

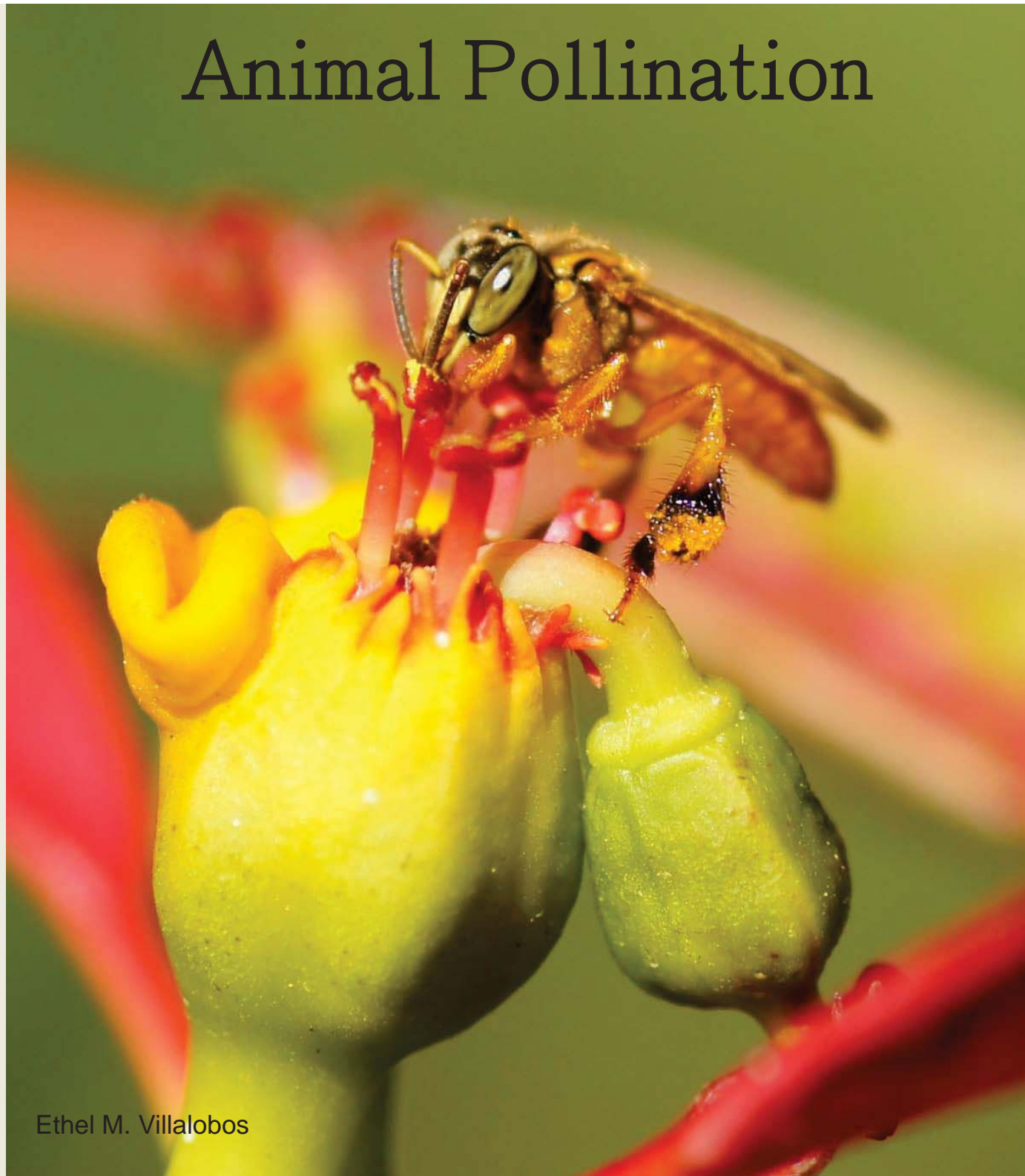
UH Honeybee Project

Meet the Pollinators

Global and Local Trends
in Pollinator Diversity

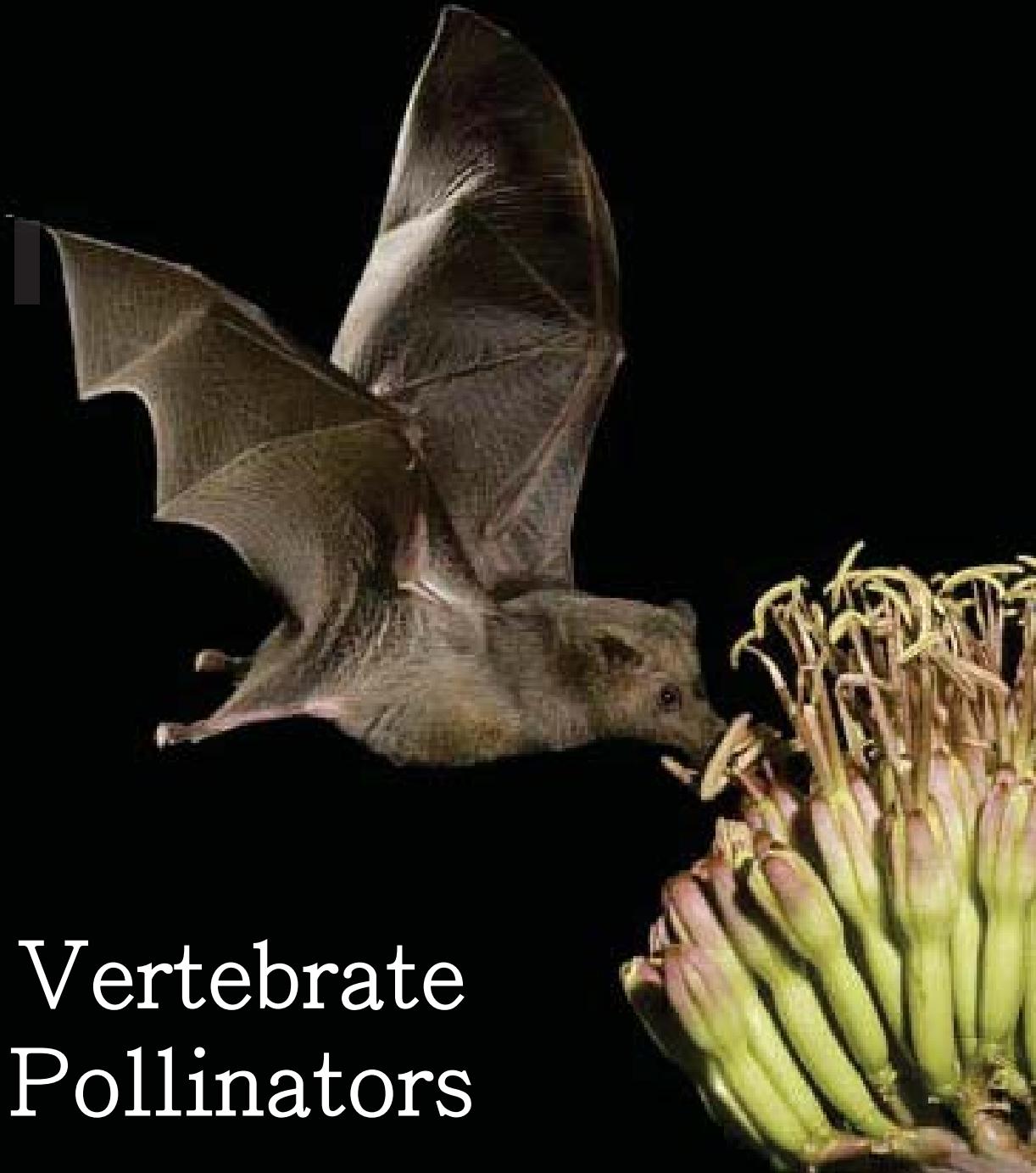
Animal Pollination

- The majority of flowering plants rely on animal pollinators
- Over 200,000 species of animals are involved in pollen transfer
- Pollen transfer leads to fertilization and to fruit set



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Vertebrate Pollinators



- 1200 bat species
- 1/3 of all bat species are pollinators



Hawaiian hoary bat

- Not a pollinator
- Insectivore

Vertebrate Pollinators: Birds

Hummingbirds



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Honeycreepers



Emma Shelly

Insect Pollinators

- Very important for natural and agricultural ecosystems
- Belong to 4 main taxonomic groups

