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Gardening for Dragons

MaLisa Spring
State Coordinator of
The Ohio Dragonfly Survey







early 1650s
Jan van Kessel the Elder

Why Care???

- They are cool!!!
- 171 species in Ohio!



Eastern Amberwing
(*Perithemis tenera*)
MaLisa Spring

Importance of Odonata



© Jan Hamrsky
www.lifeinfreshwater.net



DEEP
LOSER

Importance of water quality

© Jan Hamrsky
www.lifeinfreshwater.net



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www.lifeinfreshwater.net



Food for other organisms





© Brian Gooding



Pied-billed Grebe
© Andrew Cannizzaro



Common Grackle
© Tracey Fandre



Eastern Kingbird
© Alan R Biggs



Green Heron
© Sam Kieschnick



Eastern Phoebe
© Jim Heflich

Insectivorous bird populations

Data and graphs from
The State of Canada's Birds 2012

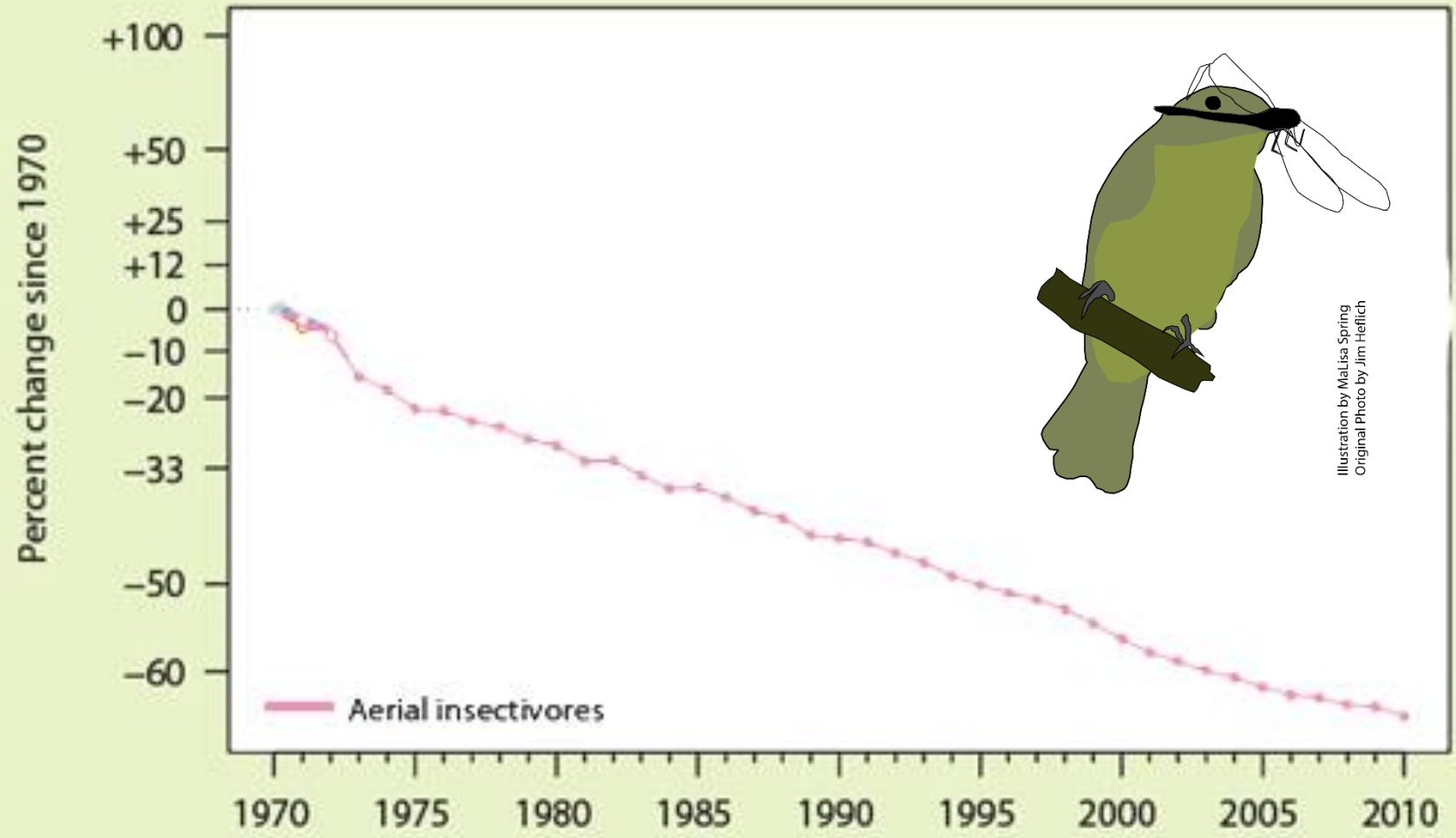


Illustration by MaLisa Spring
Original Photo by Jim Hefflich

Indicators of the national population status of all regularly occurring native bird species in Canada and eight selected subgroups.

Habitat Loss and Degradation



© Chris Spring



© Chris Spring



© Jakec

Turf



Endangered and Threatened

- Endangered 16/171
- Threatened 6/171
- Species of Concern 1/171



How are plants involved with dragonflies?



© MaLisa Spring



Blue Dasher
(*Pachydiplax longipennis*)
MaLisa Spring



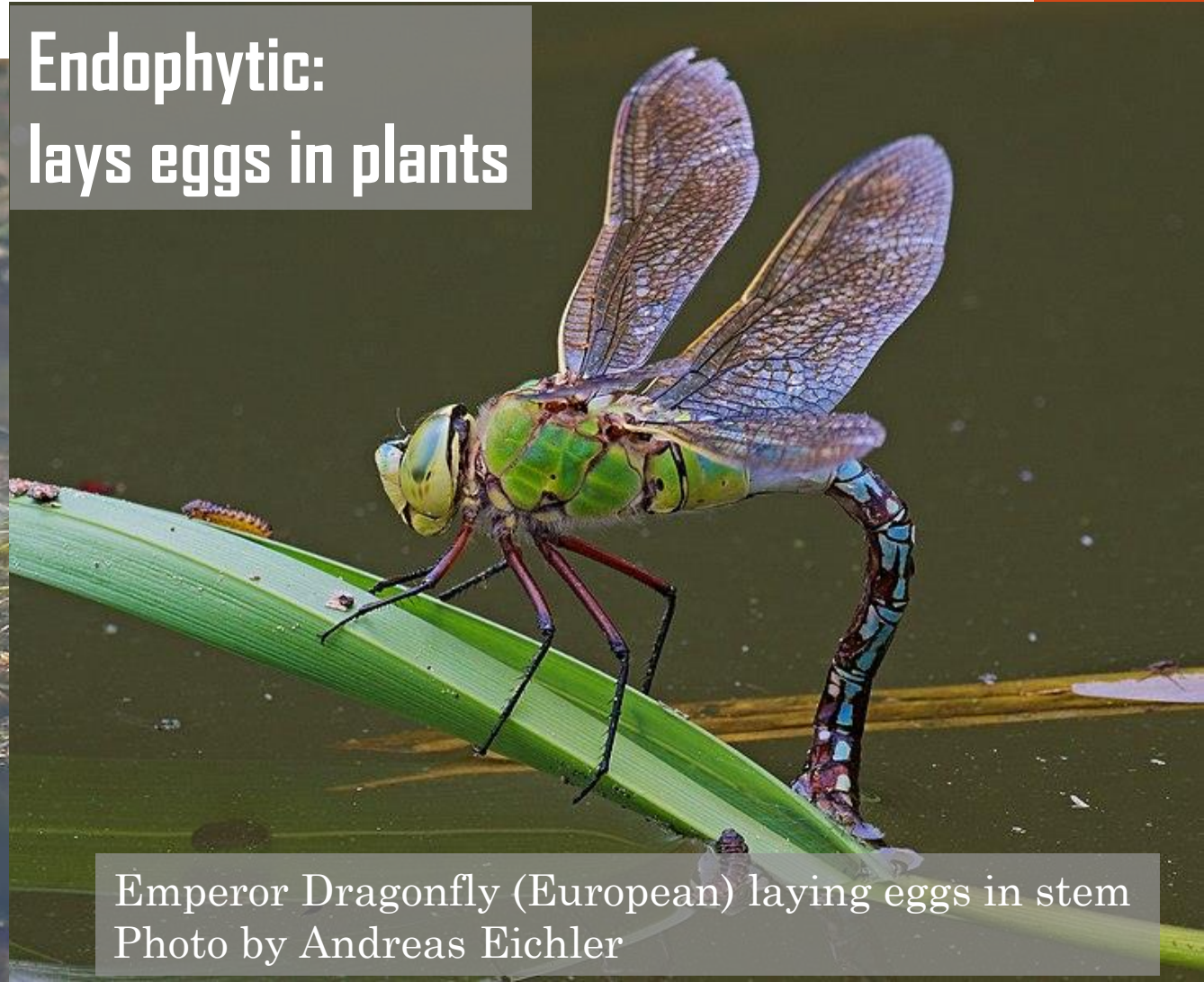
Laying Eggs

Exophytic:
lays eggs in water or soil



Eastern Amberwing depositing eggs
Photo by John Flannery

Endophytic:
lays eggs in plants



Emperor Dragonfly (European) laying eggs in stem
Photo by Andreas Eichler

Directly into water



Blue Dasher
(*Pachydiplax longipennis*)
Tom Hissong

Directly into water



Common Whitetail
(*Plathemis lydia*)
Dave McShaffrey

Directly into water



Common Baskettail
(*Epitheca cynosura*)
Jim Lemon

Directly into water



Black Saddlebags
(*Tramea lacerata*)
Dave McShaffrey

Directly into water




Autumn Meadowhawk
(*Sympetrum vicinum*)
Dave McShaffrey

Wet Wood



Swamp Darner
(*Epiaschna heros*)
Dave McShaffrey

Submerged Aquatic Vegetation

A photograph of two Common Green Darner dragonflies (Anax junius) perched on a submerged log in a pond. The dragonflies have green bodies with a prominent blue stripe along their abdomens and transparent wings. The water is dark and rippled, and the log is partially covered with green algae.

