

# On-farm Habitats and Habitat Farming

Claudia Knab-Vispo

Hawthorne Valley Farmscape Ecology Program



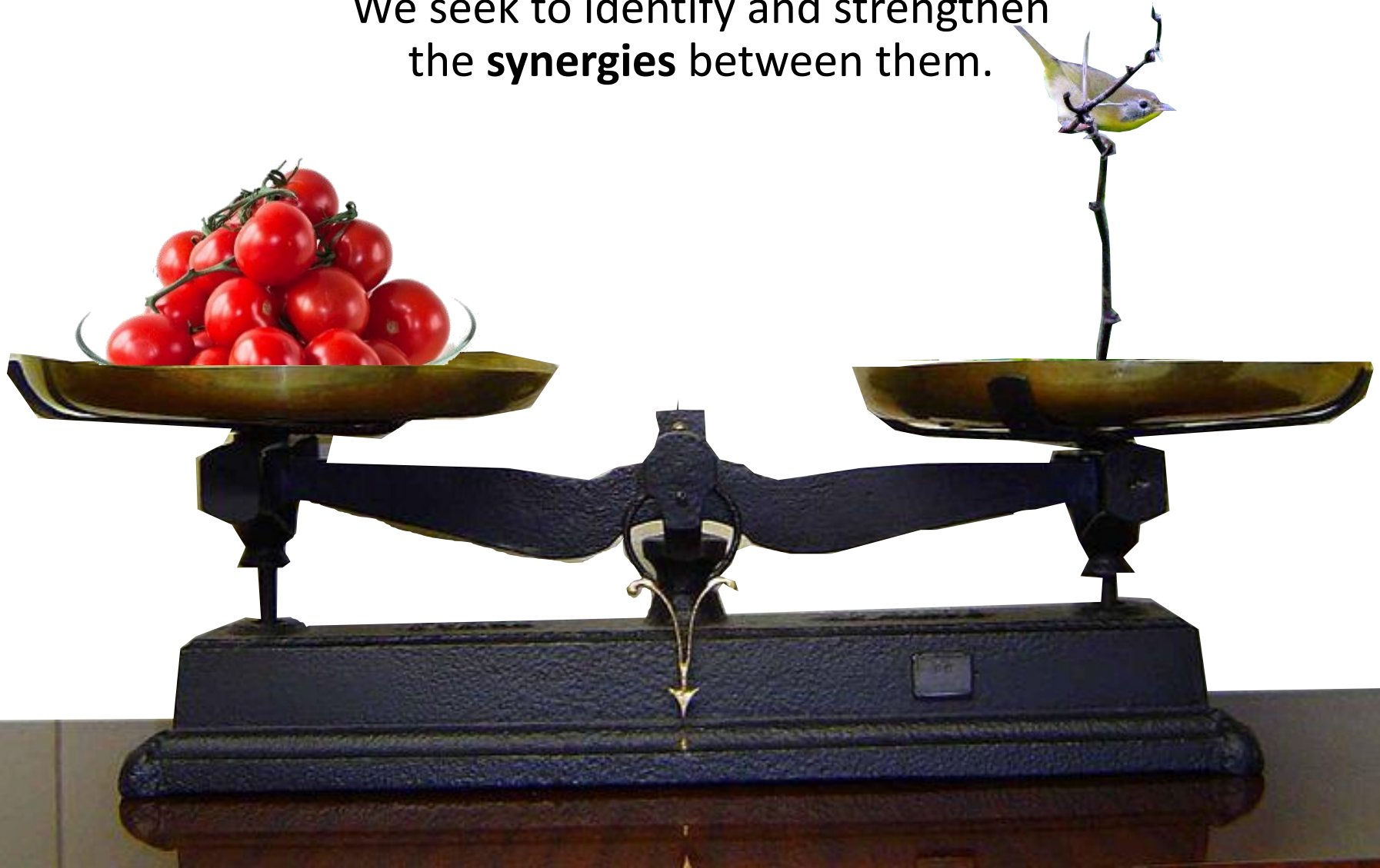
Food production and nature conservation  
are both very important and need to be balanced.





Food production and nature conservation  
are both very important and need to be balanced.

We seek to identify and strengthen  
the **synergies** between them.





While we expect farmers to produce most of our food, we obviously can't put all the responsibility for nature conservation on them at the same time.





If we want to stem the global decline of wild organisms, there is an urgent need for nature conservation across landscapes, using a variety of tools.













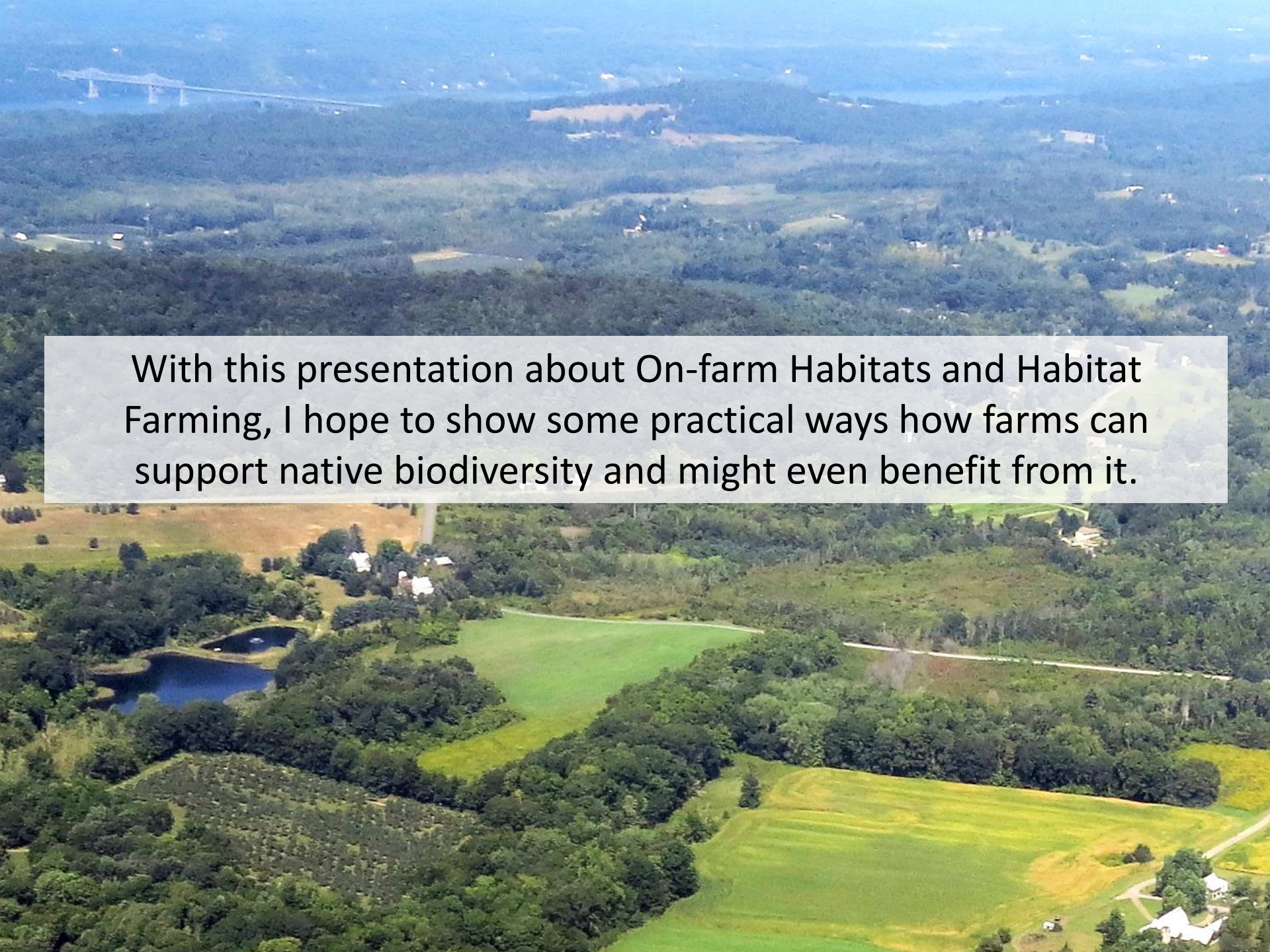




Because large areas of land are devoted to agriculture, farming can significantly support or damage native biodiversity, depending on how the farms are managed.







With this presentation about On-farm Habitats and Habitat Farming, I hope to show some practical ways how farms can support native biodiversity and might even benefit from it.



# What do farms provide for wild nature?



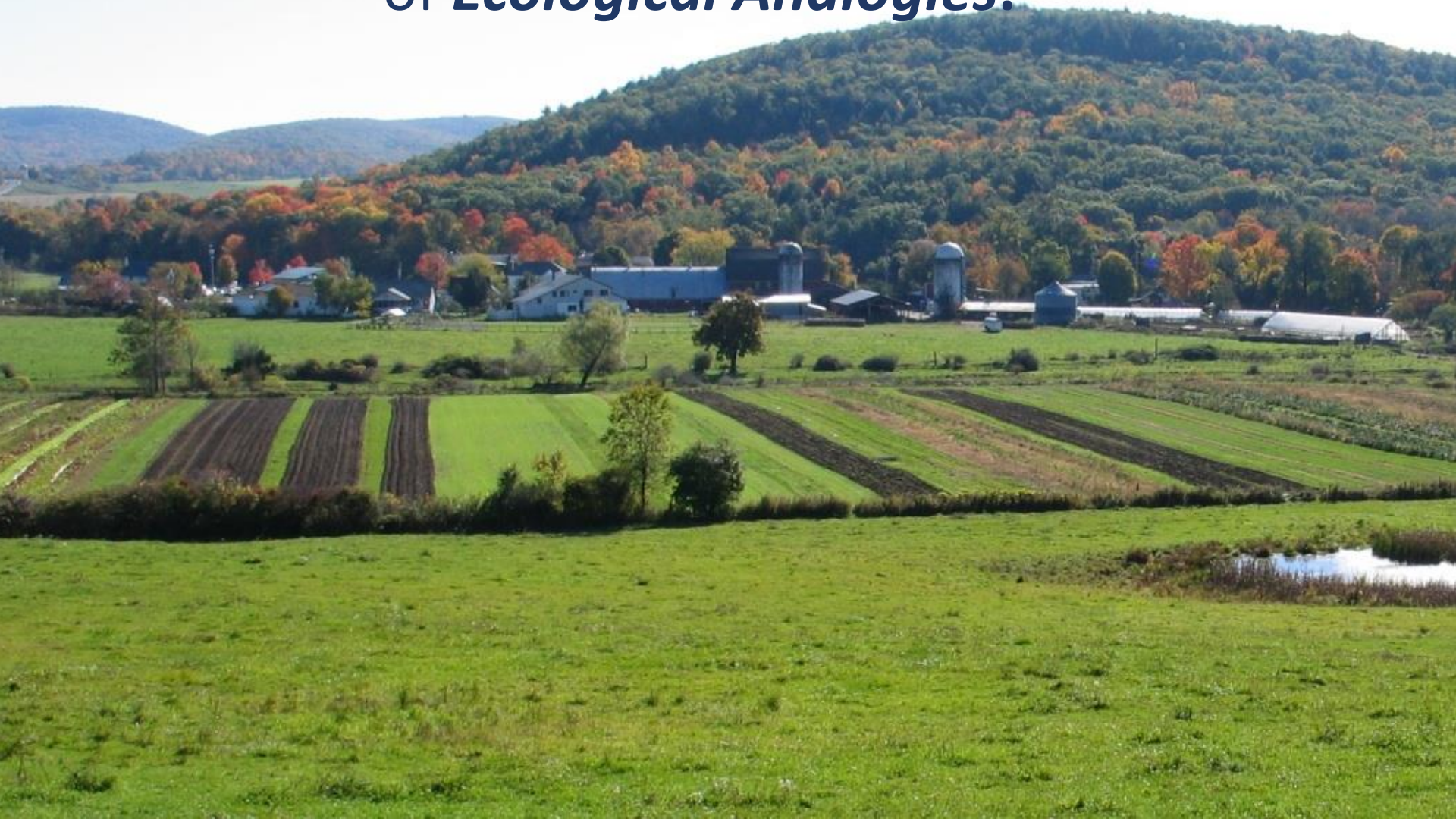


What do farms provide for wild nature?  
What does wild nature provide to farms?





