ARIZONA COOPERATIVE EXTENSION
THE UNIVERSITY OF ARIZONA • COLLEGE OF AGRICULTURE AND LIFE SCIENCES

Backyards & Beyond

Spring 2009 RURAL LIVING IN ARIZONA Volume 3, Number 2

Featured Plant

Common Name: Globemallow

Scientific Name: *Sphaeralcea* spp.

Susan Pater

Kim McReynolds, Area Extension Agent, Natural Resources, University of Arizona Cooperative Extension, Cochise, Graham and Greenlee Counties

Globemallow is a common native wildflower found throughout most of Arizona. There are 16 species (and several varieties) occurring in the state, the majority of which are perennials. They are found between 1,000 and 6,000 feet in elevation and grow on a variety of soil types. Depending on the species, globemallows are either herbaceous or slightly woody at the base of the plant and grow between 2-3 feet in height (annual species may only grow to 6 inches). The leaves are three-lobed, and while the shape varies by species, they are similar enough to help identify the plant as a globemallow. The leaves have star-shaped hairs that give the foliage a gray-green color. Flower color varies from apricot (the most common) to red, pink, lavender, pale yellow and white. Many of the globemallows flower in spring and again in summer. Another common name for globemallow is sore-eye poppy (*mal de ojos* in Spanish), from claims that the plant irritates the eyes. In southern California globemallows are known as *plantas muy malas,* translated to mean very bad plants. Ironically, the Pima Indian name for globemallow means a cure for sore eyes. The Hopi Indians used the plant for healing certain ailments and the stems as a type of chewing gum, and call the plant *kopona*. Globemallow is used as forage for livestock and wildlife, including deer, elk, bighorn sheep and pronghorn antelope. Because of their ability to withstand drought periods and grow on a variety of soil types, globemallows make a nice addition to home landscapes and are used in seed mixes for revegetation of disturbed lands. Several species can be found in local nurseries that specialize in native plants. If the plants get large and rangy in appearance following flowering, they can be trimmed and new shoots will appear soon after.

Featured Bird

Common Name: Curve-billed Thrasher

Scientific Name: *Toxostoma curvirostre*

Dan L. Fischer

Dan L. Fischer, Author of *Early Southwest Ornithologists*, 1528-1900, University of Arizona Press

The conspicuous Curve-billed Thrasher occurs as a resident bird in the southern portion of Arizona in close association with many thorny shrubs including several cactus species—especially cholla. The ability of several animals in the Southwest to move with ease among potentially dangerous thorny plants is a successful adaptation that provides protection in an often barren landscape. When not observed running swiftly from bush to bush in search of insects, or pausing momentarily to dig out a small morsel with its long bill, it is commonly seen flying directly into thickly branched cholla covered with long barbed spines that appear to most predators as vicious and formidable. To this bird and several other desert denizens that share this hostile and sometimes brutal environment, these obstacles pose no threat, but protection. Most common of the five thrashers that occur in the state, the Curve-billed is a rather large uniform dull brown bird with faint, slightly darker spots on its breast, a long tail with outer feathers tipped with white, a large sickle-shaped bill, and eyes that have a yellow or glaring orange iris.

Compared to the delightful singing qualities of Bendire's Thrasher or the Northern Mockingbird, the repertoire of the Curve-billed Thrasher lacks variety and qualities that sometimes separate distinct phrases, but it does rival them with a lovely, clear, although often repetitious, melodious song. Although its song is not often heard, the bird more frequently delivers at unsuspecting moments a rather startling two or three sharp call note similar to a penetrating whistle which resonates quite loudly.

Like many desert birds, breeding successfully is in large measure dependent on the precipitation and insect prey availability during critical periods of the year. In normal precipitation years, they are among the earliest to nest, often beginning in January. Two to three clutches are the general rule, but nesting activity might slow during mid-summer or resume if late summer monsoon rainfall is substantial. Their rather large stick nests are generally built among thorns and usually contain three pale, bluish green eggs. After a period of about 13 days the eggs hatch and the young remain in the nest for another 16 days.

After selling his museum in London, William Bullock (1775-1849), with his son, sailed to Mexico in search of mining investments in 1823-24. During his rather short visit, he maintained his interest in birds and obtained many specimens including this bird. On his return to England Bullock presented his collection to William Swainson (1789-1855), a fellow English artist-naturalist, who described and applied to this bird a specific name consisting of two Latin terms *curvus* and *rostrum* which describe the long "curved beak."

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Tammy Fullum

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ARIZONA COOPERATIVE EXTENSION
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USA-NPN:

Volunteers Needed to Monitor the Pulse of the Planet

Gary Woodard, Associate Director for Knowledge Transfer, SAHRA Center, The University of Arizona

Spring officially began on March 20, and summer arrives June 21. But many of us mark the seasons by events occurring in our backyards or the surrounding countryside. Saguaros blooming and tortoises emerging from hibernation in the Sonoran desert, the departure of sandhill cranes in Cochise County, aspens leafing out in the higher elevations—these are some signs of spring across Arizona.

The study of these recurring plant and animal life cycle events is *phenology*. Many of these events are sensitive indicators of climatic variation and change, making them valuable tools for identifying and understanding environmental trends. Uses of phenology data include:

- predicting wildfires and pollen production,
- detecting and controlling invasive species,
- monitoring drought conditions,
- assisting agricultural decision-making, and
- evaluating impacts of climate change.

Unfortunately, scientists lack instruments to tell them when plants leaf out or bloom, crops ripen, and insects emerge. Collecting the necessary data requires human observers—lots of them—in rural and urban areas, across every state.

The National Phenology Network, USA-NPN, is a partnership of federal and state agencies, non-governmental organizations, academic researchers, and the public with its headquarters at the University of Arizona. USA-NPN was created to recruit tens of thousands of volunteers to observe and report on plants and animals, in their backyards and neighborhoods, or where they work and play.

Many plant and animal species throughout the world are being affected by climate change. For example, some plants and animals respond to warmer winter and spring temperatures by shifting the timing of activities, including fish, mammal and bird migrations, insect emergence and flight, honey production, and flowering and leafing of plants. Other natural events such as insect breeding, some bird migrations, and the flowering and leafing of other plants, are based on length of day rather than temperature. This can result in ecological mismatches; for example, flowers may bloom before their pollinators arrive, leaving both out of luck. In other cases, migratory birds may arrive at their summer breeding grounds after their primary food source has come and gone. Such mistimed behavior has already been noted across many parts of the world.

As an USA-NPN observer, you can help scientists and natural resource managers better understand these changes, and develop adaptation strategies. Volunteering is easy. You can visit www.usanpn.org and follow these four simple steps to begin observing:

1. Learn which plant species in your area are included in the monitoring program, get information about them, and find out what phenophases to monitor. About 60 plants found in Arizona currently are being monitored, with another 30 to be added soon. Whether you live in Yuma or Flagstaff, you'll find many plants on the list native to your part of the state. (Monitoring of insects, birds, and other animals is scheduled to begin spring 2010.)
2. Get the details on monitoring. Find out what you should consider when selecting a site or plants, how to mark your plants, and about recording your phenophase observations.
3. Sign up to be an observer. Become an official participant and set your username and password. All you need is an email address and Internet access.
4. Log in to MyNPN. Now you are ready to register your site and the plants you will observe, and start reporting! As you collect data during the season, log in to your account at "MyNPN" and enter the observation data you recorded.

Participating in usanpn.org is simple and fun. Check it out and consider joining this effort to monitor our local environment.

Chiropteras are Bats

Jim Riggs, Owner and Manager, Crossed J Ranch

One of the attractions to the Desert Southwest is the open space and the opportunity to observe wildlife in a natural setting. This is a value held by many people who have lived a considerable part of their lives here as well as the new resident or visitor. One common group of wildlife species that often goes unnoticed are bats. Because of their nocturnal nature, some of their nasty habits, and the myths that surround them, they are ignored or avoided. Having lived here and around bats all my life, they somehow captured my curiosity, leading to a more aggressive seeking of knowledge of these beasts. It is a rewarding if not easy task.

