Living Community Engagement and Urban Forestry

by Brad Lancaster

www.DesertHarvesters.org

www.HarvestingRainwater.com

Have you ever experienced a true *living* oasis?

What was it like for you?

What did it enable?

Did you have a role in it?

Oasis

Oasis

Photo credit: John Hoffman, www.nps.gov

Oasis

The Ancient Oasis

4,000 Years of Agriculture and Irrigation in Tucson

Hohokam farmers,
circa A.D. 1000

Tucson's fields, circa 1915

Jonathan Mabry
Tucson Historic Preservation Office

Oasis

Mirage

Mirage Infrastructure

We ignore, deplete, or pollute our local waters
— then import ever more distant water

The largest consumer of electricity
(and single source producer of carbon)
in Arizona is the pumping of water

Photograph: Pete McBride on the parched Colorado River delta, by Jonathan Waterman

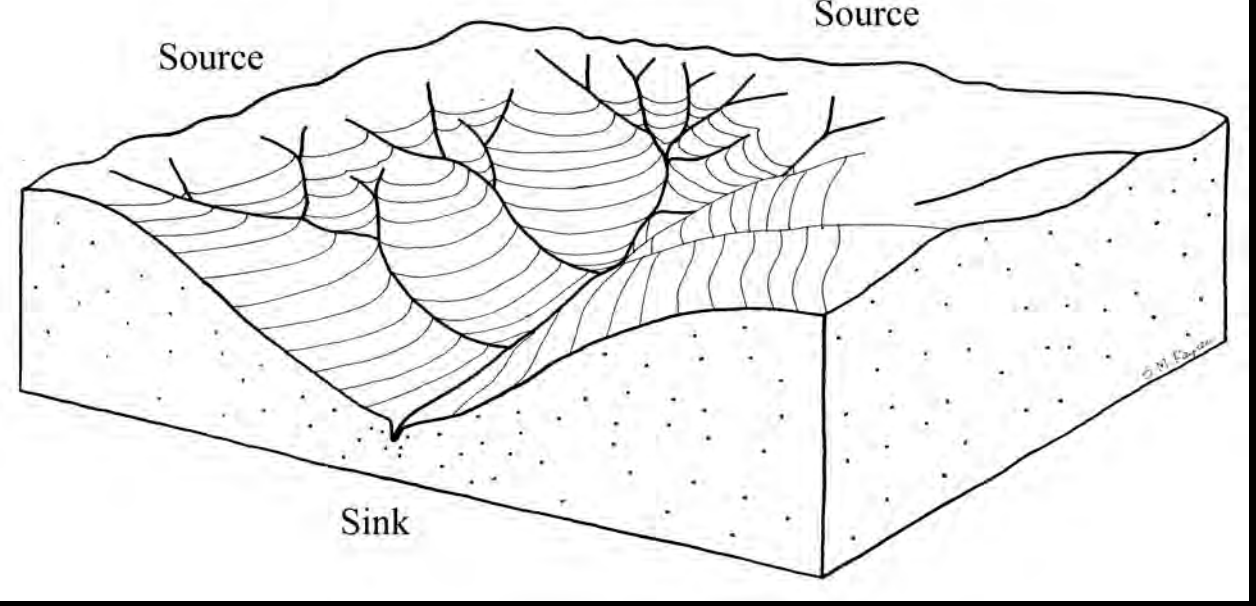
A choice between mirage or oasis

Tucson, Arizona

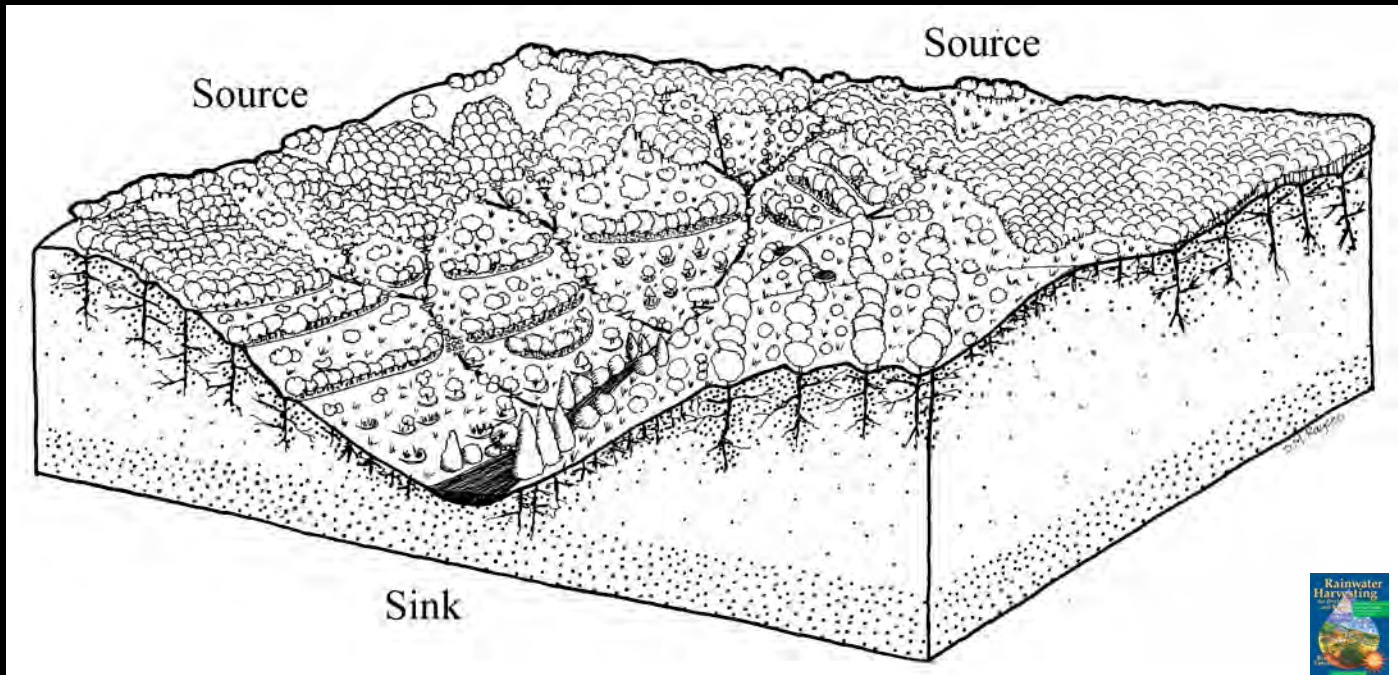
RAINFALL INCOME[e]	231	GPCD
	874	lpcd
UTILITY-WATER USE[10]	112	GPCD
	424	lpcd

WATERGY	⚐5	% MUNICIPAL ENERGY CONSUMPTION USED TO MOVE & TREAT WATER[14]	44%

For references and calculations see:
One-Page Place Assessment page at HarvestingRainwater.com



Drain /
Dying mirage



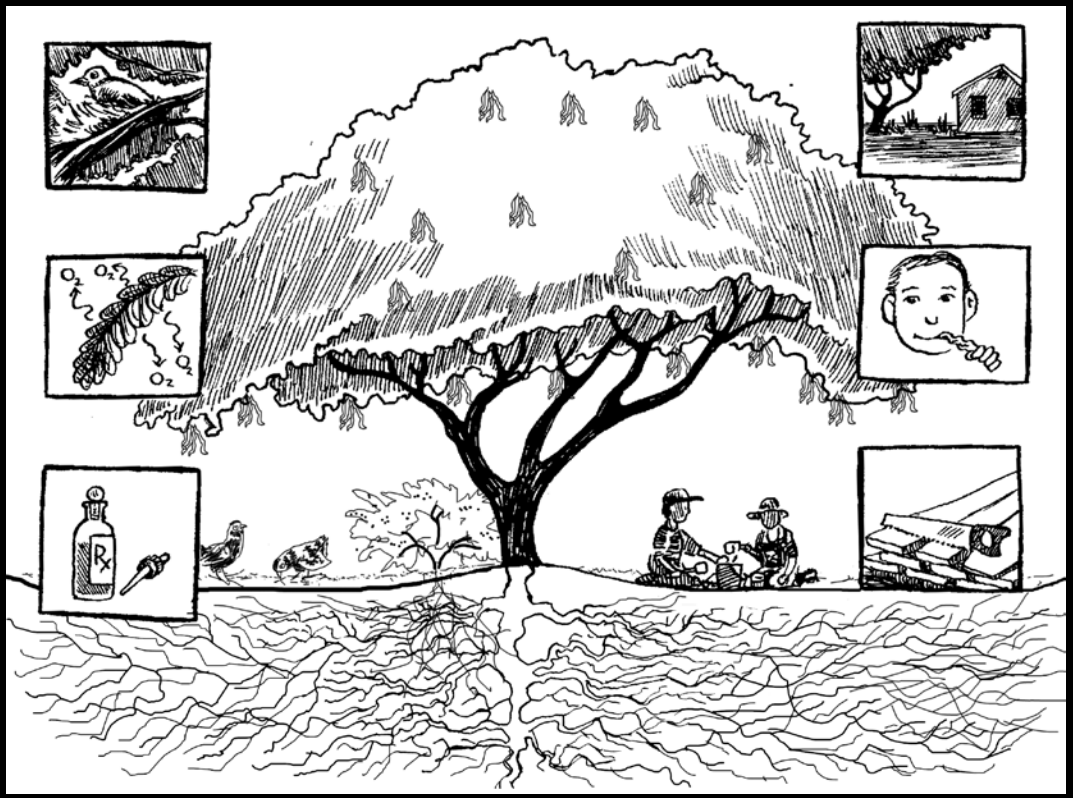
Net /
Sponge/
Living Oasis

In 1996
the Dunbar/Spring
neighborhood was
neither
an oasis
nor a mirage

Then the planting
of a *living* oasis
was initiated,
aiming to *maximize*
the positive impact
and *grow* potential

Plant Community

Plant Multi-Use Trees



TUCSON CLEAN & BEAUTIFUL INC.

