Riparian Forest Buffers for Wildlife and Pollinators

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We all know the many benefits of RFBs

- Improve water quality
- Improve herd health
- Improve ag production
- Increase ag profits
- Reduce flooding
- Replenish clean groundwater
- Lower costs of water treatment
- Increase property values
- Make stream habitable for fish and aquatic fauna
- Pollinator habitat
- Wildlife habitat
- Source of edible fruits, mushrooms, other forest products

The good stuff.

In a heavily forested landscape, riparian corridor still unique and important

- Unique vegetative community
- Receives periodic disturbance – critical for many species
  - And more susceptible to invasions!
- Corridor for movement

What about other landscapes?

Keep in mind that PA is only 59% forested.

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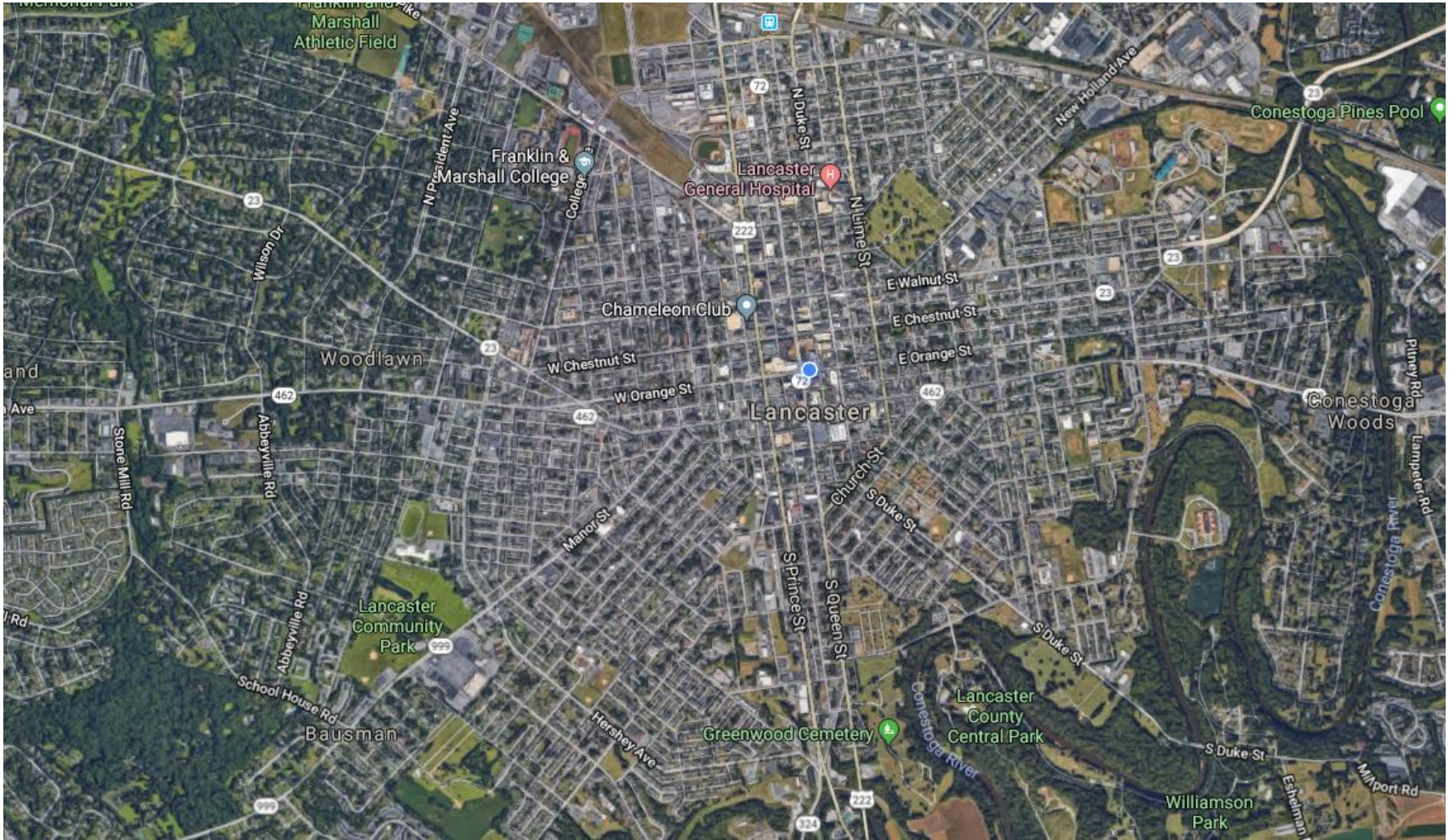


What about other landscapes?