Bats are very interesting and beneficial animals. Although bats live on nearly every land mass of the planet, they have not been the target of a great deal of scientific study. To complicate this lack of factual material, bats have long been the object of a great deal of mystery precipitating all kinds of myths. Adding to this confusion is the human habit of anthropomorphizing, resulting in rather weird and sordid notions of what, or maybe who, bats are. Again, bats are animals! A bat's ability to fly is unique to them as mammals. The classification name of *Chiroptera* literally means that they have a wing like a hand. The bone and muscle structure of a bat's wing is very similar to that of the human hand. With a thin membrane of skin connecting the "finger" bones they are able to form an airfoil allowing for powered and sustained flight.

Most bats found in the Southwest are insectivores (they eat insects) and rely on echolocation to locate and capture their food. All bats have fairly good eyesight, but it must be remembered that bats are nocturnal and hunt insects in the dark. Challenging the bats even more is that they have voracious appetites, eating nearly one half their weight in insects each night. Micro-bats use echolocation that is similar to our radar or sonar, although theirs is much more sophisticated. This enables bats to fly in total darkness without crashing into each other or objects and allows them to locate and capture their food, mostly flying insects. Some bats capture and eat their food on the wing, some capture then land to eat, and one species (the pallid bat) can actually sit and wait for the right kind of insect to crawl across open ground where the bat pounces on it and then flies away. The pallid bat's habits are rare for bats in that it can take flight from the ground. It is also interesting to note it eats scorpions and centipedes without being affected by the inflicted toxins. Two species of bats that occur in the area are primarily nectar eaters, relying on sight and smell, but they occasionally use echolocation to capture and eat insects. These two are exceptional at emptying hummingbird feeders during the night and offer a wonderful opportunity for viewing.

Upside down to us they roost in high places such as attics, caves, trees, or abandoned mine tunnels where they hang by their back feet, head down and wings wrapped around them. This keeps them safe from most predators and enables them to take flight by merely turning loose. Roosts may be specialized such as resting roosts where bats rest from feeding or nursery roosts where the females will leave their young while they feed. Some species occur in large groups called

colonies, while some will be in small family groups and still others like to be solitary. Bat boxes, or man-made roosts, are sometimes recommended. Here in the Southwest they are only successful when specific requirements are met, such as proper construction and placement in locations that lack natural roosts.

Southwestern bats differ in how they spend the winter. Some are active year around, some migrate, some hibernate, and some use a combination. All have the ability to become torpid, a method of slowing their metabolic processes down so as not to require food or water for several weeks. This state of hibernation is usually done in isolated and protected areas such as caves, rock crevices, under tree bark, or in some manmade structures. Bats that migrate will move to an area of warmer climate which can be simply going to an area of lower elevation or it can mean flying many miles south. Some bats migrate and then hibernate and some bats will stay in the local area to hibernate coming out to seek water and occasionally to hunt prey on warm winter evenings.

Having bats around the living quarters can be enjoyable, but can cause some problems. Most of the problems can be eliminated or mitigated. First, make sure that all openings to the attic are either completely sealed or screened. Attics are one of the favorite roosting sites. Leaving porch lights on at night attracts insects which serve as a “bat feeder” which in turn can become an “owl feeder”. If you need to leave a light on at night, locate it so the bats that are attracted will not be bothersome. On occasion a bat will get into the house. If this happens it is best to isolate it in a room with an outside door. Simply open the door and leave the bat to its own. It will find the door. Bats in a room can be captured using a soft towel and released outside, however never handle a bat with your bare hands. Bats roosting in an attic can be encouraged to move away using an exclusion net that allows them to leave, but not return (this should be done after any pups are already grown).

It must be remembered that bats are wild animals. They are to be observed from a distance and not handled. In fact it is against the laws of Arizona to capture or keep them in captivity. Remember that by nature wild animals will try to bite when frightened and bats are no exception. They have sharp teeth that can bite through the toughest of beetle bodies. There is one other caution to be taken with bats and that is they can transmit rabies to humans. This is very uncommon considering the large population of bats and statistically, getting rabies from house pets is much more likely. When talking about bats, I always tell people the best thing is to **leave bats alone!** Bats that are found on the ground during the day time are usually sick and remember, most bats can not take flight from the ground. They need a distance of free fall, so by instinct when they find themselves on the ground they will try to climb up any thing close including a person’s leg. Because bats are used to hanging on to the ceiling of a cave, they have the ability to hang on to the most violent shaking of a pant leg.

If you enjoy or want to watch bats, a good place is near an expanse of open water at dusk and into the night on a summer evening. All southwestern bats drink their water by scooping it up as they fly close over a surface. The bats will also be busy feeding on the insects that are attracted to the water. Porch and street lights are also good for viewing and don’t forget to watch your hummingbird feeders in the evening.

For more information go to:

Arizona Game and Fish Department
http://www.azgfd.gov

The Organization for Bat Conservation
http://www.batconservation.org

Bat Conservation International
http://www.batcon.org/home


Stephanie Shank

Getting Bugged in Arizona!

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Because of Arizona's geographical location next to Mexico, its varied habitats, its many mountain ranges rich in biological diversity and its numerous unique plant species that serve as insect hosts, Arizona is a "hot spot" for insect collecting. This means that entomologists (people who study insects) from around the world plan dream vacations to Arizona to collect our local insects.

Despite the fact that explorers and scientists have devoted years investigating Arizona insects, there is a lot more to discover. There are over 1 million insects described worldwide and some scientists estimate there are as many as 10 million that have not yet been named (Turpin, 1992)! Most research has focused on naming and controlling those insects that become a "problem." Humans in general don't pay much attention to insects unless the insects are bothersome, or unless they are large and beautiful or showy. While some insects are thought to be undesirable, many are beneficial or benign.

INSECT OBSERVATION

Studying insects is an interesting and inexpensive hobby. Here are tips you can use to increase your chances of finding insects. The first tip is to go where the insects live. Insects spend a good deal of time searching for and consuming food. While some insect herbivory could be viewed as detrimental to your landscape, orchard or garden, low levels of plant herbivory is not harmful to plants. Look on trees, shrubs and other plants for grasshoppers, cicadas, lacewings and walking sticks; look in and on flowers for bees, wasps, bugs, butterflies and beetles; under tree bark for beetles, caterpillars; under rocks or logs for beetles, earwigs, crickets, roaches, (be aware that venomous snakes, scorpions, and centipedes also like to hide under rock ledges and logs); near water for dragonflies, damselflies, stoneflies and caddisflies.

LURING AND TRAPPING INSECTS

The second tip is to lure insects to a place where you want them to be. Learn the habits and favorite foods of insects and provide them. Plant a butterfly garden with plants that attract butterflies. Purposely provide hiding places for insects by placing some wood down and checking underneath it weekly to see if insects seek shelter there. Create pitfall traps by burying empty soup cans up to the rim. Cover each soup can with a small board elevated,¼" or less off the ground, with small pebbles. Insects crawl underneath the board and fall into the can. Carefully check pitfall traps daily, as spiders and scorpions may also fall into the traps. Night-flying insects will be lured to a porch light or a blacklight. To create a blacklight lure, suspend a white bed sheet from a clothesline or other suitable structure; replace the fluorescent white bulb in a fixture with a blacklight bulb, and place the blacklight so that as much of the white sheet glows as possible. Insects will start visiting the sheet at dusk and different species will continue to arrive until dawn.

INSECT PHOTOGRAPHY

Many people enjoy observing or photographing insect's habits and behavior. Observing how and what insects eat, and how insects change is fascinating. Insects can be detained in small jars to begin with, but if they are caterpillars, they will molt and get bigger, so an "upgrade" to a larger container may be necessary. If the captive insects normally crawl about on the ground hunting for food, a more spacious cage where a mini-habitat can be created is desirable. Usually some clean soil or sand, a small shallow jar lid for a water dish and a place to hide are basic requirements for an insect habitat. Identify the insect and research its food requirements. Realize that insects are not common household pets which will notify you when they are hungry. Most caterpillars in nature feed on only one or two species of plants. When the caterpillar has eaten all the tender leaves of that particular plant in its vicinity, it has to hunt for more of the same species of plant! If a person wants to keep a caterpillar and watch it grow and become an adult, fresh leaves must be collected, rinsed gently, tapped dry, and placed in the cage on a daily basis. By rinsing and tapping the leaves dry, parasites of caterpillars may be washed away and the small amount of moisture that remains will substitute for a source of drinking water for the caterpillar. Although some insects are capable of drinking from a "water dish," caterpillars may crawl up on the edge, fall in and drown. Take notes on your insect experiences. If you are rearing caterpillars make notes of what the caterpillars eat, the dates that caterpillars molt and their appearance.