Beetles
An ancient pollinator group



Butterflies and Moths
15,000 species

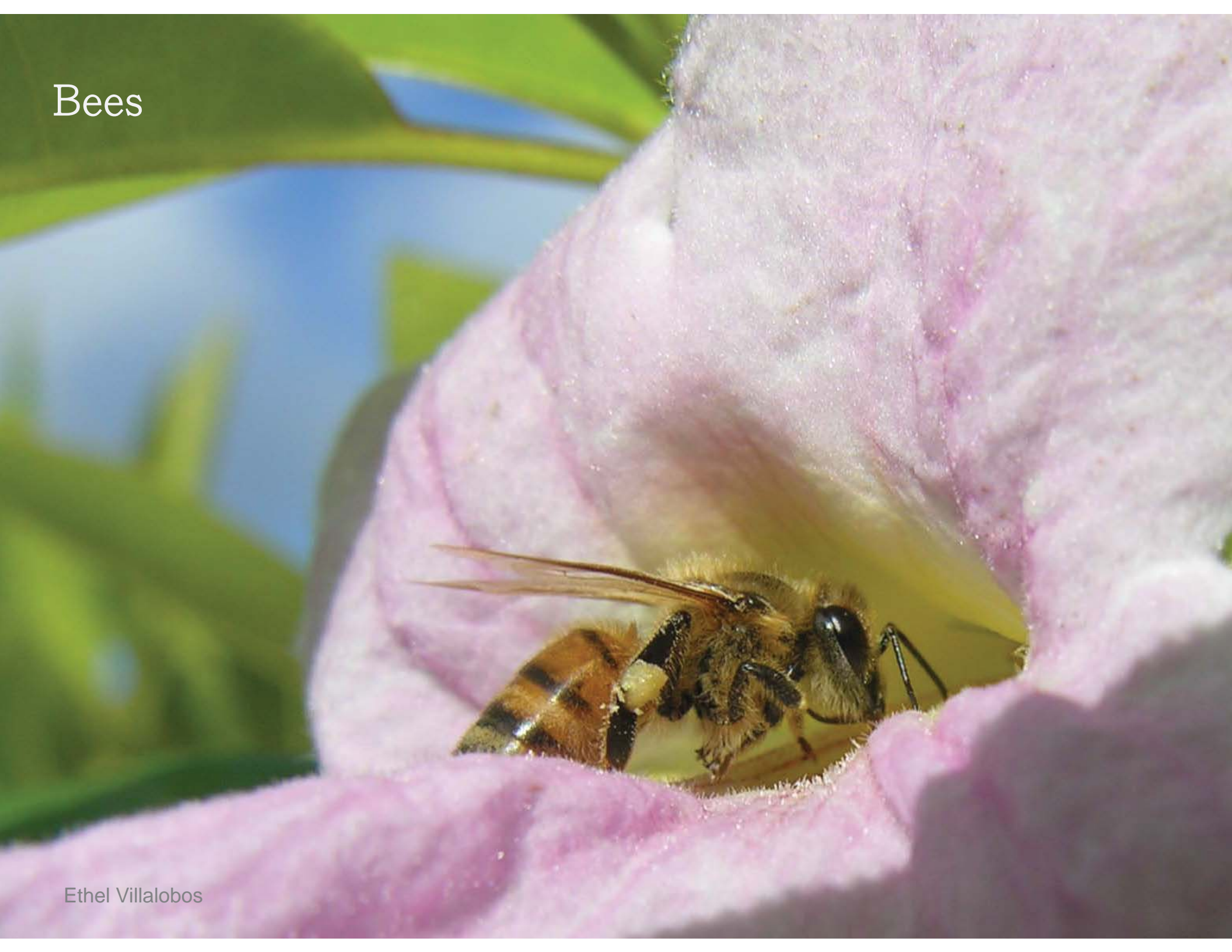


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Flies



Bees





Over 20,000 species
Only a few are social



Stingless bees in the Neotropics

- Great majority of bees are solitary
- Each female provides for her own offspring



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Endemic Hawaiian Bees

- Hylaeus (60 endemic species)
- Family Colletidae
- Called Yellow Faced Bees

- Solitary
- Small
- Hairless
- Lack structures to collect pollen (eat pollen)



