

SWD Natural Resources Workshop

Invasive Species: What We Need to Know

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INVASIVE SPECIES

What we need to know about Protecting Pollinators



Native Prairie
Photo Credit: C. Phillip



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Local Farming



Pulaski Heights Farmers Market, Little Rock, Arkansas
Photo Credit: C. Phillip



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Consumer



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Pollinator Initiative Objectives

1. Improving honey bee population health by reducing honey bee losses by 50% from current levels to a sustainable 15% loss rate by 2025.
2. Restore or enhance 7 million acres of land for pollinators over the next 5 years through federal actions and public/private partnerships.
3. Increase the Eastern population of the Monarch butterfly through federal actions and private partnerships to 300 million butterflies by 2020.



Pollinator Initiative Objectives cont'd

- These are lofty but attainable goals however, our efforts would be futile if:
 1. We did not take the time to understand the importance of pollinators in all our lives.
 2. We do not take precautions to protect the pollinator species when we rage war on the invasive species.
 3. We did not make an effort to support the pollinator initiative.

Quiz: Guestimate the number of animal species that serve as pollinators



Giant Swallowtail feeding on Snow-on-the-mountain (Euphorbia marginata) Photo Credit: C. Phillip



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Threats to Pollinators includes:

- Pesticides (**Human**)
- Agricultural Intensification (**Human**)
- Invasive Species (**Human**)
- Diseases, Parasites & Predators
- Natural Habitat Fragmentation (**Human**)
- Physical factors such as weather
- Climate change- Changes in flower phenology: the study of cyclic and seasonal natural phenomena, especially in relation to climate and plant and animal life. (**Human**)



Butterflies on Button Bush (Cephalanthus occidentalis)
Photo Credit: C. Phillip



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How Does Invasive Species Harm Pollinators?

1. Alter native plant communities/composition which reduces food and shelter resources available.
2. Native pollinators co-evolved with plants they visit. Physiology is matched to allow them to efficiently exploit nectar and pollen from the flowers upon which they specialize.
3. Non-native plants may have floral structures that are inaccessible to local pollinating animals.
4. Pollinators may be drawn away from native plants which may result in reduced reproductive capacity and degeneration of native plant habitats thereby further reducing pollinator habitat.
5. Out-compete native plants that are primary food sources for caterpillars which are host specific.
6. Introduce pathogens and other diseases.



Quiz: Who stings, the male or female bee?



How are Pesticides Harmful to Pollinators?

- Pesticides (insecticides, fungicides, herbicides) may fall into 2-broad categories:
 1. **Contact pesticides:** Usually sprayed on plants; and kill insects when they come into direct contact with these chemicals by crawling over leaves or flowers. Bees landing on leaves and flowers can be just as susceptible as other, destructive insects.
 2. **Systemic:** Are usually applied to the soil or on seeds. These pesticides will then be absorbed by the plants, whose leaves, nectar, and pollen will become toxic to some insects, including bees.

Quiz: How many generations of Monarchs does it take to complete the annual migration from Mexico to the U.S & back?



