Fields: Flora, Fauna, Forage and Fashion
Old New England
New England
New & Improved!
1) **Why? What’s a good field to do?**
   The different motives for maintaining fields, conservation being one of them, and how they interact.

2) **What? A field is not a field is not a field.**
   From a biodiversity perspective, there are many types of fields.

3) **Where? Adjusting to the neighborhood.**
   The biodiversity role of a field depends not only on its intrinsic qualities but also its context.
1) Why? What’s a good field to do? 
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Why maintain a field?

Food Production
Why maintain a field?

Aesthetics
Why maintain a field?

Biodiversity
Production Value

Biodiversity Value (for openland organisms)
Production Value  

Biodiversity Value (for openland organisms)
Biodiversity Value (for openland organisms)

Production Value

OR MAYBE
Biodiversity Value (for openland organisms) vs. Production Value
Most of the time, there are probably trade-offs at least in terms of biodiversity’s relation to immediate production value.

Yet, biodiversity can benefit production under at least some circumstances.

And fields may not continue to be fields without active intervention such as farm work.

If we accept that production and biodiversity are both good in their own right, then finding workable compromises involves knowing the trade-offs, setting the goals, and searching for the sweet spot.
There may not be any single, over-arching answer, but the search for answers that apply to particular circumstances seems key to finding workable compromises.

Some half-baked examples...
A bovine perspective on diversity
MILK PRODUCTION vs. # OF NATIVE PASTURE PLANTS

- **Low Production, High Diversity**
  - Orange oval

- **Moderate Production, Good Diversity**
  - Green oval

- **High Production, Low Diversity**
  - Blue oval

**Relative Milk Production Value of Given Pasture**
(within 24 hrs of grazing)

**Total Number of Native Plant Species found in Given Pasture**

**SOURCE:** FEP with help of farm apprentice Laura Weiland
MILK PRODUCTION vs. # OF NATIVE PASTURE PLANTS

Total Number of Native Plant Species found in Given Pasture

Relative Milk Production Value of Given Pasture (within 24 hrs of grazing)

Medicinal Leys?

SOURCE: FEP with help of farm apprentice Laura Weiland
Grassland Birds

Grasshopper Sparrow

Bobolink

Meadowlark

Loggerhead Shrike

Vesper Sparrow

Paintings by J.F. Lansdowne
Date of Fledging for Two Common Grassland Birds.

Hay Quality, Quantity and Value vs. Cut Date

Date of Fledging for Two Common Grassland Birds.

From:

How Cutting Date Affects Yield, Quality and Profitability of a Hay Crop
by Bill Lazarus, University of Minnesota and Dan Underander, University of Wisconsin

U.S. Department of Agriculture, Natural Resources Conservation Service.
Hay Quality, Quantity and Value vs. Cut Date

Date of Fledging for Two Common Grassland Birds.

Is it all or nothing?

From:

How Cutting Date Affects Yield, Quality and Profitability of a Hay Crop
by Bill Lazzaro, University of Minnesota and Dan Undersander, University of Wisconsin

An ‘Apple – Grass Savannah’
(aka apple orchard)

(Cricket photo by Lang Elliot and Wil Hershberger, songsofinsects.com; used with permission)
Conventional Orchard                Organic Orchard

Sonograms:  more light fuzz = more insect calls = more life
Conventional Orchard         Organic Orchard

Can appreciation for ecological beauty compensate in part for reduced
physical beauty?
Installed Native Plant Meadow

- High Aesthetic Value
- $2,000-10,000/acre to install, more to maintain
- 83 native plant species
- 23.5 Native Moth Species
- 17 Native Butterfly Species

Old Field

- Moderate Aesthetic Value
- Tax break if hayed
- 73 native plant species
- 27.5 Native Moth Species
- 14.5 Native Butterfly Species
What’s the biggest bang for the buck – when are a few really ‘good’ fields better than many almost as good fields?
Milk production and/or Plant diversity?

Hay quality and/or Grassland birds?

Apple saleability and/or Singing insects?

Aesthetic value (& biodiversity) vs. Relatively low-cost biodiversity conservation?

Perhaps not questions that can be explicitly and eternally answered, but ones that may help highlight information we should gather for particular situations.
1) **Why? What’s a good field to do?**
The different motives for maintaining fields, conservation being one of them, and how they interact.

2) **What? A field is not a field is not a field.**
From a biodiversity perspective, there are many types of fields.

3) **Where? Adjusting to the neighborhood.**
The biodiversity role of a field depends not only on its intrinsic qualities but also its context.
Just as humans create fields for a variety of aesthetic and production purposes; so too does considering their conservation role require recognizing a diverse repertoire of fields.
Where are our native grasslands?

Fig. 1—Looking east across dry valley at Hempstead Brook, east of Garden City, showing treeless horizon about ½ mile away. No traces of cultivation in this view. Sept. 29, 1909.
Beaver Meadow
Where do native organisms from these natural grasslands find habitats in our modern landscape, and what role does agriculture have in creating those habitats?
For whom does this habitat analogy work?