What do farms provide for wild nature?  
We approach this question from the perspective  
of *Ecological Analogies*.





**Ecological analogies** refer to human-shaped habitats which, while not the ones that the given organism co-evolved with, offer enough similarities (or analogies) to be ecologically functional *for that species*.







Photo from Parks Canada



Common  
Yellowthroat

For example, some shrubland birds, who might have evolved to take advantage of **post-fire shrubland...**





Common  
Yellowthroat

For example, some shrubland birds, who might have evolved to take advantage of **post-fire shrubland**...



might find a suitable ecological analogy in a **shrubby pasture**





Wetland butterflies, who had evolved to live in and around **beaver ponds and beaver meadows...**



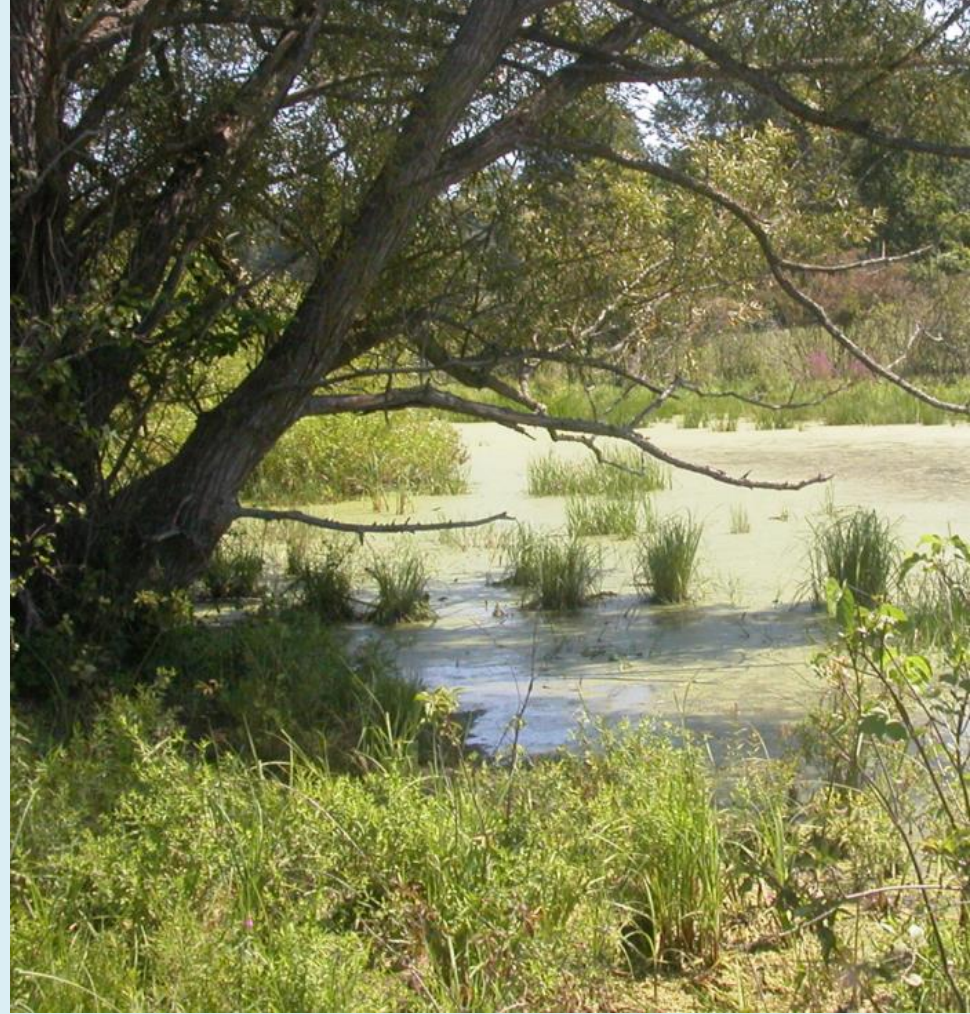
Baltimore Checkerspot





Baltimore Checkerspot

Wetland butterflies, who had evolved to live in and around **beaver ponds and beaver meadows...**



might find a suitable ecological analogy in loosely managed **farm ponds and wet meadows**





(photo from [http://virtual.parkland.edu/stelle1/len/biface\\_guide/chert/documents/glacial\\_till.html](http://virtual.parkland.edu/stelle1/len/biface_guide/chert/documents/glacial_till.html))

Meadowlark



Grassland birds, who  
had evolved to breed in  
Midwestern **Tallgrass**  
**Prairie...**



Meadowlark



sometimes find a suitable ecological analogy in a **mature hayfield**

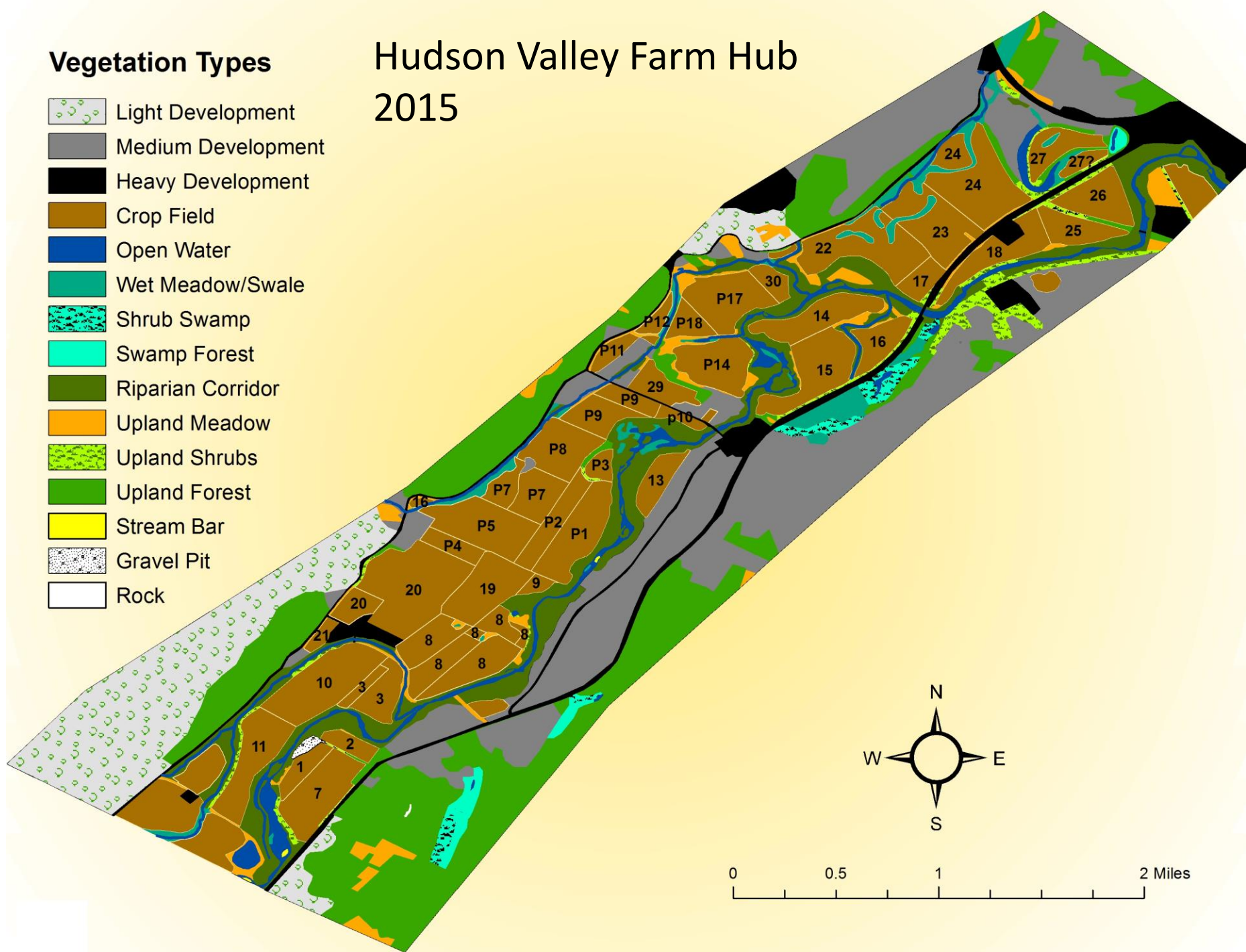
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## Vegetation Types

- Light Development
- Medium Development
- Heavy Development
- Crop Field
- Open Water
- Wet Meadow/Swale
- Shrub Swamp
- Swamp Forest
- Riparian Corridor
- Upland Meadow
- Upland Shrubs
- Upland Forest
- Stream Bar
- Gravel Pit
- Rock

## Hudson Valley Farm Hub 2015





	<b>Fields</b>	<b>Riparian Corridor</b>	<b>Upland Forest</b>	<b>Wet Meadows</b>	<b>Swales</b>	<b>Upland Meadows</b>	<b>Upland Shrub</b>
proportion of land within core area covered by vegetation map	62%	17%	6%	2%	1%	2%	2%
# locations rapidly inventoried for plants (FEP)	23	14	3	8	5	20	11
tot # plant specs documented (FEP)	133	194	30	148	22	245	185
# native plant specs documented (FEP)	49	145	21	102	7	135	107
% native plant species (FEP)	37%	75%	70%	69%	32%	55%	58%
# rare and unusual plant species (FEP)	3 or 4	15	2	7	0 or 1	17	15 or 16
# invasive plant species (FEP)	6	18	6	13	2	21	18



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On-farm habitats for native plants:

**Dry and Nutrient-Poor Meadows** (occasionally grazed or mowed)

Analogous to fire-maintained open areas?





