

A New Era In Sports Turf Management



**Do we change our ways of
Sport Turf Maintenance ?**

No!

**Agronomics Cant Change.
We have to!**

Waste



Water Efficiency



Green House Gas



Storm Water Pollutants



Why Worry?



Red Tide



Fish Population Lost



Wildlife



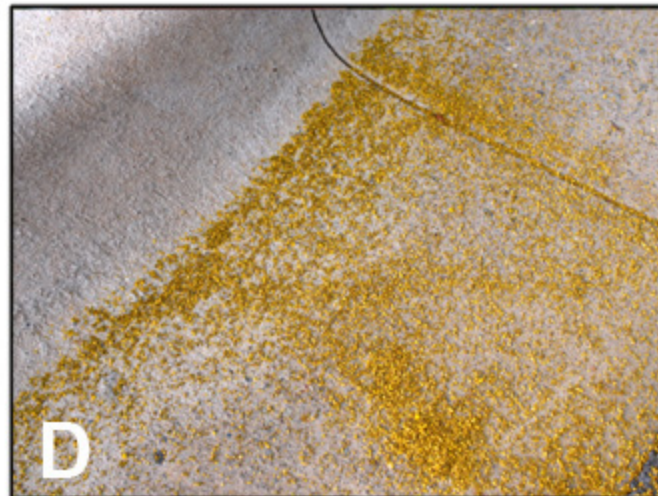
Closed Beaches

**Our We Prepare Enough To
Protect Our Local Water Shed**



**Lets Started With Good
Housekeeping**

Fertilizers & Pesticides Applications



Pesticides Storage



Fueling & Pesticide Mixing Station



Paint Mixing



Equipment Washing Station



Irrigation Runoff



Environmental Four Rules Of Protection

Protect Your Local Water Shed From These Four Types Of Measures.

- 1. Preventalbe**
- 3. Culture**
- 3. Biologic**
- 4. Mechanical**

Preventable



Rain Gardens



Proper Turfgrass Selections



Rain Barrels



Cleaning Drains

Culture



Biological



Mechanical



Get Involved

Get involve with your Local Water Shed Association

<http://water.epa.gov/action/adopt/network.cfm>

1. Click On Your State.
2. Click On Your County.
3. Find a local watershed association that is near you.

Maryland

Group Name: [St. Mary's River Watershed Project](#)

Contact: **Dr. Nancy Paige Smith**

Contact Address: **General Delivery**
St. Mary's, Maryland 20686

Contact Phone: (301) 862-0392/0405 (office), 301-862-3615 (home)