One may not have room to keep live insects for lengthy observation, however, photographing insects is a satisfying pursuit and images can be stored in a very small space! Insect photography requires a camera that can focus on small objects, and a notepad for taking notes of when and where the insect was found. Once an insect is found and the camera in hand, the challenge becomes keeping the insect in the view finder while composing the photograph. This can be overcome by collecting the insect in a jar, and briefly refrigerating it, thus slowing the insect's activity level. The photographer then carefully removes the

insect from the jar and positions the insect on a previously arranged background for multiple photographs from different angles. If the insect warms and begins more rapid movement, it can be returned to the jar and to the refrigerator for additional chilling. Once the insect has been photographed, allow it to return to ambient temperature and release it in its natural habitat. Insects should not be released into habitats where they are not normally found.

COLLECTIONS

To make a scientific insect collection, other equipment and supplies are needed. An insect net, a killing jar, a spreading board and a storage or display box, can be homemade or inexpensively purchased at local discount stores. Special insect pins are available from scientific supply companies. When killing an insect for a scientific collection it is important that the insect be handled as gently as possible. Capture the insect in a net or a jar. Once captured in a net, the insect should be transferred to a jar and placed in the freezer until dead. An alternative to killing insects by freezing is to have a jar that contains a small amount of killing agent, the fumes of which will kill the insect. Handled with care, household ammonia can be used to kill insects. Ensure that the insect is really dead before removing it from the jar for mounting. The insect is mounted by pinning it through the body and arranging its legs, wings and antennae in a natural pose. Insect collectors have learned to leave insects in the killing jar or freezer for a sufficient time. An impatient collector may remove an unconscious, but not dead, insect from the jar or freezer, pin it and arrange its legs, wings and antenna only to return later to discover the revived insect struggling to get off the pin which is thrust through its body. The insect must be re-killed before rearranging the legs, wings and antennae. Allow a week, in dry weather conditions, for pinned insects to dry before labeling and storing. Insect labels should be small, yet large enough to allow the wording to be read. At minimum, the label contains the name of the state, county and the city or natural landmark where the insect was collected; the date when collected; and the name of the collector. This label is placed on the pin just below, and parallel to, the insect's body. Insect collections must be protected from hazards such as breakage, dampness and other insects. Tight fitting wooden insect collection boxes with closed-cell foam attached in the bottom are available for purchase, but other tight fitting boxes, such as cigar boxes with Styrofoam in the bottom will suffice. To deter other insects from eating a collection, wrap a few moth crystals (the kind used in closets), in cotton fabric and pin securely to the inside box bottom. Moth crystal chemicals are harmful to insects as well as humans. Read and follow cautionary statements on the container. If protected, insect collections last years. Some museums contain specimens collected and named in the 1700's by Carl Linnaeus, the father of biological nomenclature!

Stephanie Shank

RESOURCES

Whether observing, photographing, rearing or making a scientific collection, identification of insects is like a hunt for treasure. There are field guides available from bookstores or the internet which give general information about many different kinds of insects, and how to properly pin and mount them. Other guides are more focused on specific groups, such as beetles. If you are stumped and cannot determine the insect you have collected, take the specimen to the University of Arizona Cooperative Extension Office in your county. Each office will assist you in determining the insect's identity. Additionally, each Cooperative Extension office is that county's "home base" for the 4-H Youth Development program. If young people are interested in learning about insects there may be a 4-H Club in the county whose members participate in entomology projects. If no Entomology club exists, it is a wonderful opportunity for an adult mentor to recruit some youth, start a 4-H club and using the 4-H member manuals, teach the wonders of Entomology. The joys of hunting and exploring, developing tools, collecting and displaying, the insects of Arizona are a treasure for any 4-H member and leader. Despite all the insect collectors from out of the area, information about Arizona entomology is incomplete. You can contribute to the body of knowledge by sharing information you have learned and recorded through photographs, notes on rearing and insect specimens collected.

The following are internet sources for insect collecting equipment and books.

http://www.bioquip.com/default.asp

http://www.wardsci.com

https://www.forestry-suppliers.com/search.asp?stext=insect%20collecting

http://www.carolina.com/home.do?s_cid=ppc_gl_carolinabiologicalsupply&code=L4&gclid=CK_IhMfTwZgCFRFMagodJG9E0g

Turpin, T., (1992). *The Insect Appreciation Digest,* Purdue University, West Lafayette, Indiana. Copyright 1992 by The Entomological Foundation, Lanham, Maryland.

Arizona Rain Gardens

Kathryn Hahne, Program Coordinator, Sr., Smartscape Program, University of Arizona Cooperative Extension, Pima County

Rain-irrigated landscapes, also known as rain gardens or rainscapes, are becoming increasingly popular design features in wetter parts of the country, but are they practical for Arizona landscapes…your landscape? It may seem counter intuitive, but rain gardens are actually designed to be dry environments between rains. Arizona's natural landscapes seemingly spring to life after seasonal rains, changing dry, dusty landscape vistas into a kaleidoscope of colors and fragrances. The term “rain garden” evokes just such an image, but what is a rain garden?

A true rain garden is really a purposeful component of a stormwater management system designed to recreate conditions similar to natural hydrological and ecological processes that "get lost" in built environments. Depending on scale, they may also be categorized as swales, catch basins, infiltration basins, bio-retention areas, and engineered wetlands. Their function is to intercept rainwater runoff from impervious surfaces (e.g. sidewalk, street) by capturing it in shallow basins and allowing it to seep into the ground and irrigate associated plantings, thus reducing runoff and soil erosion. They also help to filter environmental pollutants commonly associated with urban properties: pet waste, household cleaning solvents, fertilizers, pesticides, petroleum products, and other contaminants that could otherwise enter storm drain systems and eventually nearby waterways or groundwater supplies.

As we move toward more environmentally-friendly design and management practices for our landscapes (e.g., Xeriscaping, Rainwater Harvesting), it is a natural next step to move away from irrigation-dependent landscapes. With the current norm for landscape maintenance to include regular watering, periods of growth and dieback are less pronounced and are associated more with seasonal temperature changes rather than rain patterns. By contrast, rain gardens are somewhat ephemeral, truly coming to life—and doing their job—when rain events occur. The plants may need supplemental irrigation for the first 2 to 3 years to get established, but after that they are intended to survive on available rainfall.

The central feature to all rain gardens is the capacity of the design to optimize available rainfall by keeping it in the landscape and directing it to where it can be used by the plants and stored in the soil. The key factor in designing a rain garden is that it suits the site and is scaled appropriately for its location. Since rain gardening first came to light in the late 1980's, many technical publications have been made available online to assist with all phases of planning and developing rain gardens and should be consulted if a rain garden will be installed. The main aspects to be aware of include knowledge of precipitation rates and patterns, potential for rainwater catchment, capacity for soil infiltration, and suitable plant materials.

Each landscape has its own particular characteristics that will influence the location and functionality of the rain garden, but nearly all can benefit from installation of such a feature. Rain gardens are most suitable for landscapes with a slope between 4 and 12 percent. In general, the steeper the slope the longer the infiltration time will be. The rain garden itself is built in a very shallow basin, only 4 to 8 inches deep. Flat landscapes will require a larger retention area to be effective as a rain garden. Keeping in mind that it is easier to work with features already in place than to change them, take note of where water on the property naturally drains/pools or is directed to drain, as in the case of gutter and downspout systems. These are important details to know when deciding on an appropriate location for the rain garden. As a rule of thumb, rain gardens should be a minimum of 10 feet away from building foundations or other structures so as not to undermine their integrity.