Common Green Darner
(*Anax junius*)
MaLisa Spring

Submerged Aquatic Vegetation



Citrine Forktail
(*Ischnura hastata*)
Dave McShaffrey

Submerged Aquatic Vegetation

A close-up photograph of a damselfly nymph (Eastern Forktail) resting on a dense mat of submerged aquatic vegetation. The nymph is light-colored with a prominent yellow-green patch on its thorax and a dark stripe along its abdomen. Its long, segmented legs are spread out on the plant matter. The water is dark and still, reflecting the light. In the background, a thin, light-colored stem or root of a plant extends into the water. The overall scene is a natural, underwater habitat.

Eastern Forktail
(*Ischnura verticalis*)
Dave McShaffrey

Submerged Aquatic Vegetation



Powdered Dancer
(*Argia moesta*)
Dave McShaffrey

Submerged Aquatic Vegetation



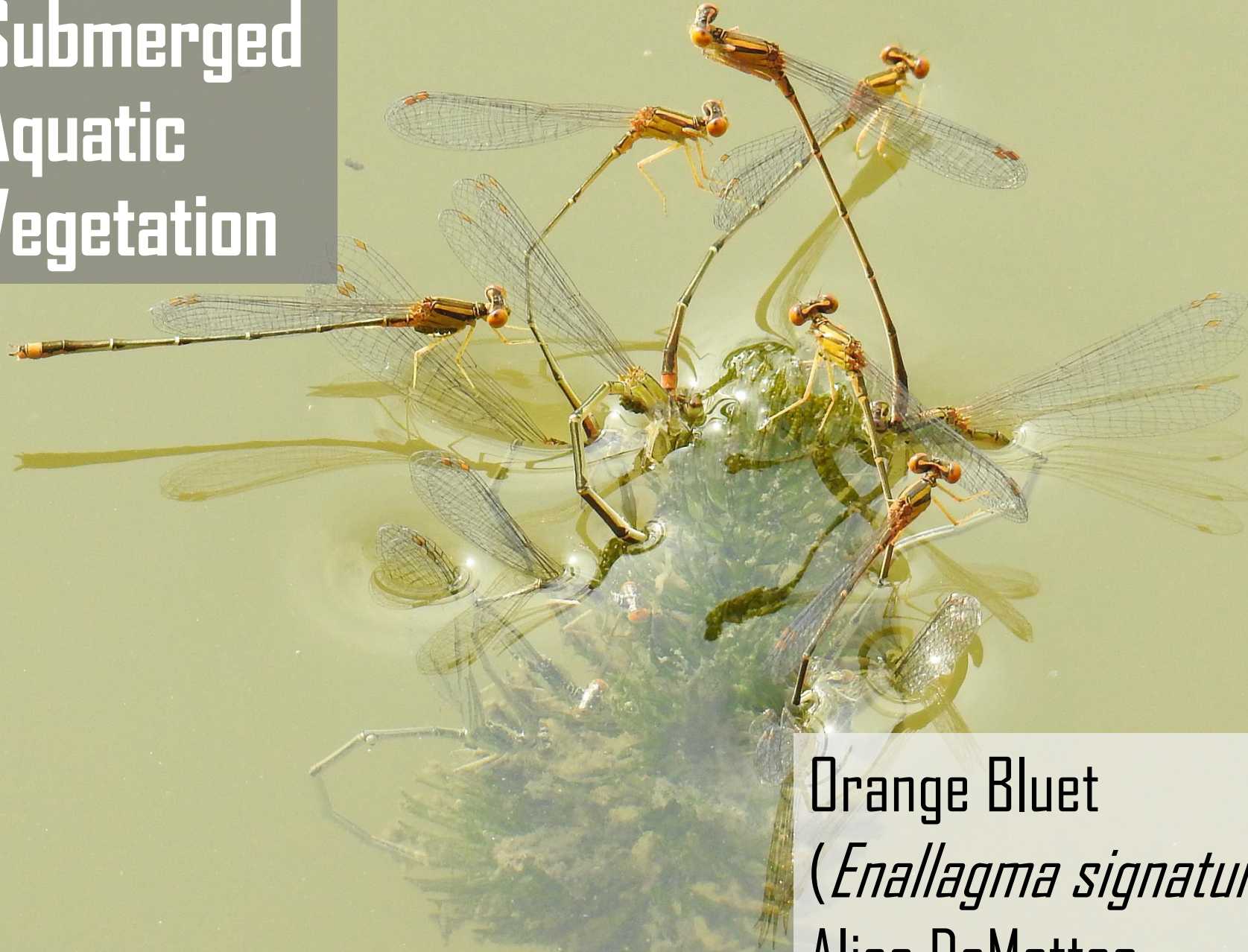
Dusky Dancer
(*Argia translata*)
Dave McShaffrey

Submerged Aquatic Vegetation



Slender Bluet
(*Enallagma traviatum*)
Dave McShaffrey

Submerged Aquatic Vegetation



Orange Bluet
(*Enallagma signatum*)
Alisa DeMatteo

Host plants?