Keep in mind that PA is only 59% forested.

Even if your area *is* mostly forested, how healthy is your landscape?

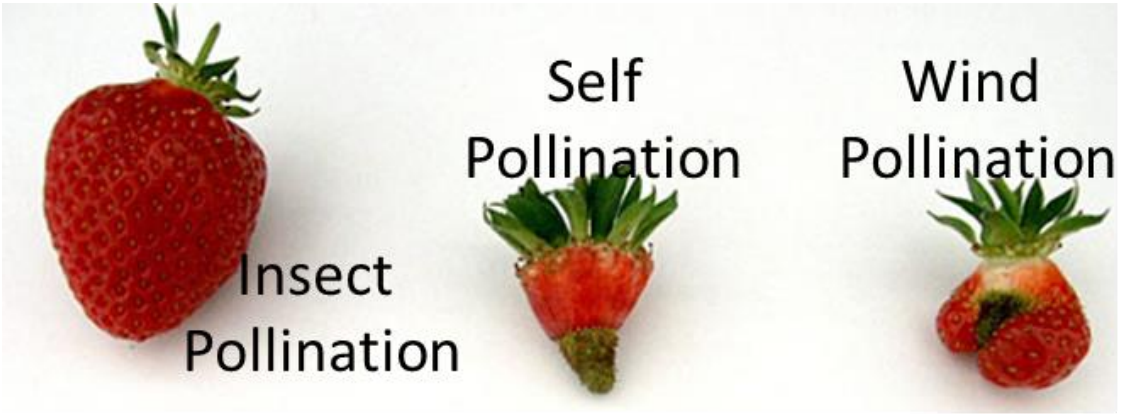
- Do you have an understory? A midstory?

Streamside forests can provide habitat in an otherwise empty landscape

And can provide diverse communities of young forest

Even if you don't intrinsically value wildlife, humanity relies on wild pollinators

- **90%** of flowering plants use insect pollination
- Pollinators are critical for ecosystem health and our agriculture and forestry industries
- Annually add $259 million just to PA ag industry



Honey bees are not enough

- Effective because we can manage them
- However, Colony Collapse Disorder is devastating hives
- Habitat for native insects = “diversified portfolio” of pollinators
- Native insects boost yield up to **x5 production**

Pollinators, and flying insects in general, are in huge trouble

- Lack of habitat
- Decreased floral diversity
- Exposure to insecticides
- Pests and pathogens
- CLIMATE CHANGE

More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Caspar A. Hallmann, Martin Sorg, Eelke Jongejans, Henk Siepel, Nick Hofland, Heinz Schwan, Werner Stenmans, Andreas Müller, Hubert Sumser, Thomas Hörren, Dave Goulson, Hans de Kroon

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Yeah, but that's in Germany…

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Looks like pretty darn good insect habitat to me.

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RFBs can be part of the solution!

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Integrating habitat into RFBs is simple

- Only mow what's required for good establishment
- If invasives are controlled, usually have great habitat; abundant forbs
- Plant **diverse** species with consideration for pollinators and wildlife

Planting considerations for wildlife

- Mast-producing trees/shrubs
- **Dense shrub cover**

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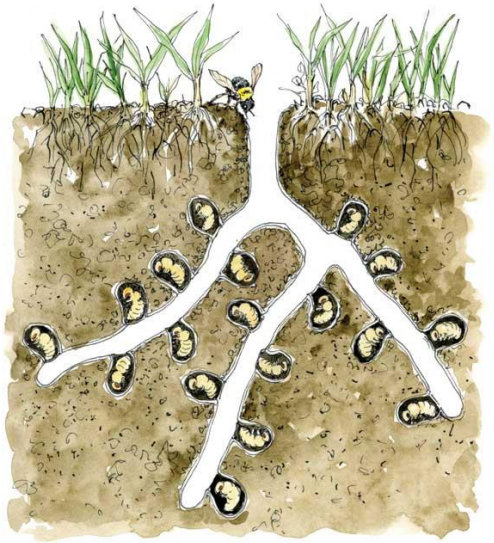
What about pollinators?

First, what *are* native pollinators?

- Bumble Bees
- Sweat Bees
- Flies
- Butterflies/Moths
- Wasps (**not** yellow jackets/hornets)
- Beetles

First, what are native pollinators?