NATIVE SHADE TREE APPLICATION

PLANTING NATIVE TREES ENHANCES OUR COMMUNITY AND SONORAN DESERT ECOSYSTEM

TREES FOR TUCSON

In partnership with Tucson Electric Power

Thanks to a grant from **TUCSON ELECTRIC POWER COMPANY**, TEP customers may be eligible to receive 1 or 2 five gallon sized trees (3 – 6 ft. tall) for only **$6.00 per tree including delivery** (***PAYABLE TO TREES FOR TUCSON – ATTACH CHECK***) if you agree to plant them to shade your house. Large shade trees can reduce cooling bills, especially if they shade windows or air conditioning units. *Supplies are limited.*

To qualify, each resident

A) Agree to plant trees within 15 of the house on the WEST, EAST, or NORTH sides to shade it from the rising and setting sun during the summer months, but retain access to direct winter sun/heat on the south side in the winter months. Planting location will be checked when trees are delivered. **Planting and maintenance instructions are provided with trees.**

B) Agree to hold Trees for Tucson and Tucson Electric Power Company harmless from all liability associated with the trees or tree planting.

Name: _____ Phone: _____ (H) _____ (O)

Address: _____ Zip Code _____

Indicate Your Native Tree Choice(s) (total of 2 trees per house) - all trees below are low water users:

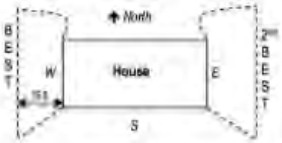
___ **Velvet Mesquite** (*fast/moderate growth rate to 20' + tall & wide, semi-winter deciduous, yellow flowers*)
___ **Desert Ironwood** (*moderate growth rate to 20' tall and wide, evergreen, plant in warm microclimate, purple flowers*)
___ **Blue Palo Verde** (*fast/moderate growth rate to 20+' tall and wide, blue-green leaves and bark, yellow flowers*)
___ **Foothills Palo Verde** (*moderate growth rate to 20' tall and wide, yellow-green leaves and bark, yellow flowers*)
___ **Desert Willow** (*fast growth rate to 20' tall and wide, winter deciduous, no thorns, purple/white flowers*)
___ **Cat Claw Acacia** (*moderate growth rate to 20' tall and wide, winter deciduous, grey bark, yellow flowers*)
___ **White Thorn Acacia** (*moderate growth rate to 15' tall and wide, winter deciduous, red bark, yellow flowers*)

_____ _____
(Signature of Resident) *(Date)*

Planting: Mark an "X" on the map in the general location you wish to plant each tree:

Plant trees at least:
- 10 feet from sewer lines,
- 5 feet from water lines, and
- 3 feet from other utility lines.

Do not plant trees under overhead lines.
Do not plant in public right-of-way without permit & Blue Stake clearance (For Blue Stake dial 811 or 1-800-782-5348)

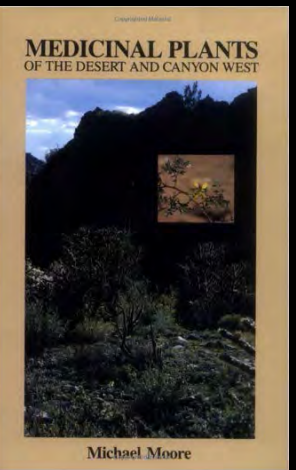


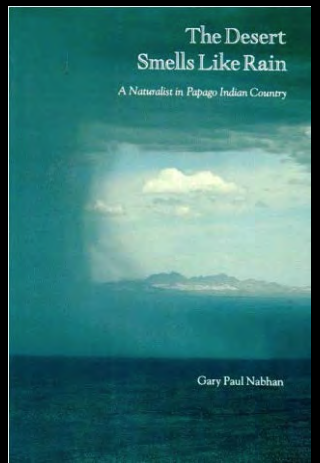
lines, 5 ft. from water lines, and 3 ft. from all other utilities. Do not plant under any overhead utility lines.
Do not plant in the public right-of-way without a permit and Blue Stake clearance.
Plant trees at least 20 ft. from one another.

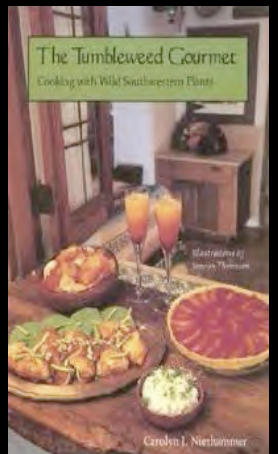
Send Applications To: TREES FOR TUCSON P.O. Box 27210 Tucson, AZ 85726-7210 791-3109
Trees for Tucson is a program of Tucson Clean & Beautiful

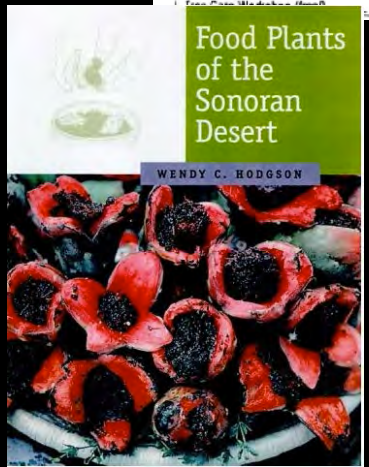
ARE YOU INTERESTED IN OTHER TREES FOR TUCSON PROGRAMS?

Tucson and Southern Arizona Tree Tour – Fall/Spring *(includes lunch and transportation)*



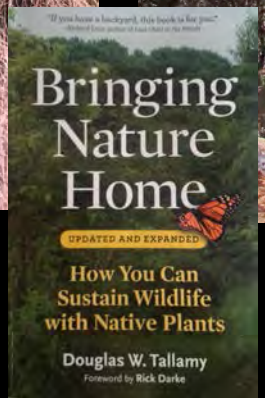






Maximize Habitat for Life

Non-native mirage



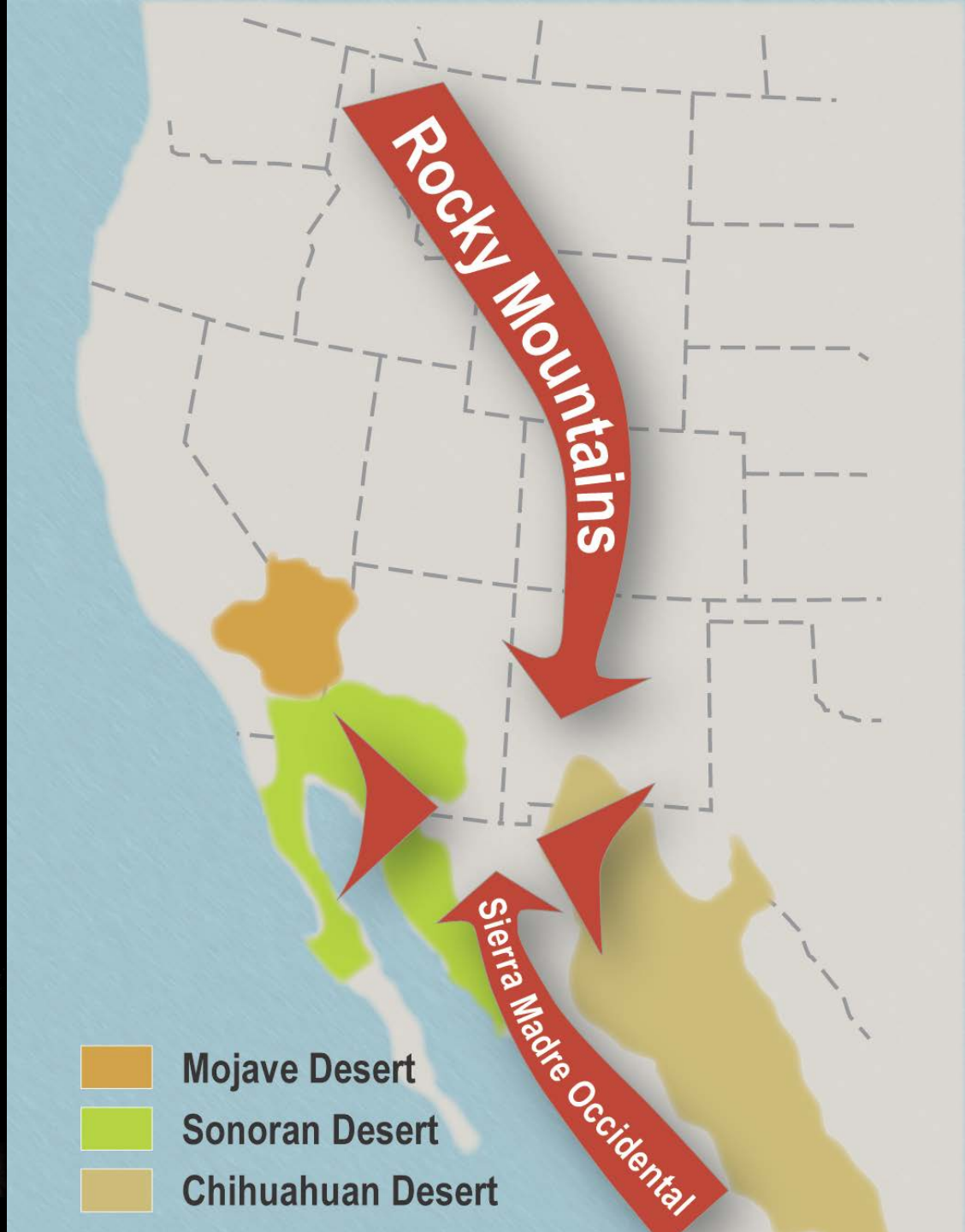
Native oasis

Street-side basin wolfberry harvest

Watchable wildlife activities generate $1.4 billion in economic activity per year to Arizona