The average annual rainfall varies throughout the state and in combination with elevation changes, determines to a large extent the native and adaptable plant palette in a given region. Arizona’s native

plants are adapted to the two rainy seasons, summer and winter, with precipitation as snow as an extra consideration in the higher elevations of the state. Winter rains are predictably characterized by low intensity storms of long duration which allows a high rate of rainwater infiltration into the soil with minimal evaporation. Conversely, summer rains are usually short and intense localized storms which often result in high rates of runoff and flooding, low rainwater infiltration and high evaporation. Knowing how much of that rain can potentially be held on the property is helpful when determining an appropriate size for the rain garden feature. For a quick estimate, keep in mind that a 1-inch rainfall will yield approximately 0.62 gallons from a 1 square foot catchment area (e.g., roof).

Soil structure and texture are important considerations for drainage and water holding capacity. Soils which are compacted, as from foot or vehicle traffic or construction, will not allow high water infiltration. Sandy soils provide excellent water infiltration and drainage but are not favorable for the majority of plants one would choose for a home landscape. Opposite of this are clay soils which are slow to allow water penetration, but have excellent storage capacity. Obviously, a soil that allows easy water penetration and has water holding capabilities (i.e., loam) is desirable, but is not commonplace.

To help determine the soil texture of the landscape site, a simple "feel test" can be used. Take a handful of soil, wet it, and squeeze. If the soil does not hold a shape and the mass crumbles, it has a high sand content. If it clumps, but breaks apart easily, it is loamy. If it doesn't break apart, and can be made into a continuous ribbon by pressing it between the thumb and forefinger, it is clay. The longer the unbroken ribbon, the more clay is present.

Plant selection allows the greatest opportunity to personalize the rain garden. All plants need sunlight in order to photosynthesize. Therefore, the quality and quantity of light the rain garden will receive is of concern when deciding on its location. Full to partial sun is required by most native plants and is the best light for the rain garden. Think too of how the rain garden plants can also serve other purposes such as a providing a windbreak, privacy or shade. The plants selected must be 1) well-adapted to the prevailing conditions in the landscape, 2) drought tolerant and 3) able to withstand periodic flooding.

Proper placement of the plants in the rain garden is also an important consideration. Xeric plants, those that are drought tolerant, are best placed on the periphery or upper portions of the basin while wet- and moisture-loving plants are better suited to the lower portions. Mesic plants are good mid-level choices. For year-round interest, choose annual and perennial native plants. In general, woody species (i.e., shrubs and trees) will comprise the foundation plants, giving structure to the design. Perennial groundcovers and native grasses are good choices for continuity of the design. Accent plants provide focal points and annuals and biennials are used primarily for color and seasonal interest and can be changed accordingly.

The question remains, which plants to use? Advocates of rain gardening insist on native plants, but many plants are adaptable to this type of landscaping and should be considered if they appeal to the homeowner. The easiest way to make good choices is to observe what grows well in your area. Look to the natural landscape for compatible plant associations and in neighboring yards for further variety. Chances are, what grows in those sites will also grow in yours. Additionally, many local plant lists are readily available to assist with choosing plants appropriate for the Arizona rain garden. *(If you are unfamiliar with what plant species grow well in your area, your county Cooperative Extension office can refer you to the appropriate resources.)*

Kathryn Hahne

Although the rain garden has a "hardier soul" than pampered landscape plants, one cannot expect the plants to perform as they would if provided regular irrigation. It may take some trial and error to establish a "permanent" rain garden. In fact, it probably will, but starting with reasonable expectations and a workable plan will lead to eventual success. By designing and planting landscapes to take advantage of seasonal precipitation and to keep and hold that water on the property, we can enhance and improve the overall quality of our environment. Into every garden a little rain—or a lot—must fall. Plan for it!

References *(available online)*

Mechell, J. and B. Lesikar. Rainwater Harvesting – Raingardens. The Texas A&M University System. AgriLife Extension.Bulletin L-5482. August 2008. **http://agrilifebookstore.org/publications**

Waterfall, P.H. Harvesting Rainwater for Landscape Use. The University of Arizona Cooperative Extension. Bulletin AZ1344. Revised 2006. **http://cals.arizona.edu/pubs/water/az1344.pdf**

Netiquette for Your Backyard, Boardroom & Beyond

Amy Parrott, Extension Agent, 4-H Youth Development, University of Arizona Cooperative Extension, Yuma County

With all of the options the Internet has given us, more than 88% of Internet users are currently emailing family, friends and co-workers. With so many people using email as an inexpensive and quick way to communicate, we are all doing what is the most convenient and comfortable for ourselves. The nature of electronic communication can easily lead to misunderstandings, unanswered questions and frustrations. To ease the level of angst we experience, network etiquette or "netiquette" has become a relevant topic and source of conversations. Netiquette as a concept and its application remain in a state of flux, and vary from online community to online community.

Wikipedia defines netiquette as a set of social conventions that facilitate interaction over networks, ranging from Usenet and mailing lists to blogs and forums. We all want to do our part to reduce the size of useless information in people's inboxes, and this article attempts to do so. There are three main sections to help you brush up on your email etiquette so that you don't become the person people cringe about when they see your name appear in their inbox.

NETIQUETTE OF SENDING

BE BRIEF – In this day and age when the average person is receiving more and more email, brevity is critical! Long emails require considerable time to read and glean. When you receive more than one, you most likely don't read the entire message, and if you do, you don't always get the intent of the message because of its length. One helpful guide is to make sure your message is never larger than your own screen, and don't require people to scroll down several times to get to the meat of your message.

USE DESCRIPTIVE SUBJECT LINES – The subject line is oftentimes a neglected aspect of electronic communication. For people who receive many emails, the subject line can be the difference between someone opening your message or not. Rather than using something along the lines of "hey" or "meeting", be much more descriptive and use subjects such as "lunch today" or "Ficus Tree."

STAY ON TOPIC – Make a concerted effort to stay on topic when replying to a message. When someone sends a notice to the group asking about the format of a newsletter, it's inappropriate to bring up other topics that may not relate to the entire group or to the goal of the original message. Rather than everyone focusing on the task at hand, the off-tracked nature of the conversation can waste valuable time and energy.

PEOPLE AREN'T THEIR ORGANIZATIONS – Many people send and receive email from work email accounts because that's the one they check the most frequently, or because they don't have a personal account. Always check with your company's Internet policies to see what is appropriate and allowed before using work resources for personal use. If you are someone who uses your work email for personal use where appropriate, remember that while you may not be speaking for your employer, what you write reflects on them as a user of their email system, so keep it especially professional and of the highest integrity.

BE PATIENT WITH REPLIES – The Internet has certainly taught us to be able to send and receive information instantaneously, but it doesn't mean that everyone sits in front of their computer all day waiting to reply to your messages. Be patient when sending someone a message as we all live in different time zones and have different priorities throughout the day.

BE PROFESSIONAL – If you are new to the workforce or in search of a grant to increase your funding, make sure you are using a professional email address—which could mean changing or getting a new account. If your email address is SuperSexy4u@yahoo.com, the likelihood of your future employer or granting agency to hand over money or opportunities could be jeopardized because of the lack of professionalism.

BE CAREFUL SENDING ATTACHMENTS – Unlike a typical email message that is relatively small in size, an attachment can be considerably larger and require more time and space on your network. Avoid sending attachments to mailing lists, rather send a message inviting people to find the document on a separate link or to email you directly if they want a copy. Attachments can take up a great deal of space and take quite a while to open on handheld devices such as the Blackberry, iPhone or Palm, so be careful about sending too many attachments.

COPY THE MINIMUM NUMBER OF PEOPLE – While it's fairly easy to add people's names to your recipient list, take the time to consider who needs

the information. In addition to the annoyance it creates to include people with no significance on the message, it also requires more bandwidth on your behalf. When you receive a message with several people copied, it's not always necessary to continue replying to the entire group. When messages don't involve the entire group, take the time to edit your list so that you're not contributing to the huge influx of Internet traffic.

EMOTICONS AND ABBREVIATIONS – True, the smiley faces are cute and personalized, but they aren't appropriate for general email. They are best left to instant messages and personal emails to friends and family. Similarly, use abbreviations sparingly. Feel free to use organizational or commonly used abbreviations such as FYI and FAQ, but avoid trendy abbreviations designed for texting such as AAR and TTYL (at any rate or talk to you later).

