



Highland Lakes Steward

October 2013

Volume 4, Issue 10

MISSION

The Texas Master Naturalist program is a natural resource-based volunteer training and development program sponsored statewide by Texas A&M AgriLife Extension and the Texas Parks and Wildlife Department.

The mission of the program is to develop a corps of well-informed volunteers who provide education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within their communities for the state of Texas

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WE HAVE LIFT OFF!

By Linda O'Nan

HLMN members Ed Myatt and Jerry Stacy officially marked out and flagged the boundaries for the new Inks Lake State Park wildlife viewing station recently. Twenty nine holes to anchor the structure were staked and will be dug by park employees with a post hole digger. Park Superintendent Terry Rodgers and maintenance supervisor Terry Young were present and expressed their enthusiasm for the project. Over the coming weeks, the bird blind committee will be hard at work. Contact Jerry Stacy if you would like to participate. Let's plan on a "topping out" party as things move along to celebrate the new bird home!



We just wrapped up another successful chapter trip last week to Caddo Lake (see page 7). Besides the wonderful educational opportunities we experienced, we participated in removal of mostly invasive species at the Port Jefferson Nature Center. It is so rewarding to see the amount of debris this group can handle when we work as a team. Many thanks to trip organizers Billy Hutson, Lyn Davis, George Brugnoli, Judy Bloomquist and Helen Smith (for pulling together the pot luck meal). It is sad to see how the giant salvinia is choking out the life in Caddo, but encouraging solutions were part of the presentations. Cypress Bend Master Naturalists were incredible hosts and treated us to a fajita lunch, along with a great bird program and overview of Caddo

Lake. (see page 7) I'm already looking forward to next years' trip somewhere—how about you?

HLMN was a co-sponsor for the recent Native Plant Festival hosted by the Highland Lakes Native Plant Society (see page 4). Many individuals in our chapter volunteered, and HLMN members Fred Zagst and Sue Kersey (though wearing their HLNPSOT hats!) were co-chairs. Despite a change of venue necessitated by the fed shut down of ILDNFH (!#**?), the festival and subsequent garden tour was a big success. Camp Buckner was a great spot for the event. Many thanks to our numerous HLMN volunteers and a great HLMN booth headed up by Sammie Childers.

Speaking of volunteers, check out the recent cumulative hours report submitted by log keeper Jerry Stone. For the period of January-September 30, 2013, we had 10,146 hours submitted. Compared to the

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Please submit pictures, articles, reports, stories, announcements, etc. to

chili865@gmail.com.

Photos should have captions and appropriate credits. The deadline for submissions to each month's newsletter is the 10th of the month and publication will be by the 15th.

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WE HAVE LIFT OFF!

same period in 2012, we had 9070. Thanks to all! A special thanks to JERRY for his hard work "keeping the books".

Around 25 of us will be attending the TMN state meet at the end of the month. It is always interesting to talk to other chapters and see how they tackle issues that we all face. There will, of course, be enlightening speakers, field trips, and all kinds of interesting things to do. We will report in at our November meeting.

This is a great time of year for all kinds of activities, both volunteer-wise and personal fulfillment. Stop and enjoy the flush of new blooms on thirsty native plants, look skyward at our returning birds heading south, and wonder in the flutter of butterflies that always make you feel better no matter how your day is going. I'm looking forward to our next encounter—new and old projects with the best of the best! See you soon. Can't wait.

NOVEMBER PROGRAM by Pat Campbell

The next meeting of the HLMN is scheduled for Wednesday, November 6, 2013, at 1:00 pm at the Methodist Church in Marble Falls. Our speaker this month is going to be our own Deb McCintock. She will be speaking on Colors in My Valley - Roots, Wood, Bugs, and Berries. She will talk about how we get those colors to "bite" with mordants. Included will be how you use different "assists" to push the colors different directions such as vinegar, iron and even the impact the type of water used, rainwater versus well water, has on your colors. She will look back in time at what was used historically and talk about safety today. Deb will have some examples of the colors produced by cactus tuna, cochineal and Texas ball moss plus more. She won't make a natural dye expert of you in one try but you will start looking at your region's plants in a new light. What color will your valley provide?

Lunch will be at Tea Thyme Cafe at 11:30. It is a good time to visit with fellow master naturalists as we don't have much time at the meetings. Come join us!

Also I wanted to remind you about the field trip to Lady Bird Johnson Wildflower Center on Saturday November 2. Carpool from the Methodist Church at 9:00 or meet us at the center at 10:00. After our walk and lunch at the cafe there, we will be stopping by the Barton Creek Nursery. Let me know if you are interested.