- 95% solitary (do not swarm, only sting in self-defense, many males have no stinger)
- 70% nest underground, rest in woody debris
- Eat nectar and/or pollen from flowering plants



Pollinator Habitat Needs

- Water
- Minimal insecticide application
- Nesting Sites
  - Undisturbed soil, retained plant debris (woody and herbaceous)
- Overwintering habitat – retained debris, leaf litter
- Diverse, abundant flowering plants
  - Overlapping blooming periods March-Oct so that there is never a gap

Buffers meet these conditions!!

And are most often on marginal land anyway

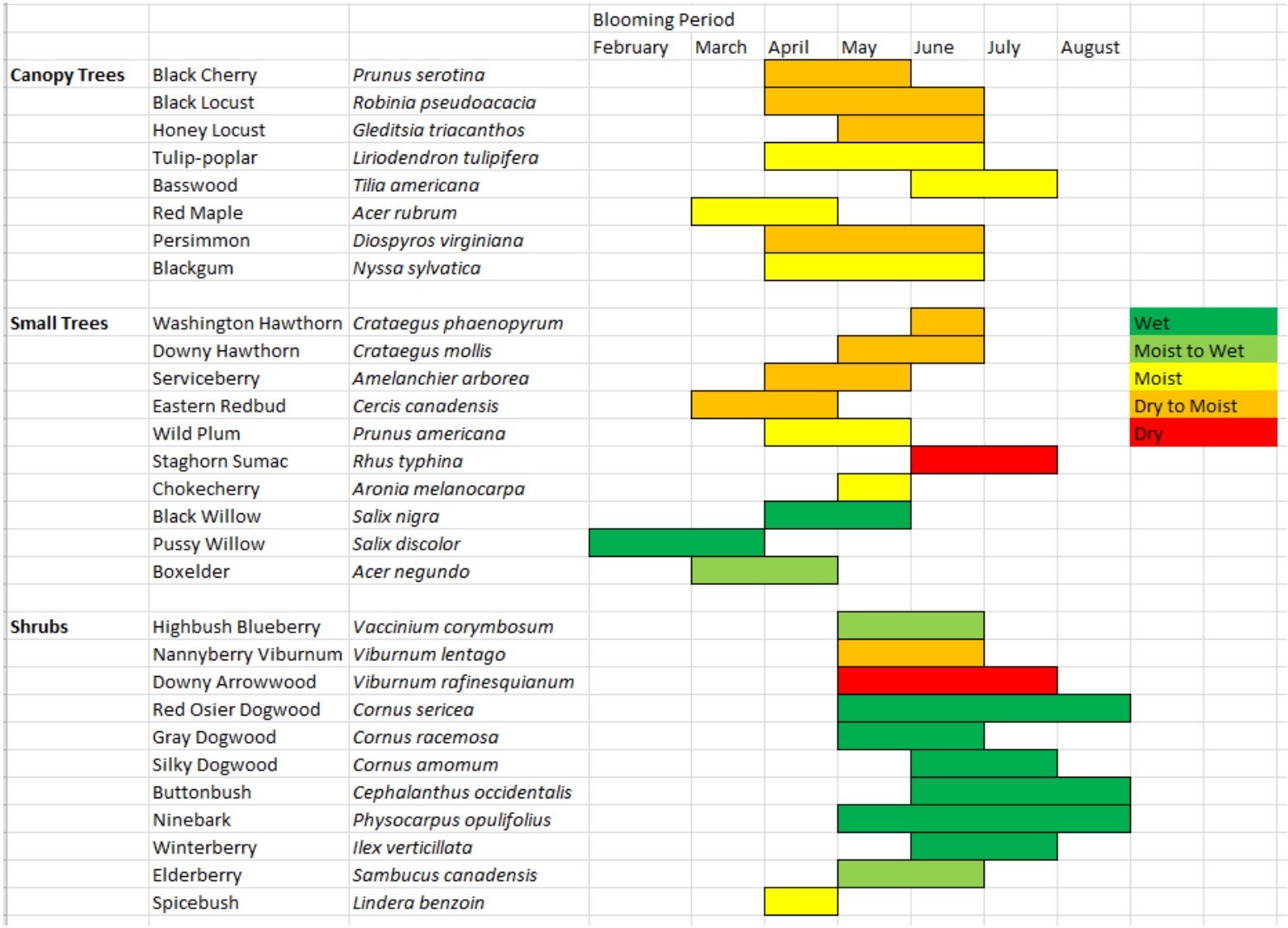
A word on Lepidopterans

- Many have specific requirements for larval food
- Caterpillars are key components of food chain
- **Best Practice: Diversity of native plants**

