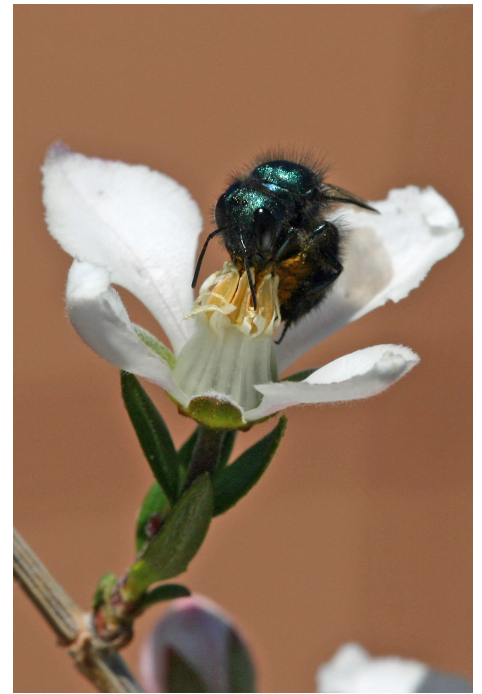


Changing Seasons, Changing Pollinators

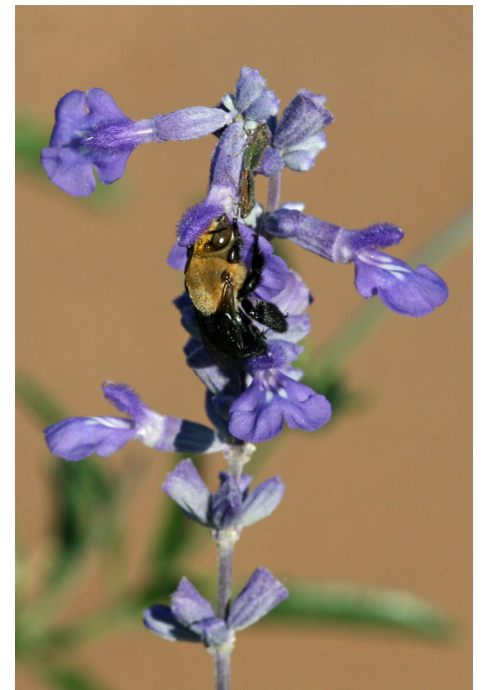
by Cynthia McAlister

In the *Chihuahuan Desert Discovery*'s previous issue (F/W 2006), I wrote about my initial experiences working at the CDRI and SRSU What's the Buzz? pollinator grant. That first season in the botanical gardens was an extraordinary experience. I learned at once about the spectacular diversity of insect pollinators. Work continued in 2007 as plants moving in and out of bloom were accompanied by their pollinators. I cannot help but compare last summer to this year. Clearly, the diversity of plants and pollinators is strongly affected by seasonality and precipitation. I expected to find different plants and insects in the gardens this season, and I have not been disappointed.

When my work began in August of 2006, the botanical gardens had been dry all season. This year began moist and has remained so. As an Entomology student last summer I hunted the grasslands in vain for grasshoppers. But this season, all over the gardens, multitudes of grasshoppers in various colors and sizes leap along the paths as we walk by. Last summer I collected several genera of native bees. This season, in addition to all the previously collected bees, I have been delighted to find "spring bees" in the gardens. Spring bees hatch out early in the season, reproduce, and are gone by summer. Early this spring I observed the large, bristly, metallic blue, mason bee *Osmia* (Megachilidae) nectaring on agarita and cliff fendlerbush. Mason bees nest in



▲ Bristly, bright metallic blue *Osmia mason* bees were observed foraging on agarita and cliff fendlerbush early in the spring.