Stewardship

An ethic that embodies cooperative planning and management of environmental resources with organizations, communities and others to actively engage in the prevention of loss of habitat and facilitate its recovery in the interest of long-term sustainability



Wednesday,  December 4th

HLMN December Meeting 

Auction  and Christmas Party

Quail Point in  Horseshoe Bay
5:00 Cocktail Hour

TEAM
WORK

Red Harvester Ants



are coming soon with your invitation to your home for you and your spouse/guest/or significant other....please respond then if you are coming and even if you cannot make it please respond

Start thinking about an Auction Item:

-  A service or talent – such as fishing, kayaking, hiking, plant survey, photo lesson, game hunt, wildlife dinner, class to friends or grandchildren, etc.
- Any item with a nature oriented theme  – such as photos, art, books, objects, bird feeder, game feeders, gardening supplies, wine, plants, etc.

4TH ANNUAL NATIVE PLANT FESTIVAL & GARDEN TOUR “BRINGING BACK THE MONARCHS”

by Sue Kersey, Sherry Bixler, and Fred Zagst

Thank you!

What a wonderful group of volunteers we have here in the Texas Hill country.

The steering committee worked selflessly for several months to organize the 4th Annual Highland Lakes Native Plant Festival & Garden tour.

Those on the committee were Sherry Bixler, Beth Mortenson, Fredi Franki, Joan Mukherjee, Cathy Hill, Terri Whaley, Pat Campbell, Linda O’Nan, Susan Morgan and Sheryl & Robert Yantis.

The true backbone of the success was all of the organizations that had booths at the festival. We want to thank the Highland Lakes Master Naturalist, Highland Lakes Master Gardeners, Highland Lakes Birding & Wildflower Society, the Friends of the Inks Lake Dam Fish Hatchery and Highland Lakes Native Plant Society. What really sticks out is how folks volunteered in the morning and then again in afternoon on the garden tour. We are truly blessed to have such great volunteers.

Please be sure to say thank you to our sponsors, Land Art, Backbone Valley Nursery and Printworks.

More than 130 folks attended the festival and visited the gardens providing us a great opportunity to

spread the work about the value of native Texas plants in a drought environment. Approximately 75 people attended Cathy Downs’s presentation on “Bringing Back the Monarchs.” Attendees bought more than 128 of the 2” plugs of green and antelope milkweed. And more than 60 pots of tropical milkweed were also sold.

Think of all the milkweed that is being planted and how those plants will benefit the monarchs!!

All proceeds from the festival will be used for the establishment of monarch way stations and butterfly gardens in our Highland Lakes area. What a tremendous boost that will be for this iconic emblem of Mother Nature’s amazing work!

Thanks again to all!

Fred Zagst & Sue Kersey, co-chairs

I wanted to add my thanks to all the volunteers - I think we had at least 60 people who worked on this and needed every one of you - I am still amazed at the number of people who aren't aware of the connection between native plants, providing food for wildlife, and saving water.

Sherry Bixler





THE “UN” COMMON RAVEN

by Joanne Fischer

Anyone who has an interest in birds and likes the film classic “It’s A Wonderful Life” has probably been intrigued by the Common Raven – Uncle Billy’s pet bird in the film. Ravens are among the smartest of all birds and have been the object of countless myths and legends throughout time and around the world.

Common Ravens are part of the Corvid family (which includes Crows and Jays). Corvids are the largest of all the perching birds. Ravens are 22 – 27 inches in length with wingspans of over 45 inches. They are entirely black – including their legs, eyes and beaks. They have thick necks, shaggy throat feathers and a “bowie knife” beak. Common Ravens are largely nonmigratory and occur over the western portion of the Northern Hemisphere in nearly any type of habitat.

Ravens are considerably larger than Crows but you often have to look at their shape and features to determine whether you are seeing a Crow or a Raven in flight. The Raven has a heftier bill, a shaggy throat and is more slender than a Crow. In flight, the Raven shows a wedge-shaped tail from below, unlike the Crow, which has a slightly rounded tail and the Raven’s wings are longer and less rounded. Ravens typically soar and glide, while Crows tend to flap continuously and fly in a more direct path.

Common Ravens are omnivores, but most of their diet is meat. At times they will eat large insects or spiders, seeds, and grain, but they are more carnivorous than crows. They scavenge for carrion and garbage and also prey on rodents and unfortunately, on the eggs and nestlings of other birds.