Karl Magnacca

Status of native bees

- Threatened due to habitat loss
- Narrow flower preferences

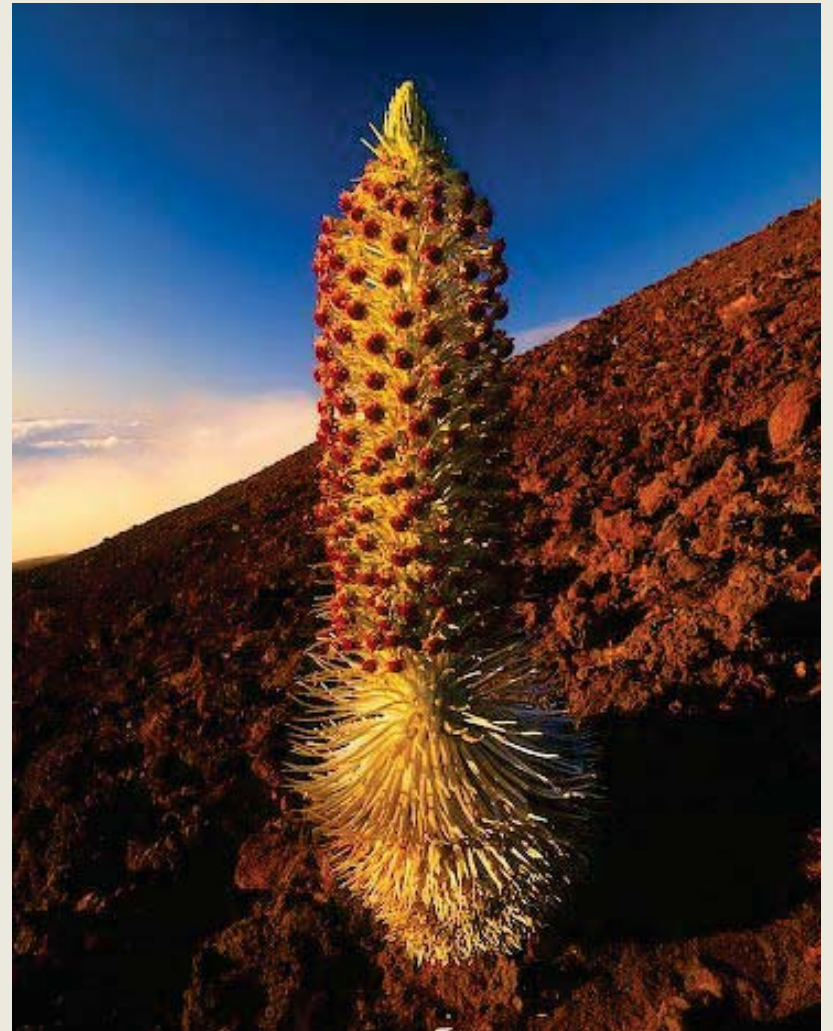


Pollinator webs or narrow co-evolution?



Pollen constancy by *Hylea*

- Silversword (Asteraceae) and Ericaceae



Alternative pollinators in agricultural lands

- Bees
 - Carpenter bees
 - Leafcutters
 - Sweat bees
- Flies
 - Hover flies
- Butterflies and moths



Carpenter bees: *Apidae*





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Small carpenter bee

Pithitis smaragdula



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Sweat bees (Halictidae)



Leafcutters (Megachilidae)



