Volume 3, Issue 1

Spring 2008

Watershed Management Group

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Watershed Moment

WMG Updates

This spring, WMG is implementing two new public demonstration sites on water harvesting and sustainable landscaping. WMG is **working primarily with youth** at both demonstration sites and through our new School Yard program. Our first public greywater harvesting demonstration will be implemented at **Esperanza en Escalante**, a transitional housing site for homeless veterans. At this site, we will be working with high school students from Massachusetts on an alternative spring break program. The students will help install a greywater system to divert laundry water into sunken basins for growing food bearing trees, like citrus trees.

The second public demonstration site is being

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Creating water harvesting earthworks with the aid of a backhoe at the Greenlots! Demonstration site.

Greening Urban Landscapes — Overcoming Resistance

By Lisa Shipek

Communities are realizing the importance trees and vegetation have in the urban landscape. Landscaping with native vegetation provides shade, cools temperatures, offers habitat to urban wildlife and migratory species, improves air quality, supplies local food sources, and improves urban aesthetics. With all these benefits, why are revegetation efforts not being adopted at astonishing rates? What resistance might homeowners, municipal officials, planners, or developers have regarding implementing more sustainable landscaping practices?

One major reservation to increasing vegetation is the perception that more vegetation will be too expensive due to water usage and maintenance such as weeding and pruning.

Here are a few pointers that you can use to convince others that increasing vegetation does not have to be a costly affair.

1) Irrigation for new landscapes can be reduced or completely eliminated through coupling vegetation with passive water harvesting. For exam-

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Inside this issue:

Special Requests:

- ***Administrative assistance volunteer needed***
- ***Office space in central Tucson area.***

Please contact Lisa Shipek if you are interested in becoming an administrative volunteer or donating office space: lisa@watershedmg.org or 396-3266

WMG Updates (continued)…

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implemented in collaboration with Ironwood Tree Experience (ITE), a non-profit that is dedicated to empowering young people through educational ecoprograms. We are working with ITE on their **Greenlots! project**, to transform an undeveloped urban lot in central Tucson into a natural haven for wildlife and community members. At our first workshop, we worked with an excavator to create passive water harvesting features such as large, broad basins and swales that capture rainwater from the street.

This month, WMG staff member Elena Rotondi began activities with Rivera Elementary and Miles Exploratory Learning Center through our **School Yard Water Education** program. The hands-on program teaches water conservation and water harvesting principles. Elena is working with over 100 students in the 3rd and 6th grade doing activities such as performing a personal water audit, creating earthworks to collect school roof runoff, and planting native plants to attract wildlife. The program will culminate with a Saturday workshop where parents and students work together to implement a garden fed purely on rainwater on school

Staff member Elena Rotondi leading Riviera Elementary School teachers on a field trip to learn about water harvesting.

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Sustainable Living Tip

Tip # 5: Controlling Unwanted "Weeds"

The warming spring temperatures and the availability of moisture from winter rains promotes the germination of seeds stored in the soil, often creating an outbreak of unwanted plants. These "weeds" can be managed through several preventive strategies to eliminate hours of pulling and/or the use of weed killing chemical herbicides. Some methods include:

1) Apply a thick layer of mulch (4-6 inches) around established plants.

2) Use a thick layer of cardboard or newspaper in your garden and/or basins to block the growth of weeds. The paper layer eventually breaks down adding organic material to your soil.

3) Minimize surface disturbance of your soil. Weedy species are often primary succession species and soil surface disturbances continually reset the plant succession stage.

4) Cultivate a desirable plant groundcover that inhibits the growth of weeds.

Remember to turn problems into desirable solutions. Several weedy species are nutritious for us and/or wildlife; weeds can be pulled and composted (preferably before they set seed); and weeds can help increase organic material in the soil. Take the time to find out which weed species are native and invasive, and leave the natives for wildlife.

Resource Management 101

Question: What is evapotranspiration?