> Use Abbreviations Sparingly
> OMG I totally forgot about our meeting today. My bad ☹

BE UNEMOTIONAL – As wonderful as the Internet has become, perhaps the worst aspect would have to be the lack of emotion in electronic communication. When you are with a group of people, it's easy to portray your attitude and ideas based on body language, facial expression, tone and pitch of your voice. When it comes to the Internet, you have little to communicate what the intent of a phrase is. When reading a message, it's difficult to tell if the person is upset, making a joke or were completely serious. All you have are words on a screen. Whether you're discussing an important issue or trying to decide where to have your next association meeting, it's easy to misinterpret the senders meaning to the message. Humor and sarcasm have a tendency to reflect as rude and condescending. Armed with this knowledge, avoid overreacting to email messages you may receive that seem insulting or hurtful as the intent isn't always what came through when reading it. Pay special attention when you are disagreeing with someone. Always make sure to acknowledge the positive aspects of their argument or idea and in a professional and respectful manner, describe your position so as to not hurt feelings, but rather continue the discussion.

PAINT A PRETTY PICTURE OF YOURSELF – With huge corporations and information networks all over the country, we don't always work face to face with people, and often times, the only way we know each other is via email. Being aware of this, make yourself look as positive as possible. Don't use capitals unnecessarily in email—it translates to shouting and is considered rude. If you want to emphasize a word or point, capitalize, bold or underline only the word you're trying to emphasize. If you have a lengthy message where you are stressing two or three ideas, utilize the number or bullet feature to convey the message more clearly. Similarly, don't write in all lower case as it translates to mumbling. The basic rule of thumb is to remember your grammar and type how you would normally write.

> Don't Use Capitals Unnecessarily
> I KNOW I SAID I WOULD BE THERE BUT I WAS BUSY!!

NETIQUETTE OF REPLYING

REPLYING AND FORWARDING – Always reply to the sender. When someone sends an invitation to be involved in a workgroup or neighborhood watch, it's only necessary to reply to the original sender rather than replying to the entire group who received the invitation. It's generally of little interest to the rest of the group why someone can't take on another project or doesn't want to be involved.

MINIMIZE FORWARDING – When you receive a message that needs to be sent on to a group of people, make sure you've carefully looked at the recipient list so you aren't forwarding a message to someone who was included in the original. However, if you receive a message where the recipient list is suppressed, it's always better to be safe than sorry, so include the people who you know should receive the information.

INCLUDE SUBSEQUENT COMMUNICATIONS – Include a portion of the original message that you are replying to so readers know what you're referring to. It's not necessary to include 12 messages worth of communications as more information than necessary is going back and forth and people end up getting long, meaningless messages.

ACKNOWLEDGE THE COMMUNICATOR – If someone sends you an important email, the polite thing to do is to reply! Even if you can't answer their questions or get to the intent of the message right away, reply to acknowledge that you in fact received their communication. If you're being included in an office or neighborhood association meeting and you know there is no chance that you'll be attending, reply immediately to let them know you can't make it, but that you appreciate being included. There's rarely a good excuse for ignoring co-workers emails, especially when work is providing a computer and Internet connection.

RESIST THE FLAME – "Flaming" is what occurs when people express a strongly held opinion or idea without holding back. It's the type of message where you don't have to wonder what the person means or how they really feel—it's out in the open for the world to see and react to! Flaming can be fun to read and write, and oftentimes, it's well deserved. However, it takes a great deal of bandwidth and gets old very fast for those that aren't involved but have to sort through it to get to the intent of the site. It gets the group off track and ruins the momentum. If your group is discussing how much to water newly planted citrus, ranting and raving about your monthly water bills doesn't help matters!

> **Resist Flaming**
>
> It doesn't matter to me what kind of cookies we have—I'm sick and tired of our grocery store. They never have parking, it's always jammed packed with slow people and the prices keep going up. Anyone else annoyed by this?

AVOID CHAIN LETTERS – If you are unfortunate enough to be the recipient of a chain letter, do the online community a favor and simply delete the message. Not only are they a waste of time and energy, but they are illegal in many countries.

TEACH DON'T PREACH – At some point, everyone was new to the Internet, so if someone makes a mistake, either grammatical or by asking a seemingly stupid question that's already clearly been answered, be nice about pointing it out. If it's a spelling error and it isn't of a critical nature, don't bring it to their attention. Most likely, they've noticed their own mistake and are embarrassed enough about it. If it's a mistake that reflects on the entire group or is so important that you decide to inform the sender, be sure to do it politely and privately. It's not necessary to reply to the entire group that the sender didn't spell something correctly. Always give people the benefit of the doubt!

NETIQUETTE OF CONFIDENTIALITY

DON'T PUBLICIZE OTHER'S EMAIL ADDRESSES – Most people receive messages that raise the question how did the author find our email address,

so we can all appreciate this particular rule. It is considered unprofessional and rude to distribute other people's email addresses via email or posting messages to persons unassociated with the communicating parties.

DON'T SEND WHAT YOU DON'T READ — It's inappropriate to forward an email you haven't read, or send someone an attachment you haven't opened. It can prove to be an embarrassing incident if the email or attachment contained inaccurate or unprofessional information.

REMEMBER ARCHIVING — It's important to remember that mailing lists, listserves, and groups have systems that archive information. If you don't want your words and messages archived and brought back at a later time, then don't press send. This can be even more important if your message is of a confidential nature that shouldn't be discussed electronically or if it involves other people.

RESPECT COPYRIGHT — It has become quite easy to find information on the Internet, put it in an email message and send it, giving the reader the impression that they are your words. Whether it was the sender's intent to take credit for the idea or not, it's hard to tell because of the emotionless atmosphere of the Internet. Always give credit where credit is due. Also, if you are forwarding someone else's work, don't change or edit their words, grammar or structure, even if you think you are correcting their typos and/or mistakes.

The Internet has created an easy and affordable way for people to communicate. With budget and geographic issues, the Internet will continue to become a critical aspect in our private and professional lives. By following these simple rules of thumb, you will quickly become one of those people your family, friends and co-workers appreciate communicating with.

SOURCES

The UCLA Internet Report: Surveying the Digital Future. UCLA Center for Communication Policy. 2001

Shea, Virginia. Net Etiquette. published by Albion.com. **http://www.albion.com/catNetiquette.html**

Merrill, Laura. Top Ten Rules for Netiquette. Manager of Cooperative Education, **http://ulmercenter.wordpress.com/2006/11/03/top-ten-rules-for-effective-netiquette/**

Living Internet. **http://www.livingInternet.com**

Von Rospach, Chuq and Spafford, Gene. Net Citizens. **http://web.jjc.edu/Dept/Tech/EET/SyllabiPDF/EET108SyllabusF05.pdf**

Randall D. Babb, Arizona Game and Fish Dept

A Rattlesnake Medley

Randall D. Babb, Biologist, Arizona Game & Fish Department

RATTLESNAKES — Misunderstanding, hatred, and fear have followed them through history like a bad credit rating. "I saw a rattlesnake 6 foot long, it was as thick as my arm." "Baby rattlesnakes are the most dangerous because they can't control their venom." "I was chased by a rattlesnake." "Mohave rattlesnakes are the mean ones." "Rattlesnakes travel in pairs." "Rattlesnakes are more toxic when they first emerge from hibernation because they haven't used their venom for a long time."

In the western movies, no one survives the bite of a rattlesnake and an agonizing death comes within minutes, if not seconds. The epic proportions of this list of misnomers is only eclipsed by the exaggerations themselves. As often is the case in biology, the truth is a tad less sensational, but no less amazing. Let's start with the facts.

Arizona is the rattlesnake capitol of the United States. Currently 12 of the 16 recognized species of rattlesnakes found in the United States are found in Arizona, meaning about 1/3 of the known species of rattlesnakes are found in Arizona. One of these species of rattlesnakes is found only in Arizona within the United States and some mountain ranges in the state may harbor as many as eight species of rattlesnakes. Because many different species of rattlers may live in relatively close proximity to each other, they must partition the resources to avoid undue competition. If all the species of rattlesnakes did the same thing, the habitat could not support the numbers or variety of rattlers that it does. This makes rattlesnakes excellent examples of habitat partitioning or niche filling. For example, some species of rattlesnakes prefer rocky desert slopes while another may inhabit canyons in mesic woodlands, and yet another thrives in dry desert flats or dunes. Other species are dietary and habitat generalists and are found in a variety of different habitat types.