White Waterlily
Nymphaea odorata



© Linda Gilbert



Lilypad Clubtail
Ariogomphus furcifer



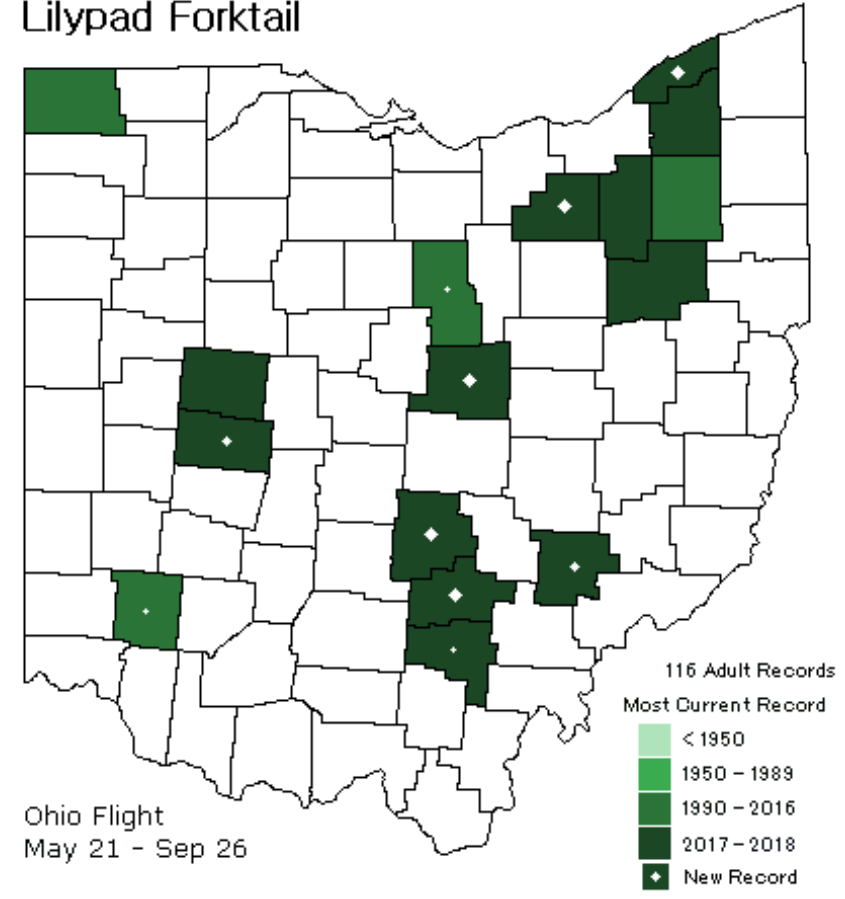
Lilypad Forktail
Ischnura kellicotti

Lilypad Forktail



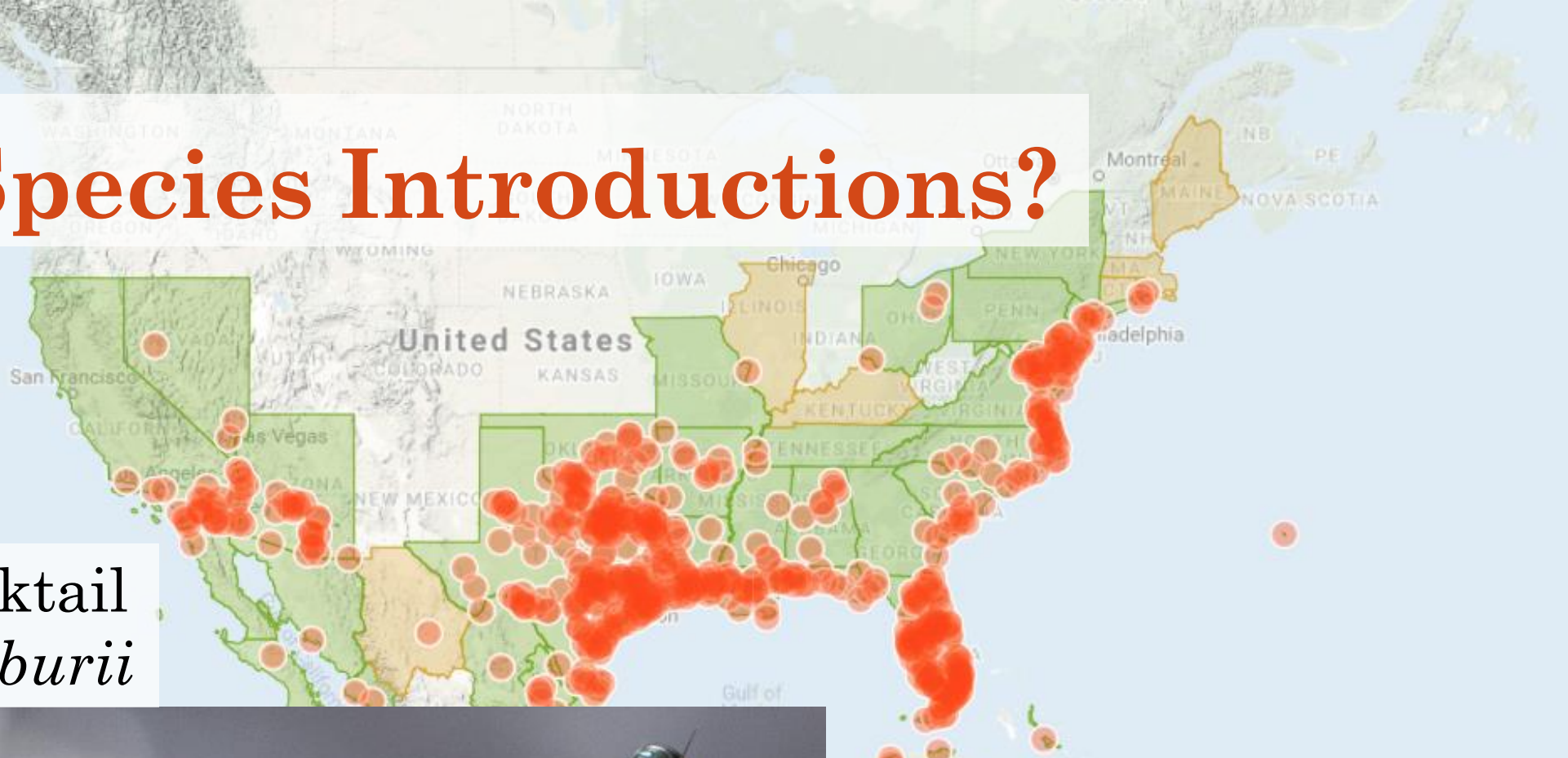
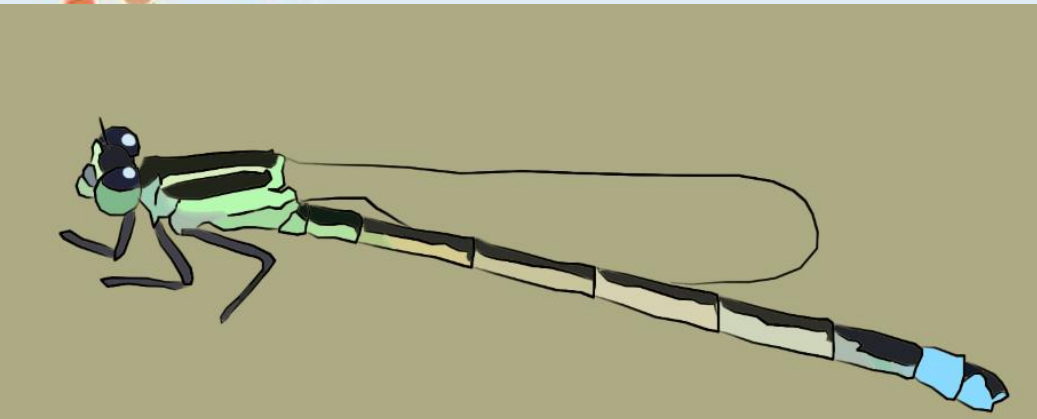
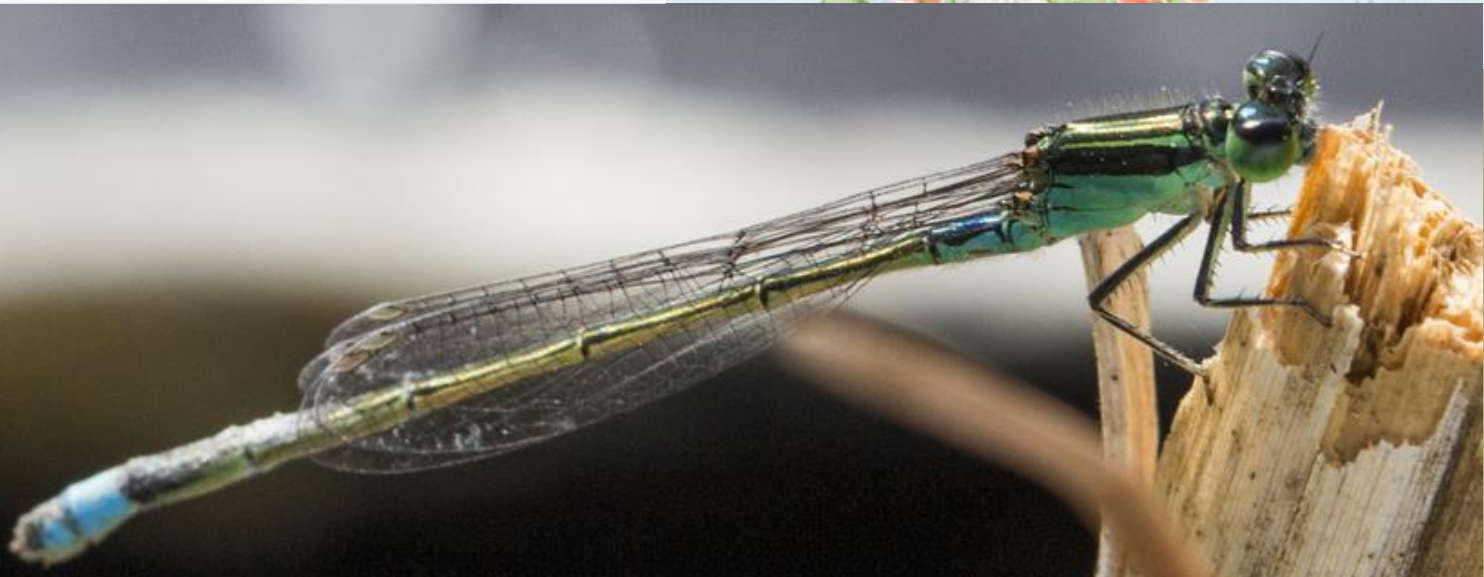
Ischnura kellicotti
Lilypad Forktail

Endangered



Species Introductions?

Rambur's Forktail
Ischnura ramburii



Only found in streams with
Water Willow (*Justicia
americana*)

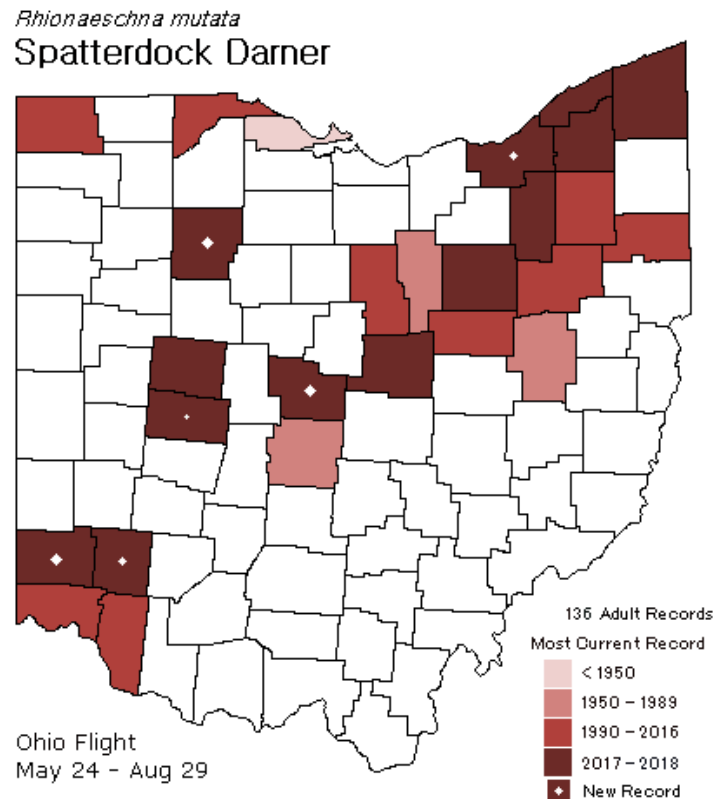


American Rubyspot
(*Hetaerina americana*)



Spatterdock Darner (*Rhionaeschna mutata*)

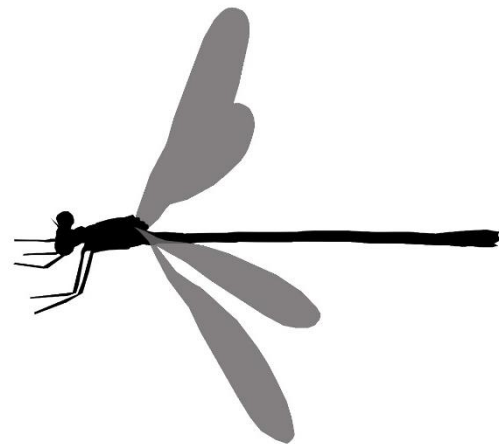
- Found at FISHLESS ponds with Spatterdock (*Nuphar* sp.)