Native plants support native wildlife, because they have coevolved

along with the region's climate (and its cyclical droughts and floods)



Re-connect & Re-envision

Photo credit: Sue Doerfler, Tucson Citizen

San Xavier Coop Farm

4th annual Cascabel Hermitage Association, mesquite milling & pancake and waffle breakfast
Cascabel, Arizona, 2002

Interact – HARVEST

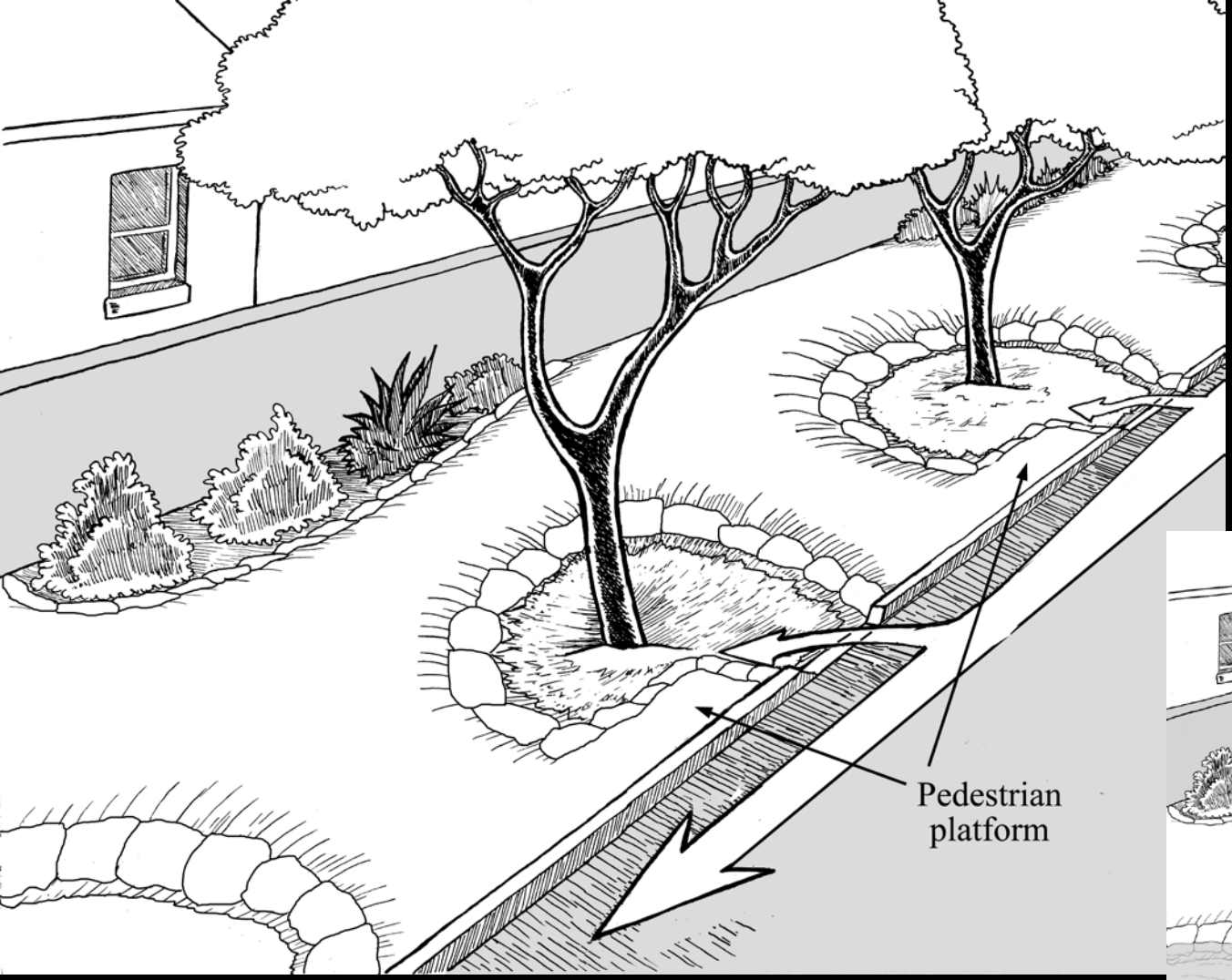
Celebrate and Demonstrate

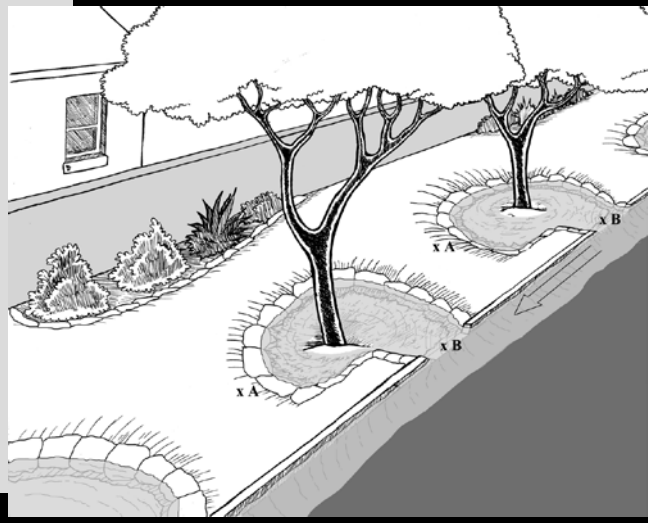
1st annual Dunbar/Spring
Mesquite Fiesta, 2003
3 griddles and 3 pancake flippers

Reciprocate & Regenerate

flooding liability turned into an irrigation asset

Plant Stormwater





For every *inch* of rainfall…

- A 10-foot wide paved street will drain 27,800 gallons of rainfall per mile
- A 20-foot wide paved street will drain 55,700 gallons of rainfall per mile
- A 30-foot wide paved street will drain 83,500 gallons of rainfall per mile

2004 – 2005 curb cuts and street-runoff harvesting began

Curb cuts legalized in 2007
$50 permit

Green Streets Policy in Tucson, AZ

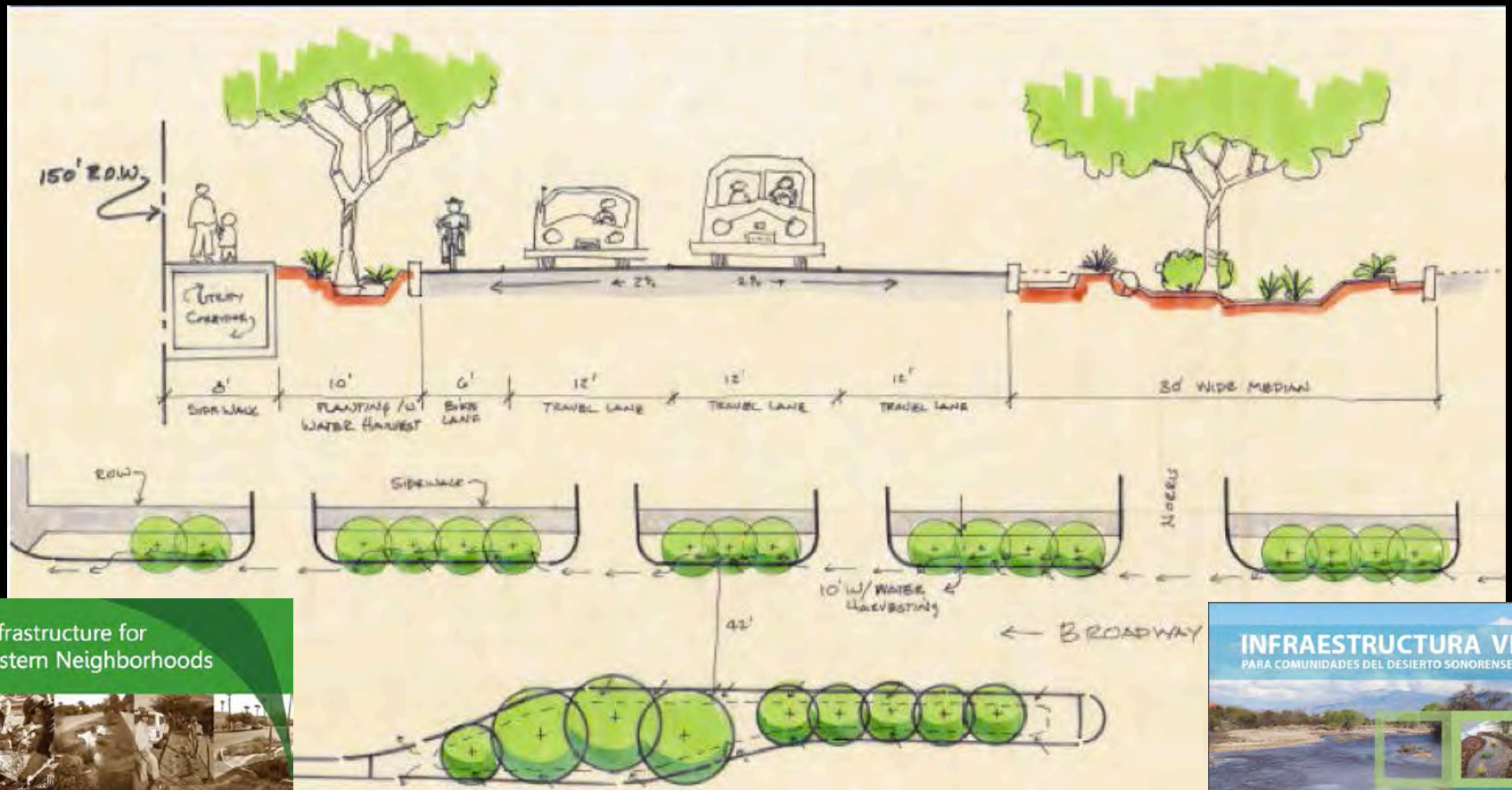
Minimum ½-inch rainfall to be harvested in roadway or adjoining right-of-way