# On-farm habitats for native plants:

**Dry and Nutrient-Poor Meadows** (occasionally grazed or mowed;  
Analogous to fire-maintained open areas?)





On-farm habitats for native plants and associated rare butterflies:  
**Dry and Nutrient-Poor Meadows** (occasionally grazed or mowed)



**Little Bluestem** (*Schizachyrium scoparium*)



**Cobweb Skipper**



**Leonard Skipper**



**Indian Skipper**



On-farm habitats for native plants: **Wet Meadows** (occasionally grazed or mowed); Analogous to beaver meadows





## On-farm habitats for native plants:

### **Wet Meadows** (occasionally grazed or mowed)



Great Blue Lobelia  
(*Lobelia siphilitica*)



Swamp Candle (*Lysimachia terrestris*)



Ragged-Fringed Orchid  
(*Platanthera lacera*)



On-farm habitats for native plants and butterflies:  
**Wet Meadows** (occasionally grazed or mowed)



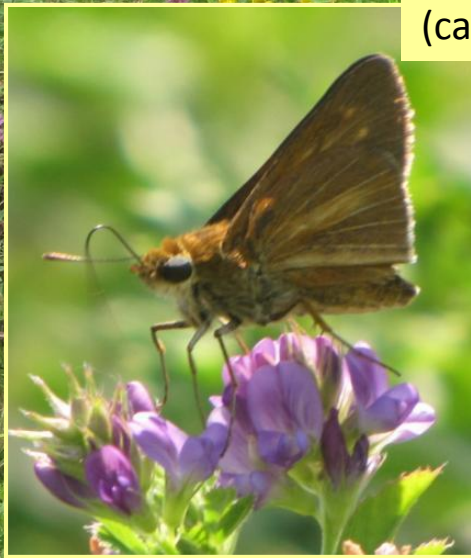
**Black Dash**

**Mulberrywing**



**Bronze Copper**

(caterpillars feed on *Rumex* sp.)



**Dion Skipper**

(caterpillars feed on sedges)



**Appalachian Brown**



**Baltimore Checkerspot**

(caterpillars feed on Turtlehead)



On-farm habitats for native plants and amphibians and reptiles:  
**Wet Meadows** (occasionally grazed or mowed)



Leopard frog



Ribbon snake



Spotted turtle



## On-farm habitats for native plants: **Hedgerows**

Analogous to forest and forest edges





## On-farm habitats for native plants: **Hedgerows**

Analogous to forest and forest edges





On-farm habitats for native plants: **Ancient Forest Remnants**  
Analogous to pre-colonial forest





# On-farm habitats for native plants: **Ancient Forest Remnants**

Analogous to pre-colonial forest





One Half of “Habitat Farming” is to recognize the value of these already existing on-farm habitats and to maintain them as habitats for native plants and animals (incl. pollinators and other species beneficial to the farmer)





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The other half of “Habitat Farming” is to create additional on-farm habitats to both support native biodiversity for its own sake, but also for beneficial organisms that can help the farmer with **crop pollination** and **pest control**.





# Examples of our pollinators





# Examples of our predators and parasitoids



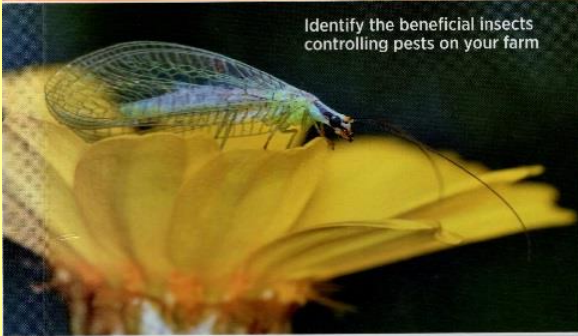


THE XERCES SOCIETY GUIDE

# Farming *with* Native BENEFICIAL INSECTS

Ecological Pest Control Solutions

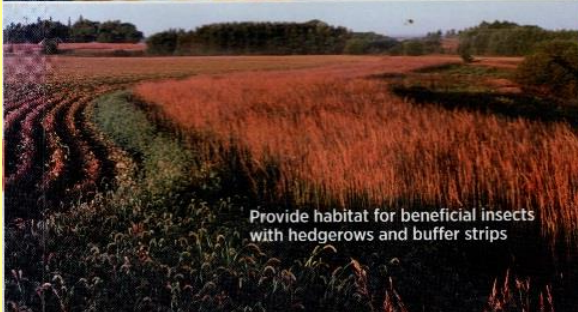
Identify the beneficial insects  
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Improve crop yields by  
reducing pest damage



Provide habitat for beneficial insects  
with hedgerows and buffer strips



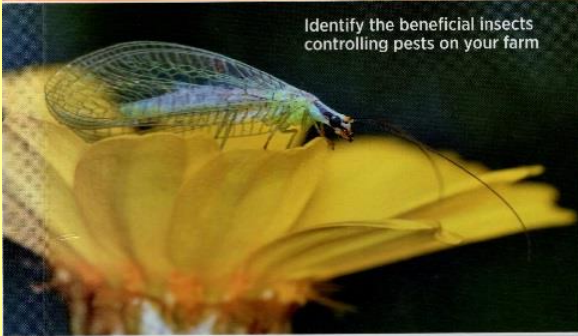


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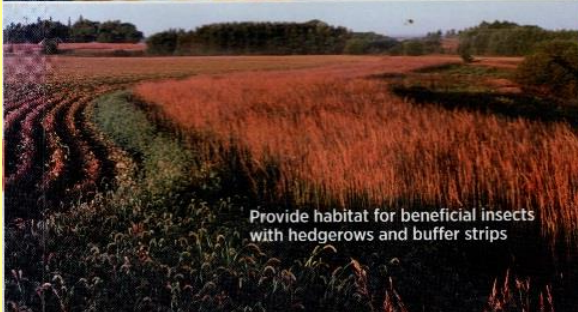
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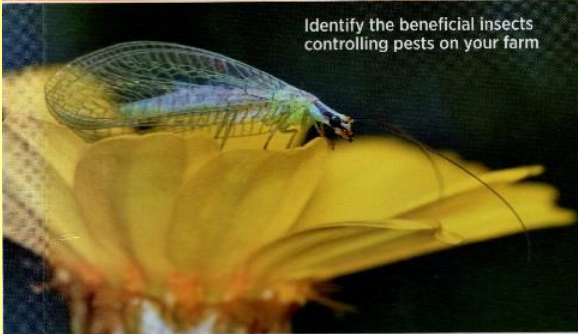
*“... Increasing the availability of flowers—especially native wildflowers—is often the single most important strategy for increasing the abundance and diversity of beneficial insects. Like pollinators, such as bees and butterflies, many insect predators and parasitoids feed on flower nectar or pollen during one or more of their life stages.”*




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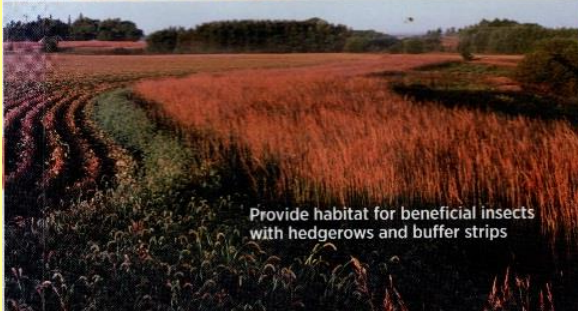
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In addition to flowers, beneficial insects need alternate sources of prey or hosts, as well as shelter (e.g., for hibernation and reproduction)

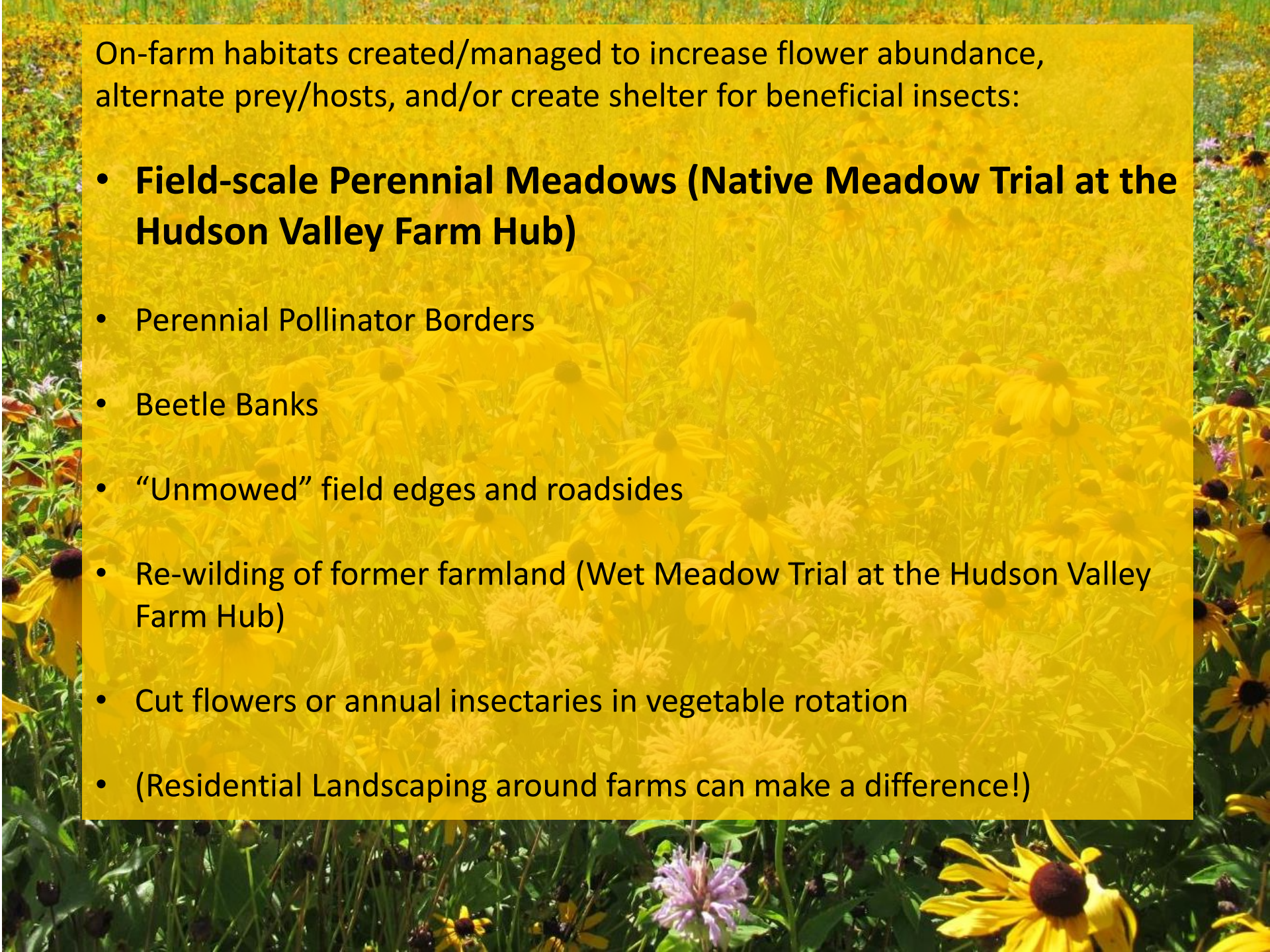




A few  
examples of  
intentionally  
created  
on-farm  
habitats

(USDA-NRCS  
offers cost-sharing  
and technical  
assistance to  
farmers through  
the EQIP)