Ravens are confident, inquisitive birds that strut around or occasionally bound forward with light, two-footed hops. In flight they are buoyant and graceful, interspersing soaring, gliding, and slow flaps. Ravens often perform aerobatics, including sudden rolls, wing-tucked dives, and playing with objects by dropping and



catching them in midair.

The Raven’s common vocalization is a drawn-out “croak” (unlike the “caw” of a crow) but a Raven can also mimic the calls of other birds. When raised in captivity, they can even imitate human words (one Common Raven raised from birth was taught to mimic the word “nevermore”).

Common Ravens begin breeding between the ages of 2 and 4. They are monogamous and form long-term pair bonds. They build their nests on cliffs, in trees, and on structures such as power-line towers, telephone poles, billboards, and bridges. Tree nests tend to be in a crotch high in the tree, but below the canopy. The female (possibly with help from the male) incubates 3-6 eggs for about 20 days. The male feeds the female on the nest and helps her feed the young when they first hatch. The young leave the nest after 4-7 weeks. At this time, they can fly short distances and usually stay close to the nest for another week or so.

The Common Raven is an impressive year-round resident of Trans-Pecos Texas and the Hill Country. Now, what was the name of Uncle Billy’s pet raven (who, by the way, was a 14-year old raven at the time and who appeared in most of Frank Capra’s films).

CADDO LAKE FIELD TRIP

By Billy Hutson

Members that went on the Caddo trip are seen here and on the next page in the process of accruing A.T. hours, volunteer hours and (yes) just relaxing and having fun.



The Brush Brigade



Serenity



Mineola reserve bridge



Stuck in the salvinia



Site of weevil lecture



Salvinia lecture- don 't fall in Terri



Before the Clearing



After the clearing



Kids at outdoor raptor educa-

Wake up and sing George!



Young Wounded redbtail hawk



Anyone know this couple?



Happy Hour after a hard day's work



Big foot cave explorers



Linda Fleming at even keel.



Lots of Antique browsing in Jefferson

BUMBLEBEES

by Phil Wyde

A few weeks ago when I was going through my emails I saw an announcement for a symposium on bumble bees. I really wanted to go to this event but it was hours away and I decided to forgo attending. However, the more I thought about it I realized how little I knew about these fascinating insects. I also became conscious that I have been enthralled with them from when I was a little kid. (I know you cannot picture me as a little kid. However, I have some pictures that prove that I was – once.) I decided that I would do some research on these bumbling, endearing creatures. I am very glad that I did because I found a lot of interesting things about bumble bees that I now would like to share with you. With the facts that you will learn, you should be able to wow your grandchildren, impress your friends and astound individuals that you are leading on hikes.

Bumble bees belong to the insect order, *Hymenoptera*, the insect family, *Apidae* and the genus, *Bombus*. Because of their relatively large size (approximately $\frac{3}{4}$ inches long when mature), furry appearance, highly visible patterns on their thorax and abdomen (often black and bright yellow, or black and bright orange), loud buzzing and erratic flight patterns, they are easily seen and recognized. However, there are other large bees, most notably carpenter bees, which have similar coloring and are often confused with bumble bees. You should also note that not all bumble bee species have yellow or orange bands on their abdomens (i.e., some have all black abdomens). So here is my first really useful information for you: The most conspicuous visual difference between bumble and carpenter bees is that the abdomens of the latter bees are all black and smooth (see Fig. 2). The latter bees also look sinister to me. That may be because I am so aware of how much damage they can do – or it may just be because they lack a fuzzy abdomen and thus are less cuddly. I don't think that most of you would have any problem differentiating bumble bees and honey bees, but just in case I have included Figure 3 which shows a honey bee and bumble bee together.

I told you that I did not know a lot of things about bumble bees. It turns out that I did not even know much about their life cycle (see Fig. 4).^{2,5,6} For example, I did not realize that all members of the bumble bee colony die in late fall – with the exception of new queen bees. These queen bees mate in the fall and go into dormancy in protected places during the win-



Figure 1. Closeup Image of a bumble bee (from ref 1)



Figure 2 Image of a carpenter bee (from ref. 3)



Figure 3. An image of a honey bee (left) and bumble bee (right) head-to-head (from ref. 4).

ter. In the spring, they come out of hibernation, become active, construct a nest with brood (wax) cells and lay eggs in the last. The larvae that hatch from these eggs go through 4 molting stages (called instars), becoming progressively larger after each molt. After the last molt the larvae spin silk cocoons, become pupae where they undergo an “intense period” of cellular growth and differentiation (metamorphosis) and eventually attain their bee morphology. All of the eggs, larvae and pupae that are produced during the early stages of the bumble bee colony become female bumble bees. Interestingly, when these new bumblebees first emerge from their cocoons, the hairs on their body are not yet fully pigmented and newly emerging bees are a grayish-white in color. The process just described (i.e., the development of an egg to adult bee) can take as long as five weeks, depending on the species and the environmental conditions. (See figure 4 for a schematic showing the life cycle of a bumble bee colony.)