All rattlesnakes give live birth. Young of most species are born from late July to August. A few give birth in September and October. All young are born "fully loaded" meaning they are capable of delivering a prey-killing bite from birth. The venom of the young of at least some species of rattlesnake is more potent than the adults of the same species on a drop for drop basis. This gives young rattlesnakes an advantage in acquiring those first few precious meals. This does not mean that young rattlesnakes are more dangerous than the adults of the same species. Young rattlesnakes produce far less venom than their adult counter parts making them less a threat to humans. The young of at least some species stay with their parent for a week or so after birth. No information or experience is passed on from the adult to the young. Rattlesnakes are born with all the information they need to survive. They are "hardwired" for survival.

Rattlesnakes share many adaptations with a variety of other venomous snakes and are among the most highly evolved of all pit

vipers. Pit vipers possess special heat sensing pits, called loreal pits, located below and in front of their eyes. These pits are capable of detecting minute differences in temperatures, as little as 1 degree Fahrenheit. Because the nerves from the loreal pits tie into the snake's optic nerves, biologists believe that pit vipers actually receive an infrared image in the brain and therefore virtually "see" with these pits. These loreal pits allow a snake to locate a warm–blooded prey item in total darkness.

All rattlesnakes possess venom glands. These are modified salivary glands and are located in the "cheek" area behind and below the eye in the upper jaw. They have folding, hollow fangs, which inject the venom deep into the victim. Rattlesnake venom toxicity varies greatly from species to species and even geographically amongst a particular species. Combine this with additional variables like bite location and amount of venom administered and the results of any rattlesnake bite is extremely difficult to predict. There is essentially no average rattlesnake bite. Snake venoms are complicated and poorly understood. Rattlesnake venom is a virulent combination of proteins that kill through a variety of methods. Some venoms block signals sent from nerves to organs and muscles. Some destroy tissue while others block the flow of salt to muscles, rendering them useless. Despite biologists generally referring to rattlesnake venoms in broad terms such as hemotoxic or neurotoxic, any single species or individual rattlesnake may possess several different types of toxins.

Though bites from rattlesnakes are not uncommon, deaths resulting from their bites are. In the period from 1989-1998, Arizona's Poison Centers in Tucson and Phoenix consulted on 1,912 bites (that's about 191 bites per year). Of these 1,912 bites, only four resulted in fatalities to humans. That translates to about one fatality every 2.5 years. So, statistically this means that you are far more likely to die by slipping in your bathtub or being struck by lightening than from the bite of a venomous snake. In fact, as disturbing as it may be, statistics say you are more likely to be killed by your spouse than to die from a rattlesnake bite. No doubt this is a greater danger for some of us than others.

Another specialization - the one from which rattlesnakes receive their name, is the rattle. Many species of snakes make sounds when they are disturbed or upset. Some species hiss loudly. Others even rub their scales together and make a scraping or hissing sound. But no other snakes in the world possess such a unique noise making mechanism as the rattle. The development of the rattle is shrouded in mystery. Some biologists believe that rattlesnakes first developed horny knobs on their tails to attract prey by a process known as caudal luring. Many snakes throughout the world use their tails as a mechanism to attract prey close enough to strike. Often the tail is colored differently from the rest of the snake's body. We see this phenomenon in some of our rattlesnake species. Baby sidewinders and massasaguas have yellow colored tails and have been observed to use them to lure prey such as lizards into close range. Other biologists believe the rattle evolved to aid rattlesnakes in avoiding being stepped upon by the many large grazing animals that inhabited North America during prehistoric times. Though exactly why and how the rattle evolved is a mystery, its purpose today is quite, clear; to warn potential predators, or other animals that present a threat, that the rattlesnake means business. The rattle is composed of the same material as are the snake's scales, the same stuff hair and fingernails are made of; keratin. The snake grows an additional segment to their rattle each time they shed their skin. You cannot tell the age of a rattlesnake by the number of rattle it has. Rattle segments are often broken off and a rattlesnake may add numerous segments in a season.

Rattlesnake diets are as varied as the snakes themselves. Depending on the species, prey may include small mammals, birds, reptiles, amphibians and invertebrates. Prey are killed with their venom and consumed whole. Due to the loosely constructed nature of the serpent's skull, most snakes can easily consume prey items four times the size of their head or larger. That is akin to a human being swallowing a 30 lb watermelon whole. Interestingly, it has been recently discovered that centipedes are an important food item for the juveniles of a few different species of rattlesnakes in southeastern Arizona. Rattlesnakes are "sit and wait," or ambush predators. Research shows that they select an appropriate site based on recent use by the desired prey. It is thought that they determine this site based on scent left behind by mice, rats, lizards or other potential prey. Ambush sites may be along a regularly used runway or trail, a limb or rock used for basking, or access to a tree or near a burrow or other hiding spot. Rattlesnakes may inhabit an ambush site for weeks on end, waiting for their prey to come by. To be a successful sit and wait predator, rattlesnakes must have low metabolic requirements and be energetically efficient. Efficient metabolisms allow snakes to thrive on just a few meals a year. This means snakes are able to exploit habitats that animals with higher energy intake requirements have great difficulty exploiting. Research on black-tail rattlesnakes in southeastern Arizona indicates that these snakes catch about four food items in a year.

Take a few moments to meet the rattlesnakes of Arizona by visiting **http://www.azgfd.gov/w_c/arizona-rattlesnakes.shtml.**

Randall D. Babb, Arizona Game and Fish Dept

TEN SUGGESTIONS FOR LIVING/ TRAVELING IN SNAKE COUNTRY

1. Understand that snakes, including rattlesnakes, are important parts of Arizona's ecology and they provide far more benefits than danger. If you live in snake country you will have snakes... accept the fact and take the necessary precautions for you, your family and pets.
2. Do not place your hands and feet in places where you cannot see what's there.
3. There are no chemicals known that successfully and consistently deter snakes.
4. If you own a lot of land, leave rattlesnakes alone that are not frequenting places where people are. Don't attempt to make your property rattlesnake free but rather remove animals that present an actual threat. It is virtually impossible to make a large area snake proof.
5. Don't create places for rattlesnakes to hide such as wood or junk piles.
6. Don't try to remove rattlesnakes from your property yourself, but rather have someone with experience do it. Many people are bitten while trying to catch or kill rattlesnakes.
7. If you live in rattlesnake country check play areas prior to letting children or pets outdoors.
8. Be aware that you may encounter a rattlesnake any warm day of the year. Typically, snakes are most active from late March through early November in Arizona's lower elevations.
9. Do not walk about in snake country barefoot or in sandals or other light foot wear. Always use a light when walking at night.
10. Keep emergency numbers handy and transport snake bite victims to a medical facility as soon as possible. There is no first aide treatment for a snake bite.

Janine White

Creating a Wildlife Habitat Garden

Cheri Melton, Cochise County Master Gardener and avid plant enthusiast

In creating any habitat garden, there are four basic components: Water, Food, Shelter, and Places to Raise Young. It is essential to possess some knowledge of these components and their importance to attracting, feeding, offering shelter and nesting opportunities for a diverse assortment of living creatures.

The following offerings are methods to attract and keep wildlife along with some personal experiences in creating an enjoyable habitat for wildlife and humans.

WATER – Basic Number 1

BIRDS

Water is a strong attractant for birds. Many birds not attracted by seed feeders or plantings will visit water. And some birds do not drink water; instead they get their water requirements from the foods and insects they eat.

A shallow 1-2 inch dish will be enough to attract birds. Place a water source on level ground near shrubs or trees to accommodate ground dwellers, for preening and evading predators. Birdbaths do not have to be fancy, but remember that whatever vessel you choose to use be sure that the birds have a sure footing underneath. Placing a couple of clean rocks in the bottom of the vessels works well and placing some large clean rocks in large or deep fountains for easy access to the water is a great aide since the fountain can be far too deep for birds to wade in.

Nothing catches a bird's attention like the sound of moving water, so consider installing at least one

water feature such as a fountain or a birdbath equipped with a mister or dripper. To conserve water, run these features only when you are home and can enjoy the birds they attract to the garden. Two of the best times to watch birds is from sunrise to 10 am and from 4 pm to sunset.