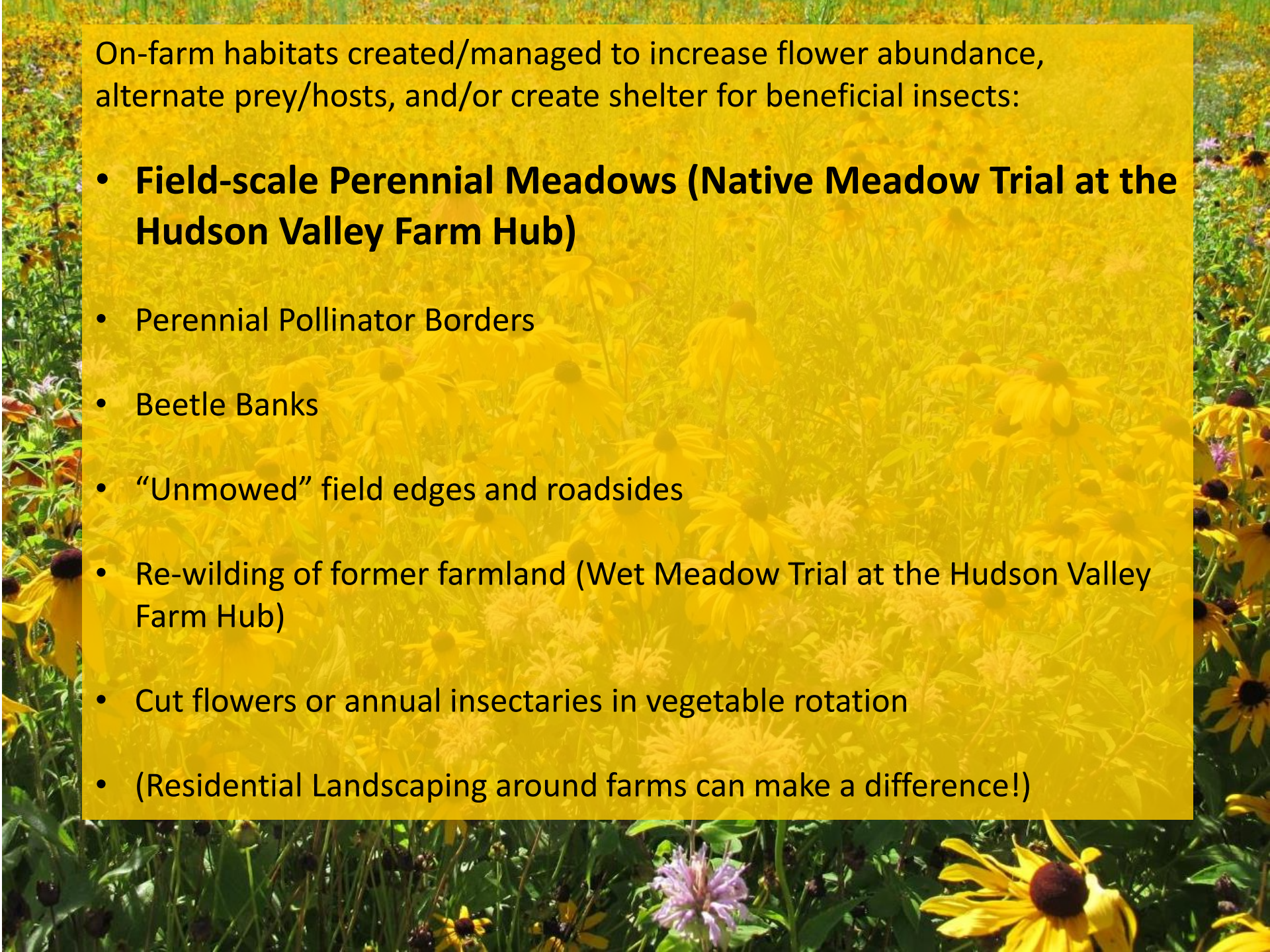


A vibrant field of yellow Black-eyed Susans and purple flowers, likely a meadow or pollinator garden, serves as the background for the text. The flowers are in various stages of bloom, and the overall scene is bright and colorful.

On-farm habitats created/managed to increase flower abundance, alternate prey/hosts, and/or create shelter for beneficial insects:

- Field-scale Perennial Meadows (Native Meadow Trial at the Hudson Valley Farm Hub)
- Perennial Pollinator Borders
- Beetle Banks
- “Unmowed” field edges and roadsides
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- (Residential Landscaping around farms can make a difference!)





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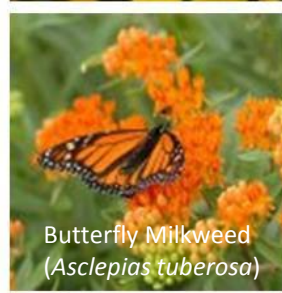
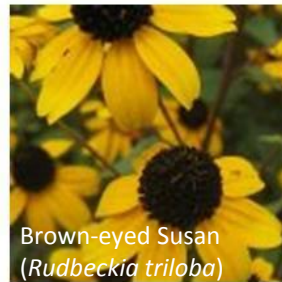
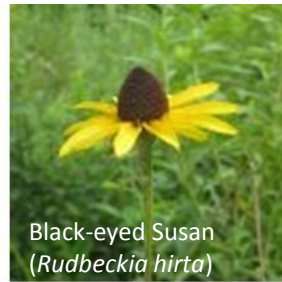
Native Meadow Trials in flood-prone former corn fields at the Hudson Valley Farm Hub





# Treatment A: species-rich seed mix (22 native wildflower species + one native grass)

designed with the help of Kelly Gill from the Xerces Society for Insect Conservation to create ideal pollinator habitat



(Plus: some short-lived annuals to get flowers during the first season)

Narrow-leaved Mountainmint (*Pycnanthemum tenuifolium*)

Lance-leaved Coreopsis (*Coreopsis lanceolata*)

Common Milkweed (*Asclepias syriaca*)

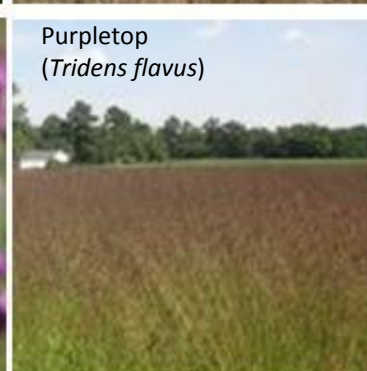
Wild Bergamot (*Monarda fistulosa*)

Slender Lespedeza (*L. virginiana*)

Pictures are from online seed catalogues, mostly by Prairie Moon



**Treatment B:** less diverse and cheaper seed mix (6 native wildflower species and 8 native grasses); designed with the help of Kelly Gill from the Xerces Society for Insect Conservation to create a workable pollinator habitat



(Plus: some short-lived annuals to get flowers during the first season)



# Site Preparation (2016), Seeding (2017), and Management (2017-2019) of the Native Meadow Trials:

2016 Summer: Rye Cover Crop  
Fall: Oat Cover Crop => Winter-killed

2017 Early Spring: Rye volunteered  
April to mid May: 3x Harrowing  
(*Perfecta II Harrow with S-tines*)  
May 19: Seeding (*Great Plains No Till Seeder*) 10 person hrs/acre  
July/Aug.: 3x Mowing to ~8"  
(*2x Flail Mower, Rotary Mower*)

2018 Late May to mid June:  
Selective Weeding/Mowing  
(*string trimmer and by hand*) 11 person hrs/acre

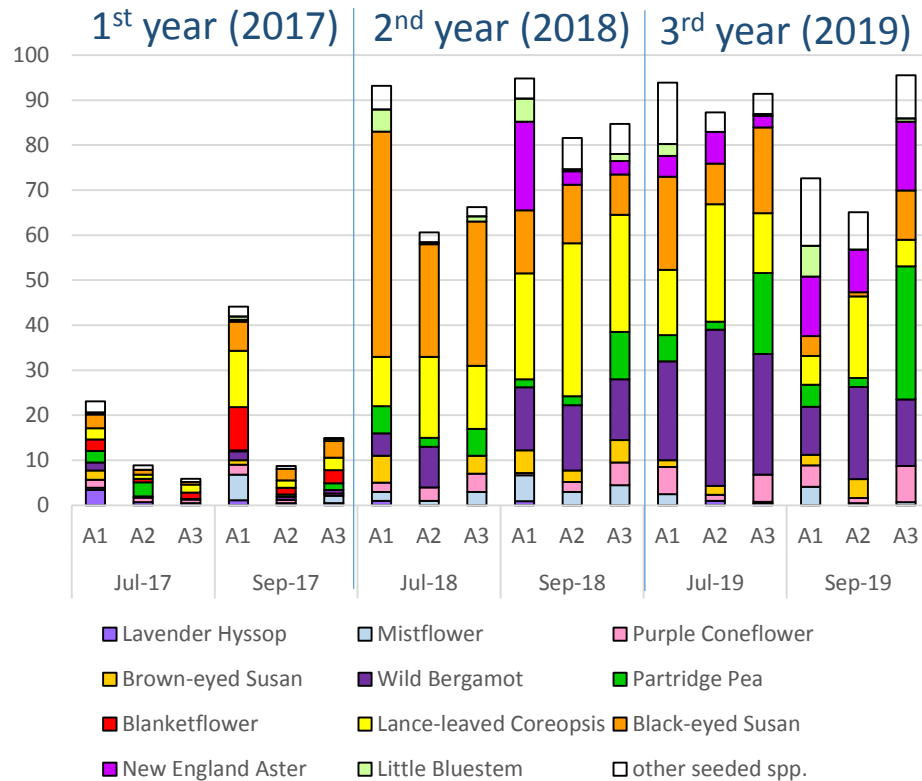
2019 May & September:  
Selective Weeding/Cutting  
(*with clippers and by hand*) 7 person hrs/acre



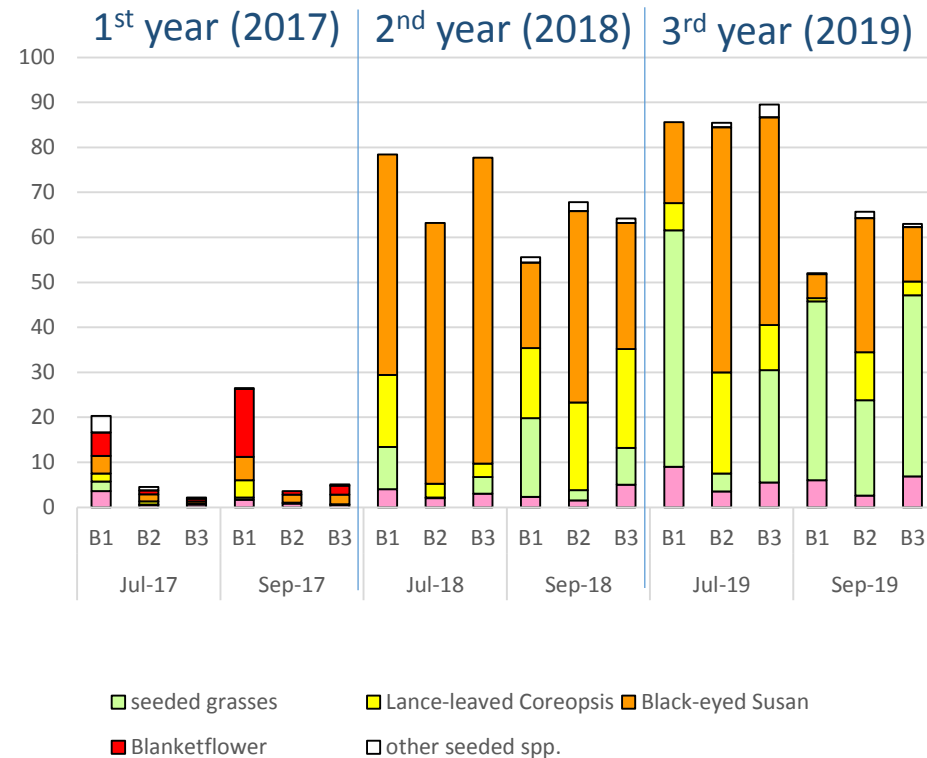


# Development of Plant Composition in Native Meadow Trials

% Cover of seeded plants Mix A



% Cover of seeded plants Mix B



1<sup>st</sup> year: “SLEEP” – 2<sup>nd</sup> year: “CREEP” – 3<sup>rd</sup> year: “LEAP”  
(Kelly Gill, Xerces Society)