Rocky Hilltop

Thin-soiled Pasture
As meadows degrade, they become richer in native species.

<table>
<thead>
<tr>
<th>Associations</th>
<th>Warm to cool relatively dry regions</th>
<th>Cool moist regions</th>
<th>Cold moist regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kentucky bluegrass</td>
<td>Kentucky bluegrass</td>
<td>Kentucky bluegrass</td>
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<tr>
<td>2</td>
<td>Canadian bluegrass</td>
<td>Canadian bluegrass</td>
<td>Canadian bluegrass</td>
</tr>
<tr>
<td>3</td>
<td>White clover</td>
<td>White clover</td>
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<td>Bluegrasses</td>
<td>Bluegrasses</td>
</tr>
<tr>
<td>5</td>
<td>Red top</td>
<td>R. I. bent</td>
<td>R. I. bent</td>
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<tr>
<td>6</td>
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<td>R. I. bent</td>
<td>R. I. bent</td>
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<tr>
<td>7</td>
<td>Sweet vernal</td>
<td>Sweet vernal</td>
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<td>Kentucky bluegrass</td>
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<tr>
<td>9</td>
<td>Canadian bluegrass</td>
<td>Canadian bluegrass</td>
<td>Canadian bluegrass</td>
</tr>
<tr>
<td>10</td>
<td>White clover</td>
<td>White clover</td>
<td>White clover</td>
</tr>
</tbody>
</table>

A table from the 1929 work of Cooper and colleagues showing the plants associated with progressively degrading pastures under three climatic conditions. Soil impoverishment increases in associations 1-7. Introduced grasses and clovers dominate the nutrient rich pastures, but progressively give way to native species as pastures degrade.
Dry and nutrient-poor meadows provide habitat for a large number of uncommon native plants in Columbia County.
Dry and nutrient-poor meadows often support the native prairie grass Little Bluestem (*Schizachyrium scoparium*), which is host plant for the caterpillars of rare butterflies. These Little Bluestem meadows taste like prairie to the caterpillars...
Smooth Aster (*Symphyotrichum laevis*)

Heath Aster (*Symphyotrichum ericoides*)

Gray Goldenrod (*Solidago nemoralis*)

Silverrod (*Solidago bicolor*)

Sweet Fern (*Comptonia peregrina*)
Bluecurls (*Trichostoma dichotoma*)

Blue waxweed (*Cuphea viscosissima*)

Lady’s Tresses (*Spiranthes lacera*)
Wet Meadows have a high number and high proportion of native plant species compared to other on-farm habitats.

Total Spp. (194) 95 194 158 109 159 31 68 97 45

- **Habitat**
  - Proportion of native and introduced plants in each habitat

- **64%**
Examples of uncommon native plants from **wet meadows**

- **Nodding Lady's Tresses** (*Spiranthes cernua*)
- **Swamp Candle** (*Lysimachia terrestris*)
- **Cardinal Flower** (*Lobelia cardinalis*)
- **Yellow Stargrass** (*Hypoxis hirsuta*)
- **Ragged-Fringed Orchid** (*Platanthera lacera*)
- **Allegheny Monkeyflower** (*Mimulus ringens*)
Butterfly host plants of **Wet Meadows**: e.g. **Sedges** (*Carex sp.*)

- **Mulberrywing**
- **Dion Skipper**
- **Black Dash**
- **Appalachian Brown**

**Hop Sedge** (*Carex lupulina*)
Butterfly host plants of **Wet Meadows**: e.g. **Docks** (*Rumex* sp.)

**Bronze Copper** caterpillars feed on docks
Butterfly host plants of **Wet Meadows**: e.g. **Turtlehead** (*Chelone glabra*)

**Turtlehead** (*Chelone glabra*)

**Baltimore Checkerspot**
caterpillars feed on Turtlehead
Wet Meadows: Amphibians and reptiles of conservation interest

- Ribbon snake
- Leopard frog
- Spotted turtle
Mature Hayfields
Upland Hayfield in Columbia County

Tall Grass Prairie in Illinois

(photo from http://virtual.parkland.edu/lstelle1/len/biface_guide/chert/documents/glacial_till.html)
Population Trends of Grassland-breeding Birds

Population Trend in New York State from 1980-85 to 2000-05

- Henslow’s Sparrow - 80%
- Upland Sandpiper - 65%
- Vesper Sparrow - 50%
- Grasshopper Sparrow - 42%
- Horned Lark - 37%
- Eastern Meadowlark - 25%
- Field Sparrow - 16%
- Bobolink - 8%
- Killdeer - 4%
- Red-winged Blackbird - 2%
- Northern Harrier - 1%
- Song Sparrow - 1%
- Savannah Sparrow + 2%

(The Second Atlas of Breeding Birds in New York State 2005)
Mature Hayfields

Can be important for grassland birds, less so for native plants and invertebrates.

