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The key: Stop thinking of insects as pests

By GEORGIA TASKER
Herald Garden Writer

Like wading birds, black bears and other wild animals, bugs, bees and bats, vital pollinators of flowering plants, are disappearing.

No wild pollinators, no wild flowers.

And in extreme cases, no fruit, no nuts, no vegetables, no crucial partners for survival of endangered species.

South Florida gardeners can help bring about a return of pollinators. All it takes are a few simple steps, and thoughtful expansion of the idea of butterfly gardening:

■ Stop using pesticides in the landscape, or use them only as a last resort.

■ Plant more native trees, shrubs and ground covers — and be generous about such weeds as Spanish needle — to provide nectar and pollen sources.

■ Allow parts of the garden to become a little less tidy so pollinators that nest in the ground and twigs can find sanctuary.

■ Hang up blocks of wood with holes drilled into them for nesting of solitary carpenter bees.

■ Overcome the fear of insects. They extravagantly outnumber us, and most are joined in exquisite partnership with the world around them, more interested in chasing nectar than chasing humans.

Besides, we need them. Native bees, flies, wasps and other pollinators, said Gary Nabhan at the 1996 conference of the Florida Native Plant Society, are being overlooked as vital to ecosystems. They are being pushed into oblivion by pesticide poisoning, habitat destruction and habitat fragmentation — little islands of habitat separated from other little islands.

Nabhan and his colleague Stephen Buchmann have written *The Forgotten Pollinators* (Island Press, $25),

PLEASE SEE POLLINATORS, 6H

POLLINATORS, FROM 1H

and they have persuaded several conservation organizations to join the forgotten-pollinator campaign.

"We're interested in showing people their diet and medicine cabinets depend on these forgotten pollinators," Nabhan said. "Too many people have bought into the notion that we have to make a choice between protecting the environment and animals, and making our economy run smoothly."

Nabhan said 80 of 108 major crops that feed the world are pollinated by animals.

"We think of the Western diet as grain- and beef-dominated, but alfalfa that feeds cattle is pollinated by animals," he said. "The fruit of the tropics is mostly pollinated by wild animals.

"Pesticides and herbicides are impoverishing the webs of relationships on the land."

Plants face extinction

Scientists have been aware of and alerted to the decline of pollinators by endangered plants and ecosystems where seeds no longer are formed. An endangered primrose in California is down to 20 or 30 individual plants, Nabhan said, "and the moth that pollinated them hasn't been seen in the area for 30 years."

A cliff-dwelling plant in Hawaii called *Brighmania rockii* on Maui has to be hand-pollinated because its moth partner has disappeared.

In fragments of Dade pine rockland, Joe O'Brien, a graduate student at Florida International University, has found carpenter bees, sweat bees and Cassius blue butterflies visiting endangered milk peas and carrying their pollen. But in some places, "I've see a few dozen plants and I've not seen any pollination activity."

O'Brien's professor, botanist Suzanne Koptur, believes that lack of activity and seed set means there are no good partners nearby for cross-pollination, or there are no pollinators able to find them.

Koptur has spent 10 years studying plant/animal relationships. Now, inspired by O'Brien's work, Koptur is launching a long-term study on pollinators of the endangered pine rockland ecosystem scattered in fragments around Dade County.

Winged friends of Everglades

Everglades National Park has no current list of pollinators for its plants (an old study from 1937 is in the files), but University of Miami bee expert Keith Waddington is beginning a three-year study to identify them. Waddington wants a database of information before Africanized bees arrive to upset the pond-apple cart.

Tom Pliske, entomologist at FIU, said such work is time-consuming and tedious, and means hours of sitting in the field watching plants and collecting evidence, such as pollen grain on insects.

"It's like fishing — fun, but tedious," he said.

"We don't know a whole lot, especially about plants that are not economically important," Pliske said. "Specialist plants are the ones we have to watch."

Specialist plants are those that have a particular pollinator partners, such as the *Brighmania* in Hawaii, and the evening primrose in California. Orchids often have one-to-one pollinator relationships.

Most plants, however, can be pollinated by several flies, bees and other insects. Spanish needles (little aster-like yellow and white weeds that pop up here and there) and saw palmetto are among these plants. With one sweep of the collecting net, Waddington found sweat bees, beetles, bumble bees, carpenter bees and syrphid flies on a single palmetto flower stalk.