# NMT 1A through its first year (2017)



12-April-2017 (3x harrowed)



19-May-2017 seeding



12-June-2017



3-July-2017 (mowed 6 July)



11-July-2017 (mowed 28 July)



4-Aug-2017 (mowed 15 August)



11-Sep-2017 (after 3 cuts)



3-Nov-2017



14-Dec-2017



# NMT 1A through its second year (2018)



27-April-2018



25-May-2018 (selective weeding)



19-June-2018



10-July-2018



9-Aug-2018



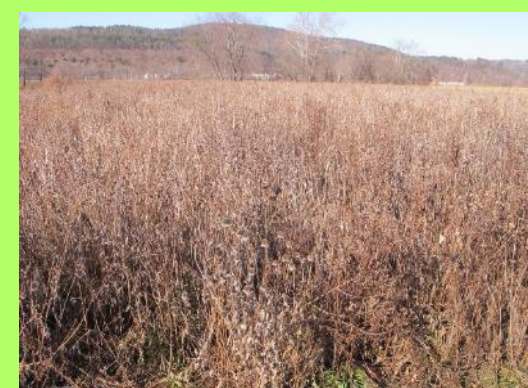
13-Sept-2018



24-Sept-2018



23-Oct-2018



10-Dec-2018



# NMT 1A in its third year (2019)



17-April-2019



22-May-2019



27-June-2019



15-July-2019



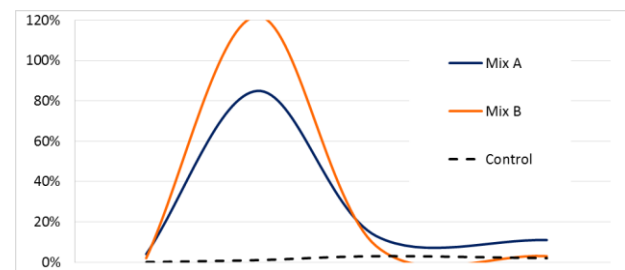
14-Aug-2019



20-Sept-2019



# Side-by-side Comparison of Flower Abundance in 2<sup>nd</sup> year (2018) Mix A (left) and Mix B (right)



10 July  
2018

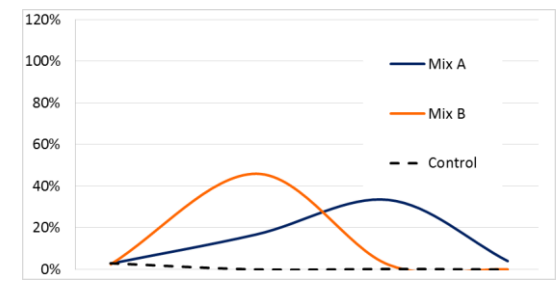


24 Sept.  
2018





# Side-by-side Comparison of Flower Abundance in 3<sup>rd</sup> year (2019) Mix A (left) and Mix B (right)



15 July  
2019



20 Sept.  
2019

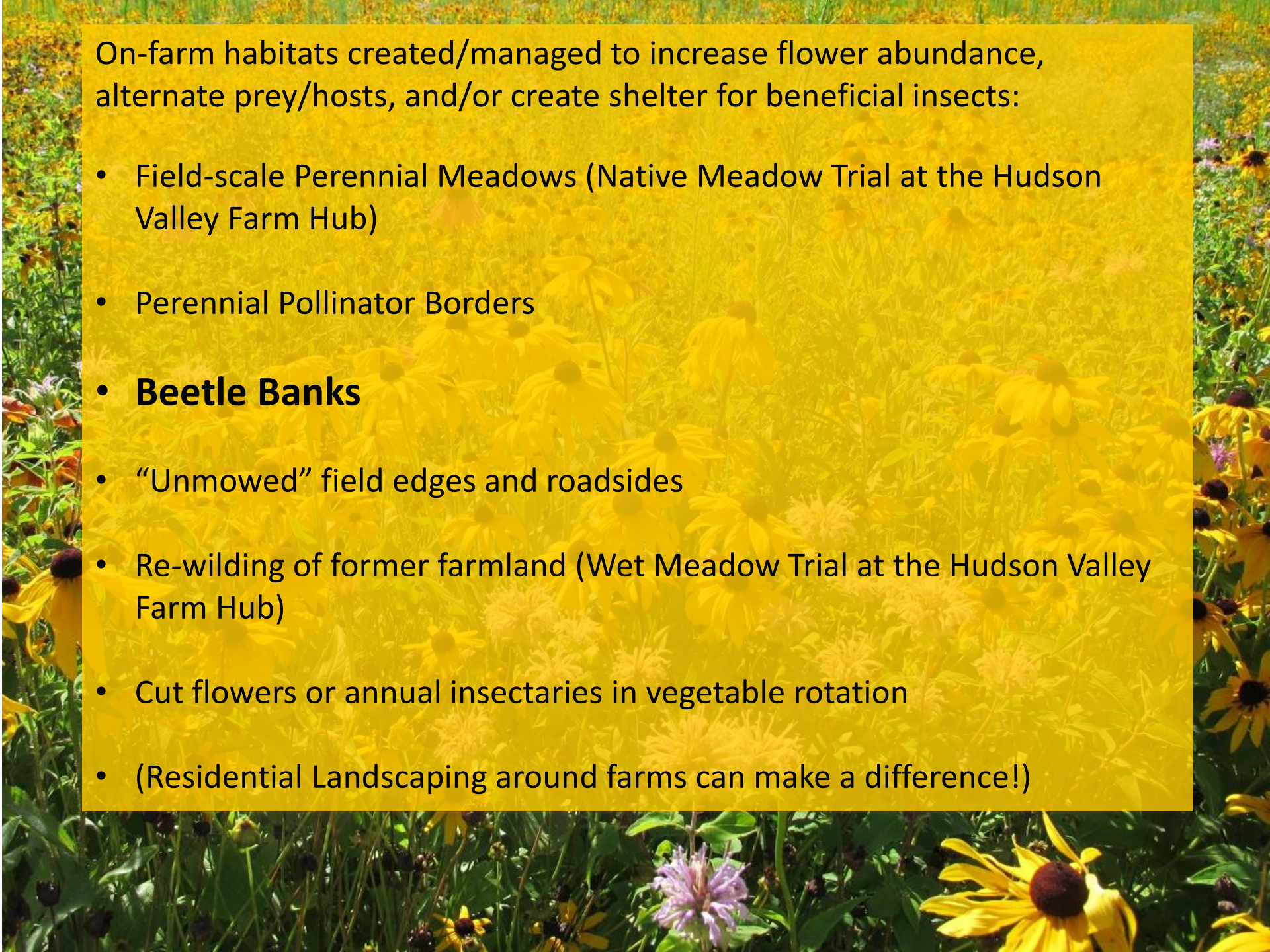






Control Plot in August 2019 (3<sup>rd</sup> season): dominated by Horseweed



A photograph of a field of yellow Black-eyed Susans with dark brown centers. A semi-transparent yellow rectangular box is overlaid on the left and center of the image, containing text. The background shows a dense field of these flowers under bright sunlight.

On-farm habitats created/managed to increase flower abundance, alternate prey/hosts, and/or create shelter for beneficial insects:

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- **Perennial Pollinator Borders**
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Perennial Pollinator Borders  
(Hawthorne Valley Farm)





## Perennial Pollinator Borders (Hawthorne Valley Farm)

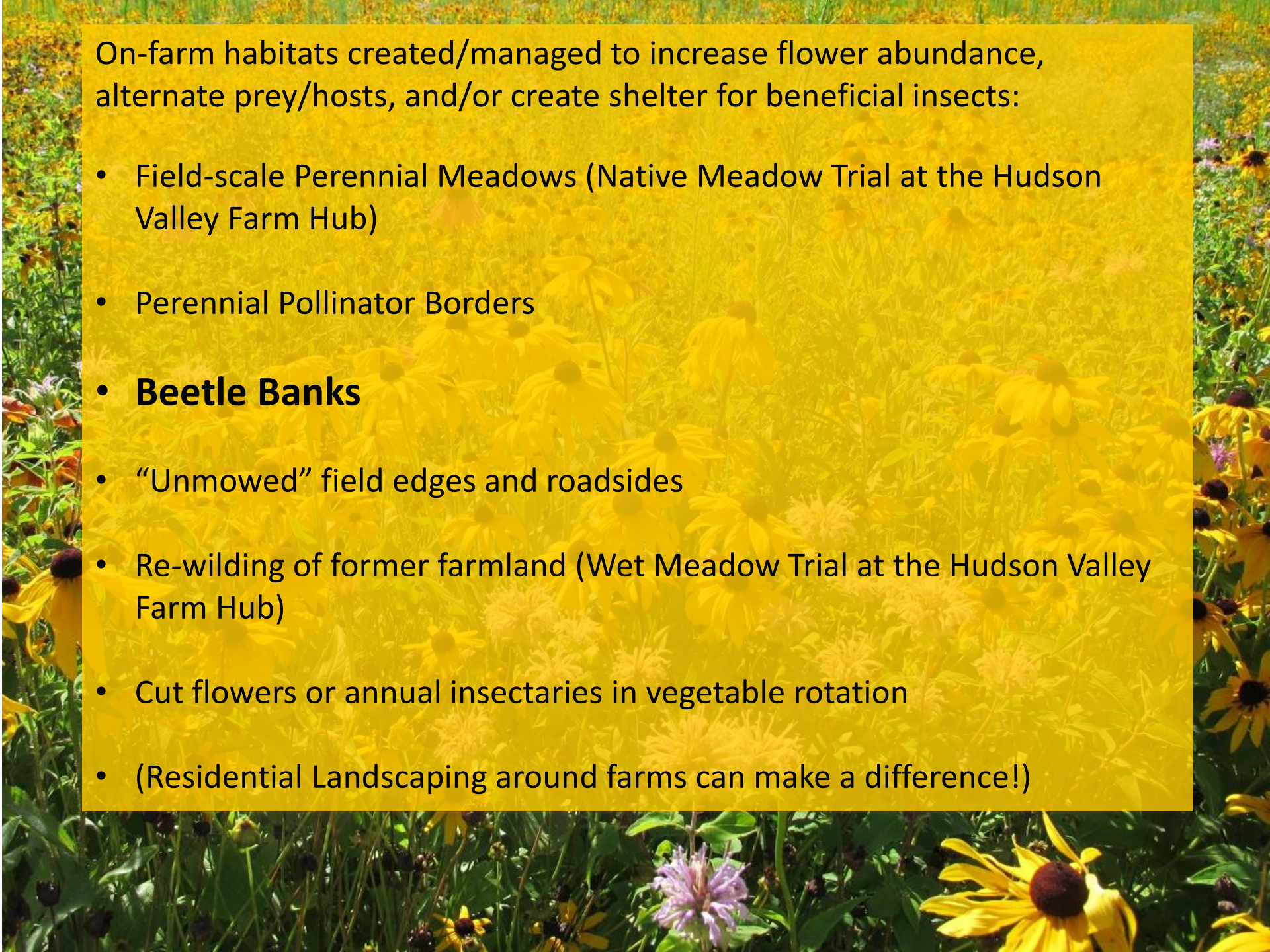




# Perennial Pollinator Borders (Hawthorne Valley Farm)





A vibrant field of wildflowers, primarily yellow Black-eyed Susans with dark brown centers, interspersed with some purple flowers. The background is a soft-focus field of similar flowers, creating a sense of depth. The lighting is bright, suggesting a sunny day.