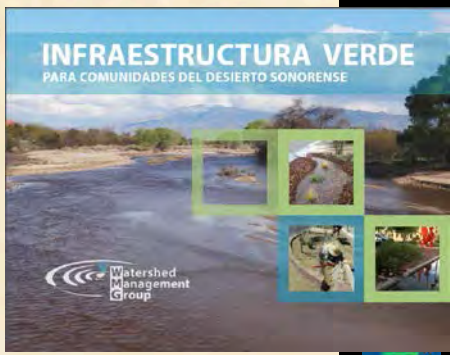
https://www.tucsonaz.gov/files/transportation/Green_Streets_APG_Signed_by_Director.pdf

Commercial landscape policy

At least 50% of commercial landscape irrigation needs must be met by harvested on-site rainwater

https://www.pagnet.org/documents/Environment/RainwaterOrdinance.pdf



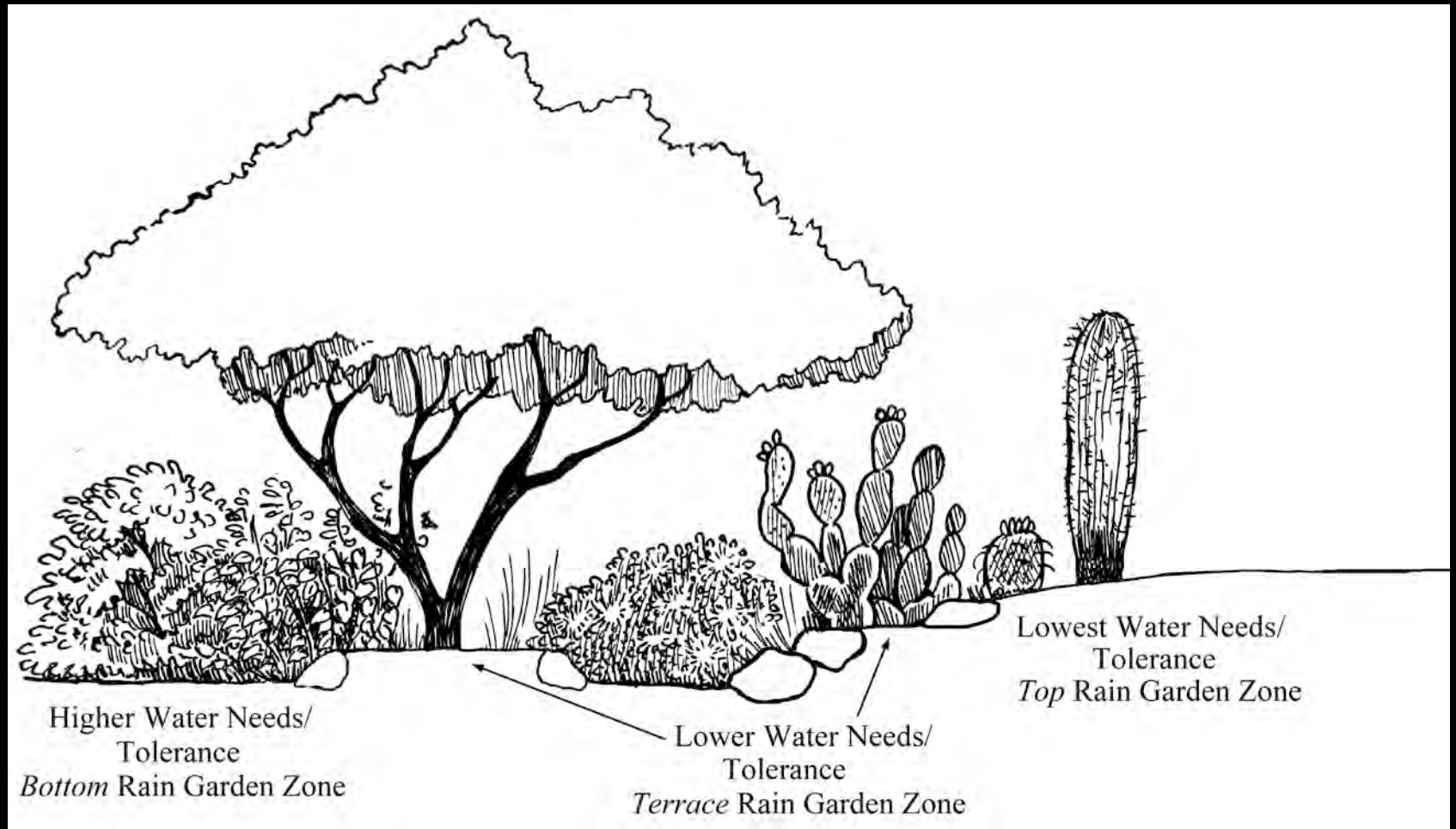


www.WatershedMG.org

Plant the Right Plant in the Right Place as you Plant the Rain

Rain Garden Zones
Bottom, Terrace, & Top

For Multi-Use Rain Garden Plants Lists see: • *Rainwater Harvesting for Drylands and Beyond, Volume 1, 2nd Edition*, appendix 4
• Plant Lists & Resources at www.HarvestingRainwater.com




BURNS
PEST ELIMINATION
877-971-9782


Rainwater
Harvesting

Box A4.2. Native Multi-Use Trees for the Tucson, Arizona Area

Species	Water Needs	Rain Garden Zone	Size	Cold Tolerance	Elevation Range	Growth Rate	Type of Tree	Human Uses	Wildlife	Domestic Animals That Use plant
Desert ironwood (*Olneya tesota*)	LW (1)	terrace top	25 × 25' (7.6 × 7.6m)	sh 15°f (-9°C)	2,500' (750m) and below	moderate	e	f, m, nf, s, T	Birds, pollinators, large and small mammals	Chickens, goats
velvet mesquite (*Propsopis velutina*)	LW (1)	terrace bottom	30 × 30' (9 × 9m)	h 5°f (-15°C)	1,000–5,000' (300-1,500m)	fast	sD	f, fW, m, nf, P, s, W	Birds, pollinators, large and small mammals	Chickens, goats, cattle, honey bees, dogs
screwbean mesquite (*Prosopis pubescens*)	LW (2–3)	terrace bottom	20 × 20' (6 × 6m)	h 0°f (-17°C)	4,000' (1,200m) and below	moderate	D	f, fW, m, s, W, WB	Birds, pollinators, large and small mammals	Chickens, goats, cattle, honey bees, dogs
Cat Claw acacia (*Senegalia greggii*)	LW (1)	terrace top	20 × 20' (6 × 6m)	h 0°f (-17°C)	Below 5,000' (1,500m)	moderate to fast	D	m, P, s, T, W	Birds, pollinators, large and small mammals	Cattle, honey bees
Whitethorn acacia (*Vachellia constricta*)	LW (1)	terrace top	10–15 × 10–15' (4.5 × 4.5m)	h 5°f (-15°C)	2,500–5,000' (750-1,500m)	moderate to fast	sD	f, G, m, s	Birds, pollinators, large and small mammals	Cattle
Desert Willow (*Chilopsis linearis*)	LW (2–3)	terrace bottom	25 × 25' (7.6 × 7.6m)	h –10°f (-23°C)	1,500–5,000' (450-1,500m)	fast	D	fr, fW, m, s, W, WB	Birds and pollinators	Cattle, honey bees
Canyon hackberry (*Celtis reticulata*)	mW (2–3)	terrace bottom	up to 35 × 35' (10.6 × 10.6m)	h –20°f (-28°C)	1,500–6,000' (450-1,800m)	moderate	D	f, s, W, WB	Birds, pollinators, large and small mammals	Chickens
foothills Palo verde (*Parkinsonia microphyllum*)	LW (1)	terrace top	25 × 25' (7.6 × 7.6m)	h 15°f (-9°C)	500–4,000' (150-1,200m)	slow to moderate	D	f, s, W	Birds, pollinators, large and small mammals, desert tortoise	Cattle, honey bees
Blue Palo verde (*Parkinsonia floridum*)	LW (2)	terrace bottom	30 × 30' (9 × 9m)	h 15°f (-9°C)	500–4,000' (150-1,200m)	fast	D	f, s, W	Birds, pollinators, large and small mammals, desert tortoise	sheep, honey bees

For Multi-Use Rain Garden Plants Lists, see:

- *Rainwater Harvesting for Drylands and Beyond, Volume 1, 2nd Edition*, appendix 4
- Plant Lists & Resources at www.HarvestingRainwater.com