Answer: Evapotranspiration (ET) refers to the combination of two processes, evaporation and plant transpiration, both of which involve the movement of water from the ground into the atmosphere. Evaporation is the process where liquid water changes into a vapor and moves from the surface into the air. Transpiration is when water in a plant leaves the plant in the form of vapor. Evapotranspiration is used to refer to the sum of these water losses from the soil because it is difficult to measure these two processes individually. Some of the conditions that determine the rate of ET (or the rate of water lost to the atmosphere from the soil) include temperature, humidity, soil moisture availability, plant species and plant condition (health, age, environmental stress, etc). ET increases in the summer months with increasing summer temperatures and plant growth, whereas ET rates are lower in winter months due to cooler temperatures and dormant plants.

Modifying Urban Hydrology to Combat Heat-Island Effects

Global warming is not the only culprit for increasing average temperatures. If you live in an urban area, increasing temperatures in your city can likely be attributed to what is known as the **Urban Heat Island Effect**. The densely built environment, made up of buildings and streets, absorb solar radiation during the day. At night, these human structures release the absorbed heat back into the environment, thereby increasing nighttime temperatures, and increasing overall average temperatures. The urban heat-island effect has already caused a rise in average temperatures in Phoenix, and is expected to increase temperatures 15 to 20 degrees above historic averages as the city grows.

Thomas Endreny (2008) writes in the journal, *Hydrological Processes*, that simple stormwater management features can be optimized to combat the urban heat island. Endreny highlights the use of bio-retention basins to reduce stormwater runoff and pollutants and to promote vegetative cover. Bio-retention structures intercept a portion or all of the stormwater runoff into a shallow basin planted with trees and vegetation.

Bio-retention structures can be employed in both humid and arid climates to promote infiltration, reduce stormwater runoff, reduce pollutants traveling downstream, and provide additional soil moisture for plants. Endreny focuses on the importance of promoting infiltration of stormwater into the soil. The resulting increase in soil moisture allows trees and other plants to uptake more water, enhancing the plants ability to transpire additional moisture. The resulting boost in evaporation and transpiration known as evapotranspiration (ET) provides additional cooling benefits to an urban environment. This process acts in the same way as an evaporative cooler or a misting system works to cool the ambient air temperature. Additionally, the trees provide shade, which decreases the absorption of solar radiation by urban surfaces. Endreny summarizes, "research into stormwater irrigation of trees is complementary, providing a low-cost, self-organized method of sustaining tree-cooling services."

Micro-basin infiltrating stormwater runoff to promote urban vegetation.

> "...research into stormwater irrigation of trees is complementary, providing a low-cost, self-organized method of sustaining tree-cooling services." (Endreny 2008)

The use of bio-retention structures must be carefully planned to prevent potential damage to urban infrastructure (e.g. utility lines, structural foundations, etc) especially in more humid climates with existing shallow water tables.

Watershed Management Group actively promotes the use of rainwater harvesting basins in combination with native trees and shrubs along public right-of-ways through the Greening Urban Watersheds Program. Several neighborhoods in the city of Tucson are utilizing basins to mitigate stormwater runoff, increase vegetative cover, and reduce heat-island effects. These community-led initiatives serve as models for other communities and cities world-wide.

[Endreny, T. 2008. Naturalizing urban watershed hydrology to mitigate urban heat-island effects. Hydrological Processes. 22. 461-463]

WMG Updates (continued)...

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grounds. WMG recently received a grant from the Food Conspiracy Co-op which will be used to buy materials to create the rain gardens.

Interest in WMG's programs is growing steadily in Tucson, and our programs are often supported by hard-working volunteers. A recent example is WMG's new **Water Harvesting Co-op** program which has been selected as one of the community projects for the Greater Tucson Leadership class. Students from the class are developing a fundraising plan to raise enough money to start the Co-op program this year.

Volunteers in the Rincon Heights Neighborhood create water harvesting basins along the public right-of-way.

