW STRIKES



PESTICIDES



DROWNING

HABITAT COMPONENTS

FOOD



WATER











HOME



REDUCING HAZARDS



HABITAT AT HOME

4 BASIC ELEMENTS	7 KEY COMPONENTS	4 LEVELS OF HABITAT			
					
	LOCALLY APPROPRIATE PLANTS	2 or more nectar plants and/or feeder	At least 1 patch	Diverse Patches (at least 3)	Bio-rich nativescape
	VEGETATION LAYERS	1 Layer	2 Layers	2 Layers	3 Layers
	REMOVE INVASIVES	Learn about our areas most threatening invasive plants and remove them	Continue learning and identifying invasive species and remove them	ID knowledge of beneficial volunteer species, removal of invasives	Remove invasives from list
	WATER FOR WILDLIFE	1 Simple	2 Simple	Add 1 out-of-habitat water feature	Add 1 in-habitat water feature
	WATER FOR HABITAT	Optional	Choose 1: passive or advanced	Choose 2: passive or advanced	Choose 2: 1 passive and 1 advanced
	HOMES IN HABITAT	Learn about	Install 1	Install 2: 1 bird nestbox 1 home for others	Install 3: at least 1 for birds and 1 for others
	REDUCE HAZARDS	Reduce at least 1 hazard	Reduce at least 2 hazards	Reduce at least 3 hazards	Reduce all hazards

PROGRAM STRUCTURE

4 basic elements

7 key components

4 levels of habitat

HOW TO JOIN:

Online Registration

tucsonaudubon.org/habitat

One-time Fee

- \$50 - Tucson Audubon Members
- \$55 - Non-members



- Metal yard sign with correlating level stickers
- Step-by-step guide and additional reference materials



TUCSON AUDUBON RESTORATION SERVICES



BEFORE

AFTER



TUCSON AUDUBON RESTORATION SERVICES



BEFORE



AFTER

WE BUILD
TORTOISE
HABITATS!



Contact Us!



300 E University Blvd., #120
Tucson, Az 85705



kmatsushino@tucsonaudubon.org
habitat@tucsonaudubon.org



Questions?