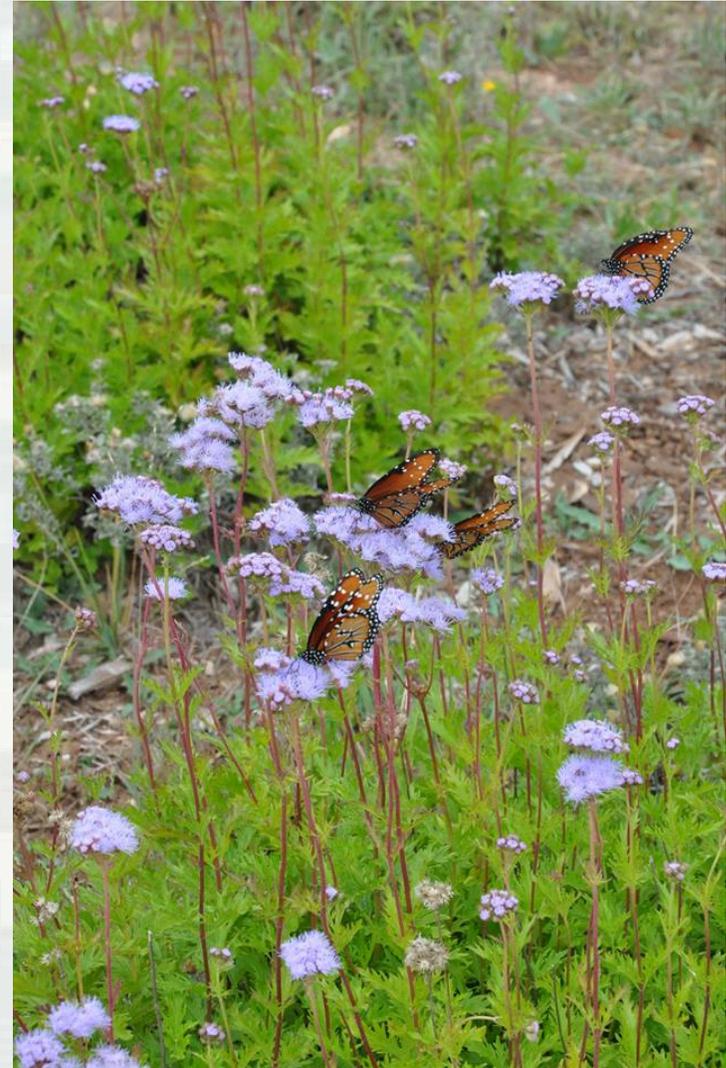
Photo Credit: Bee pollen health 2016



How Can We Help?

1) Control invasive plants using an Integrated Pest Management (IPM) approach

Definition: *IPM is a science-based, decision-making process that integrates pest biology, environmental information, consensus building, and technology to prevent unacceptable levels of pest damage. IPM considers site management goals and strives to minimize risk to people, property, and the environment, including pollinators.*



Queens feeding on Gregg's mistflower
(*Conoclinium greggii*) Photo Credit: C. Phillip



QUIZ: Do wasps produce honey?



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Examples of IPM

1. Take No Action (expect & accept some pest damage).
2. Employ mechanical control efforts i.e. grubbing, tilling.
3. Biological control: encourage natural predators with a diverse garden habitat.
4. Communicating with adjacent land owners, partners, stakeholders & encourage their input in land management activities.
5. Use pesticides when only absolutely necessary. Practice prescription burns where practical.

Quiz : How many different species of bees exist?



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If you must use pesticides...

- Only use it when you have a pest problem (not as a preventative)
- Provide a buffer between crops and adjacent pollinator forage & or host plants.
- Choose one that is effective for the target pest and with the lowest effective toxicity.
- Choose one that does not persist on vegetation.
- use the minimum application rate.
- Avoid applying when wildflowers are in bloom.
- Avoid weather conditions that promote drift



Passion Flower (Passiflora affinis Engelm.)
Photo Credit: C. Phillip



If you must use pesticides... cont'd

- Consider using vegetation specific formula; explore least toxic options and be mindful of the methodology of application (basal, aerial, IPT; spray vs. granules).
- Apply it in the late afternoon or evening when most pollinators are not as active.
- Target your application where needed (e.g., basal vs. foliar applications).
- Use liquid sprays or granules, rather than dusts, to avoid it drifting to other plants.



How to make a difference NOW!

1. Cut back on the amounts of acreage mowed and or schedule the first mowing of the year so it happens after the spring wildflower bloom and then allow the plants to come to seed. This will:
 - Save the project money
 - Reduce or deter the invasion of Canada geese
 - Give the pollinators a fighting chance
2. When writing contracts or issuing permits, licenses & outgrants that involve ground disturbances, require that restoration and maintenance be done with native plants and seeds that will be beneficial to pollinators.
3. Buy, issue & use less wasp spray; dawn dishwashing liquid mixed water in a spray bottle is just as effective.
2. On Corps land, require that right-of ways be maintained as wildlife corridors & or pollinator habitat.



Quiz: How many native milkweed species exist in the U.S?



Summary

- Get to know & understand the National Pollinator Initiative.
- It provides specific guidance on Who, What When, Where, Why, & How pertaining to pollinators.
- When destroying invasive plants, be sure to replace with native plants and seeds for additional or replacement food sources.
- Consider the effects on pollinators when trying to eliminate pests & invasives using pesticides (insecticides, fungicides, herbicides, etc.)



Asclepias viridiflora, Green-flower milkweed
Photo Credit: C. Phillip



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Questions or Comments

- Answers to Questions

1. Over 200,000
2. Female
3. 4
4. Yes- The Mexican Honey Wasp that is native to South Texas
5. 20,000
6. 70



Green-flowered milkweed/ Antelopehorns (*Asclepias asperula*)
Photo Credit: C. Phillip



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Resources & References

- <http://Pollinator.org>
- <http://corpslakes.usace.army.mil/employees/pollinator/pollinator.cfm>
- <http://www.fws.gov/pollinators/>
- <http://www.fs.fed.us/wildflowers/pollinators/BMPs/>
- http://msue.anr.msu.edu/news/contact_systemic_and_translaminar_how_insecticides_move_in_plants



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