After the emergence of the first or second group of workers, worker bumble bees take over the task of foraging and the queen spends most of her time laying eggs and caring for larvae.⁶ The colony grows progressively larger and at some point will begin to produce males and new queens. The point at which this occurs varies among species and is heavily dependent on resources available and environmental factors. At the end of the life of the colony the cycle begins again (i.e., most of the colony members die off and the newly mated new queens go into hibernation until the spring.

Here is an interesting fact about bumble bees. Unlike the workers of more advanced social insects (e.g., honey bees and many ant societies), bumblebee workers are not reproductively sterile and can lay haploid eggs (eggs that contain only one set of chromosomes – their own).⁶ Please note that haploid eggs can only develop into male bumblebees; only fertilized queens can lay diploid eggs. The diploid eggs can mature into either female worker bees or new queen bees. The worker bees do not lay eggs until late in the development of the colony when the queen bumble bee’s hormonal suppression of this process begins to wane.⁶

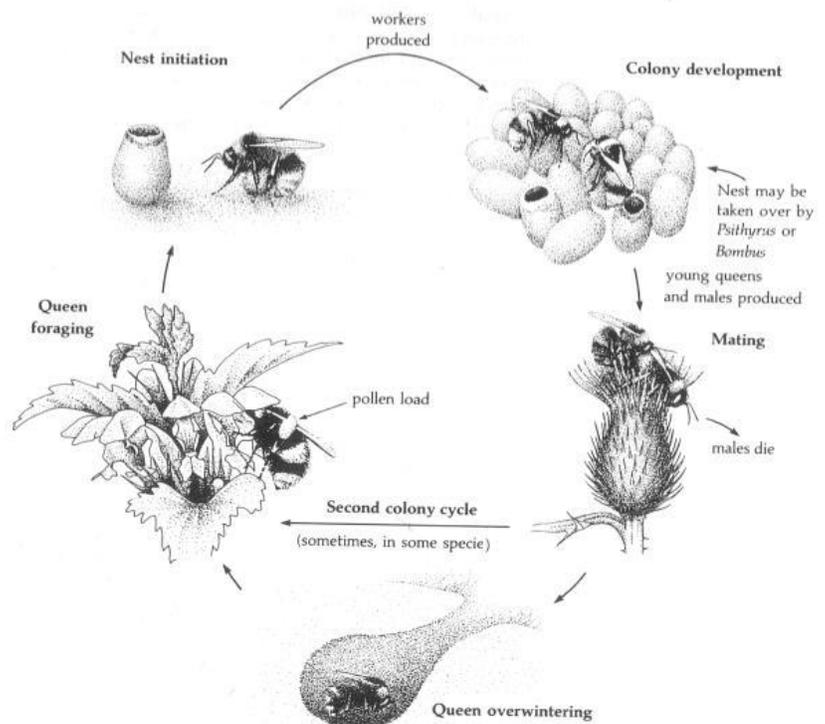


Figure 4. Representation of the life cycle of bumble bees (from Ref. 5).

(O.K. You cannot tell this to your grandchildren, but you can awe adult hikers that you are leading and other Master Naturalists.)

I was also ignorant of where and how bumble bees live.² It turns out that they DO NOT have hives like honey bees but are opportunistic nesters, making their homes in such varied places as clumps of dry grass, holes in the ground, old bird nests, vacant rodent burrows, abandoned mattresses and car cushions and in and around vacated buildings. Bumble bee colonies usually only contain 50 to a few hundred bees. However, some colonies can contain more than a thousand individuals. Their nests may be up to 12 inches in diameter and often have several entrances.

A foraging worker bee uses her long tongue (proboscis) to drink nectar. Pollen which is used to make honey to feed the larvae is collected and stored in pollen baskets found on their hind legs (only queens and workers have pollen baskets). This is usually done while the bees are drinking nectar, which incidentally only occurs during day light hours. The honey made in the nesting site is stored in wax “pots” and eggs in wax (brood) cells. Thus there is some commonality with honey bees. Bumblebees also sometimes build a waxy



Figure 5 showing a bumble bee entering a ground nest (from Ref. 6)

layer (called an "involucrum") over the top of their nest for protection and insulation.⁶ Regardless of this effort bumble bees do not usually maintain their nests through the winter.