Contact Email: npsmith@osprey.smcm.edu

URL: http://www.smrwa.org/gal_stmarysriverproject.html

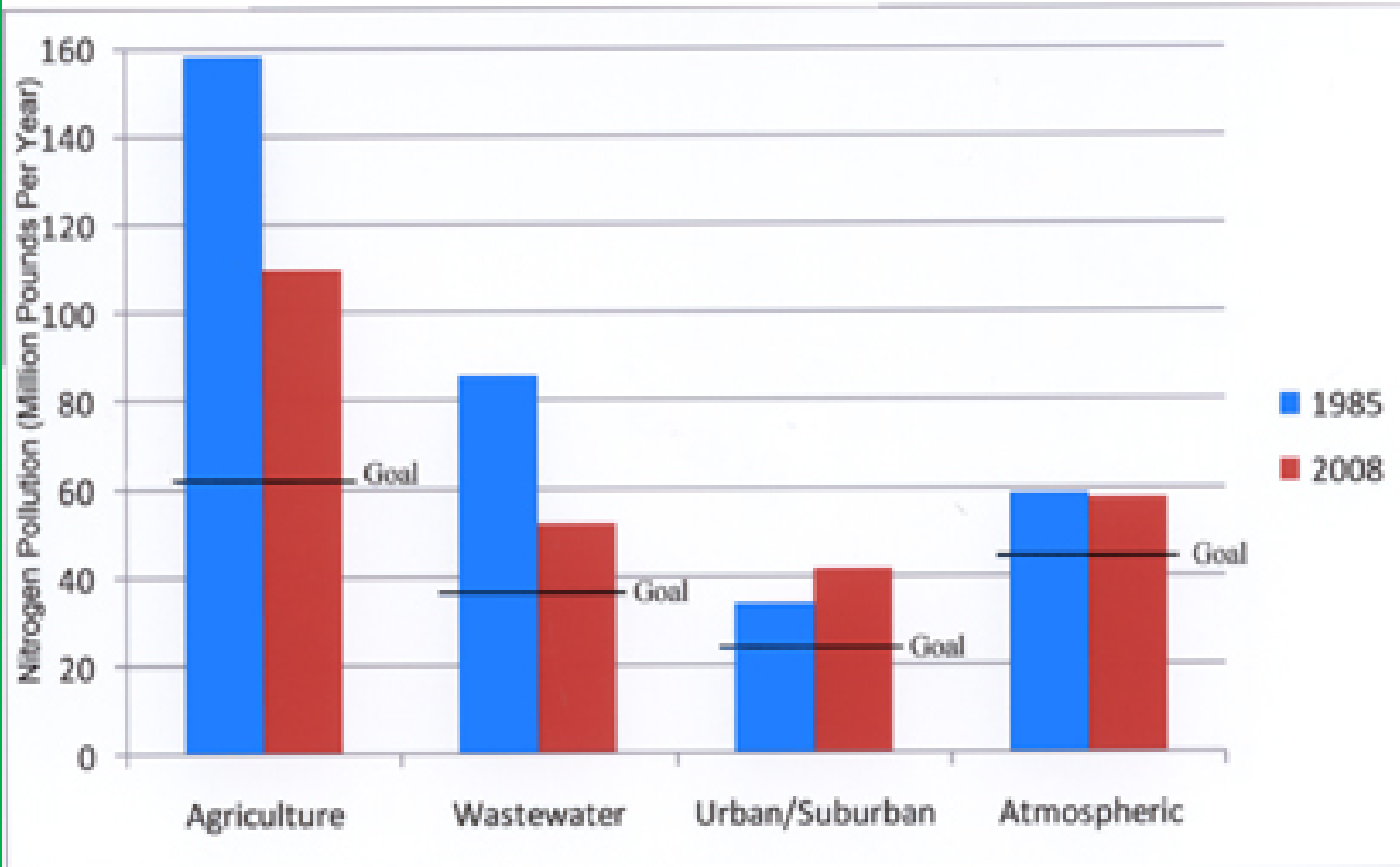
Activity: Restoration/Conservation Project, Watershed Alliance/Council

Description: Established: 1993 *Mission:* To coordinate various activities of environmental and civic groups concerned with the St. Mary's River environment and sustainable development & ecosystem management and to archive information about St. Mary's River.