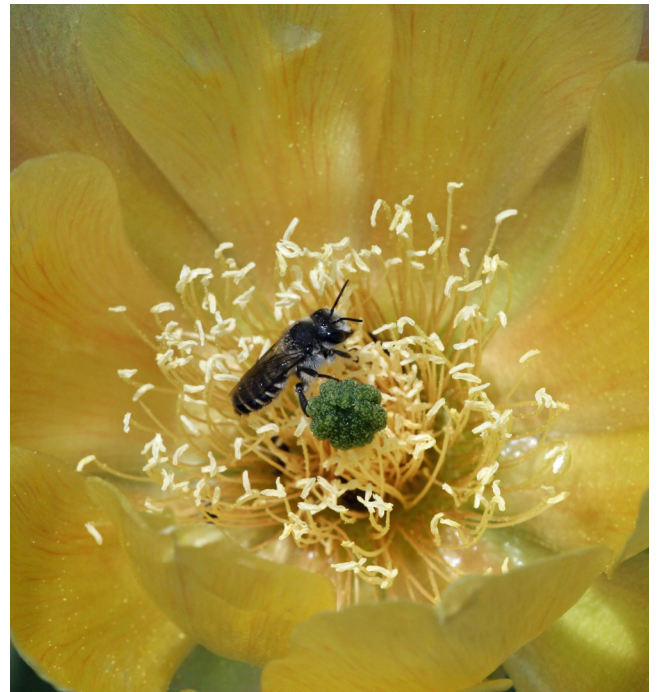
▲ *Centris digger* bees have hairy bodies, solid black abdomens, and thick black baskets on her hind legs. *Centris* bees often have brick-red eyes.

pre-existing holes in wood and seal the entrance with mud (hence the common name “mason” bees), making them likely occupants of the bee blocks set up in the botanical gardens’ newest addition, the Pollinator Garden. *Osmia* arrived in March and by the end of April she was gone.

Other bees observed and collected this season, but not seen last year, include: *Centris*, *Xenoglossa*, *Lithurgus*, *Protoxaea*, and *Nomia*. *Centris* (Apidae) is a large bee with striking brick red eyes and clypeus (nose), and thick black pollen baskets (hairs on hind legs that hold collected pollen). I observed her only a couple of times, on desert willow and mealy blue sage.

Last season’s field notes make no mention of the buffalo gourd, but this season, as the plant stretched its large triangular leaves across meters of ground and opened its cavernous yellow flowers, I watched for its pollinators. Day after day I saw countless gourd beetles massed in flowers, but these insects eat flower

parts, and are not pollinators. Finally, seeking to beat the heat, I arrived in the gardens at sunrise. Walking past the gourds I heard a low droning hum. When I peered into the flower I found a robust golden bee about the size of a carpenter bee working in the bloom. I quickly collected her. Within just a few moments I collected a second bee, which I identified as a male by his bright yellow clypeus and slightly smaller size. This bee is *Xenoglossa* (Apidae), a bee that is oligolectic on (or prefers to forage on) plants in the gourd family (Cucurbitaceae). Within a two-week period I observed pairs of *Xenoglossa* working in the buffalo gourd and a female working on her ground nest, but they have now gone as well.



▲ *Lithurgus* bees are one of several species of bees that are cactus specialists.

with my naked eyes I could see the strange horn-like structures on her face that help to identify her genus. Although I also observed and collected *Lithurgus* on desert willow and Texas thistle, she was primarily found on *Opuntia*. Once the *Opuntia* bloom ended, *Lithurgus* disappeared.

One July afternoon I went out into the gardens about 4:00 to check for bee activity on the Texas kidneywood which had finally begun blooming in earnest. In the midst of the usual suspects—flies, wasps and honeybees—I observed a pair of large, fuzzy, red-golden bees. I collected the two I observed that afternoon, noting that one was larger and more strongly colored, while the other was a bit smaller and paler. Later I identified these bees as female and male *Protoxaea gloriosa* (Andrenidae; previously in the family Oxaeidae, and at



▲ *Xenoglossa* bees are robust, golden bees that harvest pollen from gourd flowers. This bee is only active during the early mornings.

Lithurgus (Megachilidae) is a large (up to 25mm) black bee with bands of white hairs across her abdomen. She is oligolectic on *Opuntia*, and I collected her as she rooted around in the cactus flower stamens. I could see she was carrying pollen under her abdomen (not on her hind legs), making her a leaf-cutter bee. Also,



▲ *Texas kidneywoods (Eysenhardtia texana)* attract an amazing variety of pollinators including the golden red *Protoxaea gloriosa* (left) and the *Nomia* sp. (right) with its iridescent blue-green striped abdomen.

any rate, a group of bees I have not observed previously). For a few weeks after the initial sighting, it was not uncommon to see a pair or two on the kidneywood, especially early in the morning and late in the afternoon. Now that the blazing heat of summer has broken *Protoxaea* is gone as well.

Once the kidneywood starts blooming, the fragrant floral abundance draws some of the most amazing insect diversity observed in the gardens. Early one morning I observed what I knew immediately to be a new bee. She was a little smaller than a honeybee, with a conspicuous black and white striped abdomen. A digger bee (*Anthophora californica*), common on the Mexican blue sage also has a prominent black and white striped abdomen, but this bee's white stripe was iridescent and gleamed bright green. This bee is *Nomia* (Halictidae).