If you decide to use birdbaths, dishes or fountains, frequent cleaning is essential to prevent the risk of disease transmission. Many diseases can be spread in a birdbath or feeding area. Trichomonaisis, a bacteria that causes 'choking disease' is common in the southwest and is easily spread. To prevent diseases, water sources (with the exception of ponds which contain plants that promote an ecological process that is safe to drink from) should be scrubbed out once a week with vinegar or a soy-based cleaner. When nighttime temperatures fall below 55 Fahrenheit, the weekly cleaning is not necessary, but changing the water daily is still essential.

Birds keep their feathers clean to stay alive. Many birds make daily visits to safe, clean, and consistent water sources for the all-important task of preening. Some birds such as quail and towhees prefer to bathe in dust instead of water so a space where they can clean their feathers in dirt or sand is a welcome addition to the garden.

HUMMINGBIRDS

A misconception is that feeders provide hummingbirds with all the water they need, but hummers also enjoy water features for bathing and drinking. Unfortunately traditional birdbaths are not well suited for this purpose. Hummingbirds prefer running, shallow water and small fountains that mist or splash gently. Have you ever noticed that hummingbirds seem to enjoy flying though our summer rains- it's the ideal birdbath for them!

BUTTERFLIES

Wet soil or areas around ponds are frequent sites male butterflies visit - a behavior called 'puddling,' in which they extract sodium and other nutrients needed for mating. Butterflies seem especially attracted to a soaker hose laid on top of the vegetable garden. The wet soil combined with the humus-enriched soil provides them an ideal place to 'pull up a spot at the bar.' A dish filled with damp sand/native soil and manure may attract butterflies.


Steven Love

FOOD – Basic Number 2

BIRDS

Supplemental Feeding:

Bird feeders are an easy and effective way to feed birds. Feeders should be cleaned thoroughly once a week to prevent disease transmission. The gardener will find many types of bird foods on the market to include suet, nectar solutions, feed blocks, and various assortments of seed. Purchase the highest quality of product that you can afford. Many products contain fillers and the birds won't eat these fillers, not to mention it being a waste of money. If you purchase seed mixes that contain sunflower seeds in their shell you will need to rake up the feeding area regularly and dispose of the seed hulls. They can accumulate over time and spread diseases as well as become an unsightly mess in the garden. Because seed is usually sold by the pound, a good choice is to purchase no-mess blends - the hulls have been removed from the seeds and the result is pure food without the mess - which means more seed for the money. The no-mess blends also seem to attract the largest variety of birds to gardens. Another benefit of no-mess blends is that populations that cannot crack seeds very well like woodpeckers, Curve-billed Thrashers, Cactus Wrens, and Pyrrhuloxia increase greatly in your habitats.

Suet is fun and attracts many birds. In the heat, some suet's can melt so purchase suet dough that can withstand high temperatures. A couple of suggested favorites are Fruit Cake and Calcium Care. Many birds love fruit. You can make your own fruit feeder simply with an eight to ten inch piece of 2x4 wood and a couple of nails pounded in the sides (grind off the nail head to make a sharp point so it is easier to put the fruit on it.) Drill a hole on the top and screw in a closed eyebolt and hang this on a hanger from a tree or garden structure object. You can make fruit feeders that hang vertical and horizontal.

Bird Feeding Plants:

Plants are a fun way to provide seeds, berries, fruits and nectar for birds and other wildlife and unlike supplemental feeding, they are much safer, easier, and enhance the landscape. Try selecting a variety of plants that will provide food throughout the year. Choosing native plants provide beauty and require less care, fuss, and water. Need more reasons to plant regional native plants?

Regional native plants:

- Work in harmony with the natural landscape and Mother Nature
- Provides food and shelter that local wildlife are familiar with
- Conservation and diversity of native flora
- Long term cost savings and increased enjoyment due to less intensive management:
  - Self-perpetuating - helps keeps costs low by replanting volunteer plants
  - Water - little or none required
  - Fertilizer - little or none required
  - Pesticides - not needed
  - Mowing - not needed except for wildflower and grass meadows

HUMMINGBIRDS

Supplemental Feeding:

- Sugar Solution Recipe: four (4) parts water to one (1) part table sugar - boil on stove for 2 minutes and let cool. Extra solution may be stored in the refrigerator. If solution 'gums' up in feeders during hot weather try increasing the ratio to five parts water to one part table sugar. Hummingbird feeders usually have red parts on them to attract hummers – do NOT use honey or red food coloring in the solution.
- Choose feeders that have red parts on them and that are easy to take apart and clean. Clean feeders every 2-3 days with hot water and a brush - for stubborn mold use white vinegar.
- Place feeders near hummingbird garden flowers in your habitat.
- Use different kinds of feeders around the garden at altering heights to accommodate different hummingbird species preferences.
- A misconception is that hummingbirds live on sugar water and nectar alone. Small insects such as gnats, aphids, and fruit flies are a vital part of their diet.

BUTTERFLIES

Butterfly Feeding Plants:

- Caterpillar Food Plants – also known as Larval or Host food plants - The best way to attract butterflies is to grow butterflies by planting food for caterpillars.
- Nectar Flowers for Adult Butterflies - Groups of plants will be more enticing than one plant here and there in the garden. Diversify the

palette so there is always something in bloom from spring to late fall. Many butterfly species feed on small, inconspicuous plants that most gardeners would consider 'weeds.' If possible allow an area of the yard to become 'scruffy' - you'll be amazed at the insects these areas will attract - thus bringing birds, lizards, toads and others to the garden!

SHELTER – Basic Number 3

Animals need shelter to escape from heat, wind, rain, and predators. As you create and provide shelter, you will also create places to nest and raise their young. Recommendations will vary as to being appropriate for varying sizes of wildlife environments.

BIRDS & HUMMINGBIRDS

- Clustering plants into thickets will shelter birds and animals against wind, weather, and predators.
- Native shrubs and trees that do not provide food do provide valuable places for nesting, roosting sites, song perches, and hunting perches.
- If possible, construct brush piles, rock piles, and create meadow patches for cover and shelter. (Brush piles may not be suitable for small yards).
- Dead logs and trees are called 'snags' and provide areas for birds to Rock piles and brush piles are great places for shelter. eat wood boring insects as well as provide nesting cavities for birds.
- If space allows try to have one or two evergreens that will provide year round cover. During the hot weather birds and other ground dwelling animals will gravitate to the shade provided by mesquites, pines, and desert broom.
- You may want to erect a couple of nesting boxes. When not in use for raising young, birds will roost in nest boxes at night for shelter.

BUTTERFLIES

- Sunshine - Butterflies are solar-powered so locate the garden in a sunny area. Butterflies are active on warm, windless, sunny days when temperatures are between 65∞ to 95∞F. Warm rocks provide areas for “basking.”
- Shade - Butterflies will seek shady areas of the garden when daytime temperatures rise above 95∞F.
- Windbreaks - Sheltering the butterfly garden helps butterflies so they are not cooled by winds and will not have to extend extra energy searching for food, mates, and laying eggs.
- A horseshoe-shaped garden is an easy and fun way to provide sunshine, shade, and windbreaks!

PLACES TO RAISE YOUNG – Basic Number 4

Our garden has been host to many young – including Cactus Wrens, Gambel's Quail, Curved-bill Thrashers, Canyon Towhee's, Ladder-backed Woodpeckers, Roadrunners, Black-chinned Hummingbirds, Western Kingbird, Desert Cottontails, Round-tail Ground Squirrels, Gopher and Garter Snakes, Horned Toads, and over 15 species of butterflies. More importantly is the host of insects in the garden – it is fun to watch every evening as parent birds scour the garden and bring insects to their young. This young rearing activity results in having no problems with so-called pests and never having to spray the garden.

BIRDS & HUMMINGBIRDS

Birds build nests in many places - on the ground, in trees and shrubs, and even in man-made structures. As previously mentioned, consider building or purchasing nesting boxes - birds that use nest boxes include bluebirds, cactus wrens, woodpeckers, owls, and kestrels. Feathers, dried grasses and flower heads, small twigs and other objects are used to construct bird nests. Female hummingbirds build, incubate, and raise the young on their own. Nests are made out local materials such as downy fibers, animal hair, plant materials and are woven together with spider webs - spider webs are very important to hummingbirds!