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Bill Kimak



Photography: Neil Bromhall

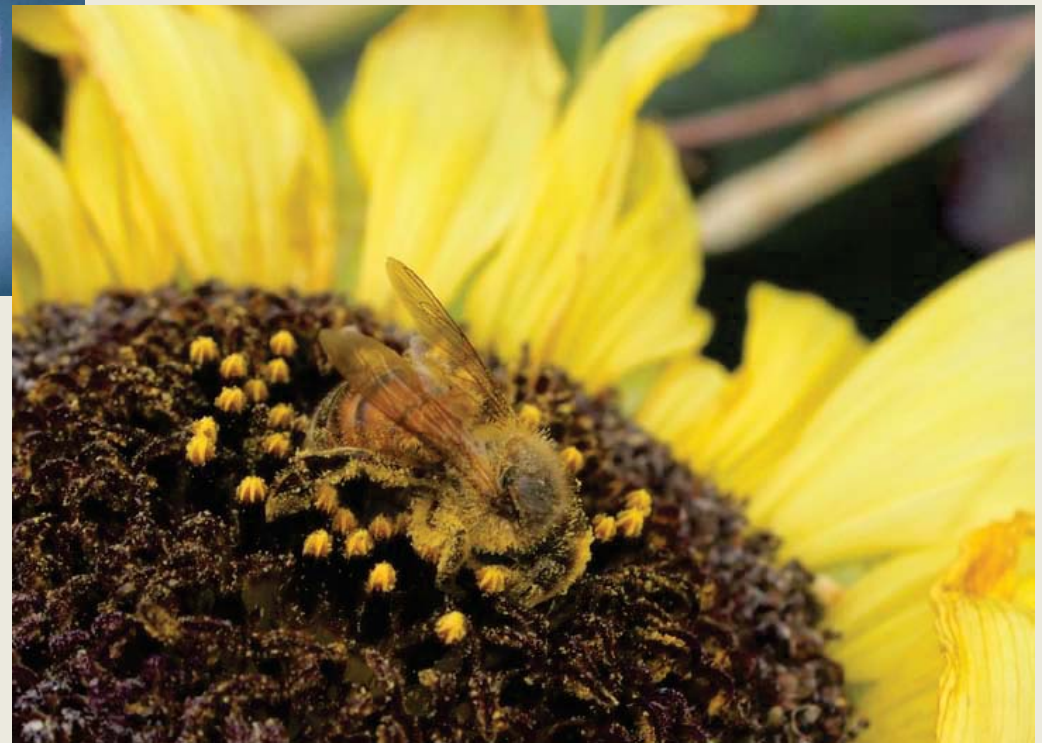
Conservation needs for pollinators

A diversity of forage



Jonathan Wright

Scott Nikaido





Suitable host plants for egg laying



Refuges

- No pesticides
- Adequate moisture and temperature



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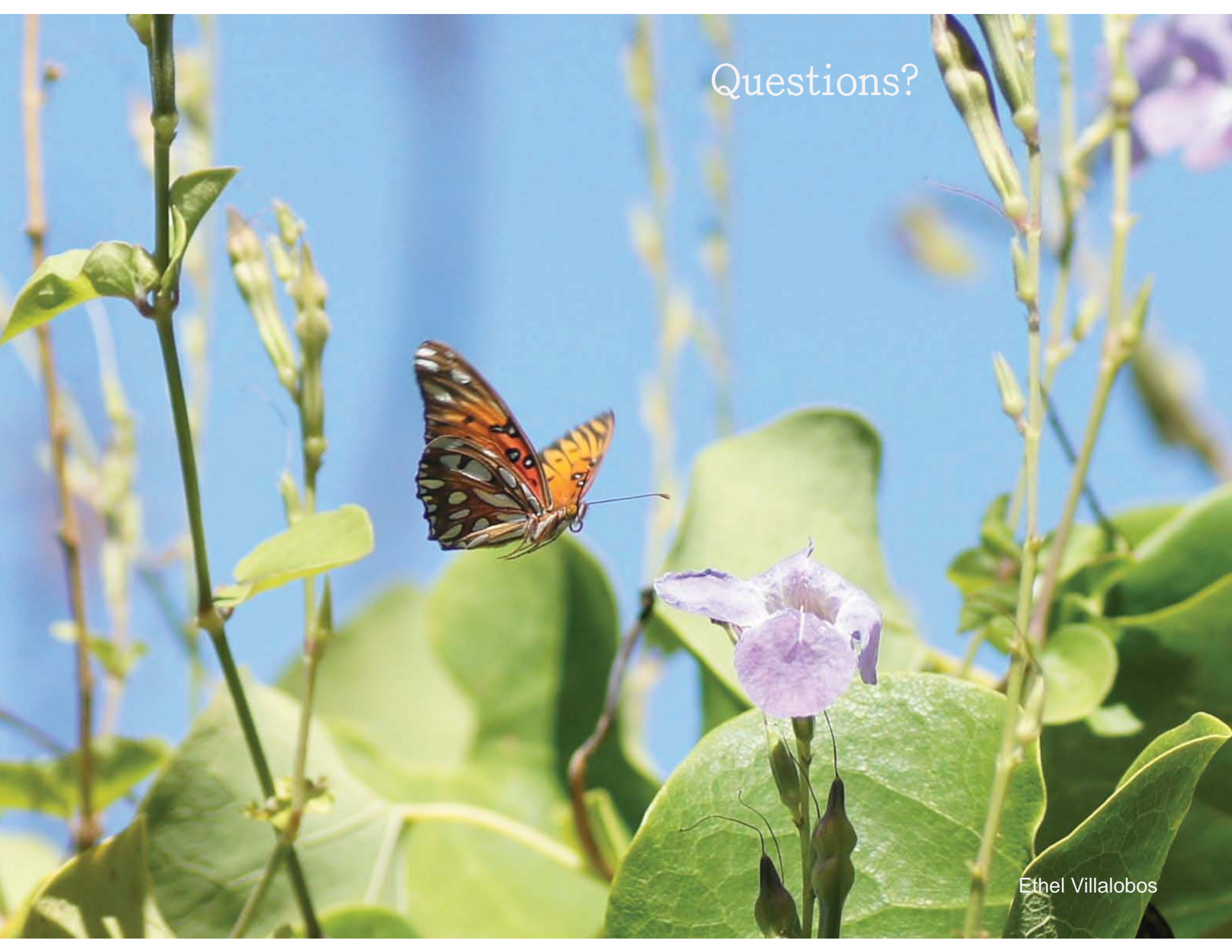
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Hawaii unique situation

- A number of endemic bees are endangered
- A number of endemic plants are also endangered
- There are few pollinators available for agricultural crops
- Honeybee colonies have declined due to invasive honeybee pests

- More work is needed to safeguard native flora and fauna
- More work is needed to understand the contributions of agricultural pollinators
- Public needs to participate to make farm and urban environments safer for pollinators

Questions?



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For more information please contact the UH
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