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## Beetle Banks (Hawthorne Valley Farm)



14-Feb-2019

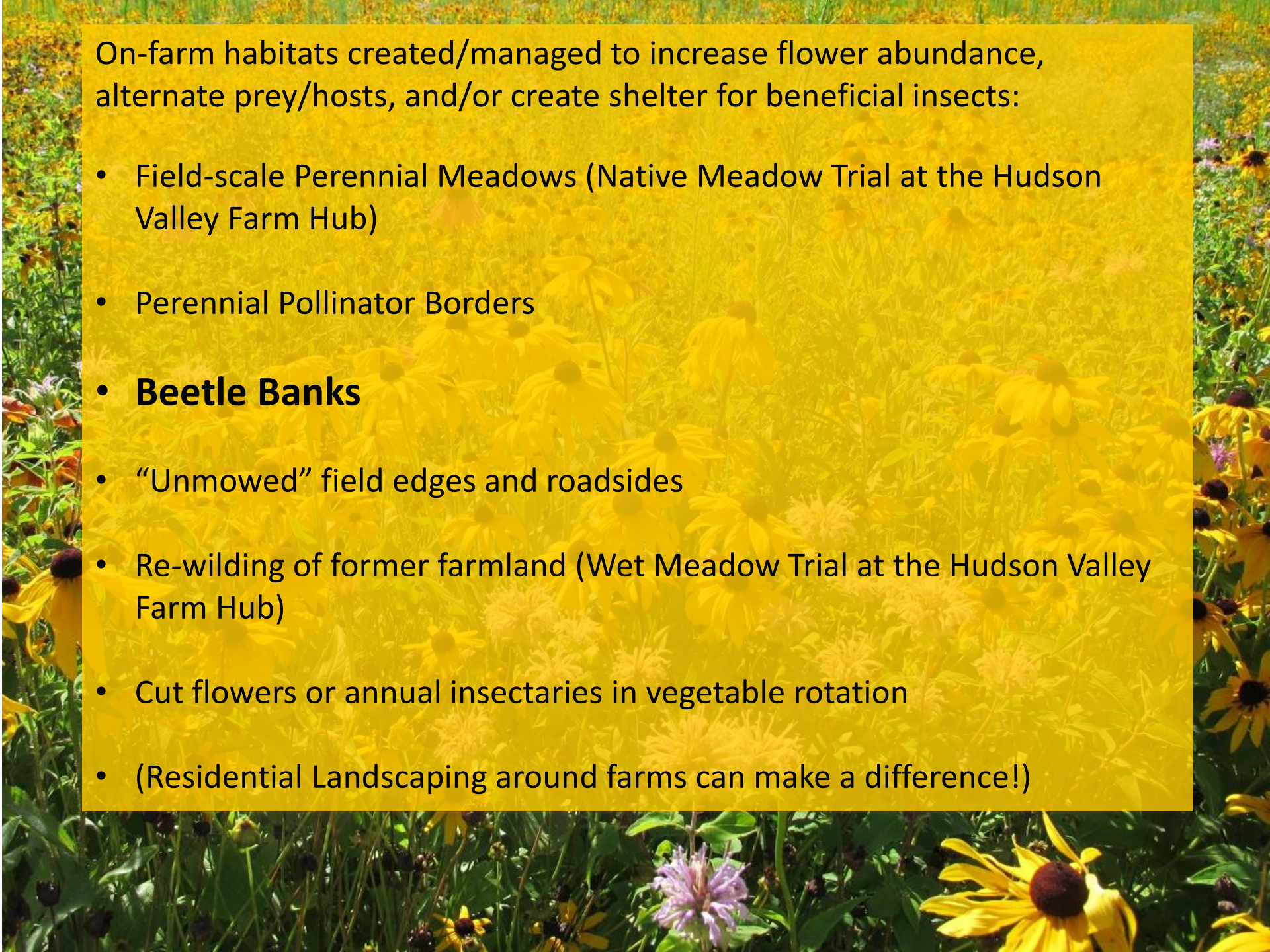


27-May-2019

10-July-2019





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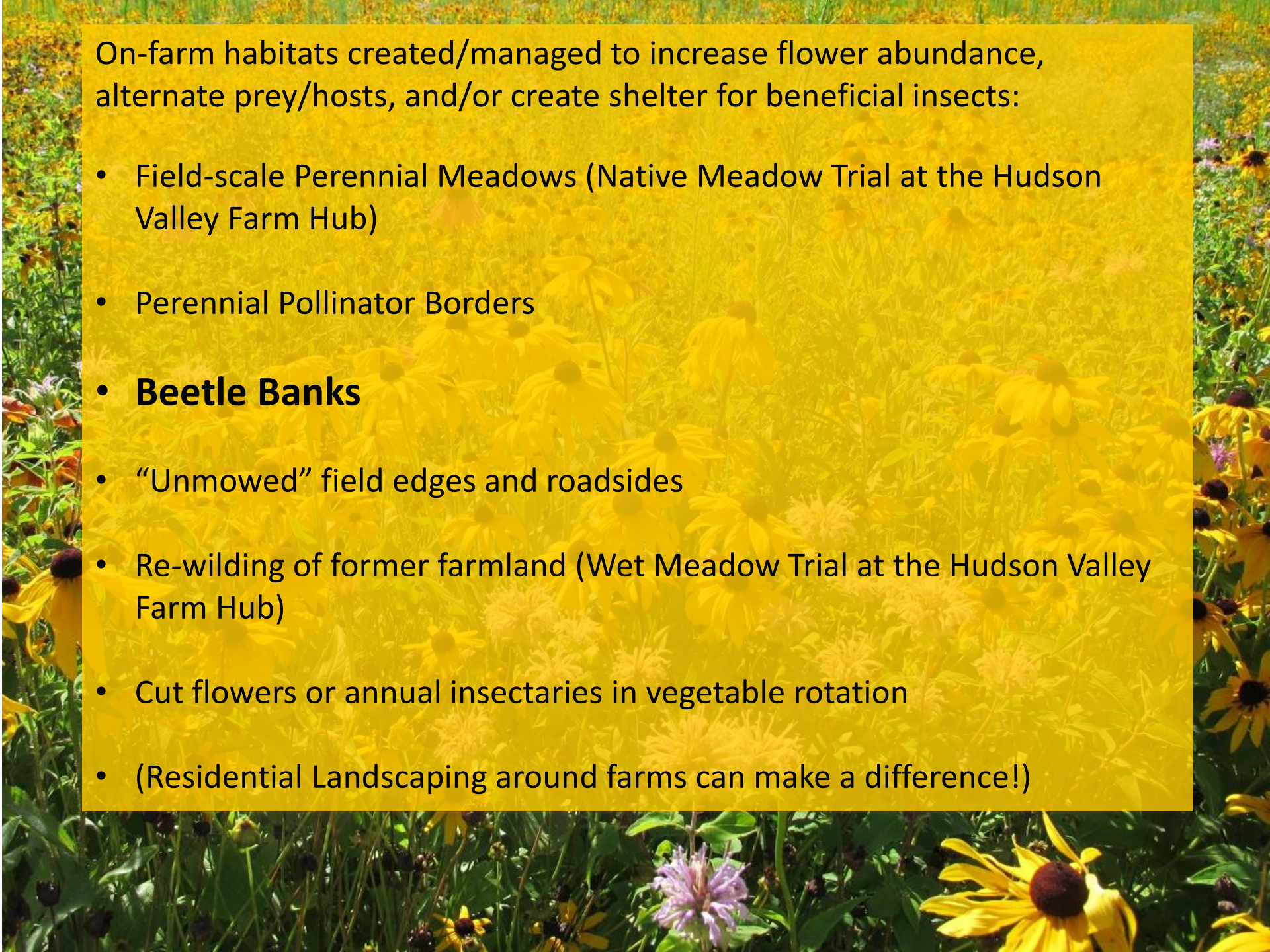
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“Unmow” field edges and roadsides (Hawthorne Valley Farm)





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Allow former farmland to remain fallow and to revegetate on its own or by enrichment seeding (Wet Meadow Trial at the Hudson Valley Farm Hub)



# Wet Meadow Enrichment Trials Seed Mix

Blue Vervain	<i>Verbena hastata</i>
Boneset	<i>Eupatorium perfoliatum</i>
Canada Bluejoint	<i>Calamagrostis canadensis</i>
Fowl Bluegrass	<i>Poa palustris</i>
Fox Sedge	<i>Carex vulpinoidea</i>
Great Blue Lobelia	<i>Lobelia siphilitica</i>
Joe Pye Weed	<i>Eupatorium fistulosum</i>
New England Aster	<i>Aster novae-angliae</i>
Nodding Bur Marigold	<i>Bidens cernua</i>
Rattlesnake Grass	<i>Glyceria canadensis</i>
Riparian Wildrye	<i>Elymus riparius</i>
Shallow Sedge	<i>Carex lurida</i>
Sneezeweed	<i>Helenium autumnale</i>
Squarestemmed Monkeyflower	<i>Mimulus ringens</i>
Swamp Milkweed	<i>Asclepias incarnata</i>
Virginia Wildrye	<i>Elymus virginicus</i>
Woolgrass	<i>Scirpus cyperinus</i>



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Allow former farmland to remain fallow and to **revegetate on its own** or by enrichment seeding (Wet Meadow Trial at the Hudson Valley Farm Hub)





Blue-eyed Grass



Rough Avenas



Ditch Stonecrop



Common Fleabane



Nodding Bur Marigold



Blue Vervain



Common Boneset



Monkeyflower

Allow former farmland to remain fallow and to revegetate on its own or by enrichment seeding (Wet Meadow Trial at the Hudson Valley Farm Hub)