Melissa Rath

BUTTERFLIES

Butterflies are cool to watch in the garden. Their life cycle is called complete metamorphosis. Successful butterfly gardening requires planting a garden that supports all phases of the butterfly life cycle:

egg (mating)

caterpillar (larva)

chrysalis (pupa)

adult (butterfly)

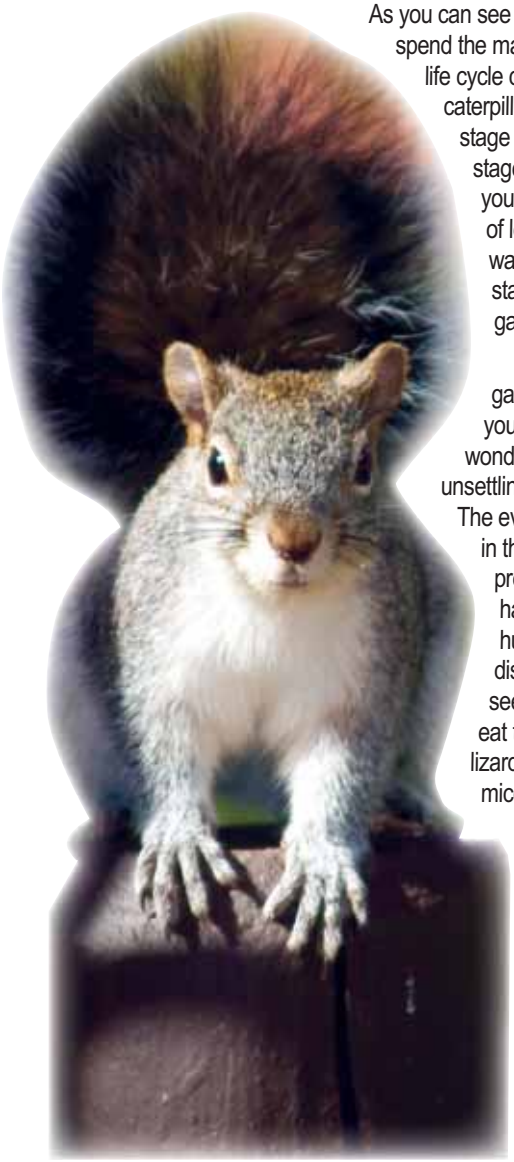
The females have a very short life and their main purpose is to find mates and lay eggs onto host plants. If all the garden has to offer is nectar plants, butterflies will come to fuel up for energy, but will soon depart looking for plants to deposit eggs. Butterflies use their two antennae to find food (usually flower nectar), as well as finding mates and avoiding predators. Butterflies use their feet for tasting, letting the butterfly know if something is good to eat or not. Some females also taste plants in order to accurately locate specific host plants for egg laying. Consider the following average life span of the butterfly lifecycle:

egg: 4-10 days

caterpillar: 3-4 weeks

chrysalis: 7-14 days

adult: 2-3 weeks



Macie J Bogacz

As you can see most butterflies spend the majority of their life cycle during the egg, caterpillar and chrysalis stage than the adult stage! Don't deprive yourself of the pleasure of locating and watching these three stages in your habitat garden.

When the habitat garden matures, you will see other wonderful and perhaps unsettling things happening. The evolution will result in the appearance of predators - everyone has to eat - including humans. Don't be dismayed when you see that Roadrunner eat that young bird or lizard or the Owl prey on mice and rats. When this happens be proud that your garden has come full circle and is a complete habitat garden!

PLANNING YOUR WILDLIFE HABITAT

GARDEN

The best approach to a habitat garden is DIVERSITY. Select a variety of plants that will provide fruits, berries, seeds and nuts, nectar and pollen, attract insects, and offer shelter and nesting opportunities throughout the year. Diverse habitat types include a meadow here, woodland area over there, an area where tall grasses, weeds, and wildflowers are allowed to go to seed, a row of shrubs near the fenceline, a brushpile out back, etc. (Be sure to check with your local zoning regulations on what is allowed in your area.) These different types of ecotones create 'edges' and will attract a wide assortment of birds, butterflies and other creatures.

Here is your homework:

Assess the garden: What worked well in the garden last year and more importantly, what didn't work. If plants are not thriving - why? Is it due to a lack of water - then perhaps it needs to be relocated to a spot where it would receive an adequate amount. Perhaps the garden has matured and plants that were once in sunny spots are now shaded by large shrubs and trees resulting in leggy plants and sparse blooms. Evaluate and make a list of chores that need to be addressed. If starting a new garden, don't even think about getting any plants until a temporary or permanent irrigation system is installed.

Draw a map: Draw a map of the garden to include all hardscape, the house (mark the window locations for wildlife viewing from inside the house), and any future plans such as a greenhouse, RV pad, vegetable garden etc. that may be installed at a later date. Don't forget to mark heavy traffic areas. The map doesn't need to be to scale but you can certainly use graph paper to make a detailed map to scale. This will help you see your landscape from a 'birds-eye-view.'

Take inventory:

Make a list the wildlife you would like to attract to the garden.

Make a list of all the plants currently in the garden.

Now divide the plants into the following categories:

1. Plants that produce berries, fruits or nuts
2. Plants that provide nectar for butterflies and hummingbirds
3. Plants that produce seeds for birds and other animals
4. Plants that attract insects and bugs
5. Plants that provide shelter/shade for animals
6. List any features and plants that you DON'T like in your garden

Number six may seem strange but I have talked to too many gardeners who live with things they don't like! My belief is that one should LOVE everything about their garden. Focus on gradually replacing plants and features with things you would love to see in your garden. If the spirit moves you start now by removing plants or garden features you don't like.

Basic Design Ideas

The more types of foods and habitat niches you can provide, the more wildlife you can attract. Homework:

- Find out which wildlife species are in your area and which plants they use for food sources. There are regional plant differences, which can determine how well they will thrive in your garden.
- Take a hike! Observe natural habitat and recreate that in your garden. Check with local nature centers to locate local Audubon or butterfly organizations - most clubs have informational meetings, workshops, and field trips that will increase your knowledge.
- Evaluate your garden style or preference (informal vs. formal) and decide how much time you want to spend maintaining the garden.

An informal garden will be easier to care for than a formal one. Garden chores may include:

- Watering
- Mulching & Weeding
- Deadheading annuals for continuous bloom
- Tip pruning host food plants to produce new leaves for caterpillar food
- Early spring mowing of habitat wildflower and grass meadows (optional)

- Using your map decide where you want to create, add, or retro-fit habitat niches:
- Begin researching what plants you want to add to the garden. Select and group plants into plant communities (thickets) according to water requirements. Use wildflowers, shrubs, and trees that will provide berries, fruits, seeds, nuts, nectar, and will attract insects from spring until fall.
- What! Attract insects to the garden? YES! Birds consume insects for their protein needs. Insects are especially important for nesting birds to feed their young.
- Remember that it's not necessary to install a habitat garden all at once. Take it slow and plant one area at a time.
- Deep rock mulches can be a problem for wildlife. It's hot, difficult to walk on, and seeds and insects can 'escape' into the gravel. If possible provide a space using 'living mulches.' Locate plants so at maturity they will create their own 'shade mulch.' This requires planting a natural garden so plants will grow into each other ever so slightly but not so much that unnecessary pruning is required. The ratio of the mature garden would be enough plants to cover 1/2 to 3/4 of the ground space as opposed to the wide expanses of gravelscapes with a plant here and there so often seen today. Use native grasses and wildflowers to fill in the spaces between plants. This also allows plants to fertilize themselves with fallen leaves and dead plant debris.
- Don't despair if you have limited space! Plant gardens in whiskey barrels, large containers and windowsill planters. Incorporate wildlife plants into existing ornamental gardens and vegetable gardens.
- Visit public and private bird & butterfly gardens, botanical gardens, and local nurseries for plant selection ideas. These are also excellent places to observe and get great garden design ideas

REMEMBER! The balance of nature will take care of itself - reduce the use of pesticides- they kill insects that attract wildlife to the garden in the first place. A beautiful habitat garden can and should be had without the use of pesticides. Too much neatness and tidiness may actually make your garden less attractive to wildlife. So have a ball and let the garden get a little wild!

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