Nomia is an alkali bee; she nests in the ground and alkali soils are her preferred type. When the temperature reaches a certain mark, that is, when it has been hot enough for long enough, the bees pupate and emerge from their nests. This may explain why, on that first day, I observed hundreds of bees working hungrily in the blooms. By the next day their numbers had decreased markedly and by the third day, I observed them only occasionally. In just a few weeks *Nomia* too had disappeared.

As these bees appear and disappear, seeming to follow a plant's bloom, it is interesting to remember that the adult stage of a bee's life is usually quite short, maybe only two weeks. Most of the bee's life is spent in immature stages (egg, larvae, pupae) in a nest underground, in twigs, stems or other cavities. Bees in the larval stage

may live two years or longer, waiting for enough precipitation to trigger a bloom of their food plants. A few bees over-winter as adults, laying eggs in the spring. But most lay eggs and die within a few weeks of the time they emerge. As soon as a bee emerges from its nest, it flies to flowers to eat and mate. Then the females get busy building and provisioning their nests.

While I have focused on fluctuation of bee genera over the seasons, similar patterns are observed in other insect pollinators. Last summer the American Snout butterfly migration was so impressive that the mainstream press reported on it. By the end of July, I observed the first two Snouts of the season in the gardens. They were nectaring on the kidneywood. One had tattered wings, the other appeared fresh. Are more on their way? Time will tell. I have also collected a bright lime-sherbet colored soldier fly not observed this year until July, and not observed last season at all. Though the huisache did not have a big bloom this season, I checked it regularly for visitors. In June I found many orange

▼ *A lime-green soldier fly nectars on the kidneywood during the heat of the summer.*



leaf beetles milling around in the foliage and occasionally in a flower. Later, they showed up on the Soapberry where they devoured every fruit the tree had made. While this beetle is a flower visitor, its behavior suggests it is not a pollinator.

Last summer I observed and collected just one Great Golden Digger wasp (*Sphex ichneumonius*). She is a large wasp with prominent glittery gold hairs on her face. She nectars on flowers for her own nourishment, and hunts caterpillars to lay eggs on. However, this season I have observed many individuals foraging on the kidneywood and soapberry. The pollinators appear in tandem with floral abundance, and here in the northern Chihuahuan Desert, floral abundance is strongly linked to precipitation. Even with a late spring freeze it has been a good year for the plants, and so it has been a good year for the pollinators as well.

Cynthia McAlister is working on her master's degree at Sul Ross State University. Her research focuses on the bees of the botanical gardens.



▲ A tiny cyna blue butterfly sways back and forth on a rock near Modesta Spring.

Fort Davis Butterfly Counts

July 3 & September 26, 2007

The first annual Fort Davis Butterfly counts were held in 2007. The count area is a 15-mile diameter circle centered on the Jeff Davis County Courthouse. The Fort Davis Butterfly Count is particularly interesting for butterfly enthusiasts because of the wide variety of habitat (ranging from semiarid grassland to pinyon-juniper woodland) and the elevational range from 5,000 feet to 6,600 feet.

We will hold at least three butterfly counts each year and all data collected will be submitted to the North American Butterfly Association. The spring count is scheduled for April 12; the summer count is scheduled for July 3; and the fall count is tentatively scheduled for September 27. If you would like to participate in upcoming counts, email Cathryn Hoyt at choyt@cdri.org or give her a call at 432.364.2499.

Fort Davis Butterfly Count Results

The first set of numbers in parentheses indicates the number of butterflies of a particular species counted during the summer count; the second set of numbers indicates the number of butterflies counted during the fall count.

Swallowtails

Two-Tailed Swallowtail (11) (0) <i>Papilio multicaudata</i>	Southern Dogface(2) (15) <i>Colias cesonia</i>
Pipevine Swallowtail (6) (22) <i>Battus philenor</i>	Sleepy Orange (15) (74) <i>Eurema nicippe</i>
Black Swallowtail (10) (5) <i>Papilio polyxenes</i>	Dainty Sulphur(10) (60) <i>Nathalis iole</i>
Giant Swallowtail (0) (1) <i>Papilio cressphontes</i>	Cloudless Sulphur(1) (5) <i>Phoebis sennae</i>
	Large Orange Sulphur (0) (4) <i>Phoebis agarithe</i>