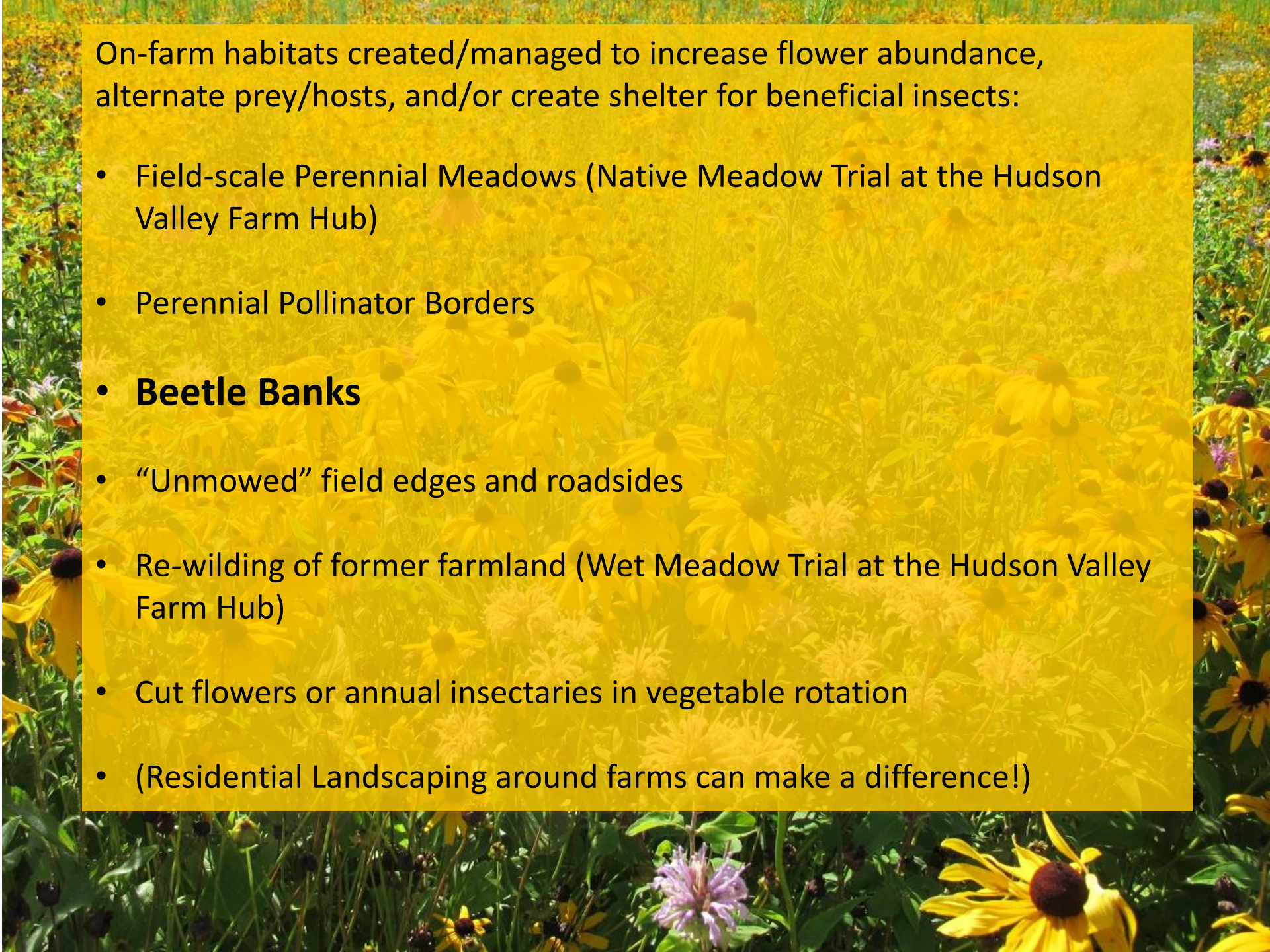
Allow former farmland to remain fallow and to revegetate on its own or by **enrichment seeding** (Wet Meadow Trial at the Hudson Valley Farm Hub)





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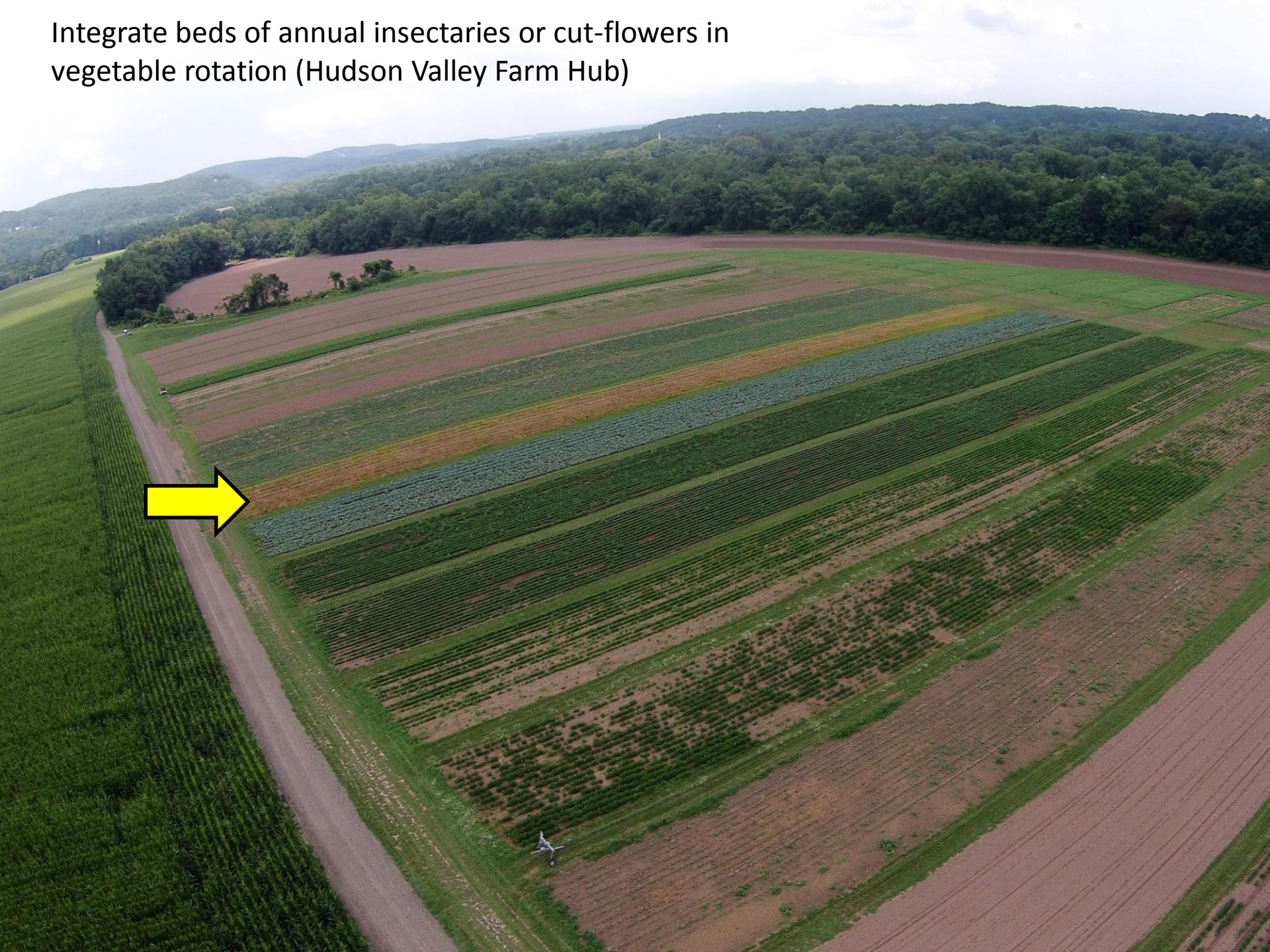
A vibrant field of yellow Black-eyed Susans and purple flowers, likely a meadow or pollinator garden, serves as the background for the text. The flowers are in full bloom, and the scene is bright and sunny.

On-farm habitats created/managed to increase flower abundance, alternate prey/hosts, and/or create shelter for beneficial insects:

- Field-scale Perennial Meadows (Native Meadow Trial at the Hudson Valley Farm Hub)
- Perennial Pollinator Borders
- Beetle Banks
- “Unmowed” field edges and roadsides
- Re-wilding of former farmland (Wet Meadow Trial at the Hudson Valley Farm Hub)
- **Annual insectaries or cut flowers in vegetable rotation**
- (Residential Landscaping around farms can make a difference!)



Integrate beds of annual insectaries or cut-flowers in vegetable rotation (Hudson Valley Farm Hub)





Integrate beds of annual insectaries or cut-flowers in vegetable rotation (Hudson Valley Farm Hub)



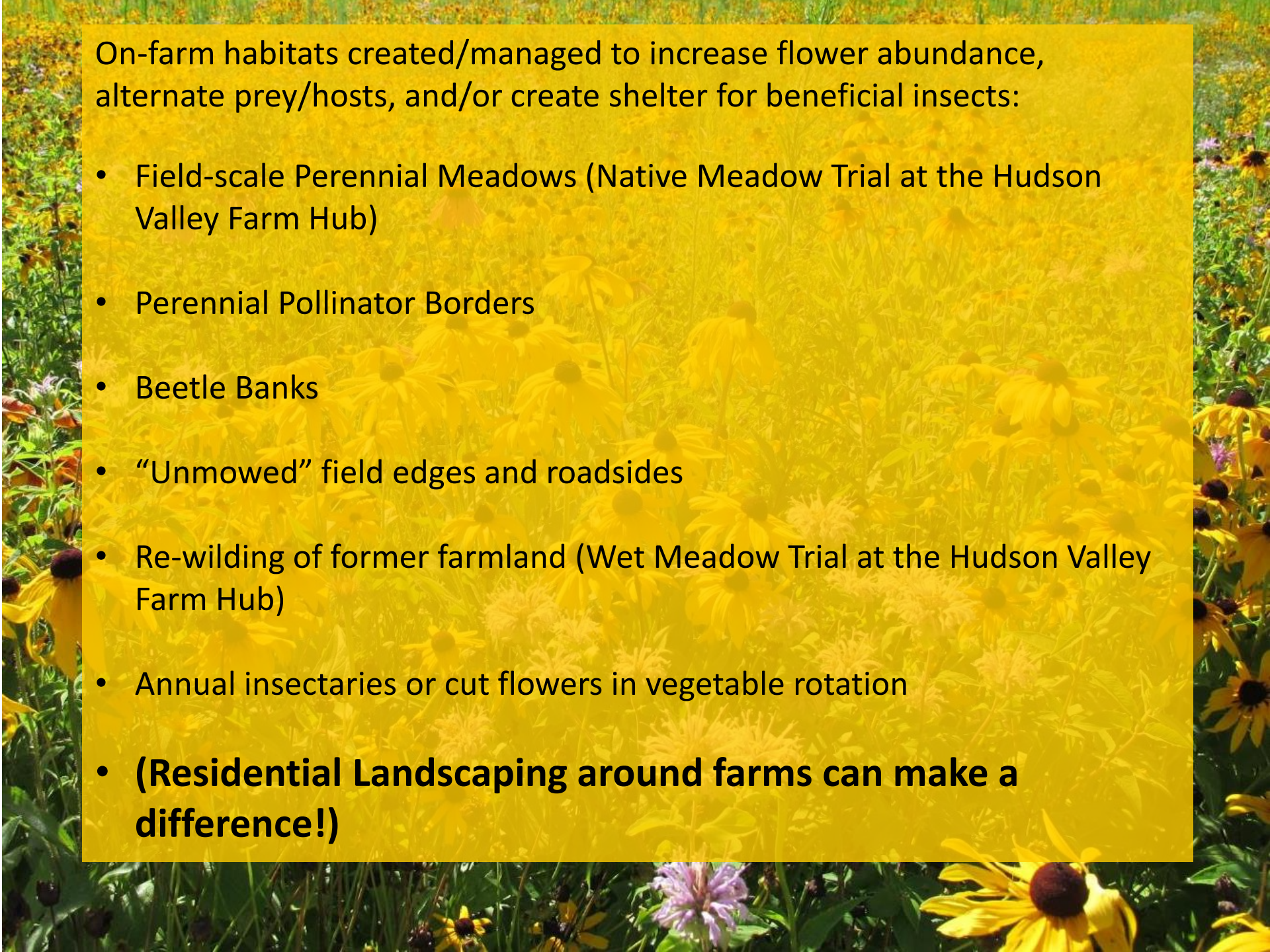
Plains Coreopsis insectary



Integrate beds of cut-flowers or annual insectaries in vegetable rotation (Hawthorne Valley Farm)





A photograph of a field of yellow Black-eyed Susans with a semi-transparent yellow text box overlaid in the center. The text box contains a title and a bulleted list. The background shows a dense field of these flowers under bright light.