Average Number of Plant Species per Meadow

(N=7)  (N=18)  (N=28)

<table>
<thead>
<tr>
<th></th>
<th>hay</th>
<th>dry</th>
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<td></td>
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<tr>
<td>70</td>
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</tbody>
</table>

Legend:
- green: native
- orange: non-native
Mature Hayfields
Can be important for grassland birds, less so for native plants and, partially as a consequence, invertebrates.
Understanding the different field types lets one accentuate the positive. From a nature conservation perspective, what potentials does a given farm have and, given those afore-mentioned trade-offs, what might be most ‘fitting’?
1) **Why?** *What’s a good field to do?*
The different motives for maintaining fields, conservation being one of them, and how they interact.

2) **What?** *A field is not a field is not a field.*
From a biodiversity perspective, there are many types of fields.

3) **Where?** *Adjusting to the neighborhood.*
The biodiversity role of a field depends not only on its intrinsic qualities but also its context.
Fields don’t exist in isolation. For example....
Understanding a particular field’s importance as a relatively permeable wildlife corridor may highlight a previously unconsidered role.
Roland Kay’s data from Fisher tracking in Albany
Context can happen at all scales.
Resource juxtaposition can affect the relative conservation value of a field.
Average Ranked Butterfly Abundance Across the Seasons (1 = high)

kms of road within 1,500m of focal orchard
Historical context matters
INTRODUCING
OUR NOMINATION FOR
THE COLUMBIA COUNTY ANT
Formica prociliata

- Can make large colonies with conspicuous nests in open fields.
Not previously known farther east than Ohio.

Why in Columbia County?

Map and ant work by Kyle Bradford.
Perhaps in part because of history.
Edna St. Vincent Millay (1892-1950)

at Steepletop in Austerlitz (1925-1950), now a National Historic Landmark

http://www.millaysociety.org
http://en.wikipedia.org
For a variety of reasons, Columbia County may have a relatively high density of agriculturally poor fields that are still at least partially open; from an ant’s perspective, these might be special habitat.

And maybe not just for ants...
Pale Green Orchid
(Platanthera flava)
Wood Lily (*Lilium philadelphicum*)

Closed Gentian (*Gentiana clausa*)

Spiked Lobelia (*Lobelia spicata*)
Remember people?
Beyond the farmer,
The social context is also important for determining the conservation value of fields.
Male Bobolinks at Point Counts, June 2016

- 0
- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 13

Ownership

- pink: leased
- white: owned

Scale: 0 1,000 2,000 Feet
It is the land availability due to relatively easy hayfield leasing that helps enable Hawthorne Valley to consider Bobolinks.
For us to form a functional vision of a grass-based food system that ‘works’ for people and for nature
we may need to step back and consider context,
we may need to understand the different sorts of fields and organisms in the landscape,
and we may need to specify what we want to get from our fields and understand the ecology and sociology of our interacting goals.
It may not turn out looking like a 19th century pastoral, but we are probably going to need the landscape-scale cultural and ecological vision the Hudson River School implied and that, consciously or not, some communities in that landscape practiced.
Other Native Bees

Context helps determine the
July

Crops
At least one quarter of the summer bee species in crops started the season on spring ephemerals.
We are going to need to incorporate our new agronomic and ecological understandings together with the new realities of land ownership.

This evening can help you be part of that.
Comparative Plant Diversity and Composition in Upland Meadow Habitats

Average number of plant species per sample location

- **Dredge spoil meadow** (n=3): 23.0
- **Gravel pit/quarry** (n=6): 105.0
- **Utility corridor** (n=3): 101.3
- **Cemetery** (n=6): 78.8
- **Hay/pasture** (n=9): 39.9
- **Old field** (n=30): 62.5
- **Dry meadow** (n=18): 64.0
- **Blueberry field** (n=4): 68.3

Legend:
- **Invasive**
- **Non-native**
- **Native**
Little Bluestem (*Schizachyrium scoparium*)
Little Bluestem (*Schizachyrium scoparium*)
Little Bluestem (*Schizachyrium scoparium*)
Little Bluestem (*Schizachyrium scoparium*)
Little Bluestem
(Schizachyrium scoparium)

Indian Skipper

Cobweb Skipper
Management for Habitat Conservation:
• No fertilizer!
• Rotational mowing/grazing
• Mow after grassland birds have fledged
• Burning?
# of Native Plant Species

<table>
<thead>
<tr>
<th>TYPE OF GRASSLAND</th>
<th>Intensive Pastures</th>
<th>Cemeteries</th>
<th>Mature Ag. Fields</th>
<th>Landscaped Native Meadows</th>
<th>Drier Pastures</th>
</tr>
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Accentuating native openland plant diversity means a certain agronomic and landscaping mindset.