© Jim Lemon

Spreadwing (*Lestes*) oviposition

- Bulrush (*Scirpus* spp): 5 Spreadwing species
- Cattail (*Typha* spp): 5 Spreadwing species
- Bur Reed (*Sparganium americanum*): 2 species
- Spikerush (*Eleocharis* spp): Lyre-tipped
- Bent Grass (*Agrostis* spp): Lyre-tipped
- Iris (*Iris* spp): Lyre-tipped
- Mannagrass (*Glyceria* spp): Spotted
- Waterweed (*Elodea* spp): Swamp
- Dock (*Rumex* spp): Slender



Bur Reed



Amber-winged Spreadwing
© Jerry Cannon

Host Plants?



Sweetflag
Acorus calamus

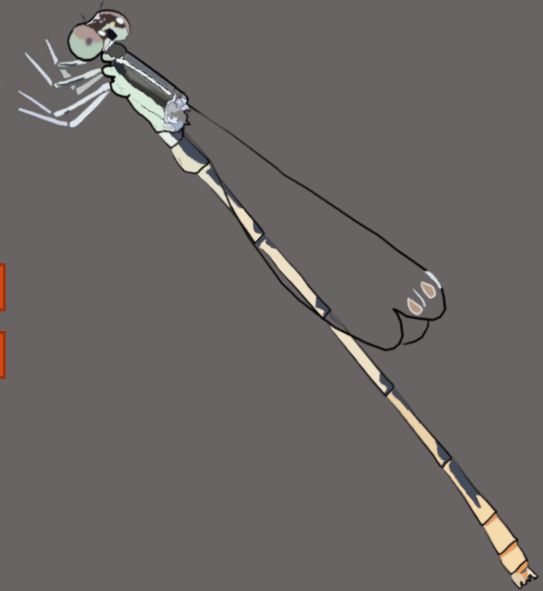
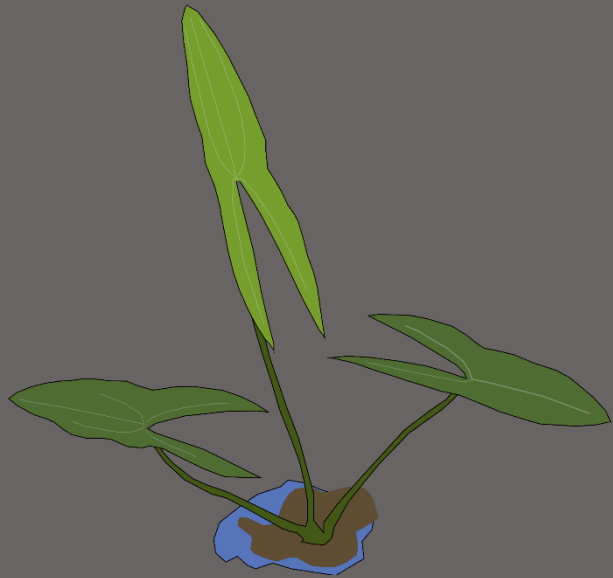


Sweetflag Spreadwing



© Malisa Spring

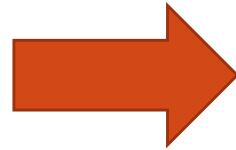
How are plants involved with dragonflies?



© Malisa Spring

More than just eggs!

- Food sources for dragons

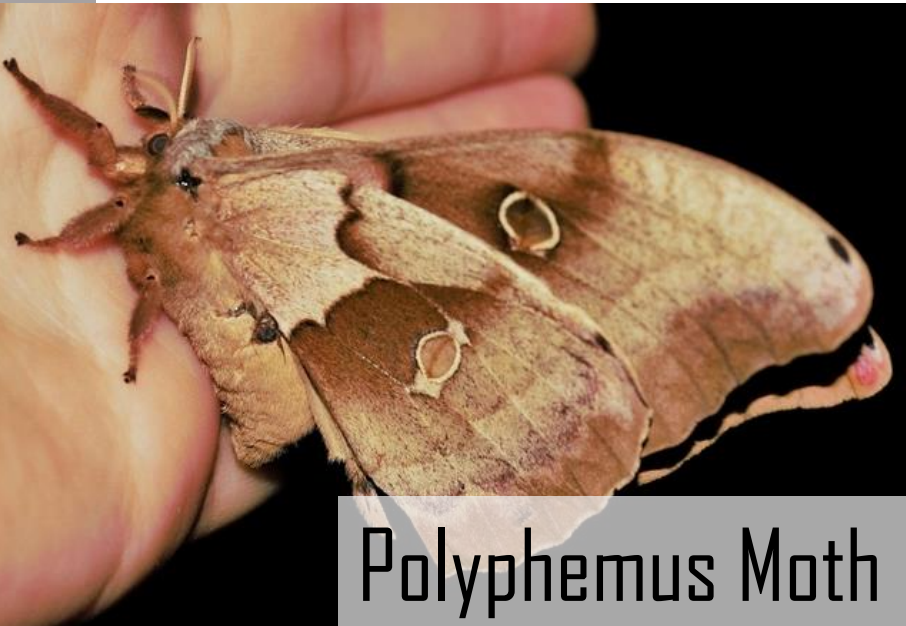


Doug Tallamy Research

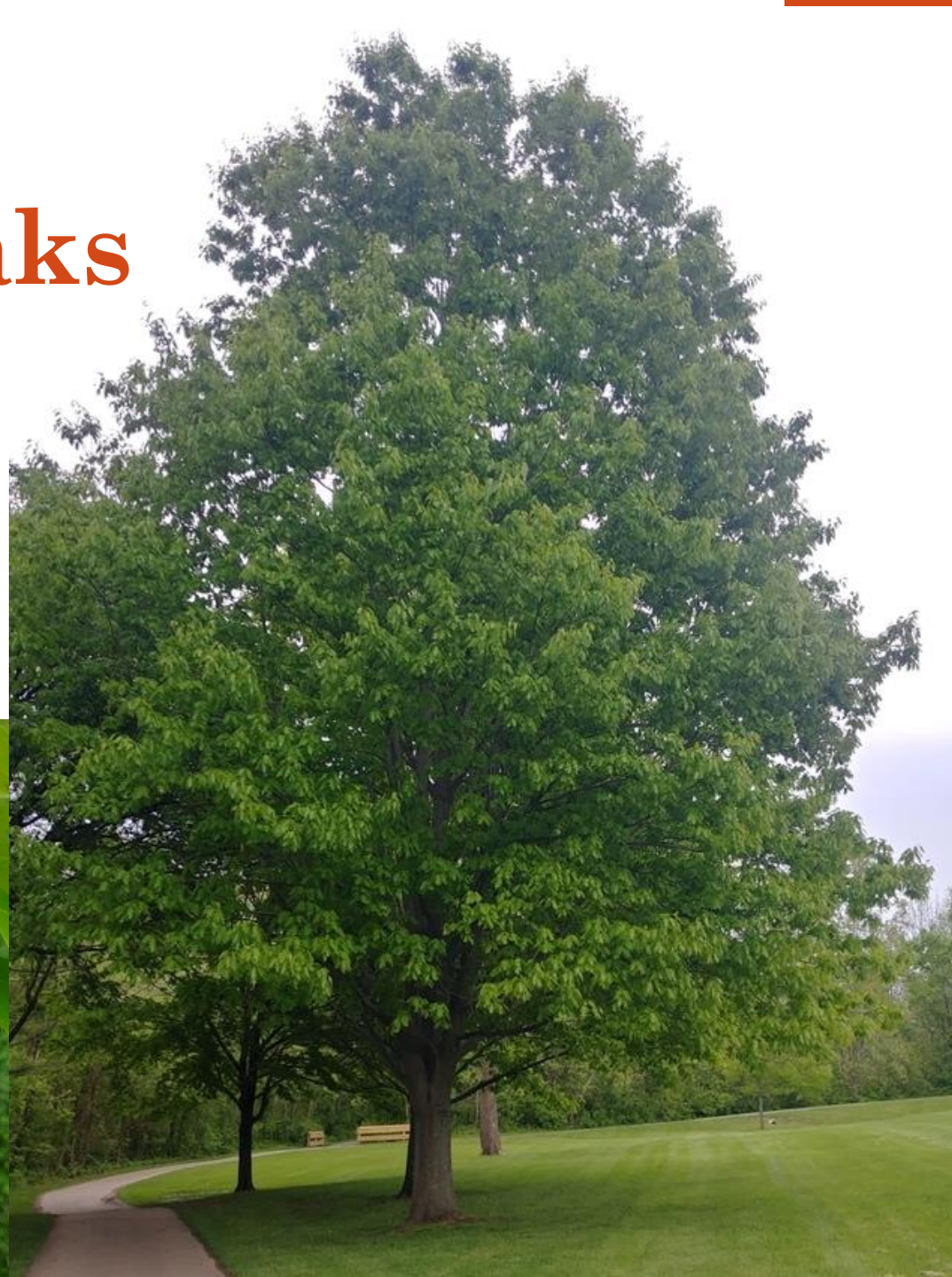
- **Anecdotal, but....**
- 4 native species (Black Oak, Black Cherry, Black Walnut, and Fox Grape)
- 5 exotic species (Autumn Olive, Mile a Minute weed, Oriental Bittersweet, Multiflora Rose, and Japanese Honeysuckle)
- Compared **herbivore*** diversity and biomass
 - → native plants produced over 4x more herbivore biomass and supported 3.2x more species