^ 1994

2006
>

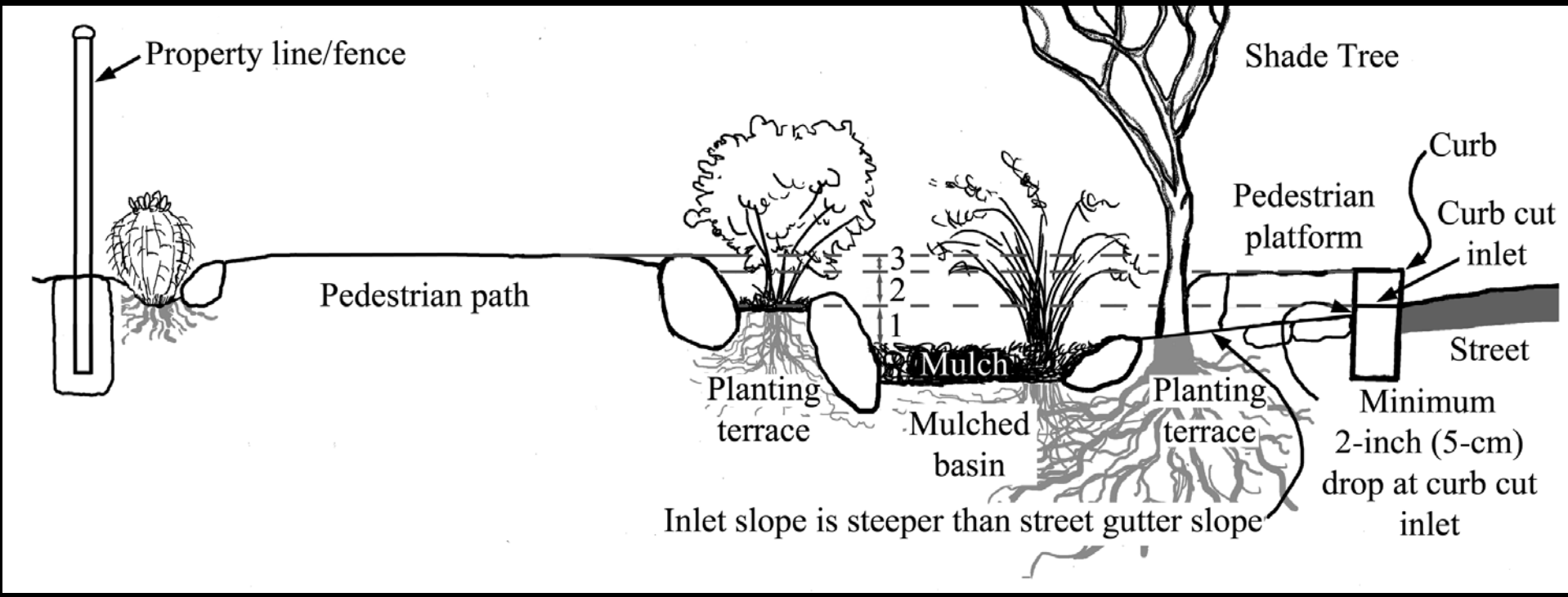
< 1996
Planting

2006 >
Harvesting

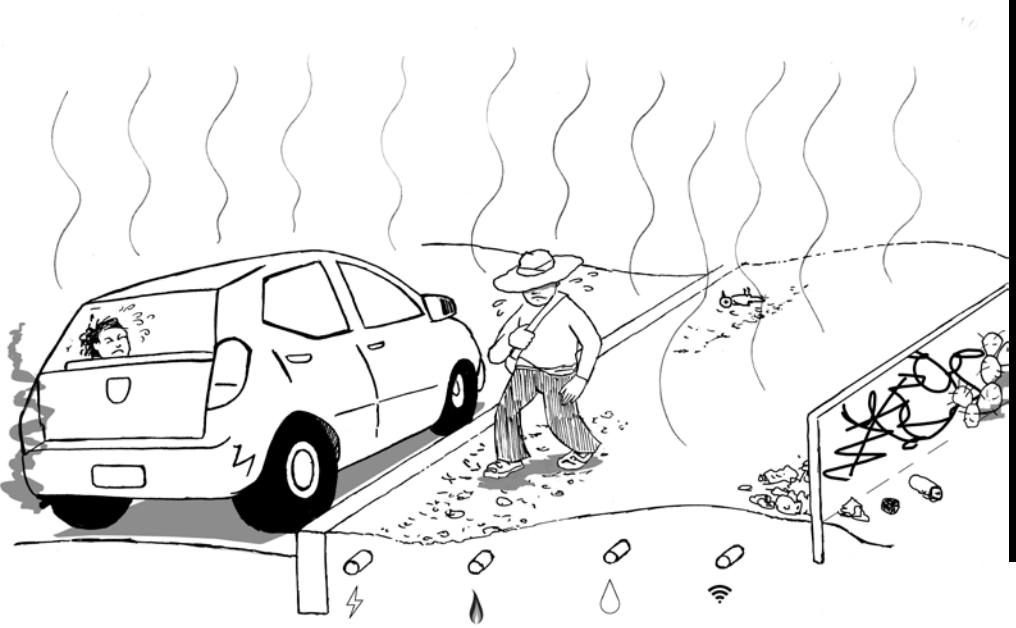
Observe & Evolve

Key Elevation and Slope Relationships

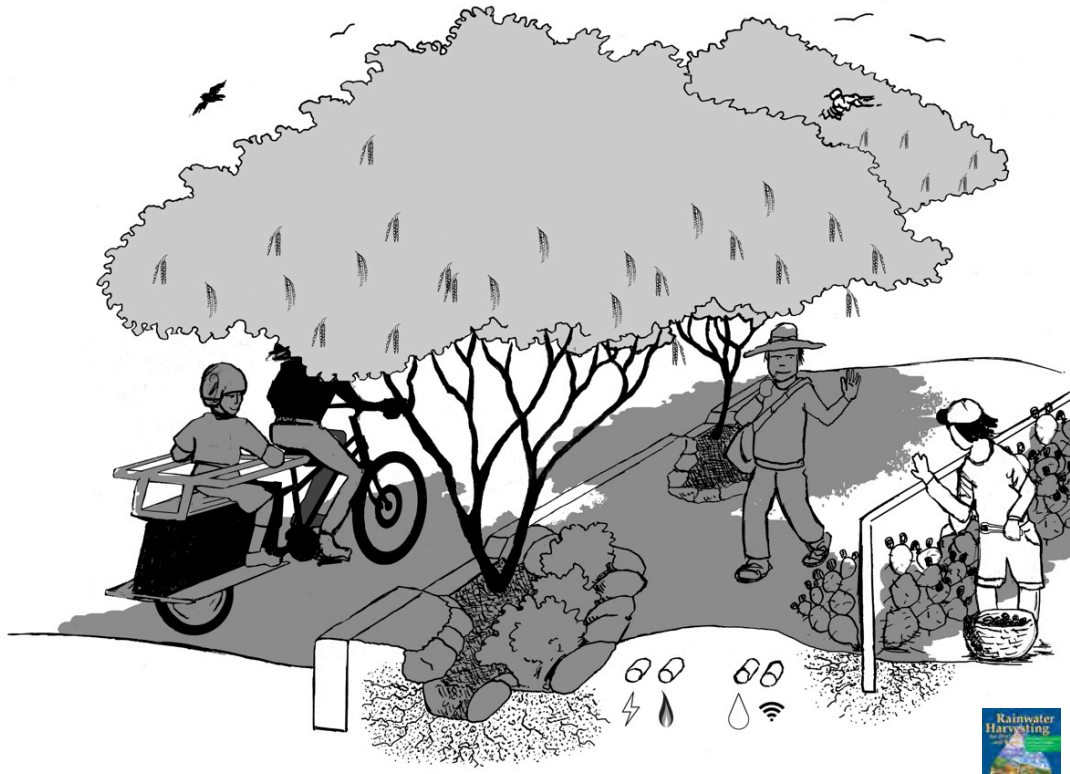
see *Street-Runoff Harvesting* page at
www.HarvestingRainwater.com
for more

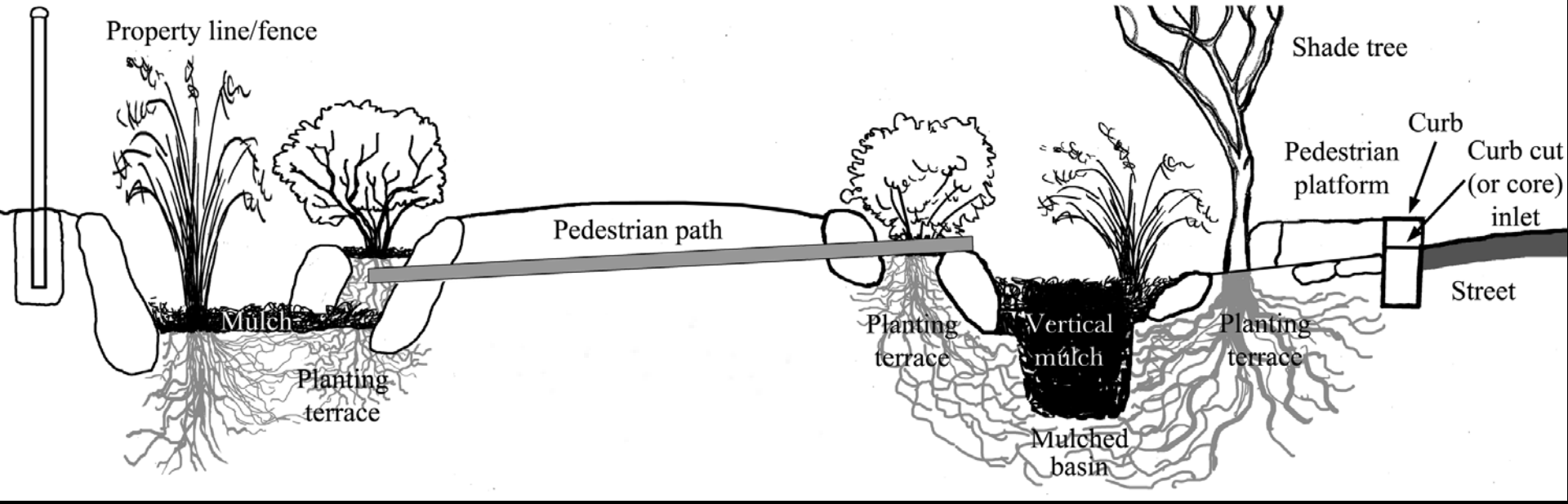


Speed
/ \
Depth — Volume



Keep Your Best Planting Spaces Plantable





see *Street-Runoff Harvesting* page at
www.HarvestingRainwater.com
for more


Rainwater
Harvesting

Plant & Reinvest the Fertility

Mirage

Oasis

Grow Stewards

Chipped and Mulchy

Re-wilding. Re-enlivening.