Our Sincere Thanks

Thanks to the following individuals and businesses who have generously donated to WMG:

A Special Thanks To:

- ◊ Food Conspiracy Coop for their 2008 Community Fund Grant
- ◊ Ross Bryant for his donation of a fax machine.

Corporate Donations
Santa Cruz River Level
Natural Territory, Scottsdale, AZ
(www.naturalterritory.com)

International Watershed Level:
Donna & Scott Ryburn

Flowing River Level:
Nicole Buono
Tamarha and Keith Evert
Toby Freebourn
Paul and Jill Grimes
Henry and Ruth Jacobson
Ed Thompson
John McCutcheon & Noelle Fukushima

Silver Raindrop Level:
Donald Eydenberg & Lisa Cozzeti
Jeanne Duguay
Ian Johnson
Nancy Laney
Kenneth Laux
David Shipek & Miss DeFoor
Gay Townsend

Dewdrop Level:
Ethelyn Fennel

Overcoming Resistance (continued)...

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ple, create basins along right-of-ways that will passively collect water off streets and sidewalks. Plant trees near or along edges of basins so the roots can benefit from the collected rainwater.

"...native vegetation can be added without installing expensive irrigation systems!"

2) Create a landscape with water needs appropriate to your region by using native trees and plants. If natives are used, all their water needs can be met through rainwater harvesting. Supplemental watering will only be needed in the first year for plant establishment. This means that native vegetation can be added without installing expensive irrigation systems!
3) Reduce time-consuming weed removal (or noxious spraying!) by adding a thick layer of mulch (4"- 6") to new plantings. A thick layer of mulch suppresses weed growth. Mulch also increases soil moisture around plants by increasing infiltration and reducing evaporation. You may be able to find free sources of organic mulch from firewood companies, tree trimming companies, or the municipal landfill.

Community workshop implementing small-scale projects.

4) Instead of hiring an expensive contractor to plant and maintenance landscapes, develop the project in collaboration with a community group that can coordinate the planting and maintenance. Partner with a school, church, or neighborhood association.
5) Maintenance for plants can be reduced by choosing plants that appropriately fit the space you are working in and placing plants with their mature size in mind. By spacing correctly, you can avoid constant trimming to prevent plants from overlapping each other or encroaching on sidewalks, etc. Also, let native plants take their natural shape whenever possible, instead of trimming shrubs to be hedge-like. This will also reduce maintenance.
6) Start with a small project that all parties involved can agree upon, and learn what works best through actual implementation. Once you have a small success, it is easier to convince others to take on a larger project.

Youth volunteers planting a native tree in a large broad basin at the Greenlots! demonstration site.

Watershed Management Group

Working together towards sustainable solutions

WATERSHED MANAGEMENT GROUP

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www.watershedmg.org

The mission of Watershed Management Group is to improve rural and urban livelihoods by integrating community development and conservation. We provide local residents and community groups with the knowledge and skills necessary to sustainably manage their natural resources.

Support Watershed Management Group Today!

Watershed Management Group is a 501(c)3 not-for profit organization based in Tucson, Arizona. All donations are tax deductible.

Suggested Individual Contribution Levels:

- ◊ Dewdrop: $15
- ◊ Silver Raindrop: $50
- ◊ Flowing River: $100
- ◊ River Basin: $500
- ◊ International Watershed: $1,000

Suggested Business Contribution Levels:

- ◊ Rillito River: $500
- ◊ Santa Cruz River: $1,000
- ◊ Gila River: $5,000
- ◊ Colorado River: $10,000

WMG Wish List

- ◊ 4 ft x 8 ft hauling trailer
- ◊ Ladder
- ◊ Garden tools (shovels, pick axes, hand trowels, etc.)
- ◊ Office space or storage space in central Tucson area
- ◊ Projector
- ◊ Laptop computer

You may also make your tax deductible donation online at www.watershedmg.org on our Contributions page.

Celebrating the joy of accomplishment following a water-harvesting workshop.