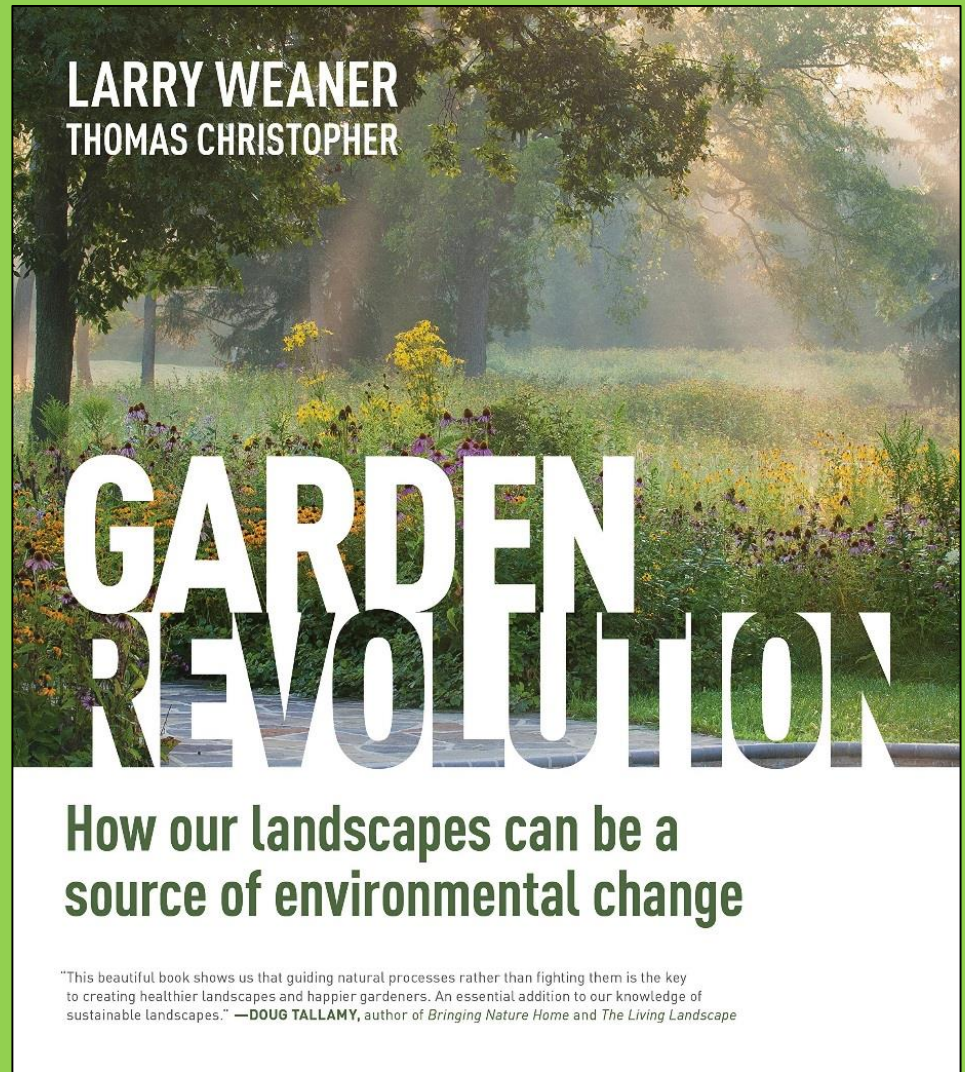
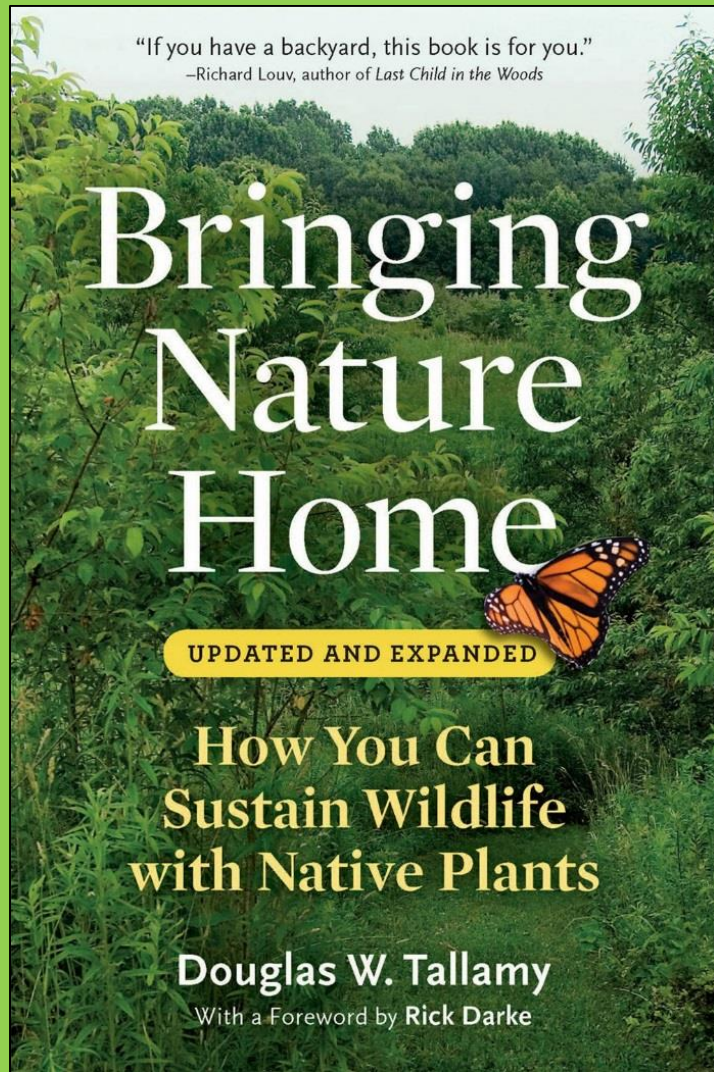
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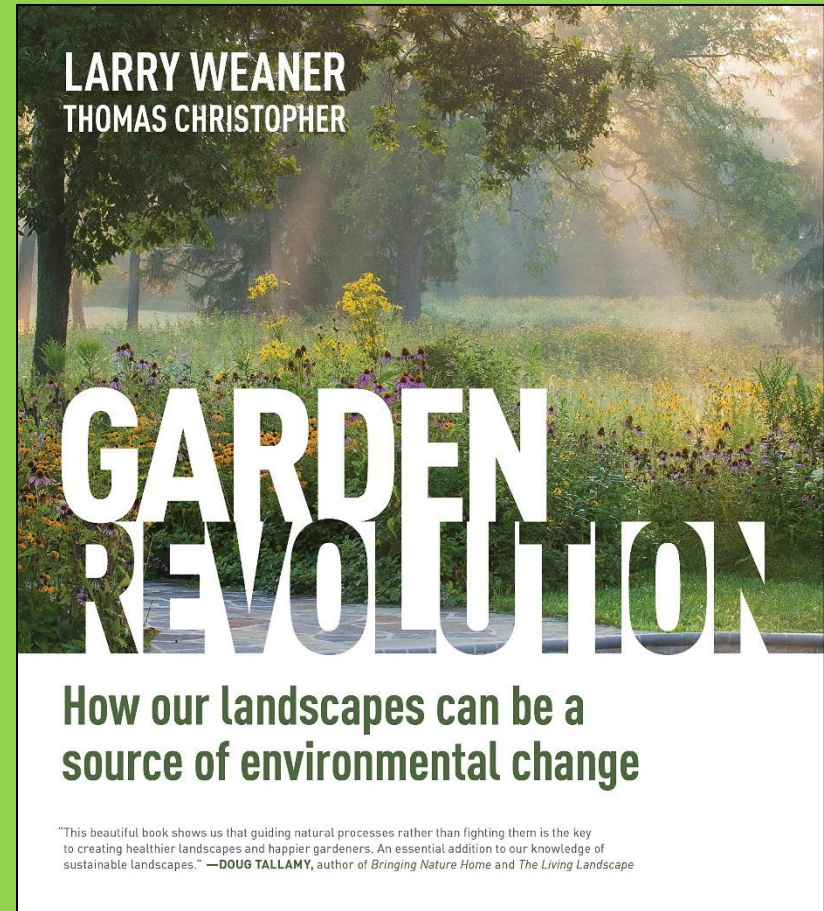
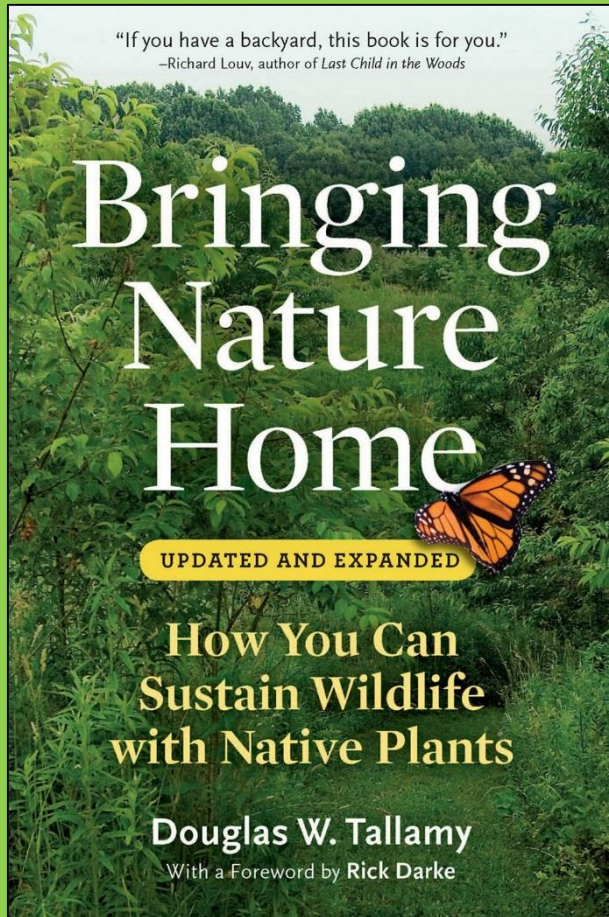






Resources such as these can help landscaped gardens and backyards become habitats for nature conservation as well as sources for beneficials for nearby farms.







# Thank You

... and the Hudson Valley Farm Hub for the opportunity to trial the creation of some of these on-farm habitats, and to all the farmers, farm crew, and staff who have helped in so many ways...

... and to the farmers of Hawthorne Valley and my colleagues and interns at the Farmscape Ecology Program for all their support.

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