Where we live, work, study, & play. Where we are.

U of A Architecture and Landscape Architecture Building, Tucson, AZ, CALA landscape tour www.cala.arizona.edu

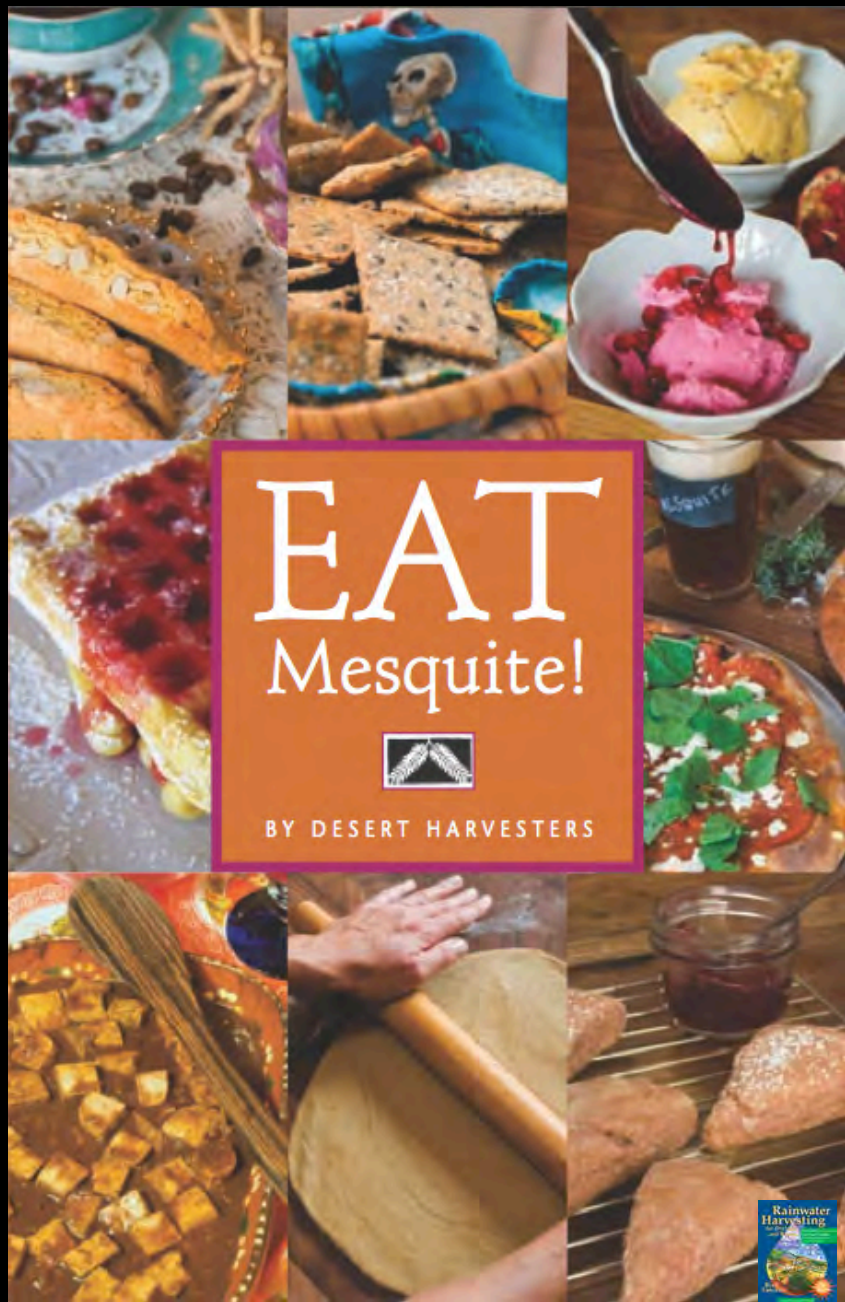
Mirage

Oasis

Landscape to Educate

Lifescape. Lushscape. Lifecake. Lifestake.

Place-Based Fusion / Inclusion



2009 Community Recipe Tasting

photos by Brad Lancaster and Ian Fritz

2010
Desert Harvesters
Mesquite Fiesta
over 1,500 mesquite pancakes served

Photos by Ruben Ruiz

8th annual Desert Harvesters Mesquite Fiesta 2010

Three hammermills milling pods, community pod sorting, and taste tests

photos by Ruben Ruiz

GROWING ORGANIZATIONS MILLING MESQUITE and/or organizing mesquite pancake fiestas and millings

Cascabel Hermitage Association Education Program, Cascabel, AZ 1998

Desert Harvesters, Tucson, AZ 2003

Kyle Young and Peter Ragan, Arivaca, AZ 2006

Prescott College, Prescott, AZ 2008

Tohono O'odham Community College, Sells, AZ 2008

Gila Pima Nation, Sacaton, AZ 2009

Baja Arizona Sustainable Agriculture, Bisbee, AZ 2010

San Xavier Farm Cooperative, Tucson, AZ

Tucson Community Food Bank Farm, Tucson, AZ 2015

2012 Bake Sale

Native and wild foods and medicinals vendors

Monsoon Kitchen,
Mesquitery, Desert Tortoise Botanicals, Native Seeds/SEARCH,
Bean Tree Farm,
Desert Survivors Nursery

Solar cooking demonstrations,

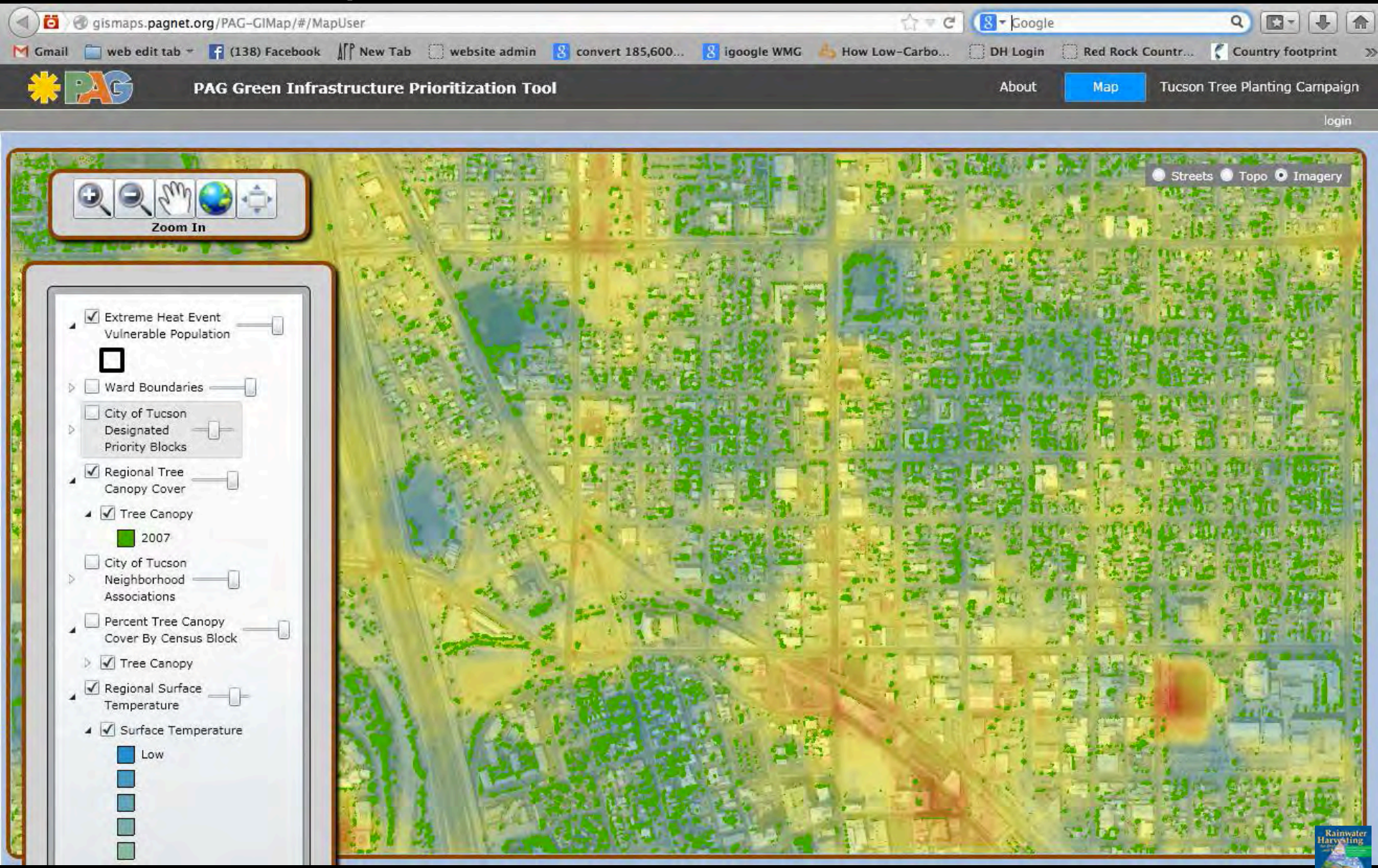
native food-bearing Christmas trees, Arizona Native Plant Society,

Wildlife whose habitat we are reestablishing


PORCHFEST
TUCSON, ARIZONA
Tucson Porch Fest
Community Organization
Like
Message
Timeline
About
Photos
Likes
More


Rainwater Harvesting

Don’t Stop Evolving
What other problems can be turned into a solutions?