Native Woody Plant Genera		
Common Name	**Plant Genus**	**Butterfly/moth species supported**
Oak	*Quercus*	534
Black cherry	*Prunus*	456
Willow	*Salix*	455
Birch	*Betula*	413
Poplar	*Populus*	368
Crabapple	*Malus*	311
Blueberry	*Vaccinium*	288
Maple	*Acer*	285
Elm	*Ulmus*	213
Pine	*Pinus*	203
Hickory	*Carya*	200
Hawthorn	*Crataegus*	159
Spruce	*Picea*	156
Alder	*Alnus*	156
Basswood	*Tilia*	150
Filbert	*Corylus*	131
Walnut	*Juglans*	130
Beech	*Fagus*	126

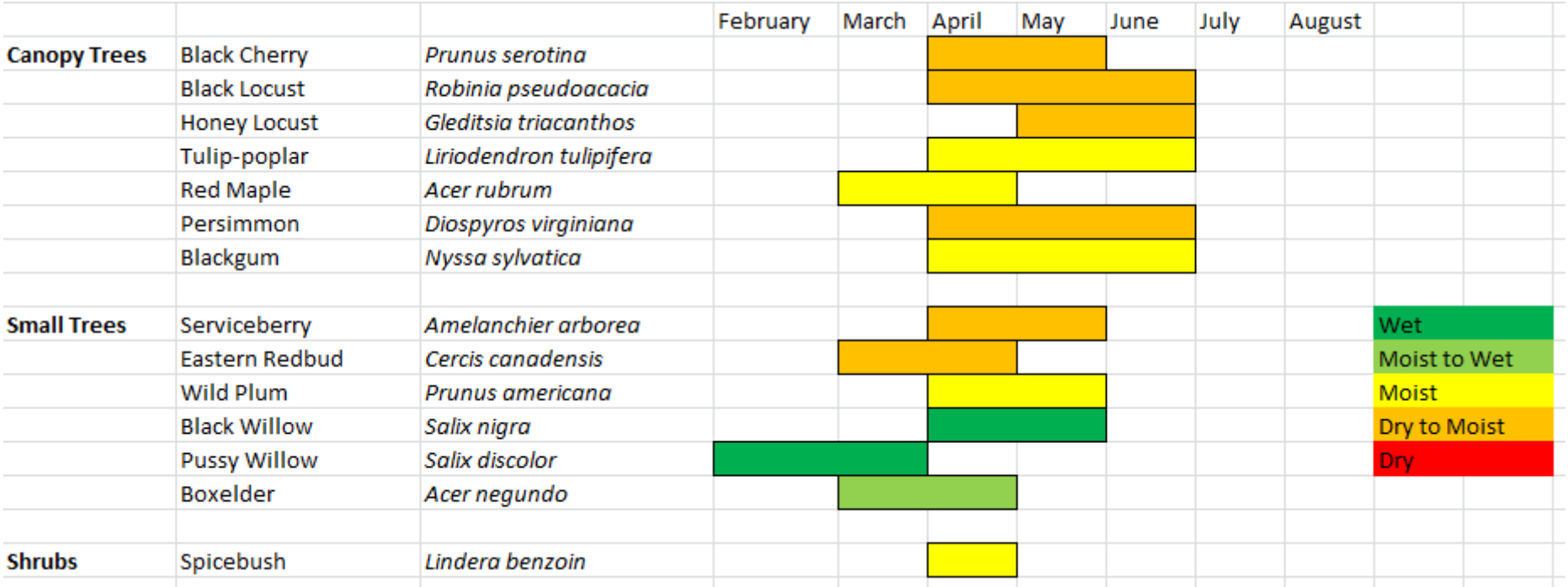
Native Herbaceous Plant Genera		
Common Name	**Plant Genus**	**Butterfly/moth species supported**
Goldenrod	*Solidago*	115
Asters	*Aster*	112
Sunflower	*Helianthus*	73
Joe pye, Boneset	*Eupatorium*	42
Sedges	*Carex*	36
Lupine	*Lupinus*	33
Violets	*Viola*	29
Geraniums	*Geranium*	23
Black-eyed susan	*Rudbeckia*	17
Evening primrose	*Oenothera*	16
Milkweed	*Asclepias*	12
Verbena	*Verbena*	11
Beardtongue	*Penstemon*	8
Phlox	*Phlox*	8
Bee balm	*Monarda*	7
Little bluestem	*Schizachyrium*	6
Cardinal flower	*Lobelia*	4

Plant Species with Continuous Blooming Periods to Provide Habitat as Canopy Closes



Early Bloomers

- **Black Willow**
- **Pussy Willow**
- **Redbud**
- **Maples**
- Tulip-poplar
- Black Locust
- Serviceberry
- Spicebush