Example species: Oaks

- "A plant that has fed nothing has not done its job" (Tallamy)
- ~534 Lep species supported



Polyphemus Moth



Oak trees and Leps

- But do dragons eat that many moths???



Io Moth

Spiny Oak-slug Moth



Spun Glass Slug Moth



Smaller Parasa Moth





Temnothorax spp

©alexanderwild.com



©alexanderwild.com

Oak trees and Leafhoppers

- At least 41 genera of leafhoppers found on Pin Oaks! (Johnson and Freytag 2001)
- Across 3 years and only 10 trees, 31,659 leafhoppers were collected!



Citrine Forktail
Jim Lemon



Powdered Dancer
Nina Harfmann

Native plants for bees???

- Extreme specialists are at the most risk
- But, not all bees are so specialized



Spring Beauty Miner
(*Andrena erigeniae*)
MaLisa Spring



MaLisa Spring

Good nectar source
Host for at least 18
species of moths/butterflies

Buttonbush
(*Cephalanthus occidentalis*)

© MaLisa Spring

© MaLisa Spring



Hibiscus Bee
(*Ptilothrix bombiformis*)

Exotic plants for bees???



Bombus fervidus on
Red Clover (non-native)

- Caveat → they must produce pollen or nectar
- Many ornamental cultivars are bred to have more petal and color and less pollen/nectar



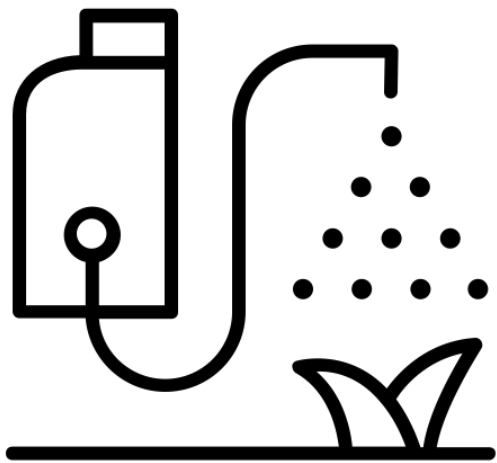
**Plants:
More than just eggs!
More than just future food!**

- Protection from predators: allow brush and tall vegetation at waters edge

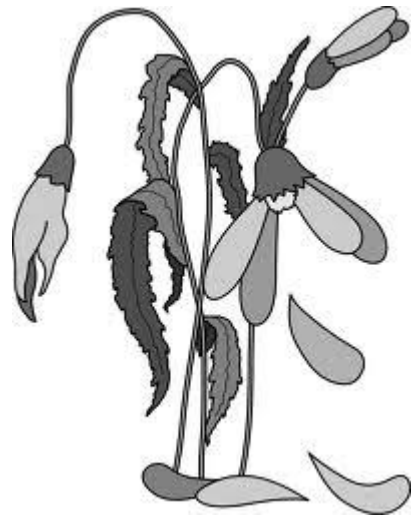


Native flora and herbicides

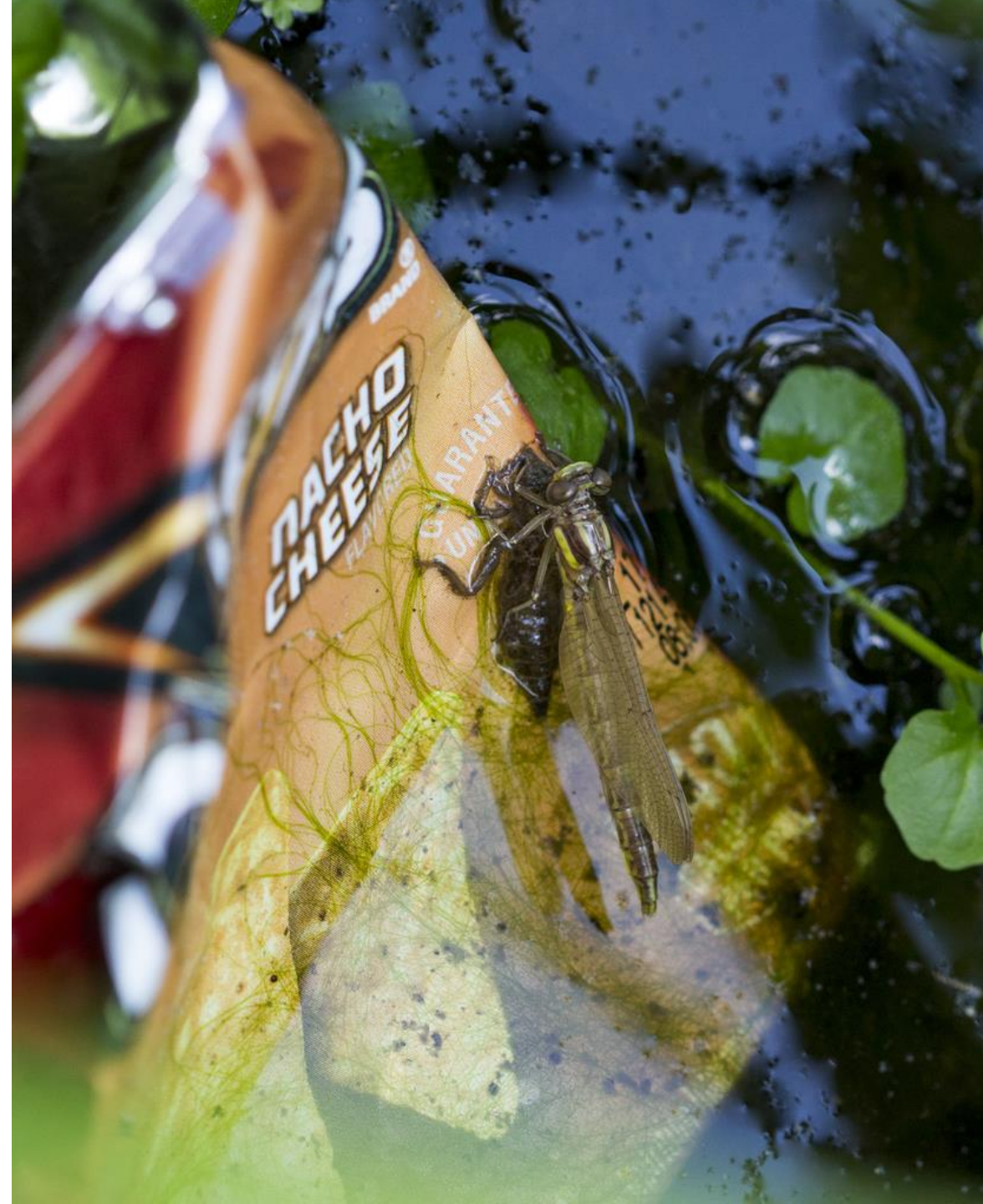
Herbicide Runoff



=



Created by Yu luck
from Noun Project



Water gardening

- Microhabitats are important!
- Some species only lay eggs in certain plants – have a variety
- Preferences:
 - Shade versus sun
 - Running versus still water
 - Water depth
 - Sandy versus muddy