Number of Volunteers: varies

Understand Your Local Watershed Pollutants Sources & Goals

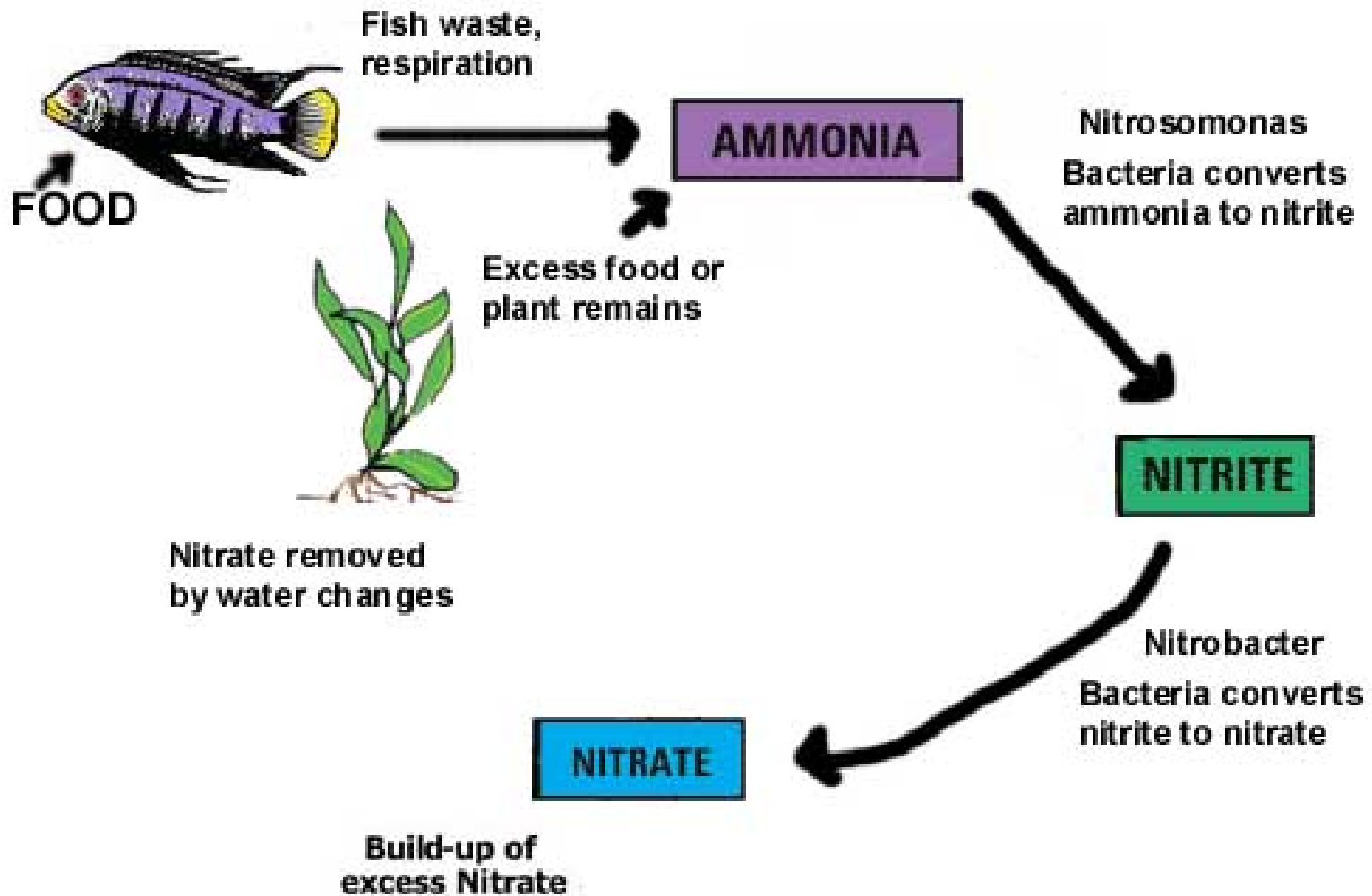
Sources of Nitrogen Pollution in the Chesapeake Bay vs. 2010 Goals



Data Source: EPA Chesapeake Bay Program

Measuring Your Storm Water Pollutants

Aquarium Water Cycle



THE NITROGEN CYCLE

Non Point Source

NPS/ Comes from fertilizers, manure, sewage, grass clippings, leaves, etc...Once the decaying process starts or the breakdown of the components, then your ammonia levels increases. This toxicity in the water results in fish loss from diseases and stress. Measuring ammonia by parts per million (PPM) is the best way to see how much of this deadly toxin you have in your storm water.

Check the storm water runoff that travels through your facility.



Draw Six Samples

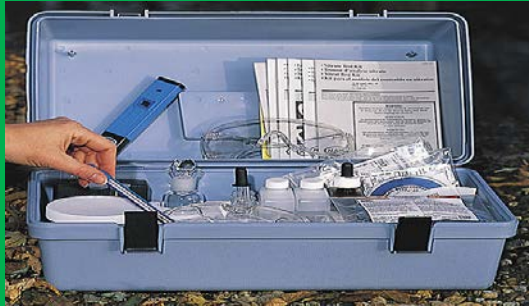


What Are We Testing For?

We are measuring Non Point Sources (NPS).