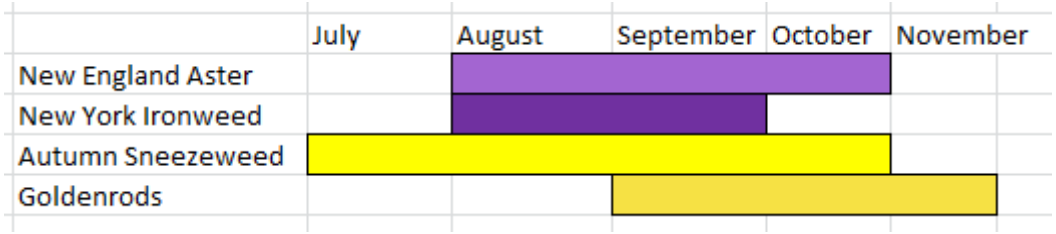
Late Bloomers

- **Basswood!**
- **Red-osier Dogwood!**
- Buttonbush
- Ninebark

			Blooming Period							
			February	March	April	May	June	July	August	
Canopy Trees	Basswood	*Tilia americana*								
										Wet
Small Trees	Staghorn Sumac	*Rhus typhina*								Moist to Wet
										Moist
Shrubs	Downy Arrowwood	*Viburnum rafinesquianum*								Dry to Moist
	Red Osier Dogwood	*Cornus sericea*								Dry
	Silky Dogwood	*Cornus amomum*								
	Buttonbush	*Cephalanthus occidentalis*								
	Ninebark	*Physocarpus opulifolius*								
	Winterberry	*Ilex verticillata*								

What about Aug-Oct?

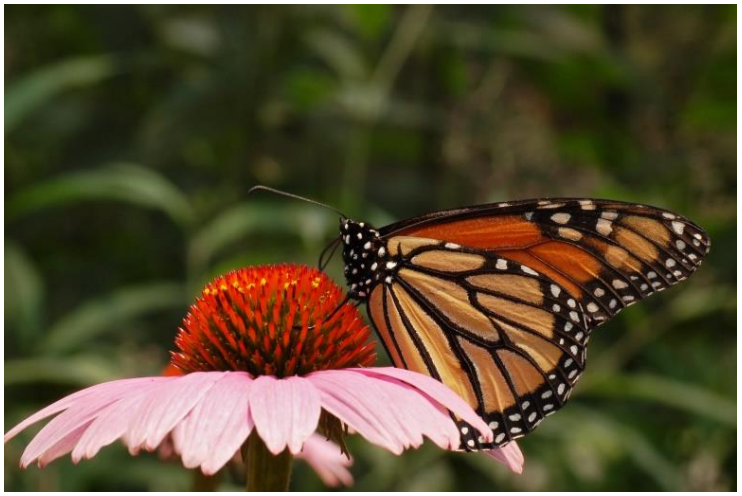
- Lean on a healthy herbaceous layer
- Our most common “weeds” bloom late
- Seeding herbaceous native plants is possible
- Often in seed bank, but can get outcompeted by invasive exotics (reed canary)
- CREP, other programs allow herbaceous buffer



Planting more RFBs is an excellent way to boost wildlife populations

3 fundamental principles of ecology:

- More plant species = more animal species
- More plant structural diversity = more animal diversity
- More habitat connectivity = stronger populations



And conversely, creating wildlife habitat is a great persuasive tool to get RFBs planted

A focus on pollinators specifically is very powerful.

There are a lot of landowners who want *less* deer and songbirds.

A focus on pollinators specifically is very powerful.

But the landowner who doesn't want more pollinators is very rare.

Pitching Buffers with Pollinators

- Most citizens are concerned about pollinators, sometimes more than water quality
- Can help change the calculus of “is it worth losing some pasture?” or “but it doesn’t look pretty”

Native Bees: Gateway Bugs

Pitching Buffers with Pollinators

- Cover crops, no-till, plant diversity critical for soil health
- Healthy riparian forests critical for stream health
- Pollinator habitat critical for *ecosystem* health

- Bringing pollinators back to a farm will likely benefit the landowner more than the water quality improvement will

Pitching Buffers with Pollinators

- Current paradigm shift towards buffers that are more useful to landowner (“Multifunctional Buffers”, Agroforestry)
- Pollinator habitat should be one of the many functions that a buffer is fulfilling, always

Pitching buffers with pollinators also helps landowners understand that we're doing more than just trying to clean up the Bay (Chesapeake or Delaware!)

Questions?

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