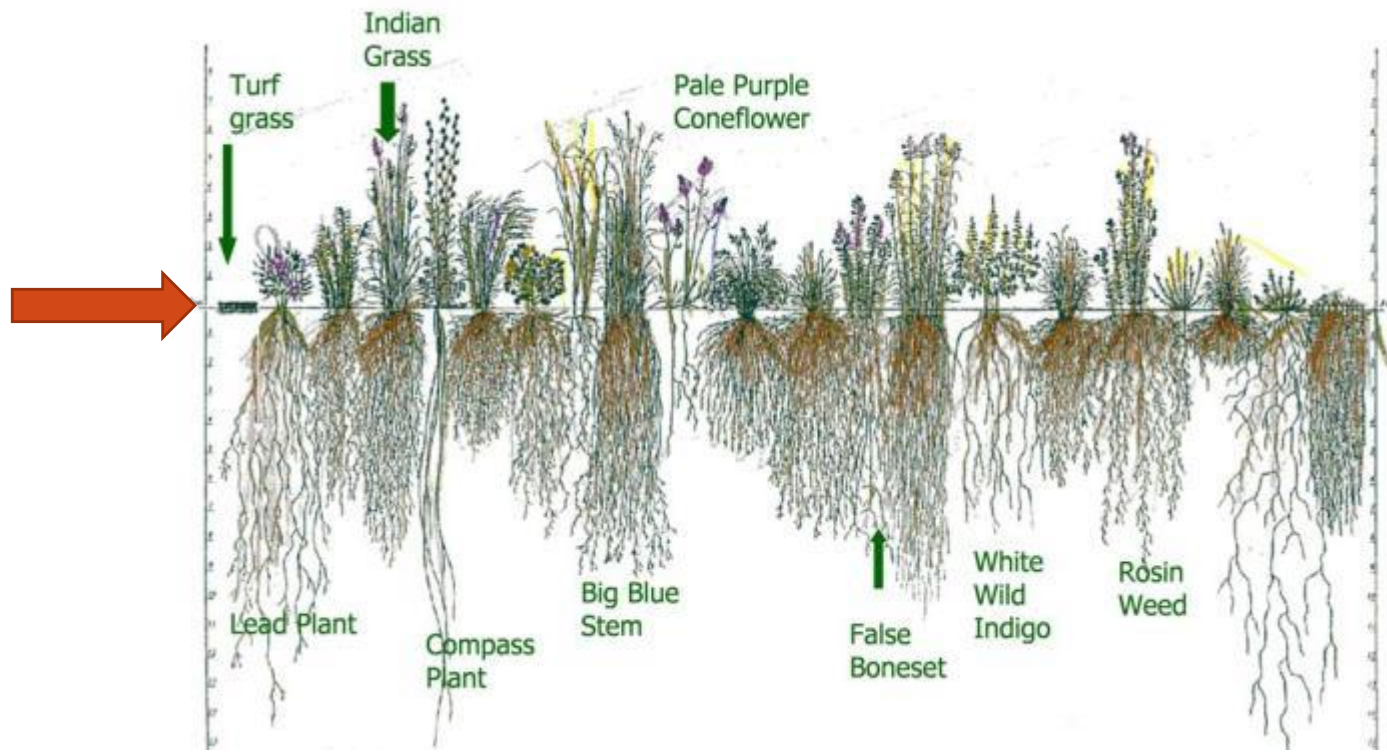
Pond/Lake management

- Avoid mowing all the way to the edge



Pond/Lake management

- Ponds mown to the water edges have problems with erosion that plants would otherwise stabilize



Schnormeier Gardens



Ponds: Fish or Fishless?

- Spatterdock darner
- Azure Bluet
- Comet Darner (*Anax longipes*)
- Mosquito Fish (*Gambusia* spp)???



© Jim Lemon



Duckweeds &
Mosquitos



Plant THIS
not THAT



Support this not that

BAD

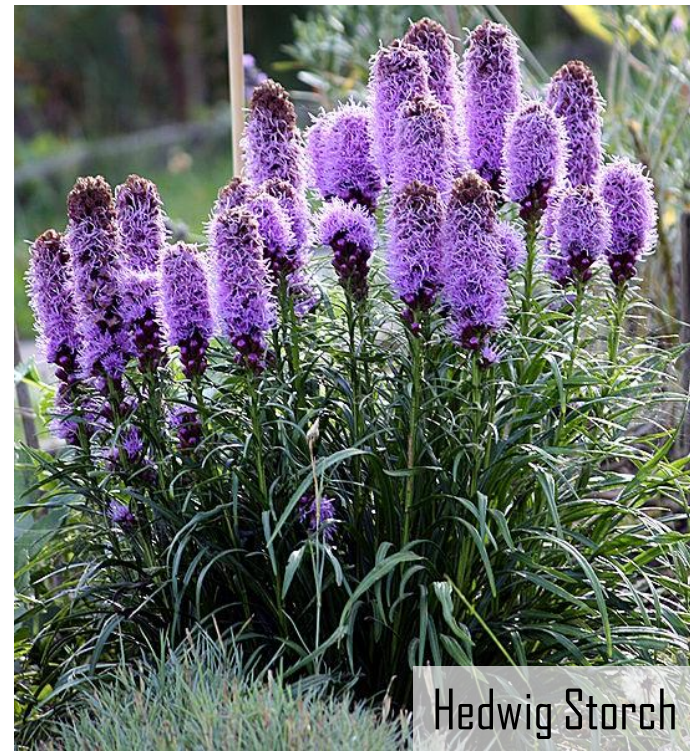
- Purple loosestrife
(*Lythrum salicaria*)



Illegal to sell
in Ohio now

GOOD

- Blazing Star –
Gayfeather (*Liatris spicata*)



Hedwig Storch

Support this not that

BAD – REPORT IF SEEN

- Water Chestnut
(*Trapa natans*)



Illegal to sell
in Ohio now

US Fish and Wildlife

GOOD

- Spatterdock
(*Nuphar advena*)



© Mark Warman

Support this not that

BAD – REPORT IF SEEN

- Water lettuce (*Pistia stratiotes*)



Please don't
buy this...

GOOD

- Pondweed (*Potamogeton spp*) ^{*Avoid}
P. crispus



Support this not that

BAD – REPORT IF SEEN

- Yellow Iris
(*Iris pseudocorus*)



GOOD

- Blue Flag Iris (*Iris versicolor*)



Support this not that

BAD – REPORT IF SEEN

- Water Hyacinth
(*Eichhornia crassipes*)



USDA

GOOD

- Pickerelweed
(*Pontederia cordata*)



Simon Pierre Barrette

Please don't
buy this...

Support this not that

BAD – REPORT IF SEEN

- European Frogbit
(*Hydrocharis morsus-ranae*)



Christian Fischer

GOOD

- White Waterlily
(*Nymphaea odorata*)



Malisa Spring

Illegal to sell
in Ohio now

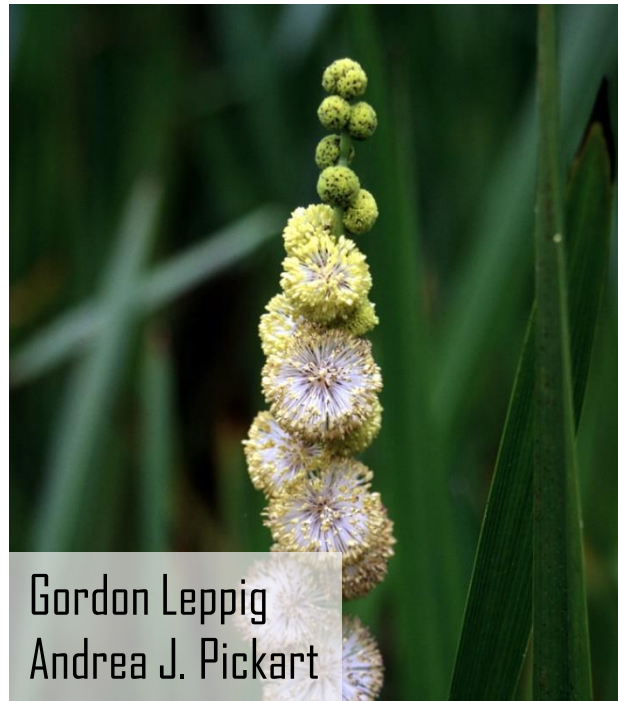
Phragmites australis

- 170 herbivorous insects feed on it is its native range
- Only 5 native herbivore species use it in North America (Tewksbury et al 2002)



Remove *Phragmites*?

- Attempt to source native *Phragmites*?
- Native Cattails (also hard to find)
- Consider Burr Reeds (*Sparganium spp*)!



Gordon Leppig
Andrea J. Pickart



Fungus Guy

Support this not that

BAD – REPORT IF SEEN

- Brazilian Waterweed (*Egeria densa*)

GOOD

- American or Nuttall's Waterweed (*Elodea canadensis* or *nuttallii*)



David Liu

Lara Gudmundsdottir



Christian Fischer

Invasive aquatic plants?



Hydrilla verticillata



Other Native Terrestrial plant options?