- **Ammonia:**
- **Nitrites :**
- **Nitrates**
- **Phosphors**
- **Coliform**
- **Pesticides**

Water Test Kits



Ben Meadows
(HACH)

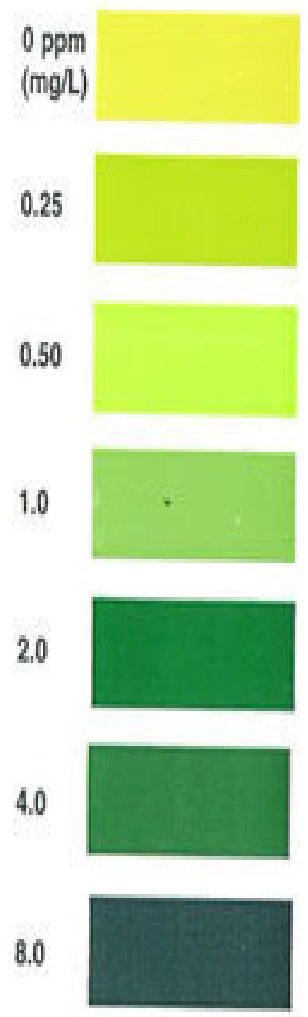


Aquarium Test Kit

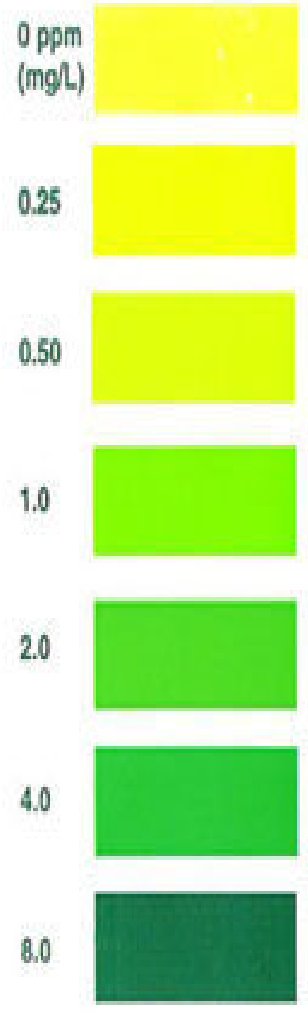
Ammonia

Nitrites

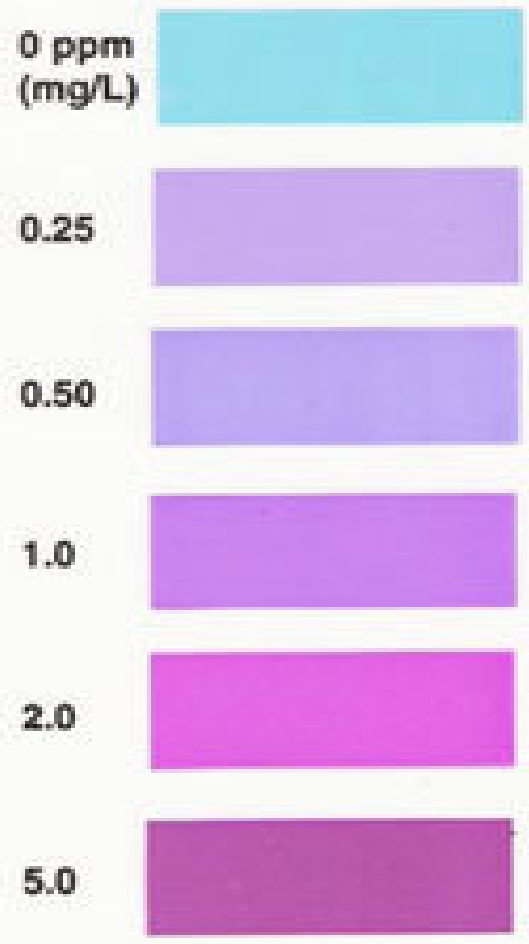
**SALTWATER AMMONIA
(NH₃/NH₄⁺) COLOR CARD**