Dunbar/Spring neighborhood surface area is:

43% impervious cover (rooftops and pavement) + 17.8% bare earth = 60.8% of the neighborhood

Currently just 12% is under tree canopy

2011 data from PAG & RFCD

Grow What the Community Can Do by Working Together

Before chicane ^

After chicane >

Cholla bud harvests from water-harvesting chicane

Public Art telling story of place

Lost Sonoran Sucker fish and water-harvesting Horned Lizard sculpture by Joseph Lupiani in a water-harvesting traffic-calming chicane

Water-harvesting
traffic circle
forest

Strive to Make it Easier and Cheaper: Plant seed in-situ with the rains

Diversify the Forest & the Harvest

Desert Ironwood
(*Oleyna tesota*)

Diversify & Convenientify the Daily Connection to Place

Photo credit: Celia Reeve & Exo Roast Co.

Reseed & Regenerate a Culture

Book nook bicycle tour & neighborhood-harvested snack stand

Where do you want to live
—in a mirage or a true oasis?

What will that choice enable in you, your community, and our shared watershed & world?

What will be your role in that choice?

DESERT HARVESTERS' MANIFEASTO
on ethical wild-foods growing and harvesting

Nature is a system of abundance, cycles, and efficiency.
We can mimic that.
Increase the fecundity of plants and their companions.
Leave and invest fallen pods, leaves, and cut-up prunings as fertile mulch for animals, soil life, and trees.
Say "thank you" for your harvest with generous actions.
Turn landscapes into lifescapes and lushscapes.
Give back. REINVEST.

We live in a land of precious water.
Use local, free, and gravity-fed water—rather than imported, costly, and mechanically pumped waters.
Therefore PLANT THE RAIN.
Capture rainwater by digging basins and other earthworks.
Catch rainwater runoff from roofs.
Divert public street run-off into public right-of-way rain gardens.
When you grow and harvest rain-irrigated desert food, you ENHANCE our local ecosystem.

HARVEST nearby.
Look for wild native-food sources in your backyard, rights-of-ways, and urban trails.
If they don't exist there, PLANT them.
Leave desert abundance where it belongs—in the desert.
Re-wild the urban and suburban core.

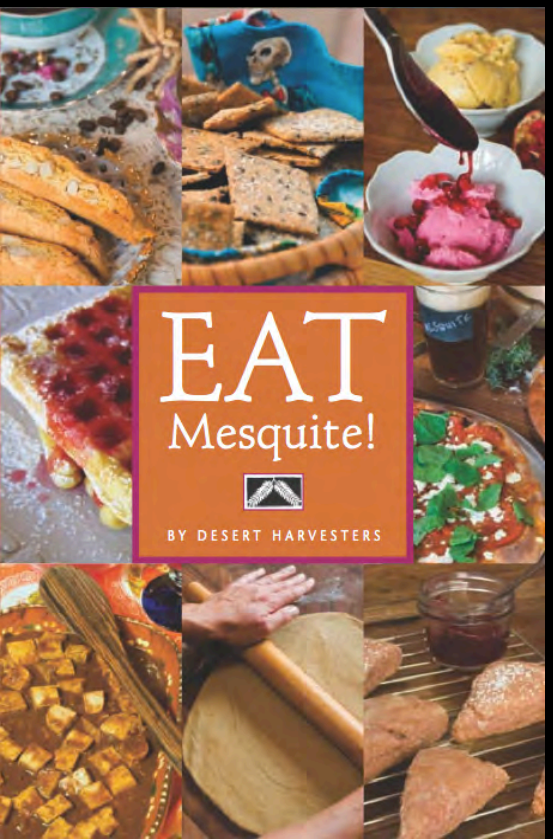
Delight your tastebuds.
Be a culinary cupid. Introduce new flavors to one another.
Find new combinations of traditional, wild foods. INNOVATE.
Prickly pear borscht, anyone? Mesquite muesli?
Practice place-based, place-appropriate, place-inspired fusion.

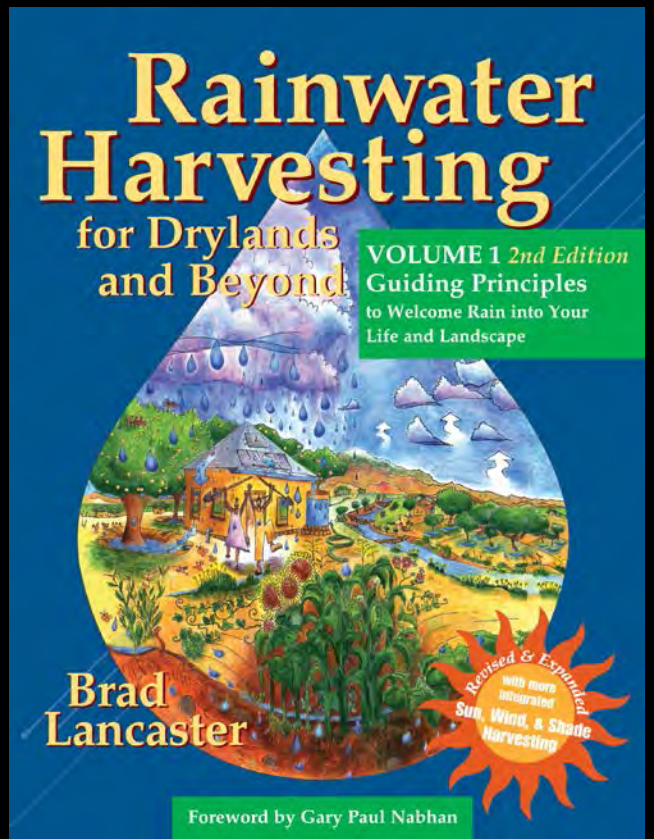
Be here now. CELEBRATE.
Give thanks to the ancestors.
Make offerings for the future.
Contribute to food, fertility, and water security, here, now, and for your children, their children, and their children.

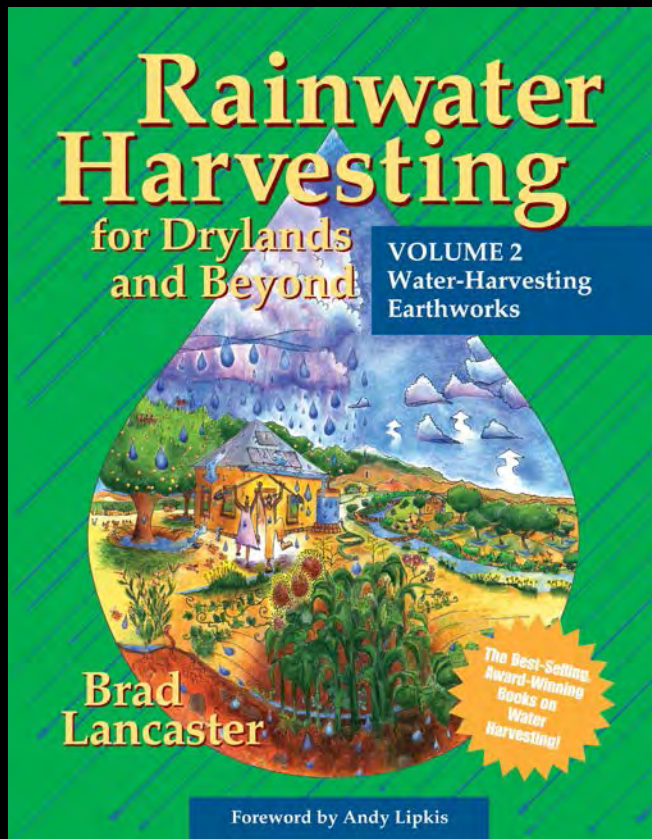
Expand your COMMUNITY.
Meet your fellow desert dwellers.
Those that have roots and flowers.
Those that crawl and flutter.
Get to know other humans who harvest.
There is so much to observe, so much to love.
Invite. Involve. Include.