- Lots of cool terrestrial plants will support native insects, which can then be eaten by dragonflies



Plants MaLisa has had success with:

- Wild Senna
- Giant and Anise Hyssop
- Ironweed
- Lanceleaf Coreopsis
- Goldenrods
- Asters
- Many others

Ditch Stonecrop
Penthorum sedoides



Cardinal Flower
Lobelia cardinalis



Swamp Milkweed
Asclepias incarnata

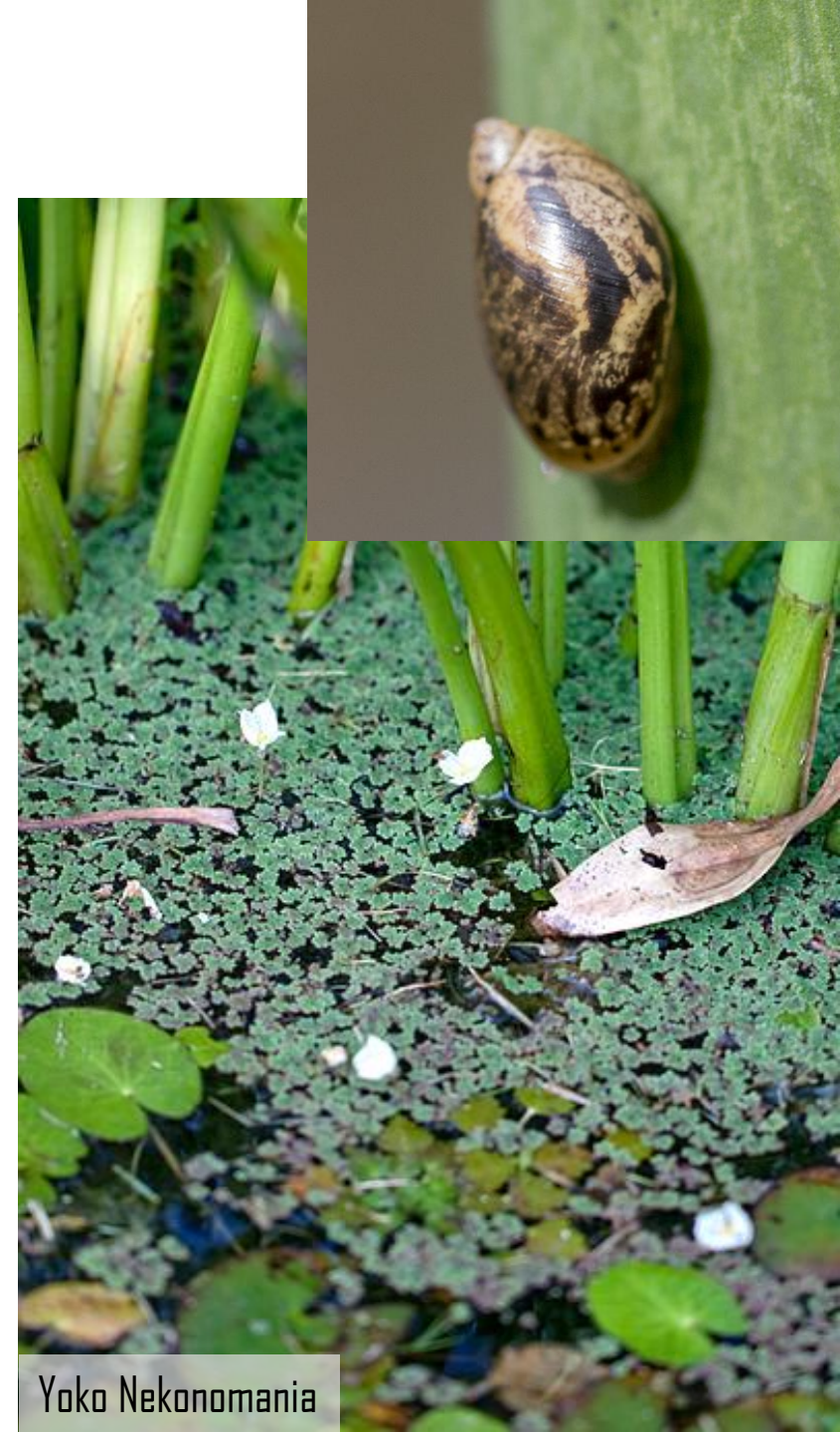


Cursed Crowfoot
Ranunculus sceleratus



On buying plants:

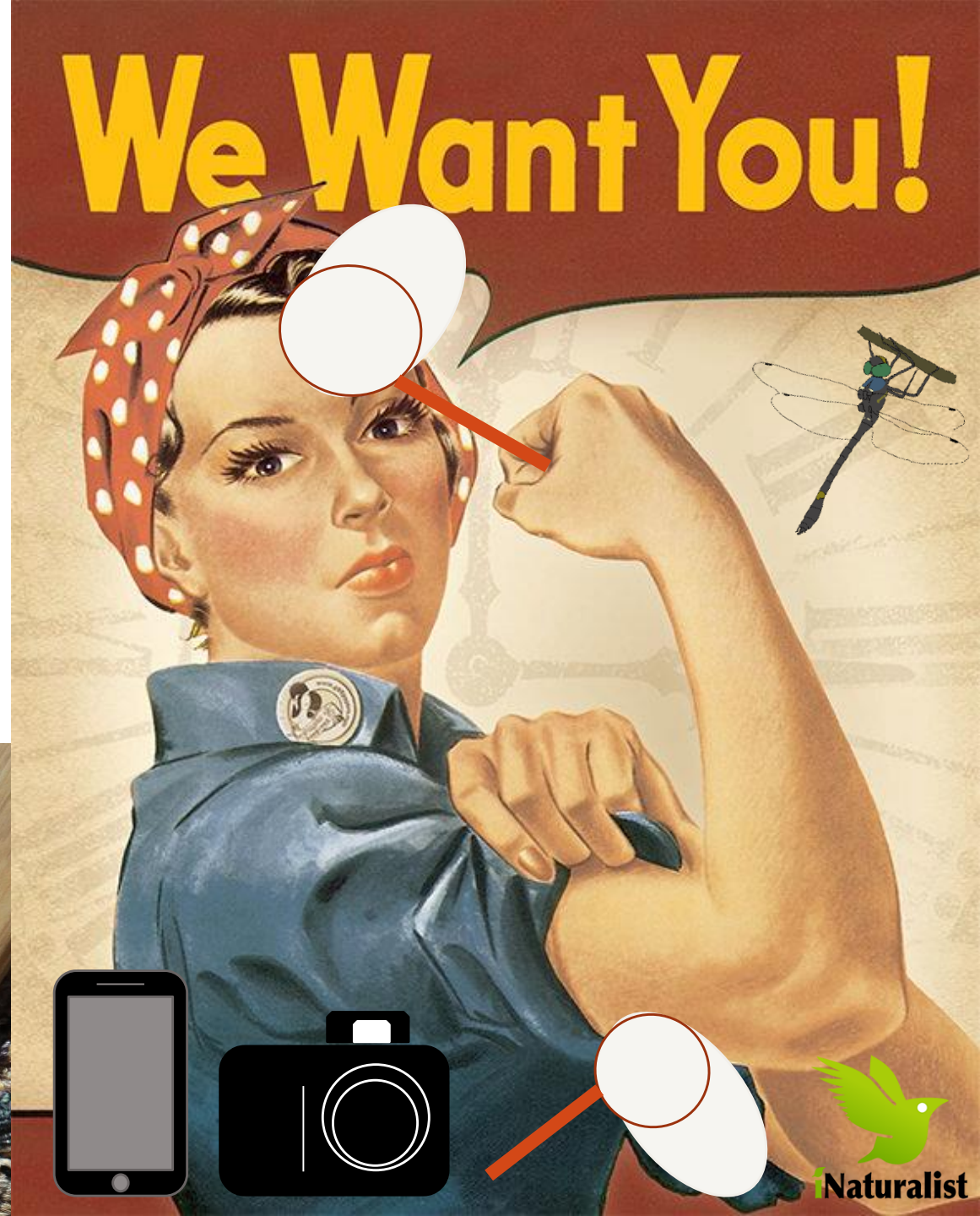
- Avoid non-native species
 - Many can still be legally sold in Ohio, so check scientific name to see if is native
- Check for hitchhikers!
- Consider a quarantine zone for new plants



Recruiting Volunteers

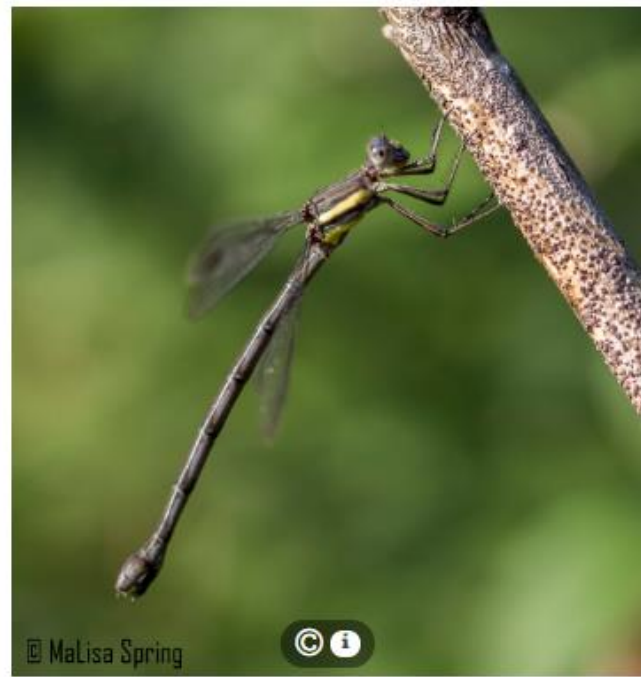
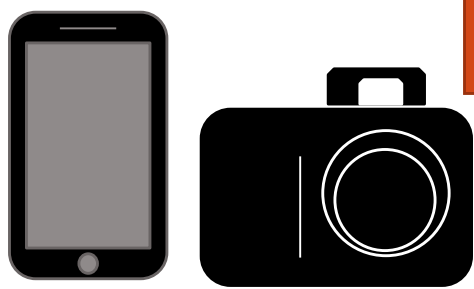
- Photo submissions
- Physical collections