**FRESHWATER AMMONIA
(NH₃/NH₄⁺) COLOR CARD**



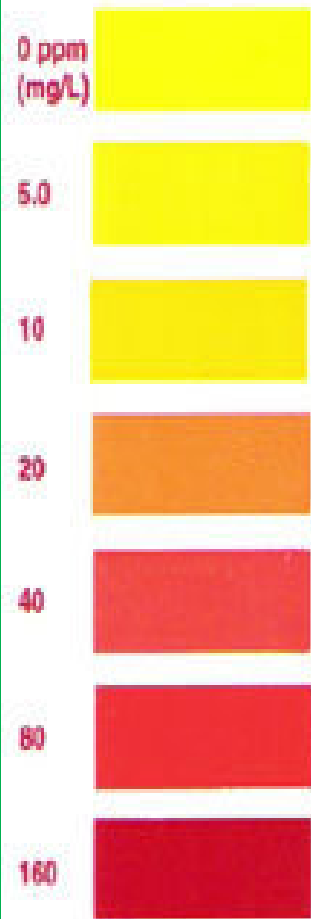
**FRESH AND SALTWATER
NITRITE (NO₂⁻) COLOR CARD**



Nitrates

Phosphors

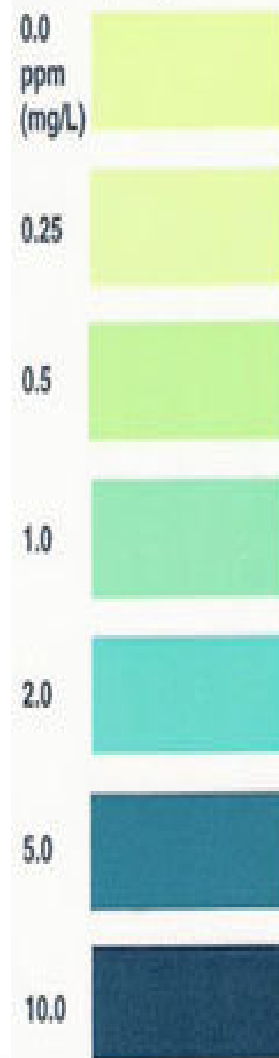
**SALTWATER NITRATE
(NO₃⁻) COLOR CARD**



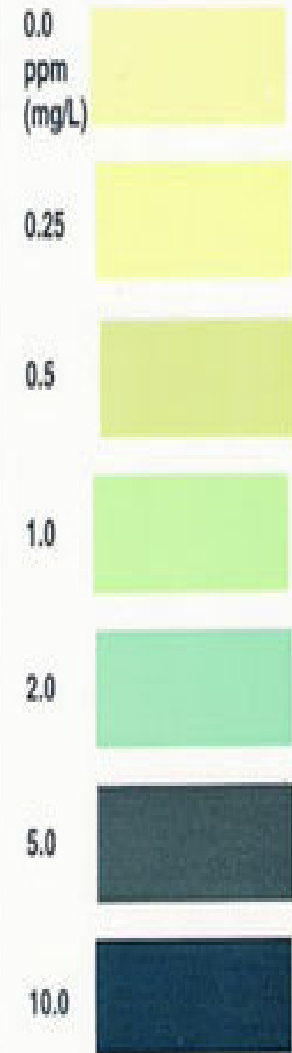
**FRESHWATER NITRATE
(NO₃⁻) COLOR CARD**



**SALTWATER PHOSPHATE
(PO₄³⁻) COLOR CARD**



**FRESHWATER PHOSPHATE
(PO₄³⁻) COLOR CARD**



Pesticides

**Table 1. Sediment Characterization Data
(mg/kg, dry, unless specified)**

	Buffalo River ¹	Saginaw Bay	Grand Calumet River ²	Ashtabula River
Total PCBs	0.33	21.9	12.9	14.6
Total PAHs	9.31	2.70	244	6.1
Arsenic	13.0	2.2	<21	21
Barium	405	322	296	903
Cadmium	2.0	4.1	7.9	3.1
Chromium	118	107	1480	591
Copper	72	59	230	34
Iron	44200	7870	182000	42600
Lead	105	46	706	59
Manganese	680	165	2390	559
Mercury	0.51	0.17	1.5	0.19
Nickel	44	58	74	53
Selenium	0.70	<0.03	<3.7	0.91
Silver	0.30	0.84	4.9	0.19
Zinc	185	140	2840	234
Total Cyanide	5.6	4.1	22	1.5
Total Phosphorus	1120	740	2650	1290
Moisture, %, as received	55.1	24.0	51.2	35.6
Oil & Grease	5980	1350	45700	1004
TOC, % weight	1.88	0.83	18.4	2.00
Total Volatile Solids, %	4.57	2.09	15.0	7.64
pH, S.U., as received	7.72	7.30	7.61	7.88

1 - Average of two analyses

2 - Average of three analyses

Coliform Testing



How to convert percent to ppm

The part P in percent (%) is equal to the part P in ppm divided by 10000:

$$P_{(\%)} = P_{(\text{ppm})} / 10000$$

Example

Find how many percent are in 6ppm:

$$P_{(\%)} = 6\text{ppm} / 10000 = 0.0006\%$$

Record Your Findings



How can we takeout these toxic
nutrients ?