Bumble bees are mainly found in the temperate regions of the northern hemisphere.⁵ However, there are a few South American species and New Zealand and Tasmania have a few naturalized species that were introduced over 100 years. Bumble bees can be found much further north than honey bees. Most notable is *Bombus polaris* which inhabits Ellesmere Island in northern Canada – less than 100 kilometers from the North pole. Indeed, this is the furthest north that any eusocial (true social) insect lives.⁶

Here are several more interesting bumble bee facts:² 1) Female bumble bees can and do sting, but male bumble bees cannot. In addition, unlike the stingers of honey bees, the stingers of bumble bees lack barbs. Thus bumble bees can sting repeatedly without injuring themselves.⁶ However, although they have the ability to repeatedly sting without losing their lives, they apparently seldom do while foraging. (So you do not have run every time that you or your grandchild-

ren see a bumble bee.) This is not true of bumble bees near their nests where they are often aggressive (remember, it was stated above that they often make their nests near human habitats).

Here are a number of other interesting facts about bumble bees:⁶ 1) Bumble bee fossils dating from the Oligocene period (i.e., around 30 million years ago) have been found. That's pretty old. 2) There are over 250 species of bumble bees. 3) Bumble bees do not have ears. However, they can feel the vibrations of sounds. 4) Despite the marked differences in bumble bee and honey bee residences, bumble bees are social insects. In addition, like honey bees, bumble bees eat nectar and use pollen to feed their offspring. 5) Bumble bees often fly 1 to 2 kilometers from their colonies to visit flowers. They also tend to visit the same groups of flowers every day, as long as they continue to find nectar and pollen. 6) The buzz of bumble bees (and other bees) is not caused by the beating of their wings. The sound is actually the result of the bee vibrating its flight muscles.⁶

Here are a set of related facts that relate to how bumble bees collect pollen.⁶ Pollen is collected from flowers by bumble bees either deliberately or incidentally. Incidental removal occurs when bumblebees "accidentally" come in contact with the anthers (male portion) of a flower while collecting nectar. The bumblebee deliberately collects pollen by grooming the pollen that sticks to her body hairs into the pollen baskets located on her legs. I put the word accidentally, two sentences above, in quotation marks because the pollen collected when a bee gets near the flower's anthers may not be so fortuitous. It turns out that while flying, a bumble bee accumulates an electrostatic charge and as flowers are usually well grounded, pollen is drawn to the bee's abdominal hairs when it lands. Then when the pollen-covered bee goes to a new flower and enters it, the charged pollen is preferentially attracted to the stigma (female flower part) because the stigma is better grounded than the other parts of the flower.

It is worth emphasizing the reproductive process of bumble bees.⁶ The queen bumble bee stores sperm from her mating. Then depending on the needs of the colony she may "allow" her eggs to be fertilized. If the eggs are not fertilized they become males. If they are fertilized, they can become either females or queens. Worker bees generally cannot produce eggs since the hormones that stimulate the development of the ovaries are suppressed in female worker bees by hormones produced by the queen bee. However, as men-

tioned above the queen bee's ability to maintain this suppression wanes as the colony's life wanes in the fall.

Here is subject that I have talked about in previous articles. The bright bands of color on the abdomen of bumble bees act as an aposematic signal.^{6,8} (An aposematic signal is one that benefits both predator and prey.) In this case predators such as birds are warned not to eat the bumble bee. The bird (i.e., the predator) is spared from being stung and the potential prey (i.e., the bumble bee) often does not get eaten. An example of an aposematic signal that you are more familiar with is the bright orange coloration of monarch butterflies. I also discussed aposematic signals in the article about giant redheaded centipedes.