Twelve Spotted Skimmer





- Phone app
- Computer

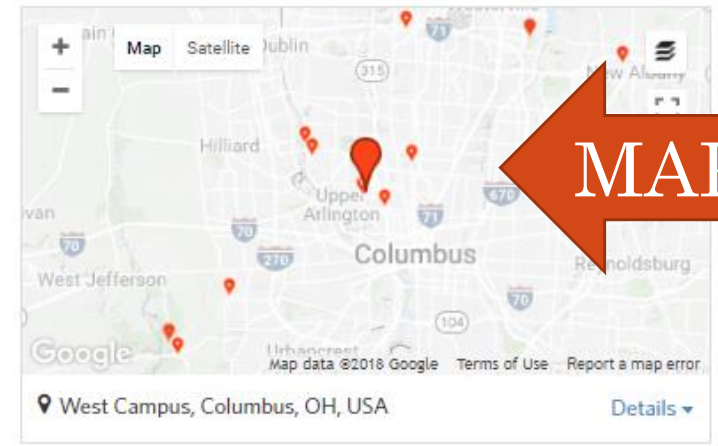


© MaLisa Spring



malisaspring
 📍 2,328 observations

Observed: Sep 19, 2018 · 5:20 PM EDT
 Submitted: Sep 20, 2018 · 8:26 PM EDT



Activity

malisaspring suggested an ID Improving 1mo

Great Spreadwing
Archilestes grandis Compare

briangooding suggested an ID 1mo

Great Spreadwing
Archilestes grandis

Community ID

Great Spreadwing (*Archilestes grandis*) VU

Cumulative IDs: 3 of 3

0 2/3rds 3

Agree Compare About

Annotations (2)

Ohio Based Projects on iNaturalist:



Summary of Gardening for Dragons

- Water-scaping
 - Think about egg locations
 - Avoid aquatic invasive plants
- Landscaping
 - Think about what produces the most insect biomass
 - What is good for insectivorous birds will be good for dragons

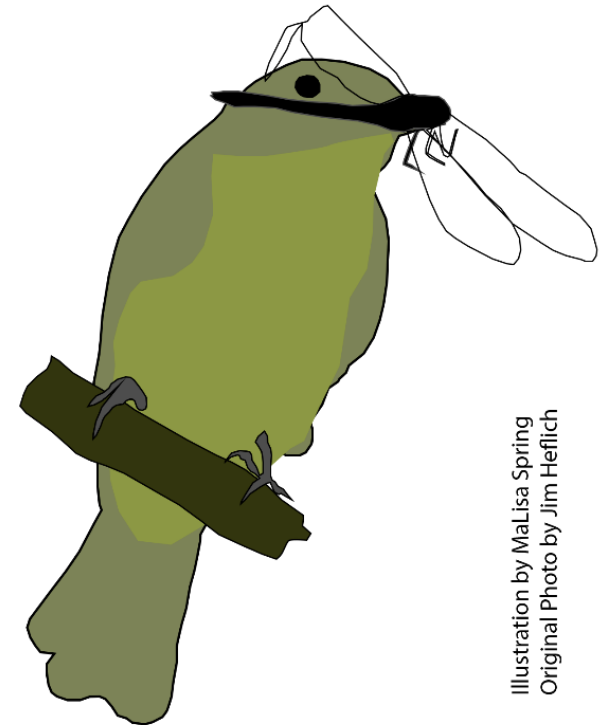


Illustration by MaLisa Spring
Original Photo by Jim Heflich

What can you do?

- **Document:** Submit photos to iNaturalist!
- **Protect:** Aquatic areas of all sorts
- **Grow:** Native plants, both aquatic and terrestrial

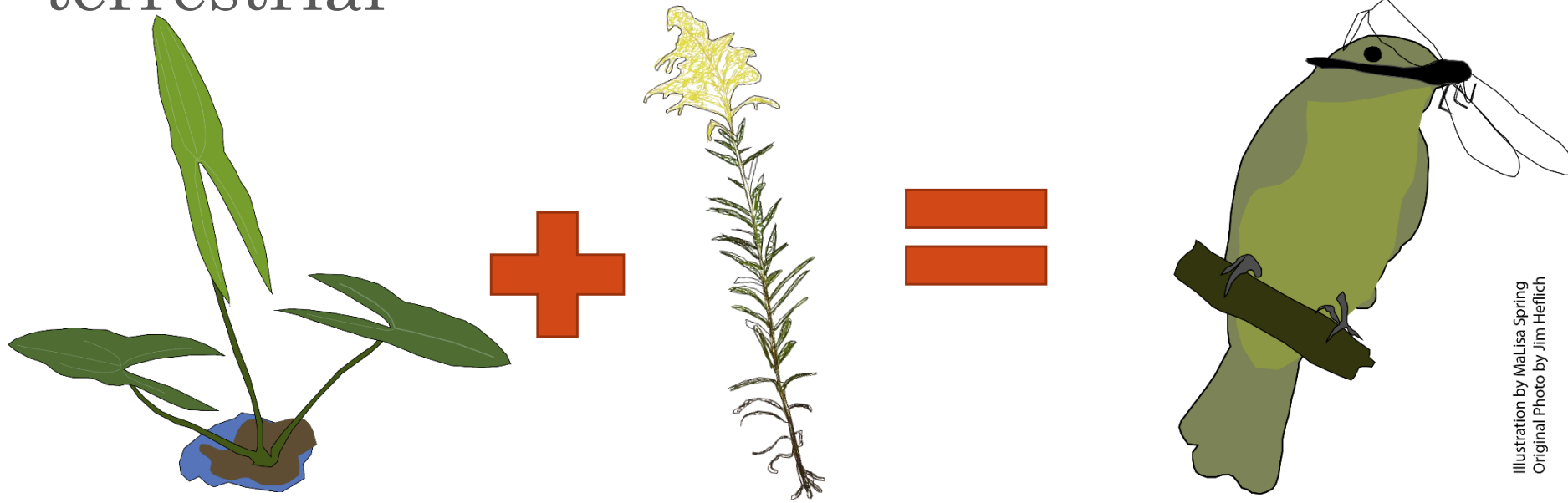


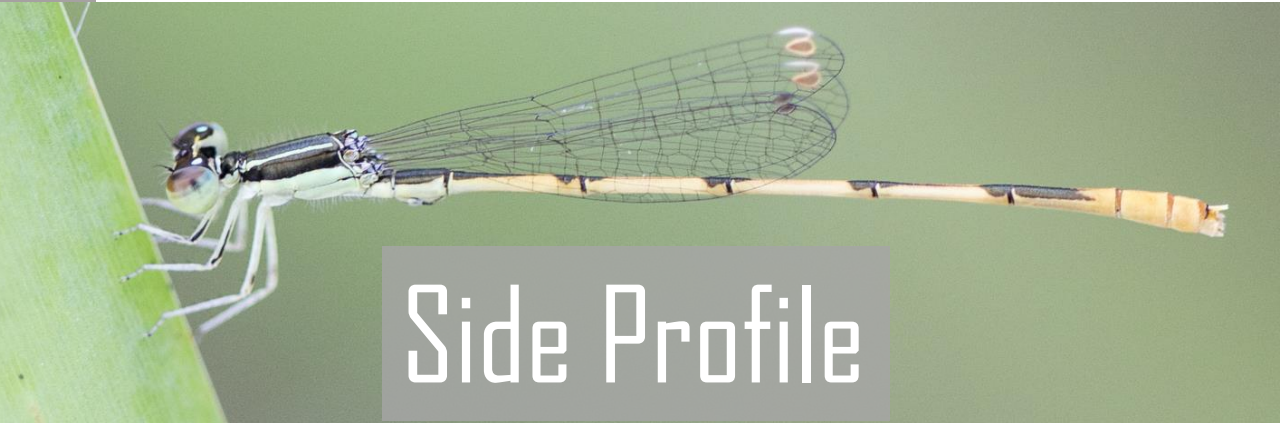
Illustration by MaLisa Spring
Original Photo by Jim Heflich

Dragonflies at the Mound: Photographing Dragonflies Blitz

- June 22 at 1:30 PM
- Infirmary Mound Park – Shelter 3
- A short presentation followed by an hour long walk looking for dragons
- Check Dragonfly Survey webpage for more events



Photography methods



Side Profile



Terminal appendages

Lestes rectangularis



Top Profile

© MaLisa Spring



THE OHIO STATE UNIVERSITY



Questions?

MaLisa Spring

spring.99@osu.edu

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or by the author



Dragonfly & Damselfly Records from Ohio!



Submit photos
to [iNaturalist.org](https://www.inaturalist.org)



Other Cool Plants



Glade Mallow
Napaea dioica



Spikerushes
Genus *Eleocharis*

Lanceleaf Frogfruit

Phyla lanceolata



Black Elderberry
Sambucus canadensis