Think of how you do maintenance to your home
aquarium.....

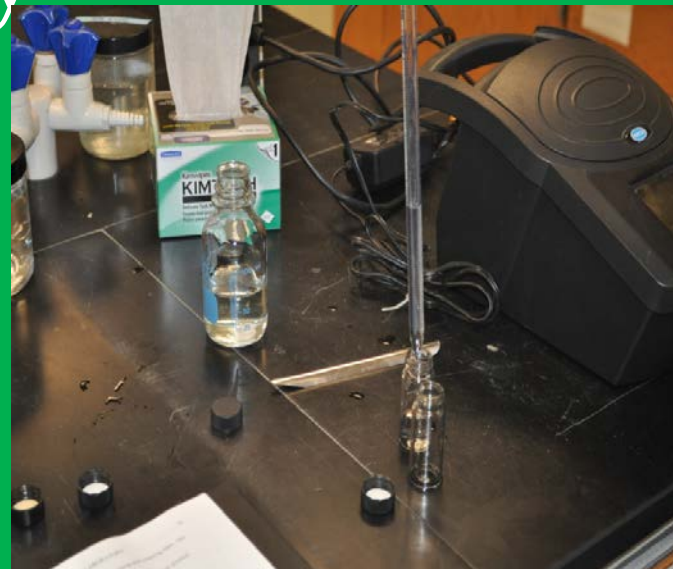
Water Changes



Biologic Filters From Plants.



Test The Water Leaving Your Property



Resource Management

- Energy/Fuel Use
- Waste Reduction
- Recycling



Reducing Your Carbon Footprint

- US EPA Tier 4 Standard
- 25-74hp Non-Road Diesel Equipment
- Mandated for Equipment Manufactured After January 2013



Energy Efficiency



Vending Machines



Lights



Air-Conditioning

Less Energy, Less Cost

- Motion Sensors



- Programmable Thermostats



Fluorescent Bulb Crushers / Compactors



Waste Oil Heater



Wildlife and Habitat Projects

Wildlife & Pollinator Gardens



Native Pollinators

- Butterflies
- Bees
- Hummingbirds
- Bats
- Other insects

Pollinate 80% of the world's food crops and provide the "sexual glue" that holds much of the plant world together.

Sustainable Gardens (Wildlife)

- Wildlife-specific plantings can encourage occupation by hummingbirds, butterflies, and songbirds
- Supplemental baths, structure or nestboxes can add habitat value to property
- Nectar-bearing plants promote occupation by pollinators
- Leaving dead trees “Snags” standing when they do not pose a safety hazard



Sustainable Gardens (Xeric)

- Xeric gardening requires little or no supplemental irrigation inputs
 - Drought tolerance
 - Reduced mowing and maintenance
 - Reduced energy costs
 - Elimination of chemical inputs



Wildlife and Habitat Projects



Supplemental Structures For:

- Bluebirds
- Purple Martins
- Wood Ducks
- Raptors
- Bats
- Bees

Enlist Community Help, Gain Local Support



- Local Gardening or Birding Groups
- Cooperative Extension
- Scouts
- Watershed Organizations

It's a Group Effort



When its “right”, your landscaping...

- Creates a healthier, sustainable mosaic of land uses on the landscape
- Maintains a diversity of plants and animals
- Maintains the gene pool of particular plants and animal species, promoting hardiness, disease resistance, and adaptability
- Protects ecosystems and ecological communities

When its “right, your landscaping....

- Improves water quality
- Creates positive, progressive, and constructive attitudes about the natural world
- Promotes the concept that natural is beautiful and desirable
- Reduces maintenance needs, reduces water use, and lessens or eliminates chemical use

Things to Remember

- Do the best you can, with what you have
- Projects need not be costly, and can improve both your bottom line and reputation
- Small steps are better than no steps at all (something little can have big impacts)
- You don't need to be an expert, merely a participant

Questions?