In South Florida, four groups of insects pollinate a lot of flowers, Pliske said: bees and wasps, butterflies and moths, beetles, flies.

Insecticides a culprit

Here and there, university researchers are putting two and two together. Sometimes, though, they are subtracting rather than adding.

Dan Austin, Florida Atlantic University botanist, began looking at what pollinates what plants in 1970, when he first began teaching at FAU.

"I'd go out and sit hour after hour, and nothing would visit the plants I was studying," he said. "Then, I realized nothing was visiting anything. I was close to agricultural fields. Ag fields have a reputation for lots of insecticides. My feeling was that was killing all the insects."

The two mites that have decimated honeybee colonies around the country in the last 10 years have also killed wild honeybees. And as suburbia has expanded, bee trees have gone the way of the Model T. No one wants a colony of even naturally docile honeybees in their back yard.

State bee inspectors say because there aren't any wild bees to speak of, home gardeners will find less production in their gardens.

Native bees fill a void

Eric Mussen, an extension bee specialist at the University of California, Davis, says the absence of wild or feral honeybees killed by mites has left a niche and, while no one has measured it, he believes native bees may be filling it.

"I've been on the job 20 years, and have never gotten as many calls as I have lately about carpenter bees and bumblebees," he said. "There has been a resurgence of other pollinators. And maybe without European [honey] bees to pollinate European weeds, the other native plants will come back. Of course, it will take years. . . .

POLLINATING PARTNERS

To increase your garden's productivity, and to create a place for pollinators, gardeners can expand the idea of the butterfly garden to include food and shelter for other insects.

What are some plants to include?

From botanists Suzanne Koptur and Dan Austin, entomologist Tom Pliske and bee expert Keith Waddington, here are suggestions. (The habitat included in parenthesis will help you locate these in your yard. Pineland usually indicates dry, usually rocky soil but sometimes sandy, full sun to light shade; dry prairie is a grassy area in the Everglades that floods occasionally, full sun; swamps are trees that grow in water, light to full shade; marsh is wet many months of the year, full sun; hammock is an evergreen forest, often slightly higher than surrounding areas of pineland or marsh, shade.)

Agalinas, *Agalinas purpurea,* bumblebees (pineland).
Milkweed, Asclepias tuberosa, butterflies and bees (dry prairie).
Bahama senna, *Cassia chapmanii,* various bees (pineland).
Pineland senna, *Cassia deeringiana,* bees (pineland).
Buttonbush, *Cephalanthus occidentalis,* beetles (swamps).
Composites, members of daisy family such as sea oxeye daisy, butterflies (many habitats).
Dwarf twinflower, *Dyschoriste angusta,* small bees and wasps (pineland).
Milkpea, *Galactia pinetorum, G. smallii,* sweat bees and leafcutter bees (pineland).
Roughleaf velvetseed, *Guettarda scabra,* hawk moth; a large syrphid fly (pineland).
Moon vine, *Ipomoea alba,* sphinx moth, also known as hawk moth (wet areas; roadsides; woodland edges).
Pinelands morning glory, *Jacquemontia curtisii,* sweat bees, leafcutter bees (pineland).
Marsh or swamp mallow, *Kostelezkya virginica,* carpenter bees (swamp, marsh).
Creeping charlie, *Lippia,* sweat bees and honeybees (lawns).
Sweet bay magnolia, *Magnolia virginiana,* beetles (swamp).
Edible (exotic) passion fruit, *Passaflora edulis,* horseflies (gardens).
Saw palmetto, *Serenoa repens,* various bees (pineland, shrubby woodlands).
Marsh fleabane, *Pluchea rosea,* various bees (marsh, roadsides).
Long-stalked stopper, *Psidium longipes,* bees (hammock).
Sabal palm, *Sabal palmetto,* various bees (many habitats).
Arrowhead, *Sagittaris lancifolia,* carpenter, leafcutter bees, skipper butterflies (marsh, swamp, slough).
West Indian lilac, *Tetrazygia bicolor,* probably bees (edge of hammock).

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A. E. PORTER / Herald Staff