Above I mentioned that one species of bumble bee, *Bombus polaris*, could be found less than 100 kilometers from the north pole. One reason that this bumble bee species can live so far north is that it can regulate its body temperature using solar radiation, by a mechanisms of "shivering" and by radiative cooling from its abdomen. Other bees can also do this, but the mechanisms have been best studied in bumble bees.^{6,9}

There is a genus subset of bumble bees called "cuckoo bumble bees" because they parasitize the larva of other bumble bee species.^{5,7} (These parasitizing bees belong to the genus, *Bombus* and subgenus, *Psithyrus*.) What is most interesting about this group of parasitizing bumble bees is that they have apparently lost social behavior and the ability to collect pollen.⁷ Until finding and invading a host colony, a *Psithyrus* female (there is no caste system in these species; all of the females are queens) will survive by drinking nectar from flowers just like any other bee. However, once she has located and infiltrated a host colony of bumble bees, she will kill or subdue the queen of that colony and forcibly (using pheromones and/or physical attacks) "enslave" the workers of that colony. The enslaved workers then feed her and her developing young. When the *Psithyrus* young emerge and mature, they leave the colony to mate. The mated females then seek out other nests to attack or go into dormancy for the winter. (I know that I do not have to tell any Master Naturalist why they are called cuckoo bumble bees, but if you cannot figure it out, approach me and I will surreptitiously explain the reason to you.)

Bumblebees are increasingly being bred and cultivated to be used as agricultural pollinators.⁶ For example, they can be, and are, used in greenhouses to pollinate tomato flowers in the production of tomatoes. Obvi-

ously bumble bees cannot be utilized for the production of honey since they do not overwinter and stockpile honey.

There is some fear that the exportation of bumble bees to other countries to help in pollination will lead to problems with native pollinators.⁶ Already there are known instances of bumble bees escaping from green houses into the wild and becoming competitive with native pollinators. Worse, there is mounting evidence that domestically, mass produced bumble bees can carry disease harmful to wild bumble bees and honey bees.^{6,10,11}

Although one might think from what was discussed above that bumble bees are doing quite well. However, bumble bees are in danger of extinction in many developed countries, primarily due to habitat destruction and reduction due to the extensive use of pesticides.⁶ I am not sure if they are subject to the same mysterious Colony Collapse Disorder that is killing wholesale populations of honey bees, or if they are in peril from other pathogens.

I will end with the schematic in Figure 6 showing the major body parts of bumble bees.

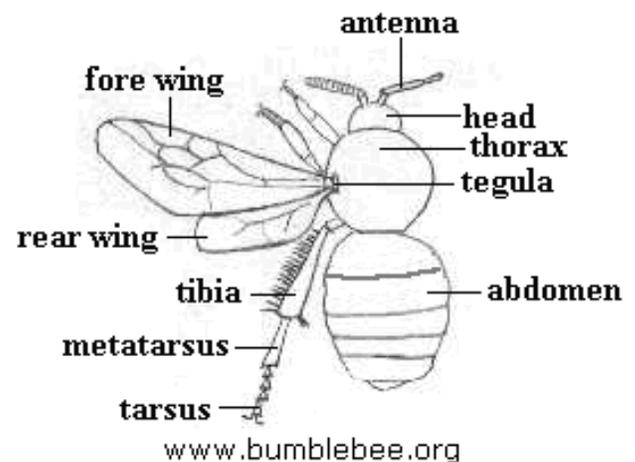


Figure 6. Schematic of parts of a bumble bee's body

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Some Primary References Related to Subjects in This Article

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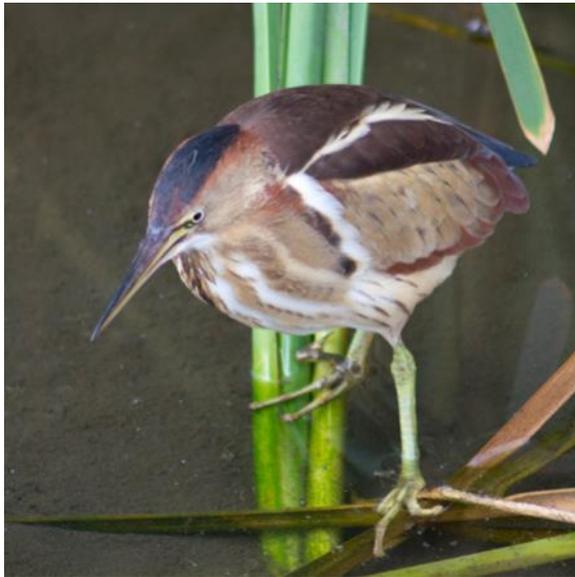
GALLERY



Monarch Butterfly - Sue Kersey



Ruby Throated Hummingbirds - Sue Kersey



Least Bittern—taken from the boardwalk at The South Padre Island Birding and Nature Center - Mike Childers



Female golden-winged skimmer - Sue Kersey



Eastern Pond Hawk - Marvin Bloomquist



Gulf Fritillary - Marvin Bloomquist