DesertHarvesters.org

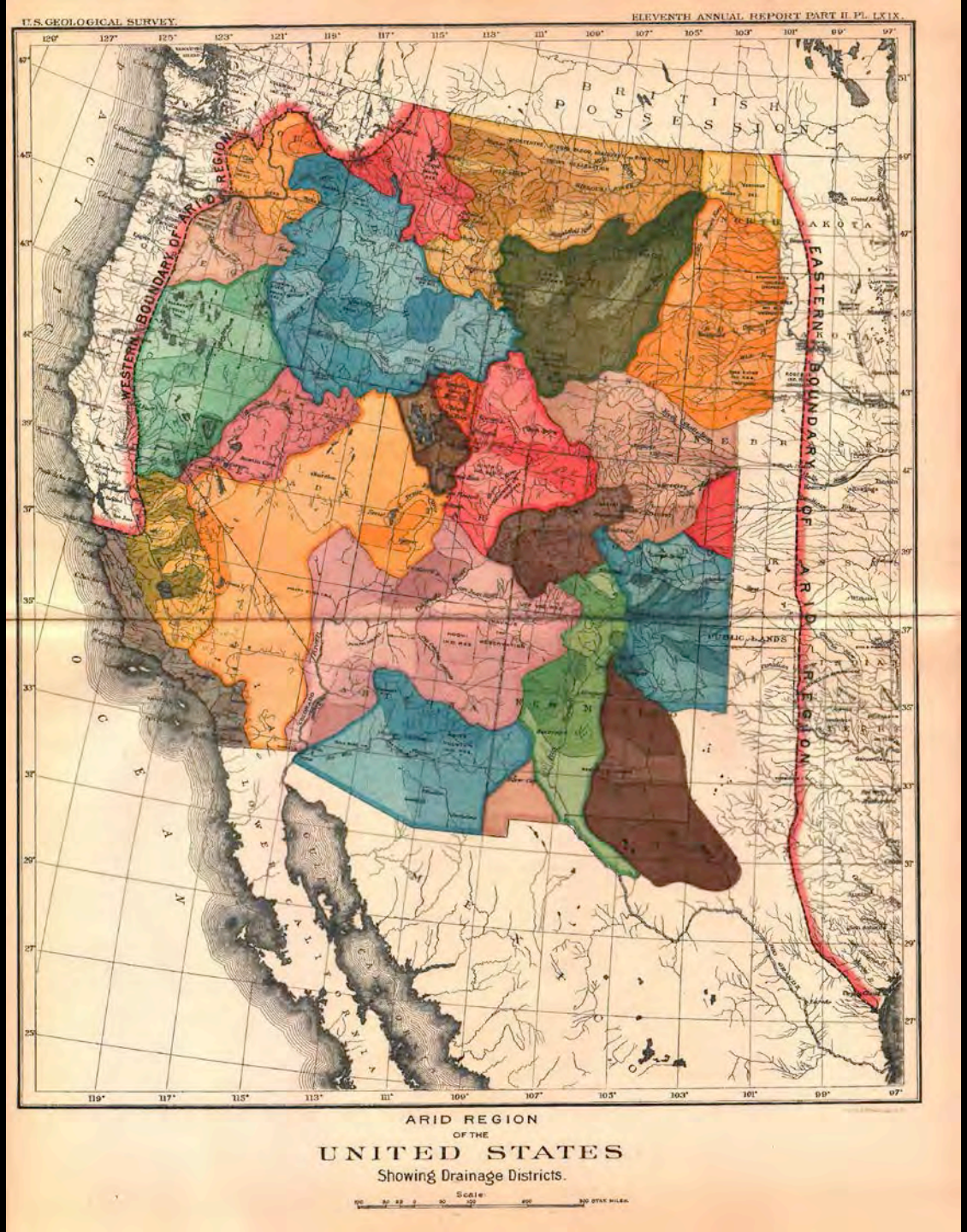
HarvestingRainwater.com







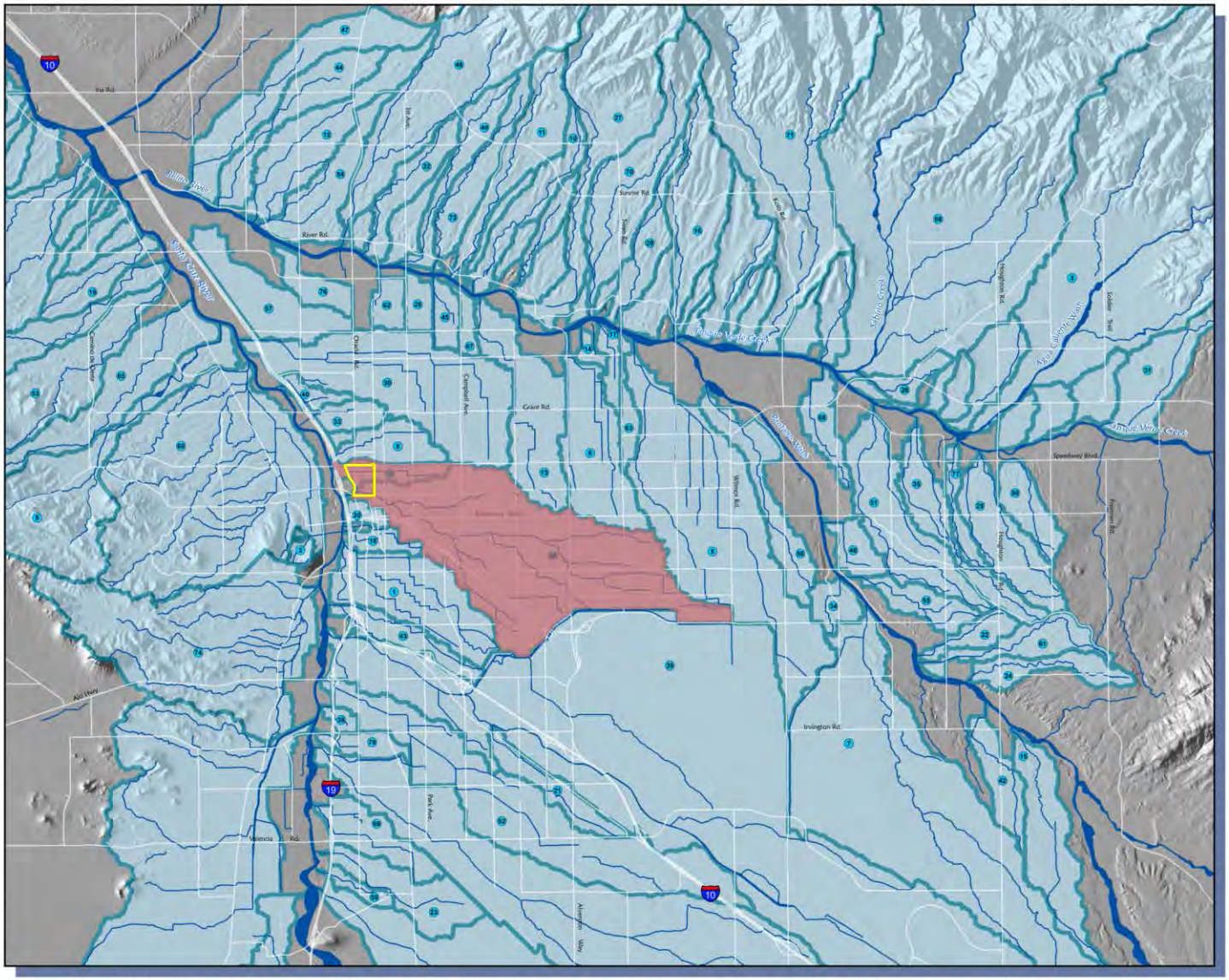

Rainwater
Harvesting



Western United States delineated by their *watershed* boundaries as proposed by John Wesley Powell

A watershed is "that area of land, a bounded hydrological system, within which all living things are inextricably linked by their common water course, and where, as humans settled, simple logic demanded that they become part of a community."

The Dunbar/Spring Neighborhood Washes & Their Watersheds*

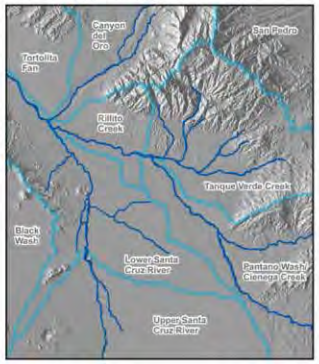


*shaded red on map & in list

Named Tucson Basin Watersheds

1. 18th Street Wash
2. A Mtn Detention
3. Agua Caliente
4. Airport Wash
5. Alamo Wash
6. Alvernon Wash
7. Atterbury Wash
8. Bronx Wash
9. Camino de Oeste Wash
10. Camino Real Wash
11. Campbell Wash
12. Casas Adobes Wash
13. Christmas Wash
14. Christopher City Wash
15. Civano Wash
16. Craycroft Wash
17. Creekside Wash
18. Cushing Street Wash
19. Del Cerro Wash
20. Downtown Watershed
21. Earp Wash
22. Eastview Wash
23. El Vado Wash
24. Escalante Wash
25. Este Wash
26. Fahringer Wash
27. Finger Rock Wash
28. First Avenue Wash
29. Fletcha Caida Wash
30. Flowing Wells Wash
31. Fortyniners Wash
32. Friendly Village Wash
33. Grant Road Wash
34. Guillermo Wash
35. Hidden Hills Wash
36. Hughes Wash
37. Idle Hour Wash
38. Irvington (Michigan) Wash
39. Julian Wash
40. Kreuger Wash
41. Los Reales Diversion Channel
42. Mesquite Ranch Wash
43. Mission View Wash
44. Nanini Wash
45. North Mountain Ave. Wash
46. Owen Park Wash
47. Pegler Wash
48. Pima Wash
49. Race Track Wash
50. Reyes Wash
51. Robb Wash
52. Rodeo Wash
53. Roger Wash
54. Roller Coaster Wash
55. Rolling Hills Wash
56. Rose Hill Wash
57. Ruthrauff Wash
58. Sabino Creek
59. Santa Clara Wash
60. Silvercroft Wash
61. Spanish Trail Wash
62. Stone Avenue Wash
63. Swan Road Wash
64. Sweetwater Wash
65. Trails End Wash
66. Tucson Arroyo
67. Tucson General Wash
68. Udall Park Wash
69. Valencia Wash
70. Valley View Wash
71. Ventana Canyon Wash
72. Villa Estrada Wash
73. WBSCR Diversion Channel
74. West Branch Santa Cruz River
75. West University Wash
76. Wetmore Wash
77. Wrightstown Wash
78. Wyoming Wash

Pima County Watersheds



Arizona Watersheds

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N

0 0.5 1 2 3 4 Miles

Major Streets

Named Washes

Major Watersheds

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Watershed Management Group

1994
Plant an imported tree, then import costly irrigation water & fertilizer

2015
Plant a multi-use native tree; and plant the free on-site rain, fertility, & community