Whites & Sulphurs

Checkered White (14) (20) <i>Pontia protodice</i>
Clouded Sulphur (1) (0) <i>Colias philodice</i>
Orange Sulphur (11) (19) <i>Colias eurytheme</i>

Hairstreaks

Great Purple Hairstreak (1) (0) <i>Atilides halesus</i>
Soapberry Hairstreak (1) (0) <i>Phaeostrymon alcestis</i>

Poling's Hairstreak (1) (0)
Satyrium polingi
 Juniper Hairstreak (3) (0)
Calliphrys gryneus
 "Olive" Juniper Hairstreak (4) (0)
C.g. gryneus
 "Siva" Juniper Hairstreak (7) (0)
C.g. siva
 Gray Hairstreak (20) (11)
Strymon melinus

Blues

Western Pygmy-Blue (1) (9)
Brephidium exile
 Marine Blue (1) (2)
Leptotes marina
 Cyna Blue (1) (0)
Zizula cyna
 Reakirt's Blue (8) (37)
Hemiargus isola
 Acmon Blue (2) (4)
Plebejus acmon

Metalmarks

Fatal Metalmark (0) (2)
Calephelis nemesis

Brushfoots

American Snout (0) (4)
Libytheana carinenta
 Gulf Fritillary (1) (1)
Agraulis vanillae
 Variegated Fritillary (76) (19)
Euptoieta claudia
 Theona Checkerspot (1) (1)
Chlosyne (Thessalia) theona
 Chinati Checkerspot (1) (0)
Thessalia chinatiensis
 Fulvia Checkerspot (1) (0)
Chlosyne fulvia
 Bordered Patch (1) (23)
Chlosyne lacinia
 Texan Crescent (7) (75)
Phyciodes texana
 Vesta Crescent (9) (15)
Phyciodes vesta
 Phaon Crescent (1) (4)
Phyciodes phaon
 Pearl Crescent (2) (4)
Phyciodes tharos



Question Mark (1) (2)
Polygonia interrogationis
 American Lady (11) (39)
Vanessa virginiensis
 Painted Lady (1) (0)
Vanessa cardui
 Red Admiral (2) (4)
Vanessa atalanta
 Common Buckeye (3) (6)
Junonia coenia
 Red-Spotted Purple (0) (5)
Limnitis arthemis astyanax
 California Sister (2) (21)
Adelpha bredowii
 Common Mestra (0) (2)
Mestra amymone
 Tropical Leafwing (0) (1)
Anaea aidea
 Hackberry Emperor (2) (7)
Asterocampa celtis
 Empress Leilia (1) (3)
Asterocampa leilia
 Tawny Emperor (2) (25)
Asterocampa clyton

Satyrs

Canyonland Satyr (0) (12)
Cyllopsis pertepida
 Red Satyr
Megisto rubricata

Milkweed Butterflies

Monarch (0) (4)
Danaus plexippus
 Queen (3) (6)
Danaus gilippus

◀ Sulphurs were abundant during the fall butterfly count.

Spreadwing Skippers

Desert Cloudywing (3) (1)
Achalarus casica
 Northern Cloudywing (34) (0)
Thorybes pylades
 Drusus Cloudywing (2) (0)
Thorybes drusus
 Arizona Powdered-Skipper (2) (1)
Systasea zampa
 Funereal Duskywing (1) (5)
Erynnis funeralis
 Common Checkered-Skipper (11) (62)
Pyrgus sp.
 Desert Checkered-Skipper (0) (2)
Pyrgus philetas
 Erichson's White (0) (1)
Heliopetes domicella
 Common Streaky-Skipper (1) (0)
Celotes nessus
 Common Sootywing (0) (2)
Pholisora catullus

Grass-Skippers

Clouded Skipper (0) (1)
Lerema accius
 Tropical Least Skipper (0) (8)
Ancyloxypha arene
 Orange Skipperling (8) (148)
Copaeodes aurantiacus
 Fiery Skipper (1) (1)
Hylephila phyleus
 Pahaska Skipper (6) (1)
Hesperia pahaska
 Carus Skipper (1) (0)
Polites carus
 Sachem (6) (15)
Atalopedes campestris
 Bronze Roadside-Skipper (3) (0)
Amblyscirtes aenus
 Simius Roadside-Skipper (1) (0)
Amblyscirtes simius
 Texas Roadside-Skipper (1) (0)
Amblyscirtes texanae
 Eufala Skipper (0) (1)
Lerodea eufala